

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

EDEN 2017 ANNUAL Conference

Diversity Matters!

EDEN 2017 Annual Conference

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Edited by

Airina Volungeviciene, András Szűcs

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Introduction

The skills and knowledge required to take an active part in a society characterised by digital technology are embedded, learned, and practiced in people's daily lives. The ever-changing media- and technology landscapes create opportunities for learning at all stages in life in formal and informal settings. New policies and practices entailed by the high presence of digital tools have to take into account the "inclusion" or "exclusion" of different groups in society.

Technology and open education open doors to groups of learners from a range of backgrounds, generations, cultures with different languages, literacies, and ways of communication. It is difficult in the meantime to meet the evolving skills demand in the globalising value chains. Lifelong Learning is not yet a reality for most!

The behaviour, interests and roles of learners are also repositioned. Technological innovation implies faster learning, and instruction has to be "useful" in order to motivate and engage students. In order to strengthen and stabilise learning, the collaboration between the human mind and the machine have to be regularly reconsidered.

It is of great importance to study how the educational framing, from policy level down to the actual learning situation, allows for various types of e-learning, open and distance education. Diversity also causes fragmentation in learning achievements which should be carefully managed, without losing identity of learners. One challenge is the often fragmented view of what has been achieved theoretically and practically in this field, and the ever-increasing offer of technology. Co-ordination of information, knowledge and creativity is of high importance for the educational experience.

How do educators deal with diversity in media and technology enhanced learning environments? How can such diversity be accounted for and used to transform and adapt online learning settings? **How do teachers and policy makers meet digital inequalities – what are the impacts of increasing complexity of stakeholder groups of education?** What will be the effects of socio-economic demands and large scale migration on learning?

Will the digital pedagogy arsenal be able to manage diversity in media and technology enhanced learning? How can learning analytics help in assessing and handling diversity in learners background and performance

How do we bring together the strengths of the past with the opportunities for the future?

The responsibility of the scholarly community includes the proper handling of diversity in education with respect to learners' profiles, backgrounds, generations, cultures with different languages, literacies, and ways of communication as well as diversity in media and technology enhanced learning environments. **We need renowned reflections of practice that support paradigm-changing transformations based on systematic knowledge.**

EDEN 2017 is the forum that offers a chance to work together for these goals, and to gain further insight into the core questions.

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Dean of Research, Jönköping University

Airina Volungeviciene
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ICT SUPPORTED COMPETENCE DEVELOPMENT – WHAT DIFFERENCE DOES ICT MAKE?

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In the Swedish adult education system, distance education is often presented as a solution for making education flexible and available to all learners. As a supporting device, ICT has been reported to enhance peoples' ability to develop capacity for learning and hence for professional competence development. In this contribution, we intend to scrutinize the veracity behind this assertion. Within the framework of the Swedish National Center for Lifelong Learning (ENCELL) we have been involved in several research and evaluation projects where ICT, in different forms, has been applied. We will take a closer look at two of these projects.

In the first project ITiS (ICT in School) the Swedish Government initiated a huge competence development of about 70 000 teachers in Swedish schools between the years 1999-2003. The main objective of this initiative was to develop new forms of cooperative learning with the support of ICT.

In the second project ECIL (European Certificate in Intergenerational Learning), the five European participating countries developed a distance education program that would be available in their home countries. A special focus on generational issues connected to ICT was addressed.

Out of the empirical evidences observed in these two research and evaluation projects we intend to review:

1. the distinction between the workplace related and the workplace situated competence development when ICT as a learning device is involved, and
2. if and how ICT as a tool for competence development contributed to make any difference for the outcome of learning for the individual learner, the working team and the organization.



INCLUSION AND INTEGRATION IN SWEDEN: USING VIDEO CHAT FOR NEW ARRIVALS IN SWEDEN – HOW TO LEARN SWEDISH LIVE WITH SWEDES ONLINE – EASY, FLEXIBLE, INFORMAL, FAST, FUN

Henrik Hansson, William Boman, Albert Jungselius, Stockholm University, Sweden

Introduction

In a time when immigration often is described as a burden, this presentation focus on how the resources brought by the new arrivals could enrich the Swedish society. The basis is an innovative video chat for new arrivals in Sweden and its potential for language learning and contact between new arrivals and established Swedes. Focus is on the role of innovative information and communication technology (ICT) services including distance education and informal cross-border communication. Demonstration of the newly developed IT-service will be conducted in relation to the following issues:

- How can the language diversity of the new arrivals be utilized as a resource?
- How can a purpose built video-Internet system facilitate the integration of new arrivals?
- What incentives need to be developed to include the Swedes and the local community?
- What kind of ethical guidelines need to be applied regarding integrity and how open the personal data should be in a specially designed ICT system for new arrivals?
- How can innovative ICT systems shorten the time for new arrivals to get internships and work in Sweden?

The broader context

One of the major challenges we are facing today is the integration of new immigrants (Andersson, 2016; Fjellner & Edin, 2016). Sweden is now much more heterogeneous than the situation some 50 years back in time, and this diversification of the society is increasing rapidly (Englund & Sandstrom, 2017). The large flows of refugees to Sweden in recent years have been especially pronounced because of the Syrian War (Lundberg, 2016) and have created considerable pressure on municipalities and migration centres around the country. We also experience increased xenophobia and hard line political rhetoric. Extreme parties are gaining ground all around the world, racist attacks increase and refugee homes are burned down in Sweden (Efendic & Kudo, 2015; Delin, 2015; Ewald, 2015). The problem is huge and this area requires much more research, focused on deeper understanding of the complexity and producing results which should be translated into action. Crucial to the integration and inclusion of the newcomers are opportunities to learn the new culture (Jönsson, 2016), learn

the new language (Andersson, 2016) and acquire knowledge to be able to qualify for employment (Burn Power et al., 2016). Several initiatives are in progress, but it needs to be faster and more holistic approaches in order to tackle these training needs. Appropriate ICT (Information and Communication Technologies) can be adapted and significantly increase the quality of education (Mohss, 2014); making the services more flexible (Hellström, 2017) and scale up the service to many more people (Lei et al., 2016). ICT has a huge potential to increase efficiency by a much faster and personalized management (Voogt et al., 2016). For up to date and relevant research articles about the issue of migration see Dekker and Scholten (2017) and Ritzen and Kahanec (2017) who describe the current the situation in Europe. According Ritzen and Kahanec (2017) the proportion of immigrants in the Scandinavian countries more than doubled between 2000–2010, with Sweden having the highest rate of new arrivals. The refugee policy in Sweden and Norway is considered as generous, while Denmark and Finland apply a more restrictive policy. AbuJarour et al (2016) highlight ICT skills as crucial for a shortening the time to get a job.

Concept, development and e-service

Based on ideas originally presented by Henrik Hansson 2015 at the National Swedish conference for popular education (Folkbildning) Hadia Qazi and Ida Sundqvist conducted a feasibility study “Digital Mentors – Integration in Sweden for new arrivals and refugees with the assistance of a digital communication tool”, which tested the concept and refined the ideas. Major results based on qualitative analysis from interviews are summarized in Figure 1 and 2 below. Based on this study, other related material and reflections on the task William Boman and Albert Jungselius developed the e-service, www.snackasvenska.nu [“chat in Swedish now”]. The video chat use (a) safe and secure log in, (b) filter-search mechanisms (such as females can search and be matched only with female speakers etc), (c) a lingo point system (more speaking time = more points; new Swedes can show how much time the spoken to Swedes and Swedes can show how much they contributed), (d) a topic box of random speaking themes, (e) a text chat with auto translation from speakers mother tongue to speaking partners mother tongue and more features. The system has been tested with new arrivals/new Swedes – Swedes in Gotland and cross regionally in Sweden. A demo will be given and results presented at the conference.

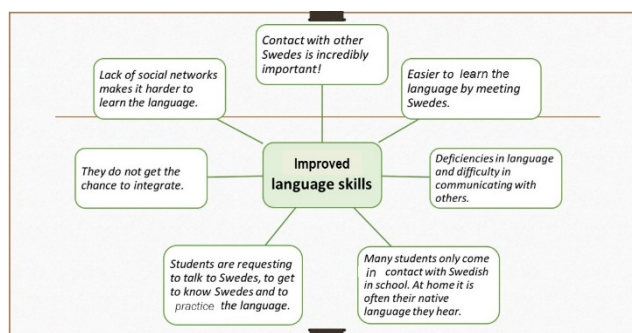


Figure 1. Video tool and improved languages skills (Qazi & Sundqvist, 2017)

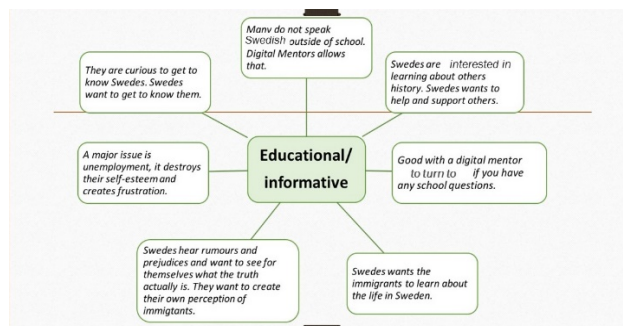


Figure 2. Video tool and educational aspects (Qazi & Sundqvist, 2017)

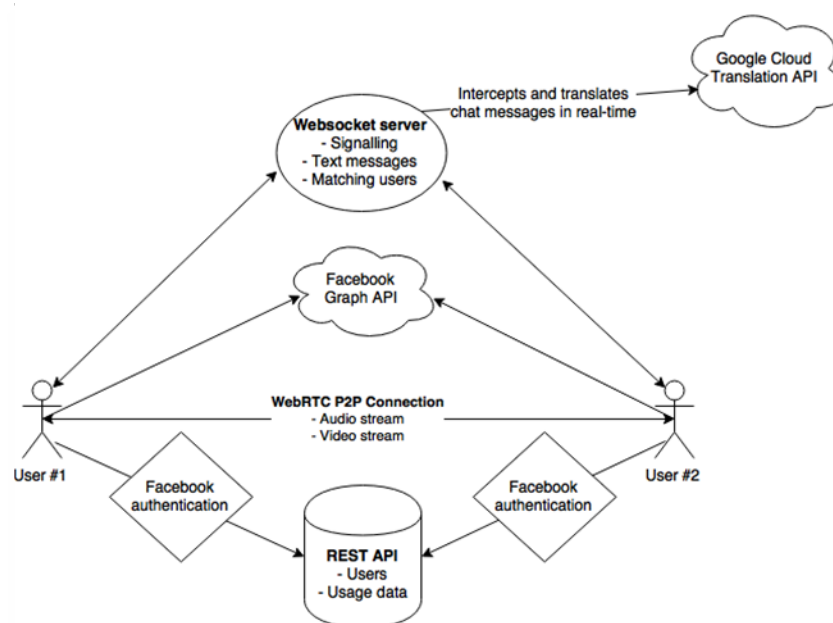


Figure 3. System design by William Boman and Albert Jungselius

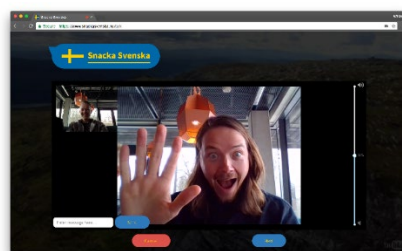


Figure 4. Matched with speaking partner

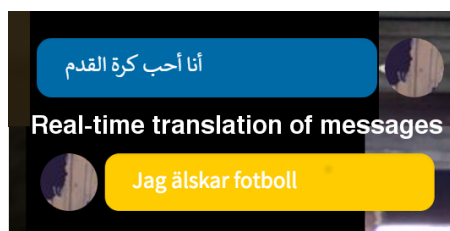


Figure 5. Language translation chat: from speaker's mother tongue to speaking partner's mother tongue

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SETTING THE TONE: DEVELOPING EFFECTIVE AND CULTURALLY SENSITIVE LEARNING RESOURCES TO IMPROVE THE INTEGRATION PROCESS OF MIGRANTS IN FRANCE

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Introduction

The handling of mass migration is subject to a great deal of public debate in the past few years, notably in light of the recent economic crisis, armed conflicts and changes in the geopolitical sphere. This migration is both a source of richness and subject of conflict for the countries that welcome these migrants. The cultural and economic benefits of such migration are highly documented.

However, due to a lack of understanding of migration on local, national and international, overwhelming misconceptions that persist and that are often emphasised by social media and the wariness that can exist when the cultural practices of a country's citizens and incoming migrants is diagonally opposed, the integration process of migrants is hindered by overriding tensions.

Providing migrants with tailored educational resources can allow them to better understand the environment within which they find themselves, allow them to recognise the specificities of that environment, comprehend the complexity of the given society and in some cases provide them with arguments in order to anticipate and respond to potential conflict.

MOOC "Vivre en France, vivre ensemble" (Living in France, living together), addresses the question of smoothening the integration process for migrants in France. We will explore how this MOOC was developed in order to respond to the needs of migrants through a considerable amount of planning in terms of both editorial and production practices.

After briefly introducing the course context and the chosen structure to respond to that context, we will examine the importance of finding the right tone, managing the mass of content at learner disposal, handling the distribution process before emitting some recommendations in maintaining an optimal production process faced with the multiple validation processes that such politically sensitive courses are subjected to.

Context

The MOOC “Vivre en France, vivre ensemble”, commissioned in 2016 and launched early 2017 is a joint venture between the French Ministry of the Interior and France Terre d’Asile, a non-for-profit organisation, specialised in issues surrounding access to asylum in France and the life of migrants who are settled on French territory (The course being launched in Spring 2017, early results of the use of the MOOC will be available and presented at the EDEN conference). Produced in conjunction with MOOC & Cie, it is destined primarily at those who arrive legally in France and those who accompany these migrants on a regular basis, even though its scope goes largely beyond these initial targets.

The overall aim of the course is to share the fundamentals of what enables the “vivre ensemble” or living together in France, that is to say the values on which the Republic is founded and their materialisation in laws and programs that tie in rights and responsibilities for both residents and citizens. It means presenting in the simplest and the most concrete way imaginable the “culture” of republican democracy in France and how that notion was forged over the centuries. It is a way of addressing something that is rarely shared, as these elements appear to be natural to those who have grown up this culture and contribute to it on a daily basis.

Equality, fraternity, liberty, the right to free education, secularism ... All of these concepts are incarnated in the political and administrative functioning that is specific to France but largely shared by European countries with Europe featuring as a module within the course. The course assumes that a better understanding of the founding values of the republic and their incarnation on a day to day basis will facilitate the integration of migrants coming from diverse horizons including countries that are sometimes irrigated by several different cultures. These cultures are not presented as being better or worse than that of France, they are simply presented as being different. In fact, it is France that appears to be the “foreign” if not somewhat strange country in this course, something that migrants should familiarise themselves with or with which may even become accustomed.

This rather solemn approach to French society is balanced by light aired sections that deal with everyday life in France with a certain degree of humour. It is a way of positioning the learner in the shoes of a migrant who is trying to understand the apparently bizarre habits of French people including the unease with which people discuss money. For example, in France, it is rarely acceptable to ask a person how much money they earn. This section works on the hypothesis that if migrants are able to recognise the particularities of life in France, they are better equipped to face situations in which these political, social and cultural differences arise.

However, the course is not to be considered as an attempt to assimilate the behaviour of migrants to that of French citizens. In order to avoid such notions, the aspects that refer to

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French customs are presented in the form of self-derision, explaining that they may sometimes appear quite bizarre to outsiders.

Course structure

The course is divided into seven independent modules; secularism, fraternity, Europe, liberty, equality, schooling and family life. Each module is then divided into six sub-sections. Each of these sections has specific objectives in terms of the accompaniment of migrants.

The first section contains a presentation of the subject through an introductory video on the given topic and a series of commented images that allow learners to apprehend the key messages within these wide-covering subject matters. The content is presented by someone who is considered to be an “expert” or authority on the matter but using a language that is accessible to migrants who may sometimes have all but an elementary mastery of the French language. For this reason, media contents are subtitled in English and Arabic with all of the course contents available in English as well as French.

The second section proposes a series of videos containing the testimonials of migrants who are settled in France and their interpretation and understanding of the subject area. This allows learners to connect with the subject matter by relating their personal experience to that of fellow migrants.

The third section contains a short quiz that covers five of the key messages for the given module. This is used to ensure that learners have correctly understood these messages and to provide effective feedback, ensuring that doubts or misconceptions arising from the aforementioned videos can be dealt with using a more accessible level of expression.

The fourth section is built from two case studies that provide a practical approach to apprehending the issues arising from this subject area in the daily life of certain migrants. They encourage learners to question how they can tackle these issues in a practical, efficient and fair manner.

The fifth section provides a couple of explanations of the specificities and sometime peculiarities of French customs and society. This section allows learners to both understand and recognise these daily occurrences so that are less phased when they encounter them. Migrants may adopt some of these customs but the learners are not necessarily encouraged to do this. A more auto-derisive approach is adopted to avoid any sentiment of cultural superiority.

The sixth and final section is a short pedagogical guide in order to explain to those accompanying the migrants on a regular basis, how they can employ the course material within a classroom environment. The majority of migrants will have access to French language courses at some point and this is seen as an effective vector for promotion of these digital tools as a complement to the existing language and cultural courses with educators able to provide further insight into these subject matters.

Finding the right tone

The aim of this MOOC is to facilitate the integration process of migrants into their new environment. There is a fine line between providing migrants with support in integrating their newfound life context and enforcing some form of social and cultural assimilation. It is therefore necessary to discuss the values of the French Republic and its society without putting a societal model on a pedestal or opposing the migrant's previous context with that of his life in France. If such comparisons are made, they are made in a very general sense without naming a specific region, country or religion.

Handling learner interpretation and understanding of social norms and customs in the host country is an equally complex subject. It is important for migrants to understand the social norms of the country so that they can understand and anticipate the adverse reactions that they may face or face others with when the value sets of the host country are far removed from that which they are accustomed to. However, this should not become the basis for stigmatising learners by highlighting the gulf between the practices or introducing some form of superiority complex.

In order to avoid such a situation, we adopted a tone that highlighted the apparent absurdity of certain practices from the migrant's point of view, attempting to provide some form of historical or logical reasoning for the custom whilst recognising its capacity to astound outsiders. This reinforces the aforementioned concept of promoting social integration without falling into the traps of attempting to force cultural assimilation on migrants.

Accessing information

As mentioned earlier, there is a considerable mass of existing resources available for migrants to learn more about the context of living and working in France. The proper of the course is not to produce yet another resource within the mass of available content but rather to provide a condensed and adapted introduction to the diverse subjects that are prominent in French society.

This represents a major originality of the course. Beyond the trivial elements of daily life presented in the resources that are generally developed for migrants that include practical information such as how to greet people or order a train ticket, the course works on the basis that the migrant is educated and capable of reflecting upon what forms the basis for common life in their new environment. The course offers them the possibility of building their own path rather than imposing a fixed and directive learning path.

Beyond the questions of society, it is important for migrants to have access to the right information at the right time. For this reason, the different modules contain supplementary resources that allow learners to obtain more detailed explanations of complex subjects including the French social security system or the varied and frequent occasions where it is generally considered acceptable to greet a French person with a kiss on the cheek or "bisous".

Permanent and accessible distribution

There is a constant and fairly regular flow of migrants arriving in France throughout the year. Whether they come for work, study, to join family members or to flee persecution, they require access to resources that will support them in their new environment. This need cannot be met with traditional MOOC models with fixed start dates, end dates and durations. It was therefore decided to make the course available on a permanent basis for learners who are free to sign up and follow the learning units as they wish.

Whilst such openness has a positive effect on the flexibility of learning, it has pitfalls on other aspects of learning, notably on social interaction between learners, as it is difficult to attain the critical mass that is necessary for sustained learner interaction. In such cases, it is important to find a compromise between the optimal environment for learning and the priorities of the learning community. In our case, the continued access to the learning resources was primordial and weighed in on the advantages of social learning. In the case of this specific course, social interaction will come through the specialised French classes who during the obligatory citizenship courses that migrants must follow.

It is also important to highlight that the MOOC is distributed in parallel with other tools and resources produced by France Terre d'Asile, including the SamSam application that provides migrants with useful information and contacts for everyday necessities in France, fulfilling the role of the aforementioned guide. This is coupled with activities on social networks, notably Facebook where migrants can get snippets of French culture and share their experiences and top tips for living and working in France, allowing migrants to partake in other forms of social interaction around the questions treated in the MOOC.

Beyond these organisational factors, the questions of accessibility, relevant to all digital courses, take a great importance faced with migrant communities. Indeed, many migrants do not readily have access to internet connected computers. It is therefore important to develop a digital strategy that necessarily integrates access to content through mobile devices and the ability to access learning resources with limited bandwidth. In order to ensure such access with have adopted many of the recommendations set out by fragile learning community specialists. This includes downloadable versions of video contents or transcripts of these videos and short learning sequences.

Production processes

The course creation called upon the skills and efforts of a wide variety of people in the three aforementioned stakeholders; the French Ministry of the Interior, France Terre d'Asile and MOOC & Cie. The videos were produced by a professional documentary producer at France Terre d'Asile, the course contents were designed and developed by three learning designers at MOOC & Cie and the project management was handled conjointly by a representative for France Terre d'Asile and a representative for MOOC & Cie. The Ministry of

the Interior were responsible for the validation of contents before integration to the platform that was handled by a technical manager working for MOOC & Cie.

It was necessary to call upon this enlarged production to deal with the complexity of the course design. Indeed, it deals with politically and socially sensitive subjects involving representatives of both the state and associations founded by citizen initiatives. It was therefore necessary to go through a rigorous validation process and to reach consensus on these questions.

In order to simplify the process, a test module was developed that would serve as a reference model for the development of the subsequent modules. This module was co-constructed by the three stakeholders. The piloting committee notably exchanged on the choice of the subsections and the level of expression in terms of French as a foreign language. Particular attention was paid to the presentation of the case studies and the development of the quizzes. They were numerous exchanges between France Terre d'Asile and the Ministry of the Interior as it is important for the actors to know one another. All of the stakeholders demonstrated a great degree of openness ensuring that the exchanges remained fluid. A consensus was reached on this initial module within a period of four months with all of the stakeholders satisfied with the results of the process.

Following this initial production it was necessary to “industrialise” the process as, in order to respect the initial schedule, in the four months following the development of this initial sequence, the following six modules were to be developed. To foster the efficiency of the production teams, the three learning designers divided the subsections of the following modules with one designer working on the editorial for the videos and the accompanying images, one designer working on the case studies and the perspectives for deployment in the classroom environment and finally one designer working on the development of the quizzes and the notions of daily life in France, with the latter being a migrant himself and aware of the issues surrounding the integration of social norms. This would ensure a more rapid development of the following modules as designers only needed to master two of the six subsections.

In order to ensure the homogeneity of the modules in terms of the tone employed, the quality of the productions and the conformity of the modules to the reference model, the designer responsible for the editorials was also responsible for the editorial validation of the modules from MOOC & Cie's point of view. The development of two modules in parallel at any given time allowed for the optimisation of exchanges between designers who were working on physically distant sites.

Once the contents had been produced, they were loaded into a mock-up document that mirrored the layout of the learning platform. In turn the stakeholders could comment upon and modify the contents collaboratively. The contents were validated by MOOC & Cie then France Terre d'Asile before ultimate validation by the French Ministry of the Interior with

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modifications performed after each reading. The contents were then loaded onto the platform with the definitive version being validated by the piloting committee involving representative of the three stakeholders.

The platform was built from Moodle and personalised to incorporate the colour scheme of France Terre d'Asile.

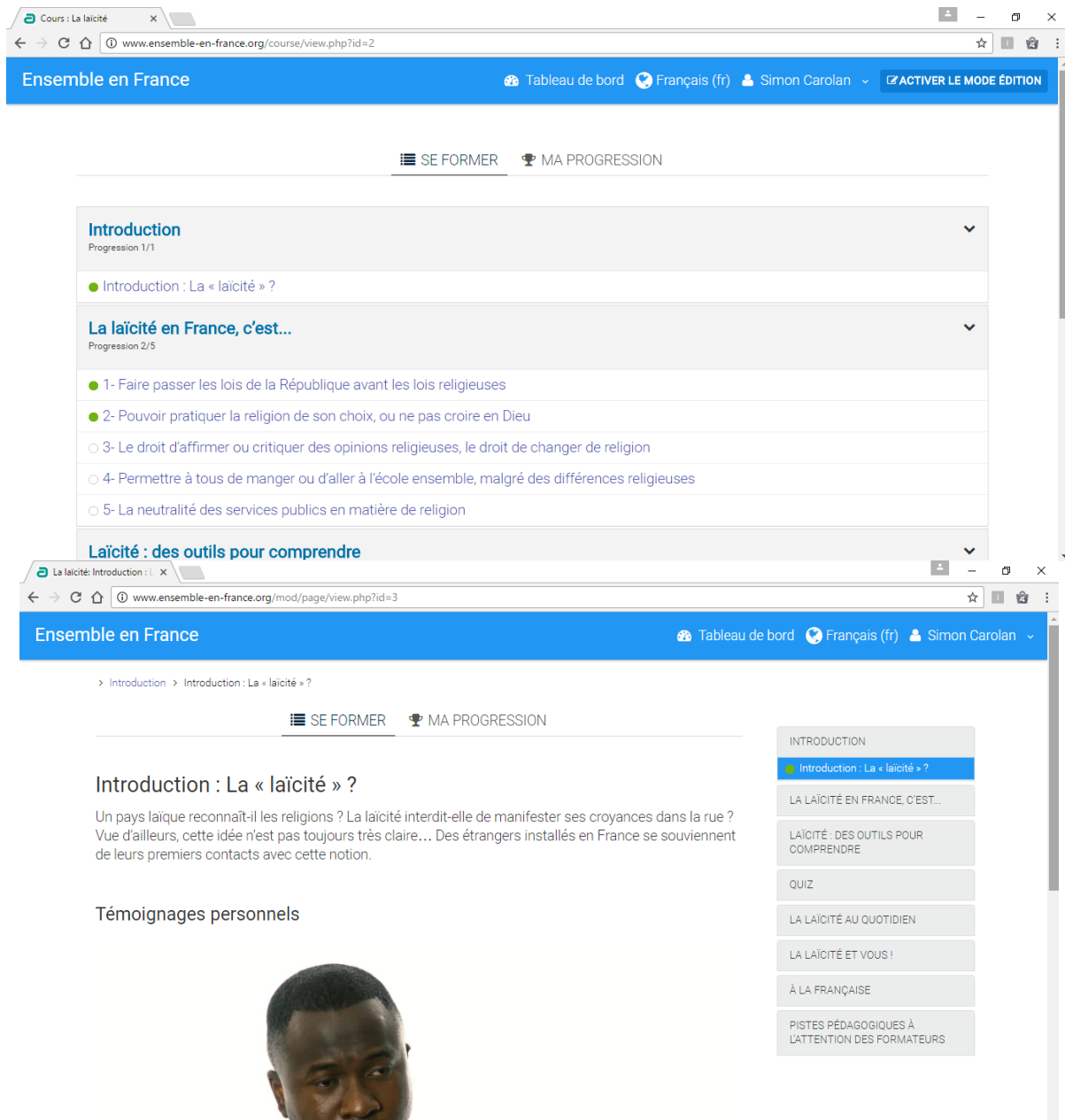


Figure 1. Screenshots of the course platform

The template for the course is simplified in order to prevent users getting lost amongst the varied resources and modules. A priority was placed on the visualisation of the resources, incorporating fat media for both the videos and the presentations. In addition, the users are able to switch easily with one simple quick between the English and the French versions of the platform.

Conclusions and perspectives

In many ways, the learning object described in this article should be not really be considered to be a MOOC but more a platform based self-training course that allows us to follow learner practices closely. The apparent lack of social interaction online is largely compensated for the majority of learners by their participation in French language and culture classes and their exchanges with the different French administrative institutions.

The course is original in terms of its contents, in so much as it does not simply address questions of daily life, it gives access to the building blocks of both French and European culture and societies. It is equally original in terms of its modes of distribution in that it is not simply a web site but a platform with the notion of free learning paths that are nevertheless highly structured. The advantages of such a structure do not only concern learners but also course providers who have the flexibility of replicating the model to produce supplementary learning modules.

In order to promote the accessibility of contents for migrant learners, it could be interesting to further explore the adaptation of the course to mobile technology working on optimised mobile interfaces that go beyond the mobile format that is currently proposed and that is largely based on the technology provided by the Moodle consortium. In order to achieve such accessibility, research teams at MOOC & Cie are currently exploring the development of specific mobile technologies for the deployment of courses.

Beyond the scope of this course for accompanying the integration of migrants, this course could be deployed in a wide variety of contexts. For example, it could be used to give recall or give new meaning to terms that are widely exploited in a complex political and social context that is characterised by tension between communities, a culture of recrimination and the omnipresence of communication and social media that bypasses fundamental questions and favours short-sighted interpretations of these terms. The course and its platform invite learners to think about and reflect upon these ideas that form the basis of French society. Learners are able to realise what brings us together more than what separates us. Could this be a new way of dealing with teaching citizenship?

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CHALLENGE-BASED LEARNING DESIGN IN HIGHER EDUCATION: A NEW CONTEXT FOR LEARNING BEYOND COMPETENCY APPROACH

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Introduction

The Universitat Oberta de Catalunya (Open University of Catalonia, UOC) – an entirely online university with over 50,000 students – has launched the PLA-Niu project and it is designed to be a methodological change in the conception of the subjects to be implemented in the entire range of training of training at the university.

It aims to transform the subjects in the University's programmes into activities designed strictly based on competencies which are aimed at resolving challenges inspired by the professional sphere; to implement a new means of selecting, designing and managing learning resources based on content curation for learning, organising it into specific aggregators for each activity; and to provide a system that enables the production and organisation of training in an agile, flexible and personalisable manner.

With this project we want to respond to the main challenge faced by higher education that is overcoming the gap between university education and the demands of society and the professional world. This gap cannot be accounted for merely in terms of a shortcoming in the relationship between the competencies of academic programmes and the real training needs of lifelong learners, but also involves the mismatch between the design of training models and students' expectations.

Project description

The PLA-Niu aims to create a methodological change in the subject design of all the programmes offered by the UOC. According to this methodology, each subject is considered in terms of a sequence consisting of what are known as PLA activities (Figure 1). They aim to ensure that competence-based design genuinely impacts on students' training; to contextualise this training activity in challenges and situations related to the professional sphere or to the students' daily lives by applying the principles of situated learning (Guàrdia, Sangrà, & Ahumada, 2006; Oregon Technology in Education Council, 2007; Stein, 1998; Lave & Wenger, 1991); and to implement a methodology and a system for managing learning resources based on content curation for learning, which links them closely to the learning process.

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Strictly speaking, a PLA activity is a compact form of training activity, which is defined based on a situation related to a challenge, is competence-based and designed around the activity to be carried out by the student. The acronym PLA stands for 'Performance Learning Activity'.

- *(P) PERFORMANCE*: The student is guided by a professional or training situation in order to obtain a result related to a challenge.
- *(L) LEARNING*: The aim is to master the skills, knowledge, attitudes and values that arise from the competencies in the programme.
- *(A) ACTIVITY*: The learning process is guided by a continuous assessment activity.

A PLA activity contains the following items: a challenge, competencies, a continuous assessment activity and the Niu.

As shown below (Figure 1), these items are closely interlinked, with the PLA activity acting as a matrix that ensures the educational consistency of all the components in the learning process:

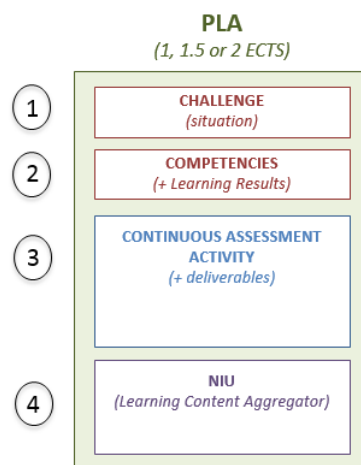


Figure 1.

1. *Challenge*. This contextualises the training activity with a situation related to the professional sphere or with an application in everyday life using an approach focused on overcoming a challenge. This challenge is related to the skills and learning outcomes that lead to the PLA.
2. *Competencies* of the programme that are worked on specifically in the PLA activity, specified in the learning results that are to be obtained. These provide the inspiration for the challenge and guide the design of the activity and its deliverables.
3. *Continuous Assessment Activity (CAA)*. This is the learning activity that the student must carry out in order to develop the competencies of the PLA which are contextualised with the challenge. By completing the activity, the student prepares deliverables that act as evidence to assess the PLA. Estimating the minimum time for training that students need is particularly important in the design.

4. *Niu*. The training resources and content required to carry out the CAA successfully. These resources may be produced internally and externally. They are accessible within the PLA by means of a visual aggregator, after a content curation for learning work presents them, highlights their value and contextualises them for use in the training activity.

Therefore, a subject includes different PLA activities that vary depending on the number of credits. (Figure 2)

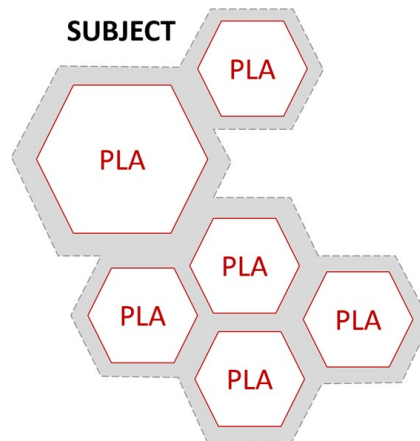


Figure 2.

Experience of implementation

The implementation of the PLA-Niu project is based on four guiding elements, which ensure the quality of the process:

1. At the University, *the project is being driven by the Office of the Vice President for Teaching and Learning*, and it is led by the eLearn Center and supported by the Library and Technology areas, with information and communication initiatives for all those involved, and cooperation and teamwork encouraged. The eLearn Center is the centre for research and innovation in digital education at the UOC linked to Oberta Publishing, the University's content and educational resources production department.
2. Various *studies of trends in higher education* led by the eLearn Center are used to provide a framework of reference for the PLA-Niu project. Future Scenarios for Digital Learners (Moyano et al., 2016) and Next Generation Pedagogy: IDEAS for Online and Blended Higher Education (Guàrdia et al. 2016).
3. We decided on a strategy of *incremental intervention*, which emphasises the factors that have defined the educational model of the UOC for over 20 years, making them evolve to meet the challenges that will affect education in the coming decades.
4. The advisory process consists of *personalised and intensive support* for the teachers' work on creating their subjects.

In the long term, the project affects the entire range of training at the UOC. To achieve this objective, its implementation is planned in several phases lasting two months each. Priority

was given to the new subjects and programmes, of which a total of 115 are anticipated for the first semester of the 2017–2018 academic year. From November to December 2016, we have carried out the first phase and worked with 51 subjects and 37 faculty members from a total of 262 (the UOC has 262 faculty members responsible for subject design and 2,991 teachers involved in classroom teaching).

Lessons learned and next steps

After the first phase had been completed, the project was evaluated, which enabled us to identify areas for improvement and items to be reinforced, and these measures will be implemented in later stages. The evaluations and reflections made led to the following conclusions:

- The process leads to the achievement of a common standard of quality in all subjects. At the same time, it has mechanisms to ensure the PLA-Niu adapts to the specific characteristics of each subject and the application of new training methodologies.
- Fragmentation into PLA activities lays the foundations for the future implementation of a range of training that is more flexible and dynamically adaptable to the demands of learners, to the pace of development of society and to the professional world.
- Personalised advice has an effect on teacher training because it enables teachers to cope autonomously with the design of future subjects. This is expected to have a positive impact on the empowerment of teachers in terms of the PLA-Niu.
- The PLA-Niu leads to changes in the processes of creation and management of subjects, from their design to their implementation in the classroom. This changes how teachers' work is organised, which led to some resistance.

Based on our experience, in addition to continuing with the next phases of work, we will observe and analyse the implementation of the PLA-Niu subjects in the classroom from the point of view of teaching, academic success and the acceptance by students.

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LEVEL THE PLAYING FIELD – IMPACT OF ACADEMIC SUCCESS COURSES

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Abstract

The purpose of this research is to evaluate the impact of two preparatory or “Academic Success Courses”, UCSP 635 and UCSP 636, which targets graduate students with little or no programming experience and prepares them for professions that require knowledge and experience in modern computer programming languages. Data representing a total of 14 classes of two preparatory computing courses conducted over three semesters in 2016 were examined. Based on a preliminary analysis of the data, it was discovered that among those who took discipline-specific classes concurrently with the UCSP courses, about 2/3 of the students who successfully completed the preparatory courses received exemplary grades. Those who failed to complete the UCSP courses exhibited a lower level of performance in the program courses. This suggests that the Academic Success Courses may have a role in helping students to perform better on the discipline-specific courses. Further research is needed to follow these students through later semesters to assess a longer term impact of taking these preparatory courses and to understand the influence of demographics on the course success rate.

Introduction

Context and relevancy of this study

One of the goals of institutions of higher learning is to improve student success, i.e. help students complete their course of study successfully. This support can come in several forms including flexibility and easy access to courses. However, an area of support that is becoming increasingly important and growing in numbers is to provide preparatory courses that would bring students up to speed with background material needed for success in their degree program. Many institutions offer fundamental courses in writing, quantitative reasoning and discipline specific subjects to address this gap. At the University of Maryland University College (UMUC), we offer several graduate technology programs that need students to have some programming skills coming into the program. Since our students come from a diverse background, we developed two basic programming skills courses that we ‘strongly recommend’ them to take. Students in 4 different programs are informed about these courses and encouraged to complete them prior to/concurrent with programmatic courses.

In this study we look at the impact of taking and completing these preparatory courses successfully on student success in discipline specific courses and in the program.

Background

The University of Maryland University College (UMUC) specializes in educating busy professionals and offers career-relevant, affordable education that fits student life styles. It is a state university that primarily provides online classes but also onsite classes around the country and the world. A member of the University System of Maryland, UMUC is regionally accredited by the Middle States Commission on Higher Education, providing credibility and recognition to students' degrees.

The Graduate School at UMUC offers more than 55 graduate programs and specializations. These include master's degrees and specializations, doctoral degrees, and graduate certificates to help students develop professional value and open the door to career opportunities.

Because UMUC graduate students often enter graduate study with academic backgrounds in very different fields and return to study after a gap of many years, UMUC offers a number of courses outside the usual required program courses that are designed to help students succeed in their graduate studies.

These “Academic Success Courses” are non-credit and currently designated with the course prefix of UCSP. Although these courses carry no UMUC credit, they appear on the official academic transcript. At the successful conclusion of the course, a grade of P (Pass) is posted. The student interested in taking these courses must be admitted or have an application on file before registering for non-credit courses.

In 2015, two computer programming courses (one is foundational and the other is more advanced) were developed to address a recognized need for preparing students to perform coding in the following academic plans: Bioinformatics, Data Analytics, Database Technology, and Software Engineering.

Typically, students under these academic plans were expected to have successfully completed an undergraduate-level programming course (with a minimum grade of C for an undergraduate course, B for a graduate course). If they do not have demonstrated experience or prior coursework in software programming, the students are required to take both programming courses prior to taking any classes. Also students who have only experience with legacy programming languages such as COBOL or PRG are strongly urged to take the two courses.

Both classes last eight weeks and are presented online.

Here are the descriptions of both courses:

- *UCSP 635: Essentials of Computer Programming*
(Recommended preparation for bioinformatics, data analytics, database technology, and software engineering students with little or no programming experience).
An applied approach to creating computer programs. Discussion covers all aspects of basic programming, including variables, arrays, conditions, and input/output.

- *UCSP 636: Structure of Computer Programming*
(Recommended preparation for bioinformatics, data analytics, database technology, and software engineering students with some programming experience, typically with older languages such as PRG and COBOL.)
An applied approach to creating computer programs. Discussion covers aspects of programming related to the structure of the program, including loops, procedures/functions, and leveraging other software libraries/packages.

The research on the impact of student success courses on student performance has generated mixed results. A Columbia University study by Karp and Stacey (2013) on non-academic college prep course found short term gains in student persistence and completion of courses.

In a 2013 study, Boatman and Long looked at the nature of courses being offered to help students entering postsecondary education who are academically underprepared. Although the results are mixed the authors prescribe some strategies to offer such courses. These include, integrating the preparatory courses into the curriculum, adding of support programs outside of the classroom (tutoring, advising), and shorter courses. In a previous study by Boatman and Long, (2013) it was found that the impact of remedial (preparatory) courses maybe more beneficial for incoming student with higher need of academic preparation than those who needed it only marginally. Sonnert and Sadler (2013) looked at the impact of taking a pre-calculus course on students' performance on the college calculus course. Their results showed no significant improvement in grade for students who took the pre-calculus course.

A recent study by Shaffer et al. (2016) looked at the impact of prerequisites on student learning in two biology courses. The authors used a *familiarity scale* to assess if students performed better in later courses on topics that they had covered in the prerequisite. The results indicated that students got a better score only on topics that were covered extensively in the prerequisite courses suggesting that merely “covering” a topic in a prerequisite course does not result in improved future performance. The conclusions from this study support more student-centered teaching methodologies.

The majority of the studies on the impact of preparatory courses are at the college level, including those noted above, however, it is our belief that some of the conclusions and strategies maybe applicable to students entering graduate school.

Methods

The two academic success courses studied in this paper had three features. First, they were not required but recommended. This placed the responsibility on the student to make the decision to sign up for the course or not. Second, these courses were offered at a low cost to reduce financial burden on the student. Third, the courses supported active learning by offering short exercises that promoted critical thinking and problem-solving skills.

The first offering of the two courses- UCSP 635 and UCSP 636 was in the spring of 2016. Since then they have been offered in the summer and fall of 2016. Over 300 students have signed up for the two courses since the first semester.

Students were asked to take the two courses in a sequence as the 1st course is needed for the 2nd course. However, those who had some programming background and knew the basic principles could skip course #1 and proceed directly to course #2. We had primarily students from the following four programs take these courses – MS in Information Technology with a specialization in Software Engineering (MSIT-SWEN), MS in Information Technology with a specialization in Database Systems Technology (MSIT-DBST), MS in Data Analytics (MSDA) and MS in Biotechnology with a specialization in Bioinformatics (MSBIOT-BIFS).

Findings

Preliminary results from the three semesters of course offerings grades are summarized below:

- More students who took one of the UCSP classes did not take a programmatic class concurrently.
- Among students who took one of the UCSP classes and passed – and concurrently took one or more discipline-specific classes, most received an A (63%) rather than a B (37%).
- For those who withdrew from the UCSP class or classes, most received a B or lower grade in a concurrent, discipline-specific class.

Lessons learned from this study include the following:

- Emphasize to new students to the programs the value and success rate of these Academic Success Courses.
- Encourage students who withdrew or failed the class to retake the course.
- Consider expanding Academic Success Course to other disciplines.

Our findings suggest that although recommended, many students recognize the need for these courses, and sign up for them. Most of the students who took the course so far are in the MSIT-SWEN or MSDA disciplines and preliminary results show that these courses may be assisting in better performance on program-specific courses.

Conclusions

Academic Success Courses such as UCSP 635 and 636 offer significant advantages for students to better prepare for the competencies needed for success in key disciplinary areas. This in turn helps ensure that the students can graduate with career-relevant skills.

We want to conduct a longitudinal study to evaluate students' performance on courses that require programming skills. This will give insights into the long term benefits of taking these courses.

An area of further research is to investigate the impact of demographics on the course success rates. For example, are older students who do well in the Academic Success Course also do well in subsequent courses? Demographic data was not available during the course of this study but will be in the future.

Another possible area of investigation is to examine the use of diagnostic tests to determine if an incoming student should be required to take an Academic Success Course if they are not adequately prepared for the program.

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100 MOOC PROJECT FOR SMES: WHAT DO THEY NEED

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Abstract

This learning needs analysis study has been conducted within the scope of a European Union funded Project that proposes to build up a Massive Open Online Course (MOOC) portal to support the adaptability of employees and employers to new social and economic structures and increase adaptability of them via ICT tools in Turkey. In the scope of this Project which is called as Bilgeİş, it was planned to create 100 MOOCs (mainly ICT usage related) and a survey was conducted for specifying the training needs in determined sectors. The data were obtained from 585 employers/executives and 1030 employees of Small and Medium Enterprises (SMEs). It is found that learning needs of the target group have occurred generally in equipment and tools used at the workplace, Office programs, accounting software etc. Also, a list has been created according to survey results and obtained six categories. Examining the current station of SMEs helped to shape the planning of MOOCs' design and development process. The results of the current study are not only important for Bilgeİş MOOCs, but also for MOOC developers, ICT trainers, experts, policy makers, etc. can benefit from them.

Introduction

Technological improvements and the economic globalization deeply affect all countries. These changes cause lots of different social activities and lead us to interrogate the situation while adapting them. Since it is a well-known fact that traditional formal courses are not sufficient to create long term effects (Hager, 2011), lifelong learning plays an important role in terms of social integration and adaptation of professional qualifications for both individuals and organizations. At this point, online learning has gained many different roles such as an equality of opportunity supporter, a fast problem solver, remarkable teacher, and a talkative classmate; especially MOOCs are excellent for promoting lifelong learning. Therefore, many people begin to learn in such learning environments. Even, some people believe it is a "transformative revolution" (Bonvillian & Singer, 2013). By means of these environments, everyone can be a "learner-teacher" since the cons related to especially Information and Communication Technologies (ICT) based training are removed (Hamburg & Hall, 2008). Today, especially Small and Medium Enterprises (SMEs) need to have flexible learning environments in order to meet their training needs. Using ICT tools for learning is considered an ideal solution for SMEs, because they promote informal learning that enables to simplify the tasks in work environment and learning in groups in natural way (Hamburg & Hall, 2008).

Problem

De Vries and Brall (2008) state that most of the companies face with several learning needs which are changeable and should be met rapidly. In this respect, the term of lifelong learning is directly related to support employability (Bienzle, 2008). In order to create more flexible and effective learning environments for employees or employers, e-learning, especially MOOC may meet the expectations. While there is extensive literature related online learning environments (Morris, 2014), MOOC are a new but very popular phenomenon in e-learning field (Liyanagunawardena, Williams, & Adams, 2013). They have become significant components of perceived innovation for online learning environments (Guàrdia, Maina, & Sangrà, 2013). Now, they can be seen a new understanding of instruction and learning (Guàrdia, Maina, & Sangrà, 2013). In other words, Kay, Reimann, Diebold, and Kummerfeld (2013) state that “MOOC have exploded onto the scene, promising to satisfy a worldwide thirst for a high-quality, personalized, and free education” (p.70).

Many MOOC offer free-of-charge courses to people, anywhere and anytime, and enable access to higher education and beyond for people who cannot afford a formal education and are disadvantaged (Patru & Balaji, 2016). So, MOOC generally allow learners to join the courses and leave whenever and wherever they want. Therefore, if it is planned to create a MOOC portal which in learners will not drop out easily and complete the courses they enrolled, designers should be careful and meticulous by applying appropriate pedagogy for the courses (Liyanagunawardena, Kennedy, & Cuffe, 2015). If educational interventions focus and deal with some risk factors, dropout rates may decrease (Halawa, Greene, & Mitchell, 2014). For instance, making content related with real life situations/problems can enable the courses more attractive and they can be more beneficial for the target group.

From the globalized world perspective, there are unlimited, mixed, changeable and unstructured opportunities to learn and consequently it is important to decompose and select what is needed, what should be learned for people who are limited by time and place (Illeris, 2011). So, analysis process has a significant role in the selection, arrangement, design and application of all learning components taking place in any kind of training program. As a result, in the scope of current project, analysing the needs and demands of target learners is crucial for the effectiveness and efficiency of the training program before creating 100 MOOC. Based on from here, the researchers wanted to examine the demands, ideas, current situation of employee and employers worked in SME in Turkey before creating 100 MOOC throughout Bilgeİş Project. By analysing the target groups' needs, demands and current situation, it will be possible to create an effective online learning environment for professional development.

About the 100 MOOC for SMEs Project: Bilgeİş

This need analysis study has been conducted within the scope of a European Union funded Project (Technical Assistance for Capacity Development of Employees and Employers via Information and Communication Technologies) that proposes to build up a MOOC portal to be free, accessible and user-friendly designed with advanced tools, which will support the adaptability of employees and employers to this new social and economic structures and to

increase adaptability of employees and employers by investing more in human capital via ICT tools in Turkey.

Methodology

Since the researchers' major aim is to determine the course topics to be developed in line with the needs of the labour market through measurements based on self-assessments of employees' and employers', this study was conducted within survey research methodology. The researchers wanted to describe the current situation, needs and demands of the target group to create an effective MOOC portal with 100 courses which will be prepared for professional development of SMEs in Turkey. By choosing purposive sampling method, it is aimed to reach employees and employers from different size and sectors of the target group in five provinces due to high population of enterprises.

Data Collection

The Learning Need Analysis survey covered five provinces of Turkey and the data were collected from micro (with 1-9 workers), small (with 10-49 workers) and middle sized (with 50-249 workers) enterprises engaging in the sectors such as manufacturing, commerce, transportation and storage, accommodation and catering (selected as dominant sectors for Turkey). The survey has been carried out in the target sectors, namely, start-up companies, R&D companies, and SMEs; following sizes of companies: micro, small and medium. As a limitation, the results of the research covered only 5 pilot cities, so they don't represent the general overview of Turkey. Also, there also have been shifts in quota according to sectors and size groups because the rate of acceptance is low.

The data were obtained from 585 employers/executives and 1030 employees between February 2016 and March 2016 with face-to-face survey technique collected by a market research company. In the phases where the survey is planned and executed, Technical Support Team of Bilgeİş Project worked in cooperation with the researchers who are in Beneficiary team.

Learning Need Analysis Survey

The survey covers a lot of issues regarding: Company background (sector, field of activity, date of establishment, scale by number of employees, relative distribution of employees by gender and education level, financial turnover, etc.), general opinion on ICT, satisfaction regarding general skills and ICT skills, the administrative and accountancy software used in the company and competency of users, software other than administrative and accountancy used by the employees to fulfil general and work-related activities; frequency of using such software; their contribution to the daily work (priority), and users' competency in using them, demographic information.

Table 1: Qualitative distribution of enterprises in provinces which are included for the Learning Need Analysis survey

		Ankara	Eskisehir	Gaziantep	İstanbul	İzmir
Sectors	Manufacturing	66.1	44.3	56.0	56.2	49.6
	Commerce	16.5	25.0	31.0	23.7	31.1
	Transportation and Storage	9.1	10.2	3.6	7.1	10.9
	Accommodation and Catering	8.3	20.5	9.5	13.0	8.4
Type of Business	Micro	6.8	29.4	27.4	17.8	22.2
	Small	46.2	41.2	56.0	71.6	59.0
	Medium	47.0	29.4	16.7	10.7	18.8

Table 1 shows the percentages of participants' response rates to need analysis survey according to their company size, sector and city. As it can be understood from the numbers, the researchers intended to create a balanced selection of groups. Participation rates of the cities are İzmir (21%), Ankara (21%), İstanbul (29%), Eskisehir (15%), Gaziantep (14%). An analysis of a breakdown of employers and their representatives interviewed shows that one of four questionnaires (24% of all) was filled out by female employers and representatives. The youngest of the employers and their representatives, who took part in the survey, was 22 years old and the oldest was 69 years old. Their average age was 40. Employees' average work experience is about 5.6 years in the companies which they are working currently and they have worked 9.6 years in the same sector. The average period of time in which the employees involved in the survey have been in business life is 12.9 years.

Findings

Before examining the survey results, to see some general findings can be helpful in terms of identifying the current situation of the target group. More than half of employers see IT as an integral part and the most important component of their businesses. One in five employers said that they use Internet banking in order to continue their business whereas one in five employers noted that the presence of IT had no importance to their business. While three of four business managers (employers) believe that ICT would contribute to their development of business and increased efficiency at their workplace, there are several factors which prevent the employees to be involved in training activities. According the survey results, following factors can show their current situation: Intense and long working hours (44%), Not having free time outside working hours (30.8%), Financial shortcomings (14.1%), Lack of a guiding person or institution in this respect (6.7%), not believing that these activities come back as financial gain (7.1%), Social environment, family obligations (10.2%) In general, 46 % of employers reported that the development of IT skills could put them in an advantageous position in their business segment whereas 27% stated that their positions in the market could only be maintained through the development of skills. 42% of employers in Istanbul, where competition is stiff, believe that this is the only way to maintain their position in the market.

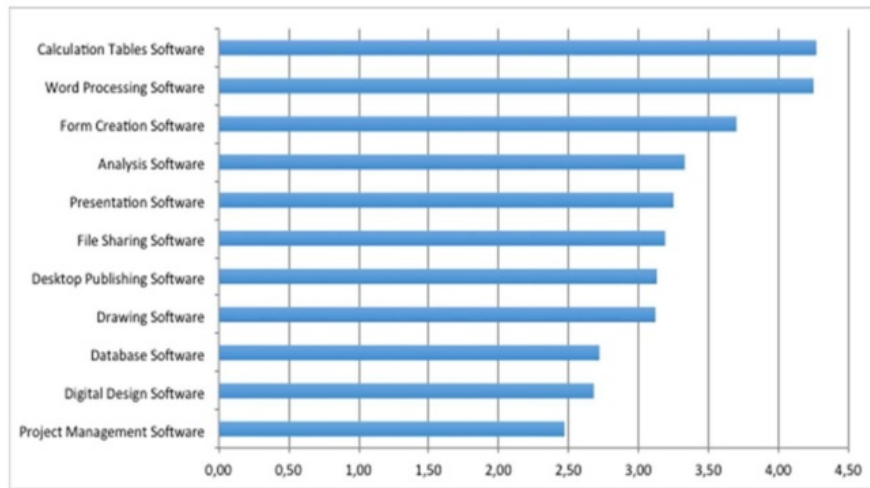


Figure 1. Frequency of Use for Software Used to carry out the Activities Related to the Work Done (Employees)

As seen from the Figure 1, the employees use a variety of software to carry out the activities related to their works. The most commonly used ones among these are software for calculation tables, (Excel, Numbers, Google Sheets, etc.) and word processing (Word, Pages, Notepad, etc.). These two types are followed by Form creation (Excel, Form Builder, Formoid, Arclab etc.), analysis (Excel, SPSS, Stata, Matlab etc.), presentation (PowerPoint, Prezi, Keynote, etc.) and drawing (Paint Photoshop, Corel Draw, SketchUp, Visio, etc.), file -sharing (Dropbox, WeTransfer, Google Drive, OneDrive, etc.), database (MS Access, Libre Office, FileMaker, MS SQL, ORACLE, etc.), and desktop publishing software (PDF Maker, Publisher, Adobe InDesign, etc.). It draws attention that digital design software and project management software are rarely used in the target workplaces.

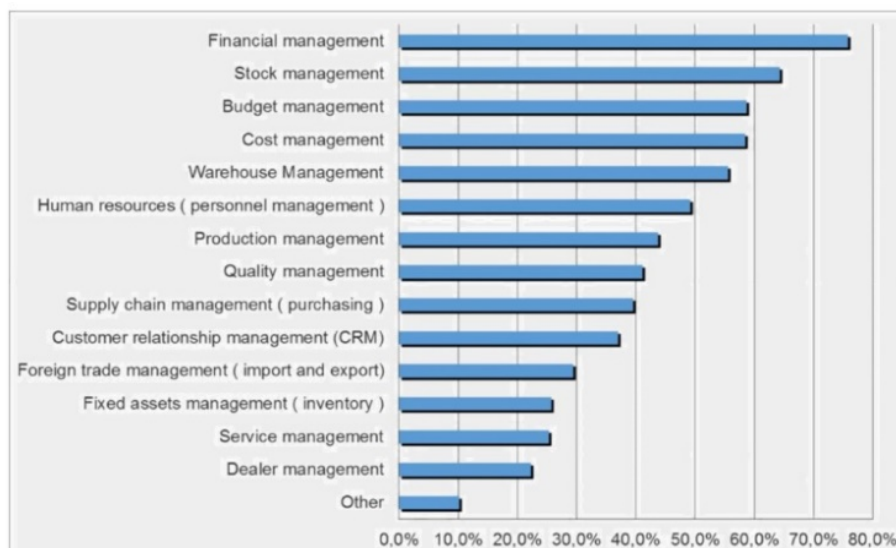


Figure 2. Frequency of Use for Software Used to carry out the Activities Related to the Work Done (Employee & Employers)

The software related to management and accounting generally used by employers in order to carry out activities related to production of goods and services and the training needs. As it can be seen from the Figure 2, the priority is always given to the software related to *financial management* in administrative and accounting software for employees and employers. This is followed by *stock management* and *warehouse management* software. However, the *financial management* takes place in first rows for manufacture, trade, transportation and warehousing sectors, the priority is given to the software related to *budget management* for accommodation and food services sector. In addition, *budget management* and *cost management* software are among the prioritized software for transport and storage sector. Also compared with the others, in medium scale enterprises warehouse management appears to be more evident. It is clearly seen that effectiveness of the software use is due to the size of the enterprise. For small scale enterprises, stock management and for micro scale enterprises budget management software is more crucial.

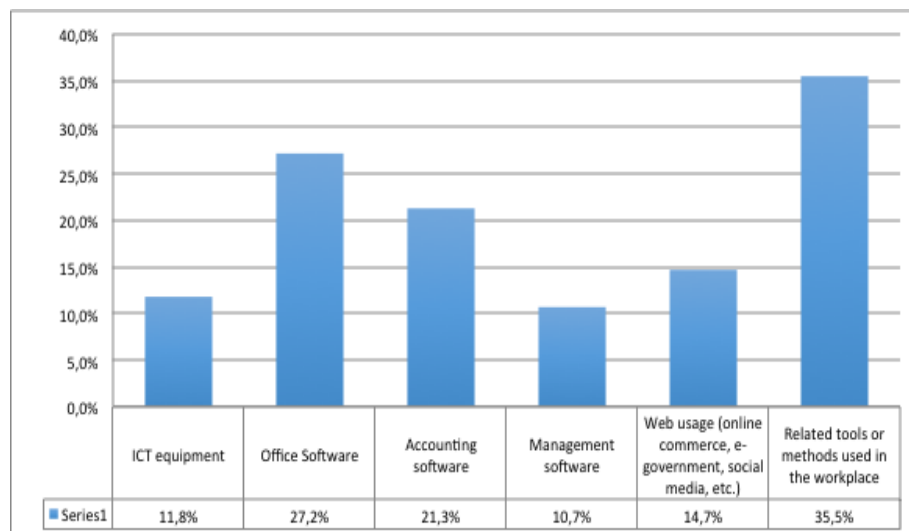


Figure 3. Employee Demand for Training (%)

Figure 3 shows that 35.5 % of employees' demand training related to equipment and tools used at the workplace. It was followed by office software with 27.2% and accounting software with 21.3%. These demands were followed by training in Internet use related to online trade, social, media, etc. (14.7%). The other learning needs are related to ICT equipment (11.8%) and management software (10.7%).

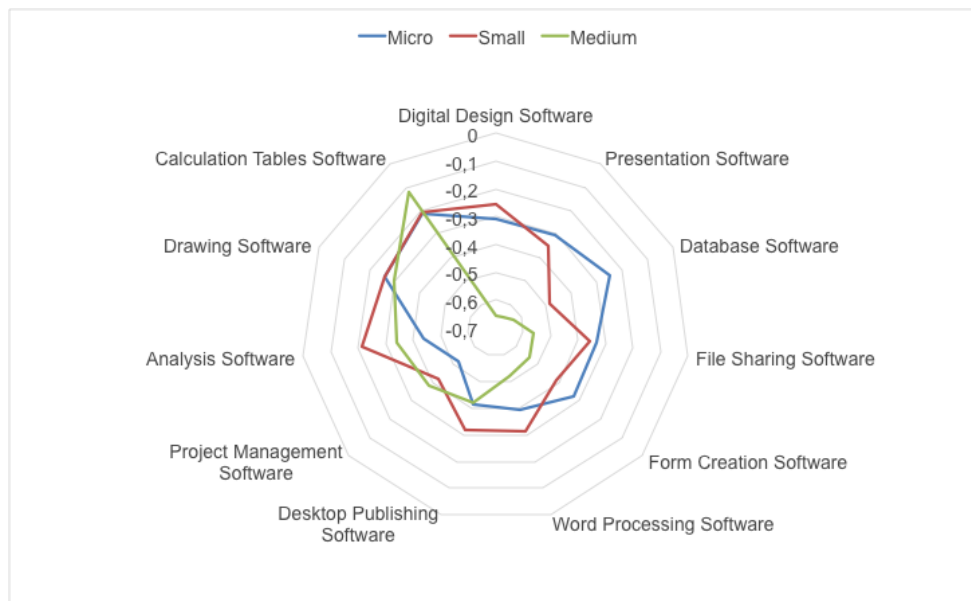


Figure 4. The need for the software training for the functioning of the enterprises due to their scales

Figure 4 demonstrates the training needs for software groups of the business based on the number of its employees. The highest training need has been found to be in medium scale businesses. It has been seen that for medium scale businesses, the biggest need is digital software groups and database software groups. Training needs occur in database, project management and form creating software groups in medium scale businesses; on the other hand, the needs occur in project management, analysis, desktop publishing and text processing software groups in micro businesses.

Although survey results have helped to decide course topics, categories etc., the researchers should have determined some criteria to specify the scope of the courses. These criteria have created with the current situation of the SMEs. For example, SME's busy schedule is very critical issue to complete the training courses and an analysis of employee satisfaction regarding IT training indicates that "lack of contribution to training" (25%), provision of training outside of working hours or on off days (23%), insufficiency of training periods (22%), and inadequacy of applications (21%) were the main factors affecting satisfaction. So, the courses will be prepared according to those concerns. Also, the content is heavily based on procedural knowledge rather than conceptual. Courses will be prepared in reasonable size learning objects, so this will make the system modular. Assessment is another critical issue, so the courses will have more authentic assessment components.

Learning needs of SMEs generally occur in database, project management, digital form creating software groups, analysis, desktop publishing and text processing software groups. A list has been created according to survey results and obtained six categories for course topics such as: (a) Hardware related (3D printer use, Installation of Network Printer, Installation of modem, etc.), (b) Business Software Related (Google Docs, MS Office, Desktop Publishing, Drawing, File Sharing, etc.), (c) Internet related (E-Commerce, Online Advertising, basic web site construction, etc.), (d) Enterprise Resource Planning (ERP) and Customer Relationship

Management (CRM) related, (e) Sector Specific (CAD-CAM-CNC, SolidWorks, Quality Control and ISO Documents), (f) Not ICT related: Managements Skills (Leadership, energy usage management, report writing, etc.) and Individual Development (Communication, Delivering Effective Feedback, Handling Difficult Customers, etc.).

Conclusion

As developments in the area of ICT affect the competitiveness and economy, new technologies also increase the opportunities for reorganization and create competitive edge over rivals who have lower technologies (Hager, 2011). Also, the necessity of further investigation on individual and organizational learning needs becomes visible (Russ-Eft, 2011). In this respect, this analysis work helped the project team to understand SME's training needs. The results made the needed course topics clear. Moreover, the enablers and barriers to take online courses were determined. To sum up, results of this research are expected to contribute to the implementation process of creating MOOCs or ICT courses for adult training designers and the instructors. The topic list created at the end of analysis can guide MOOC developers who are trying to create ICT trainings.

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ACADEMIC COMMUNICATION VIA TWITTER – THE CASE OF #EDENCHATS

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State of the art

One of the main problems we are facing as scholars in innovation in teaching and learning is a general lack of well sounded research in the actual efficiency of the main technological tools, used to support education whatever the level or context of action. The possibility to access lots of resources, thanks to the wideness and richness of the Web, we are more and more engaged in, sometimes makes the identification of useful resources even more difficult and not so easy to manage. As the theme of the EDEN conference 2017 underlines,

“the skills and knowledge required to take an active part in a society characterised by digital technology are embedded, learned, and practiced in people’s daily lives but it up to those engaged in deepening education themes and topics to understand which are the best direction to take and drive new technologies towards those paths, singled out after results and data analyses related to the impact of certain actions are sufficiently proved by actual evidence.”

We need then to take the chance of such an opportunity and work together to make development, growth and inclusion policies truly effective.

Exchange of views and research results is a very useful way of growth. The idea of creating international and interdisciplinary research communities is pivotal, if we wish to carry out significant innovation. Technology, once again, breaking the boundaries of time and space can help and facilitate interaction. Social media offer a wide range of possibilities, from Facebook to Instagram or Twitter.

The present study tries to offer an overview on the use of Twitter in scholarly communication and will focus on the #EDENchat series, offered on Twitter by EDEN NAP – Network of Academics and Professionals, since 2014.

Individual researchers or Institutions may use twitter for several reasons such as advertising their research, events or publications. The use of correct hashtags increase visibility and may help interaction and exchange of ideas. No fully comprehensive studies exist on how and why scholars use Twitter (Mahrt, Weller, & Peters, 2014) and some of them highlight how little use

of Twitter is made among scholars. Ponte and Simon (2011) for instance found that just 18% out of 349 European scholars interviewed in the survey carried out in 2010 make use of Twitter and Priem and Costello (2010) found that out of a sample of 5,800 scholars, identified in 5 selected American and British universities, just 230 could be matched to a Twitter profile and among those just 145 were active. The other issue described in the study was related to content. In fact, among those using Twitter, they did not necessarily do so for professional reasons: most of them used it just for personal reasons, in fact. Even if, according to the mentioned studies, microblogging on Twitter is not considered positively by the majority of scholars (Gerber, 2012), it is true that the service has become vital to the communication in some fields of research, Web and computer mediated communication for instance (Mahrt, Weller, & Peters, 2014). It might be that the above negative attitude is connected to the limitation in characters that Twitter imposes. As we all know, Twitter is a form of free micro-blogging which allows users to send and receive short public messages called tweets. Tweets are limited to no more than 140 characters, and can include links to blogs, web pages, images, videos and all other material online. You can start tweeting anytime, from your computer, smart phone or tablet. By following other people and sources you are able to build up an instant, personalized Twitter feed that meets one's full range of interests, both academic and personal (Mollett, Moran, & Dunleavy, 2011).

The question is: can a just 140 character academic communication has an impact? This paper tries to answer the above question, analysing some aspects of #EDENchat series from 2014 up-to-now.

Research Design and Methodology

The #EDENchat discussion series takes place on Twitter periodically, usually in a Wednesday 20:00 (GMT) time slot. #EDENchat is organised and moderated by EDEN NAP steering committee members (Antonella Poce and Steve Wheeler), but increasingly other experts and scholars have been invited to moderate sessions. It regularly attracts participants from across the globe, and discussion is archived via Storify on the EDEN main website. The most recent #EDENchats have featured topics including digital competencies, the future of the university, innovation in teaching, and social media for informal learning. A special session was also conducted during the EDEN Annual Conference in Budapest in June 2016, and also during the Oldenburg Research Workshop in October 2017. Several #EDENchats are already scheduled for 2017.

Mollett, Moran, and Dunleavy (2011) identify three different tweeting styles: substantive updates, conversational and middle ground.

The first one is essentially made of full sentences, is understandable and is normally the headline of a blogspot, web article or other longer piece of text. Focus is consistent and professional or single topic.

The second one is made of fragments from ongoing conversation with followers. Content is eclectic, drawing on professional interests but also on personal life, commenting on current events and covers diverse topics.

In the third one most tweets are substantive but some are short and conversational. It goes beyond a corporate focus without being too eclectic and it uses retweets to diversify the tweet stream.

Among the three different tweeting styles identified by the authors #EDENchat series position themselves among the third type, highlighting the more personal and organisational culture into a basically professional approach and most tweets are independently understandable.

Storify archives of the #EDENchat series have been analysed according to the following criteria indicators:

Table 1: #EDENChat analysis descriptors and indicators

Descriptors	Indicators
Geographical location. It considers the echo of the chat abroad, in real world.	- Field "location" in user profile.
Virtual Reachability. The ability of the chat to reach privileged witnesses in the field.	- Number of unique users.
Impact. How much the chat impacted the audience.	- Number of retweets. - Number of mentions. - Number of favourites.
Activity. The ability of the chat to involve active users.	- Number of posts.
References. It considers how much the content of the chat is supported by external references.	- Number of links.
Sentiment. It reports the user attitude towards chat topic.	- Number of negative posts - Number of positive posts - Chat sentimental score

Experimental setup

Gathering data

We constructed a different corpus for each #EDENChat, obtaining the texts from Twitter® historical data. Since the API of Twitter® did not allow users to gather data directly, we use the "GetOldTweets" Python script by Jefferson Henrique to get old tweets, bypassing the one-week-old limitation of Twitter Official API (Henrique, 2016). Through this script we obtained 30 CSV (Comma Separated Values) files, one for each #EDENChat, limiting the query by searching the hashtag "#edenchat" (case insensitive) and by setting specific dates. This is an example of the command used for gathering the tweets from the latest available chat:

```
python Exporter.py --querysearch "#edenchat" --since 2017-01-11 --until 2017-01-12
```

In the following table, #EDENChats topics and dates are summarized. Each year is reported and in brackets the number of chats considered per that year.

Table 2: EDENChat topics and dates (Asterisks indicate that chat was hold in a different date respect what is actually stated on the EDEN website. In 2015 one EDENChat has been removed since it is a duplicate.)

2017 (1)			Moderator
1701	Reading on screen vs reading on paper	January 11, 2017	Antonella Poce
2016 (12)			
1612	Innovation in teaching	November 30, 2016	Antonella Poce
1611	Social media and informal learning	November 9, 2016	Francesco Agrusti
1610	The future of universities	October 26, 2016	Steve Wheeler
1609	Digital Competencies in Education	October 12, 2016	Steve Wheeler
1608	Oldenburg Research Workshop night	October 5, 2016*	Antonella Poce
1607	EDEN Conference Special – Live from Budapest	June 15, 2016*	Steve Wheeler
1606	Which personal technologies?	March 23, 2016	Steve Wheeler
1605	Open Education Consortium Special – How open can we be?	March 9, 2016	Meena Hwang, Mary Lou Forward
1604	Growing Minds: Rhizomatic Learning	February 24, 2016	Steve Wheeler
1603	Critical thinking and technology in education	February 10, 2016	Antonella Poce
1602	Free content, free education?	January 27, 2016	Steve Wheeler
1601	Openness In research	January 13, 2016	Antonella Poce
2015 (8)			
1508	New learning environments	December 16, 2015	Steve Wheeler
1507	Distance Learning in Transit? – Special Edition #EDENChatUS	November 11, 2015	Steve Wheeler
1506	Reflecting #EDEN15 Keynote Themes	June 17, 2015	EDEN15
1505	Experiences with Personal Learning – Live from #EDEN15 Barcelona	June 10, 2015	Steve Wheeler
1504	Personal Learning	May 20, 2015	Steve Wheeler
1503	MOOCs and online learning	May 6, 2015*	Ebba Ossiannilsson, Antonella Poce
1502	How effective is mobile learning?	April 22, 2015	Steve Wheeler
1501	What does openness in education mean?	April 8, 2015	Steve Wheeler
2014 (9)			
1409	The Qualification Framework	December 1, 2014	Alfredo Soeiro
1408	Critical Thinking	November 17, 2014	Steve Wheeler
1407	What is the future of distance education?	November 3, 2014	Steve Wheeler
1406	E-Assessment	October 20, 2014	Antonella Poce
1405	What future for the Virtual Learning Environment?	October 6, 2014	Steve Wheeler
1404	E-skills demand in the workplace	July 31, 2014	Antonella Poce
1403	E-learning skills	July 17, 2014	Steve Wheeler
1402	Your stories with learning technologies	July 3, 2014	Steve Wheeler
1401	The Future of Distance Education	June 19, 2014	Steve Wheeler

Findings

Statistical analysis

User locations

Since for the API of Twitter® did not allow us to obtain where the tweets were written and given the fact that many users do not allow Twitter® to track their location while posting the tweet, we decided to consider the location field present in the user profile, in his/her main twitter page. Using the Twitter library for the R software, we obtained the content of location filed from obtained CSV files with the following function:

```
library(twitter)
getLocation <- function(x) {
  y <- getUser(x)
  location <- y$location
  return(location)
}
```

Given the fact that the field location hasn't any restriction (it is considered as free text), this function provided us also with some unexpected fantasy invented countries like "Twitter Chat-o-sphere" or "Omnipresent" or "Planet Earth".

Nevertheless, we found 29 (user declared) countries involved in #EDENChats: 3 from Americas, 1 from Asia, 2 from Oceania, 3 from Africa and 20 from Europe. The first two countries with the bigger number of participant are UK (72 no. of people involved) and USA (39 no. of people involved).

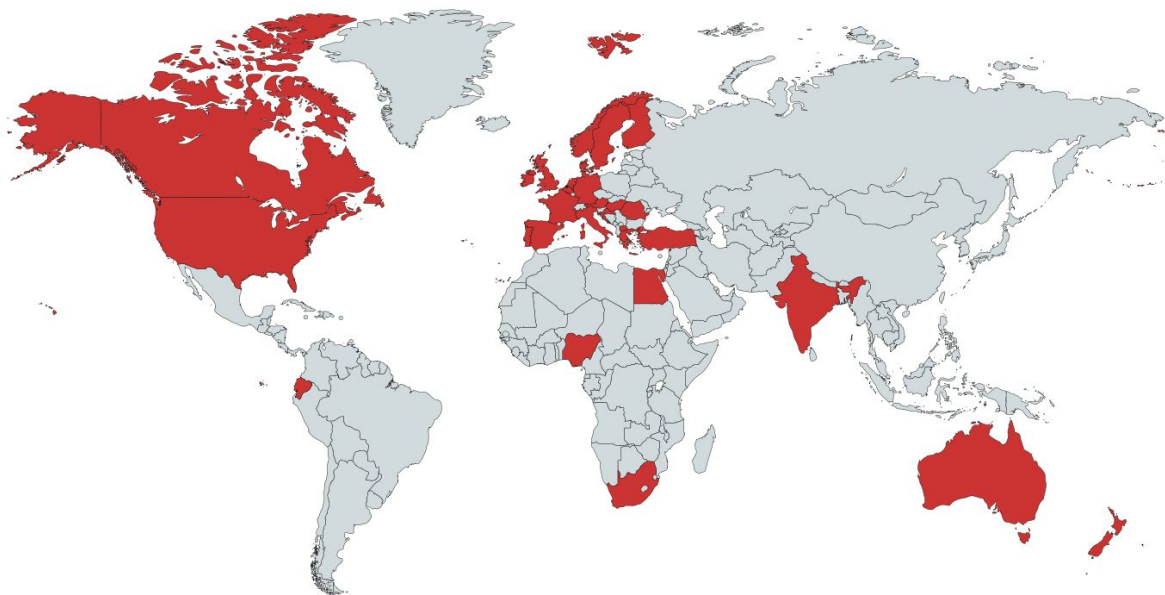


Figure 1. Countries involved in #EDENChats

Statistical tweets data

In order to evaluate the impact of #EDENChats, for each chat we calculated the following indicators:

- Number of posts: how many tweets were posted on that day with the #edenchat hashtag.
- Number or unique users: how many unique users were participating in that chat.
- Number of retweets: a retweet is a way to republish a post that another Twitter® user has written, to spread the word among your own Twitter followers.
- Number of mentions. A mention is a tweet that contains another user's @username anywhere in the body of the tweet. Unfortunately, it is not possible to distinguish between replies and pure mentions. In the present research, there is a high possibility that the mention is in fact a reply given the "chat nature" of analysed tweets.
- Number of favourites: how many tweets were marked as "favourite" by another user.
- Number of links: this indicator counts how many links were cited by users during the chat in their tweets. This could give the idea of how many external references were used to support the discussion.

Table 3: Statistical data obtained from #EDENChat (in bold are highlighted higher values)

chat topic (chatID)	# of Posts	# of unique users	# of retweets	# of mentions	# of favourites	# of links
screen vs paper (17.01)	142	21	99	172	98	6
innovation teaching (16.12)	170	19	118	178	104	19
social media (16.11)	144	16	66	118	124	5
future universities (16.10)	240	28	100	244	133	16
digital competencies (16.09)	217	25	164	155	134	21
Oldenburg (16.08)	145	18	127	146	117	12
Budapest (16.07)	94	19	52	131	55	6
personal technologies (16.06)	360	27	246	259	220	31
OECD special (16.05)	91	22	51	54	51	9
rhizomatic learning (16.04)	121	39	124	297	196	39
critical thinking (16.03)	68	9	23	43	32	3
free education (16.02)	216	35	148	91	179	51
open research (16.01)	171	12	195	173	91	14
learning environments (15.08)	186	23	148	173	74	20
distance learning (15.07)	129	11	73	95	48	2
EDEN15 themes (15.06)	58	7	19	22	11	5
Barcelona (15.05)	84	14	80	38	17	4
personal learning (15.04)	194	22	105	167	167	21
MOOCs (15.03)	166	10	31	174	29	2
mobile learning (15.02)	168	32	79	242	48	31
open education (15.01)	184	23	184	175	76	39
qualification framework (14.09)	68	8	14	147	11	8
critical thinking (14.08)	187	18	106	205	114	6
distance education (14.07)	178	18	62	275	66	13
e-assessment (14.06)	119	7	83	169	28	10
future VLE (14.05)	186	17	70	218	38	5
workplace e-skills (14.04)	146	11	99	259	48	5
e-learning skills (14.03)	242	29	120	374	92	18
young stories (14.02)	269	19	176	296	131	13
distance education (14.01)	199	19	123	263	70	12
All #EDENChats	4942	282	3085	5353	2602	446

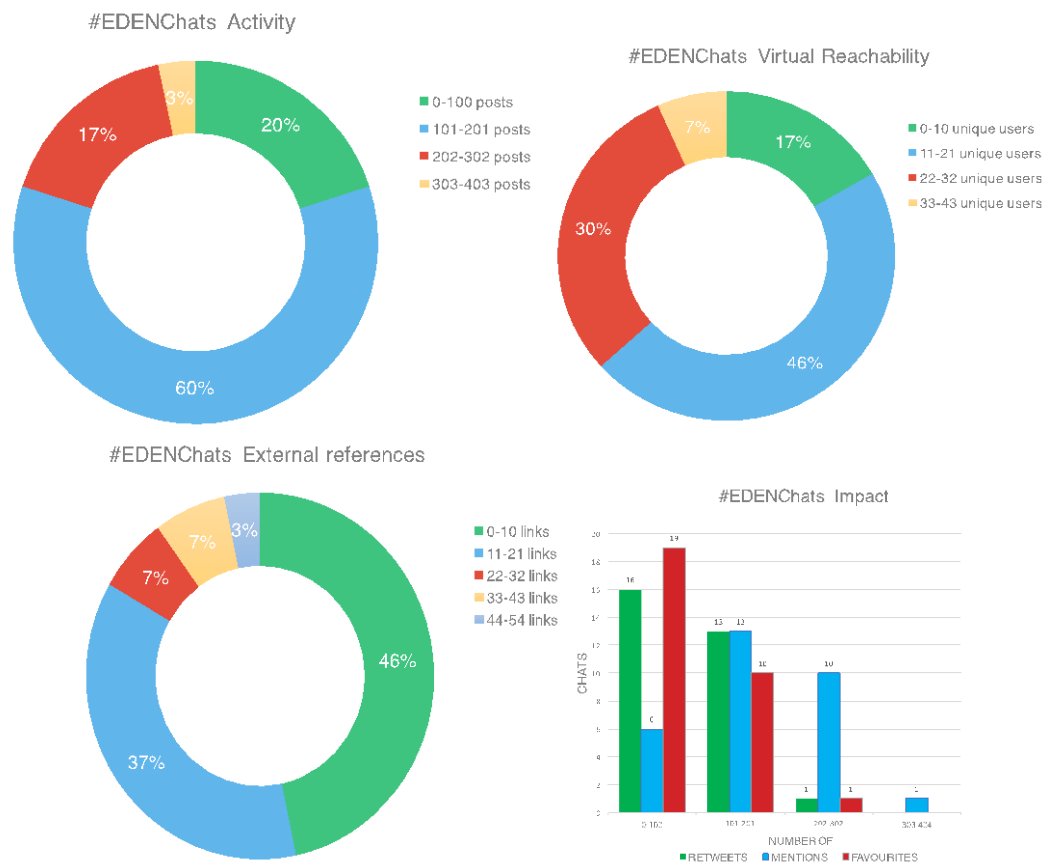


Figure 2-4. Statistical analysis of #EDENChats

Top words in tweets text

In order to obtain some information about the most discussed topic in the #EDENChats, we created a frequency list of words contained in the tweets considering all the #EDENChats simultaneously.

In the following table the top 10 most frequent words encountered in all the #EDENChats tweets are reported.

Table 4: Top 10 most frequent words of #EDENChat

word	Frequency
learning	522
Think	227
students	193
education	192
need	168
digital	159
open	159
Time	128
MOOCs	127
social	104



To compute the sentiment analysis on #EDENChat tweets we used the simple algorithm proposed by Jeffrey Breen (2011) to determine the moods of the particular #EDENChat theme in twitter. We adopted the opinion lexicon provided by Breen which is primarily based on Hu and Liu papers (2010). Through this algorithm it is possible to determine the positive and negative words in the tweets, based on which scoring will happen.

The formula used to compute the overall sentiment score (in percentage) is:

In the following table the results of the sentiment analysis for each #EDENChat are reported considering the number of negative, neutral and positive tweets and the overall sentimental score.

Table 5: Sentimental analysis of #EDENChats (in bold are highlighted higher values)

chat topic (chatID)	Sentiment analysis			Sentiment analysis score
	negative	neutral	positive	
screen vs paper (17.01)	17	83	42	71%
innovation teaching (16.12)	17	95	58	77%
social media (16.11)	13	78	53	80%
future universities (16.10)	36	122	82	69%
digital competencies (16.09)	16	131	70	81%
Oldenburg (16.08)	14	84	47	77%
Budapest (16.07)	12	59	23	66%
personal technologies (16.06)	25	203	132	84%
OEC special (16.05)	6	53	32	84%
rhizomatic learning (16.04)	12	80	29	71%
critical thinking (16.03)	14	32	22	61%
free education (16.02)	18	101	97	84%
open research (16.01)	10	101	60	86%
learning environments (15.08)	21	113	52	71%
distance learning (15.07)	11	81	37	77%
EDEN15 themes (15.06)	8	28	22	73%
Barcelona (15.05)	2	62	20	91%
personal learning (15.04)	11	116	67	86%
MOOCs (15.03)	8	107	51	86%
mobile learning (15.02)	15	78	75	83%
open education (15.01)	25	73	86	77%
qualification framework (14.09)	4	52	12	75%
critical thinking (14.08)	45	87	55	55%
distance education (14.07)	27	s	41	60%
e-assessment (14.06)	12	76	31	72%
future VLE (14.05)	8	112	66	89%
workplace e-skills (14.04)	13	98	35	73%
e-learning skills (14.03)	34	128	80	70%
young stories (14.02)	41	111	117	74%
distance education (14.01)	17	128	54	76%
All #EDENChats	512	2782	1648	76%

In the following ring chart is reported the results of the sentiment analysis for all the #EDENChat simultaneously, considering the number of negative, neutral and positive tweets. Given the nature of the analysed text, there is a high percentage of neutral posts, but the overall sentiment score is about 76% meaning that there is a positive interest towards topics discussed in the #EDENChats.

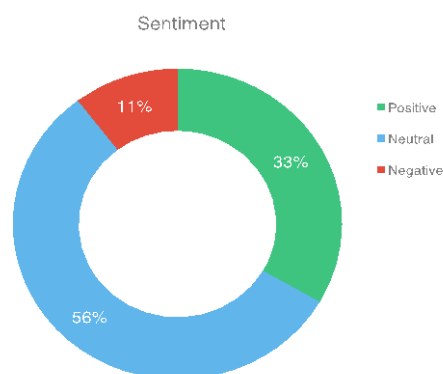


Figure 6. Sentiment analysis results for #EDENChats.

Final remarks

From the analyses carried out, several considerations can be drawn. The first one is related to the impact of the tool, Twitter chat, which helps communication and enhance true interaction among scholars interested in the same subject and located all over the world. On a given appointment they all gather together and discuss about up-to-date topics. Most of the #edenchats position themselves between 101-201 posts and activity is fairly distributed among retweets, mentions and favourites. External references should be promoted more, in order to enrich exchanges. Top 100 word cloud highlights that the core issue on which all scholars participating in #edenchats is learning, thinking and students, underlining that there's an objective need to reflect on most effective ways to increase learning for the sake of our students. Sentiment analysis was rather interesting as well and casted light on the positive attitude of field scholars on #edenchats and the subjects discussed. If we focus on different results, we find out that some topics are more interesting for the users (personal technologies, future universities) meaning that participants wish to discuss new solutions for e-learning.

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Authors

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 and Final Remarks), M.R. Re (Research Design and Methodology), F. Agrusti (Experimental Setup and Findings).



INVESTIGATING BEHAVIOURS AND ATTITUDES TOWARDS USE OF SOCIAL MEDIA AS A LEARNING TECHNOLOGY AMONG HIGHER EDUCATION STUDENTS IN SAUDI ARABIA

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Introduction

This paper presents the initial results of a work in progress regarding the use of social media technologies (henceforth known as SMTs) as learning tools among higher education institutions in Saudi Arabia. It highlights the way SMTs are being used at different levels by institutions, staff members and students in Saudi Arabia to aid their studies, and the attitudes and perceptions of students regarding the same. It also highlights certain mismatches between the usage patterns of University and staff members and those of students. The findings of the study are expected to contribute to the literature in terms of institutional, instructional and student usage of social media as a learning technology in the higher education sector and lay the groundwork for policy development among higher educational institutions in Saudi Arabia.

Background

Groff (2013) argues that the lives of millennials today are dependent on technology and social media to the extent that their social and cultural practices would probably be completely different should their digital access be revoked. Similarly, Paavola and Hakkarainen (2005; p.535) point out learning today is “an intensely social activity”. Consequently educational systems of today can no longer rely on traditional learning theories or practices alone for their curriculum development. Instead, they need to embrace digital social learning and explore theories related to it to promote connectivity among learners and create learner-centred environments. The current study proposes to add to the research in this area, in the context of Saudi Arabian higher education system.

Learning Theories for the Digital Social Era

Educational systems have traditionally relied on learning theories such as associative theory, situative theory and cognitive theory to aid in curriculum development and teaching practices. However, given the shift in the learning styles of neomillennial students, these theories may no longer be sufficient on their own to cater to the evolving educational needs of such students. There have been calls from multiple segments towards the enhancement and expansion of traditional learning theories to include and support the learning styles of neomillennial students who have grown up in the digital era. Of the developments that have occurred as a result, Siemens’ (2005) theory of connectivism remains the most prominent.

The theory of connectivism (Siemens, 2005) is essentially based on the idea that learning occurs when a learner gains knowledge through the process of connecting and feeding information to a learning community. Siemens (2005) posits that knowledge is distributed across an information network and stored in different digital formats. Each learning community is a node, which is a part of the overall knowledge network. As information continues to change based on new discoveries and contributions to the community, it impacts the learners' understanding of the field in turn as they navigate through the nodes or communities. While the theory has its critics, with some like Kop and Hill (2008) arguing that its contributions are not significant enough to warrant it being treated as a new learning theory, it is nevertheless acknowledged that connectivism plays a key role in explaining the new learning trends and styles of the digital era and its autonomous learners. Indeed, the emergence of social media combined with the theory of connectivism creates interesting opportunities for educational institutions where they can reconsider, reimagine and redesign their pedagogies to encourage more active learning. Yet, educational systems continue to struggle to adapt to the connectivist model and social media-based learning, partly due to the fact that they have not caught on to the possibilities offered by these, partly because of variations in learner skills and partly due to lack of research in the area, particularly among Middle Eastern countries like Saudi Arabia (Kop & Hill, 2008; Alharbi, 2013).

Research Aim and Objectives

The aim of this study is to investigate the current and potential uses, and implications of integrating social media into higher education in Saudi Arabia by exploring the behaviours and attitudes of higher education students in Saudi Arabia towards the use of social media in learning. The following are the key objectives of this research:

- Objective 1: To explore the state of art of social media as learning technology in higher education pedagogy in Saudi Arabia.
- Objective 2: To explore the behaviours and attitudes of students towards the use of social media as a learning technology in higher education.
- Objective 3: To determine the implications of using SMTs in Saudi Arabian higher education.

Research Methodology

The aim and objectives of the research require quantitative as well as qualitative data. On one hand, the researcher hopes to generalize the results generated by the present study to the larger Saudi Arabian student population, and this needs some form of representative sampling within the framework of a quantitative methodology. On the other hand, the study also aims to fully explore the perceptions and attitudes of participants, in this new and under-researched field of social media in higher education. This can only be accomplished through a qualitative element. Hence, a mixed-method research approach following the "Sequential Explanatory Design" (Creswell, 2009) has been chosen as appropriate to answer the research questions in the most effective manner. This includes a dominant quantitative strand with

surveys as the research instruments, followed by a secondary qualitative strand with interviews as the instruments. Participants are students, teachers and administrators belonging to three Universities in Saudi Arabia: Princess Nourah University, King Saud University and Al-Imam University.

Conceptual Model

A conceptual model has been developed to act as the theoretical guide and provide the theoretical context for the present study. The model draws references from the theory of Connectivism proposed by Siemens (2005), and is supplemented by the theory of Communities of Practice (Wenger, 1998). According to the theory of Connectivism each learning community is a node, and various nodes together form a knowledge network through which users traverse to gain and share knowledge through their differing perspectives. The theory of Communities of Practice enhances this further by elaborating on the modes that facilitate participation and knowledge generation within the learning communities. According to Wenger (1998), these modes are Engagement, Imagination, and Alignment. Engagement refers to the motivation (why) or the willingness of the community members to actively participate in communities. Imagination provides the understanding (what) and helps members make sense of the activities of the community and their own belonging in it by understanding each other, locate their own position, reflect on it and develop new perspectives. Alignment is the process (how) through which the perspectives of various members, activities, actions, communications and laws are aligned within the communities to result in the desired outcomes.

The outer layer of the conceptual model in Figure 1 is based on the concept of connectivism. Students belong to personal networks (PLs) through their social media connections. Within these networks they share and gain knowledge, leading to the creation of virtual learning communities (VLC) comprising of students from multiple personal networks. When students traverse through these communities, sharing and gaining knowledge, learning occurs. When they are motivated by the usefulness, learning, fun and pleasure of the activities in the learning communities, engagement happens. Imagination is fostered when they understand the meaning and objectives behind the activities and interactions of the community. Alignment happens when students are comfortable with the community and its members, and are able to interact, communicate, share knowledge, ask questions and respect the rules of the community. Overall, these three enabling conditions help members engage, commit and stay on in the communities, encourage them to contribute and keep the communities active. Further, the communities themselves co-exist and function efficiently due to their enterprise, mutuality, and shared repertoire of resources.

The teachers and administrators of the University facilitate or hinder the learning process through their own usage or avoidance of SMTs, participation in communities and other activities. The teachers can participate, contribute, share resources and monitor the learning processes in the communities. The administrators provide technical support and

Investigating Behaviours and Attitudes towards use of Social Media as a Learning Technology among Higher Education Students in Saudi Arabia

Fatimah Algarni

infrastructure, enable or disable access to specific SMTs or features, assist users and design social media policies. They may also control funding, training and other resources for SMT usage within the institutes. Additionally, both teachers and administrators may consider the feedback of students within virtual communities and act on it. The entire process takes place within the context of the higher education institutes.

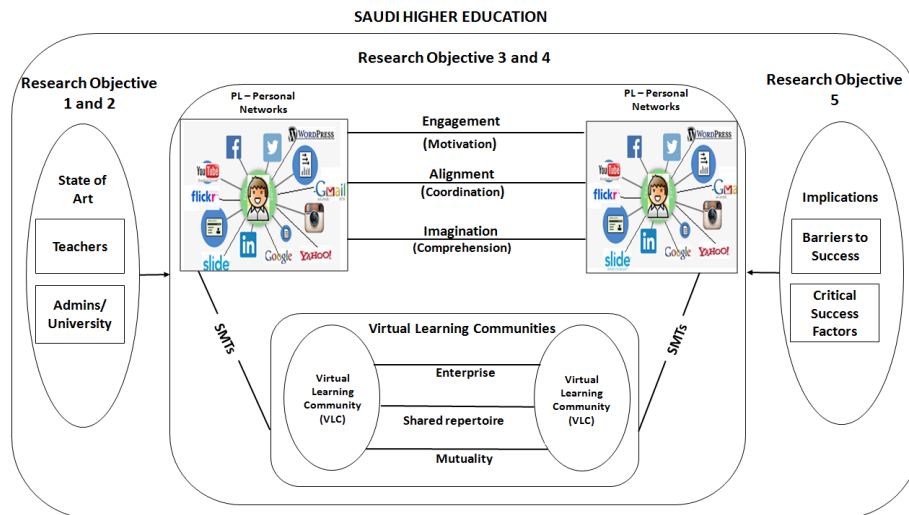


Figure 1. Conceptual Model

Overall, in the above model, SMTs play a key role due to their ability to aid digital, many-to-many interactions. They facilitate connections between members and their networks, as well as between the virtual learning communities.

Pilot

In order to test the validity of the conceptual model, processes and instruments, a pilot survey was conducted with all three groups of participants selected using a convenience sampling technique. Responses were received from 51 students, 10 teachers and 5 administrators each. Some interesting findings from the pilot survey are as follows:

- Most students (82%) seem to spend at least 3-4 hours online on a daily basis, confirming their status as digital natives. All of them also seem to have access to the devices necessary to use SMTs.
- Students indicated that they use SMTs for a variety of academic and non-academic purposes like communicating, collaborating and information sharing. From the responses, it is also evident that a majority of the students support the use of SMTs to support their studies.
- The survey analysis indicates that students use mobile devices like smartphones and tablets much more frequently compared to academics and administrators, who seem to rely more on traditional devices like laptops. This may have implications for the type of SMTs used, as some tools like Whatsapp that are used by almost all the students are much easier to use on mobile devices.

- The pilot data also indicates that traditional SMTs like Facebook and Twitter are being overtaken in popularity by mobile messaging apps like Whatsapp.
- From the survey of administrators, it also appears that there is support and encouragement for the use of SMTs at the University level. However, it appeared that the usage at the University level is mostly restricted to marketing and communication purposes rather than for teaching and learning.
- All three group of participants indicated privacy concerns as major roadblocks to their use of SMTs in studies. This may be particularly relevant for a conservative and gender-segregated country like Saudi Arabia. It indicates the need for better privacy control at University level.
- Some of the administrators indicated unfamiliarity with the features of SMT as a roadblock for their usage. This points to a lack of adequate training at the administration level although it is difficult to be sure at this stage given the limited number of administrators who participated.
- Lack of adequate bandwidth was another issue that emerged as a roadblock from the administrators' survey. Again, it is not possible to draw any conclusions at this stage although it merits further investigation.
- There are discrepancies in the choice of SMTs the students and staff members use and/or consider important. For e.g.: 100% of administrators and 66.67% of the academics say that Dropbox is one of the most important SMTs to them whereas 80% of the students say that Myspace is the one the most important SMTs they use. This indicates that the usage patterns as well as priorities students and staff may be different when it comes to academic use of SMTs and that there may be a certain lack of synchronization.
- About 53.13% of the students said that their gender does not influence the usage of SMTs while the rest indicated that it has an influence. Around 50% of the students said that their academic discipline does not impact their use of SMTs, the rest said that it does.
- Overall, while the pilot survey results largely indicate that all three groups have identified the benefits of SMTs in Academics and support using SMTs in Academics, the data also shows that the actual usage, type of SMTs used and perceptions regarding the importance of various SMTs vary drastically between the three groups, and this indicates a gap between student and staff.
- The data shows that responses of administrators and academics are more in line with each other compared to students, indicating that there may be a disconnect between the perceptions of staff and students.

Next Phase of Research

The next phase of research will involve collecting qualitative data through pilot interviews with a subset of the survey participants. After the qualitative data has been analysed and interpreted, the research processes, instruments and tools will be reviewed and refined in line with the findings. Then, the actual data gathering will be conducted using a combination of

convenience and purposive sampling from April 2017 to July 2017. Subsequent analysis of the quantitative and qualitative data will contribute towards fulfilling the research aim and objectives of the study. The conceptual model will be refined based on the findings and the results will be analysed for their implications in the Saudi Arabian higher education context.

Conclusion

Social Media Technologies (SMTs) play a key role due to their ability to aid digital, many-to-many interactions. They facilitate connections with not only a person but with network of learning communities. Students of today are relying on digital devices and SMTs more than ever before for their information needs, and to contribute knowledge. Higher education institutes should harness the power of SMTs to create learner-centred environments that help students utilise their existing social media connections, skills and affinity to learn more effectively. Studies in this area show that it is indeed happening, although the knowledge regarding the use of SMTs in conservative societies like Saudi Arabia remains limited. Consequently, the implications of such usage and the issues around it remain unexamined. The present study hopes to fulfil some of the gaps related to this area, and contribute towards the development of a framework for integrating social media as a learning technology in higher education institutes in Saudi Arabia.

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E-VOTING: ENHANCE DIGITAL NATIVE STUDENT INTERACTIONS WITH A NEW VOTING ACTIVITY IN MOODLE

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Abstract

This paper presents a new Moodle activity called *e-voting*. This activity brings wider interaction inside large face-to-face classes. The paper presents how interactions can be supported and enhanced by engaging students, and also by enabling professors to work on initial concepts in a flipped-class or distance learning contexts. This paper describes the three different pedagogical models, proposes scenarios to be used. It presents the e-voting activity on Moodle, its advantages, its functioning and availability for the Moodle community.

Context

More than 20,000 (27% of all Swiss UAS students) learners enrol every year in the different curricula proposed by the University of Applied Sciences Western Switzerland (HES-SO). This university offers students strong references to the real professional world, either by linking the teaching laboratories with real experiments or by developing projects with professionals in action. Since 2004, the e-Learning Center Cyberlearn has been in charge of developing and conducting research in blended learning, along with the pedagogical use of new innovative and disruptive technologies.

The average student age at the HES-SO is 25, and most students attending a Bachelor curriculum belong to the *digital natives* generation. The distinguishing features of their learning process is strongly influenced by technology. Such students show short attention spans, are zappers, and need a variety of short activities, preferably in a visual form, to maintain their attention. The students of this generation tend to show a natural capacity for using technology and they especially appreciate being considered as co-experts in their courses (Prensky, 2001). The *digital natives* appreciate horizontal hierarchical interactions and stop considering the professor as the only source of knowledge, and see him as a more experienced person with whom to cooperate (Prensky, 2012).

To behold whether theories dealing with Digital Natives, empirical observations reported by professors in numerous universities, and the current situation in the field actually converge, Cyberlearn conducted a quantitative study in May 2013, profiling students attending a cursus at the HES-SO (Cyberlearn, 2013).

The study shows that students' habits outside the classroom affect the ways they behave in class. 85% of them access the Internet during the course, for learning or other purposes. They massively use smartphones in addition to their laptops: 75% use their smartphone during lectures, 29% frequently, 46% sometimes. Several reasons can explain this attitude: 46% access the Internet because their professor uses the Internet during the course, 29% check on data showed by the professor, 49% seek data to supplement data provided by the professor, 68% read their e-mails, 47% browse the Internet, 32% admit being bored by the course and 28% like doing several things at the same time. Some students seem to consider the Internet as a kind of addiction ("I cannot stop myself...", "The Internet prevents me from...", "it makes me less attentive..", or use it to sanction a course which fails to meet their expectations "course is too simple or boring, I do another job" "when the course is particularly uninteresting I quickly digress").

Others researches reveal that students are constantly connected, day and night, without interruption even during class periods. Sleep seems to be the only moment without connection. This ceaseless use of the smartphone comes as an automatic response against boredom (Collectif, 2015).

Besides, students indicate that they wish a more frequent use of quizzes before the course, during the course (either at the beginning or at the end) or even at home, showing thereby how much they appreciate this activity (Cyberlearn, 2013). Indeed, interactivity is encouraged while providing a fun approach much appreciated by this public, used to such types of applications, where friends can be challenged on general topics.

Voting systems in the classroom

When a professor needs feedback from his students on a specific issue, he generally asks a question and counts the raised hands. This rudimentary system proves limited. It can deal only with yes/no answers. Moreover, voting in front of the professor and the fellow students may dodge the answers. Some might not express their true opinion, might vote as another classmate, while others may fear the professor's look on their vote. This may establish a kind of self-censorship and harm the veracity of the provided answers. The clicker voting systems enhances this issue by providing immediate and confidential answers, while enabling the professor to address each student in particular in an efficient and courteous manner.

Scenarios for use

In order to embed this type of activity in the teaching process, we will describe three models for its application, coupled with a pedagogical scenario.

1. Pedagogical approach: the role of initial concepts

This approach (Piaget, 1988; Giordan, 2010) relies on the concepts the students build up during their life. Students need no previous teaching on a topic to have a pre-conceived idea about it. These underlying ideas are called *concepts*. The learners unconsciously build them up by crystallising their vision of the world and the knowledge presented to them. Then, they will

express these in the form of more or less complex and more or less accurate models in relation with the scientific reality. Such initial concepts resist the learning process and often cause recurrent models which can be observed among learners, even among those having completed upper educational levels. Bachelard particularly mentions an “epistemic hurdle”: a ready-made answer, a ready-made idea becomes obvious and blocks the assimilation/adaptation process (Piaget, 1988). “We must think against the brain”, as Gaston Bachelard (1938) claimed. Knowing this, the professor can start working on these concepts during his teaching. After having identified these initial representations, the professor can work on the erroneous concepts and deconstruct them.

The voting tools used in the classroom can therefore contribute to help the students become aware of their shortfalls and help the professor detect them. Then, the professor can set up learning activities to help the students modify and integrate the presented knowledge satisfactorily.

Scenario 1: the voting systems in the classroom can help identify these hurdles. The professor can ask questions affirming a scientific truth linked to the taught topic and observe how the students validate it.

2. Sociological approach: habits linked to social networks

According to the survey conducted by the HES-SO Cyberlearn centre among students, regarding social media, 86% have a profile on Facebook, 25% on Twitter, 22% on Instagram and 3% on Tumblr. 13% of them have no profile on line. Additional social media are quoted, such as Google+, Pinterest, Spotify, Parlingo, Viadeo, Skype, Youtube, Xing and LinkedIn. The students are uninterruptedly connected to these networks, which they use to express their opinion and interact with their community (Cyberlearn, 2013).

Such behaviours tend to break the barriers and level out the relations between students and professors. They also reinforce a pseudo-expert-consumer position. By constantly linking fan pages, reacting and commenting, posting videos, photos on these products, the students expect their opinion and judgement to be considered as pertinent and authorised.

Scenario 2: the voting systems in the classroom can make use of these behaviours to outline the class condition in real time (satisfaction, comprehension level, expectations, etc.)

3. Flipped classroom

This pedagogical method consists in shifting theoretical learnings out of the classroom time, which can then be dedicated to achieving added value activities (practical exercises, solving problems, workshops, experiments, debates, collaborative tasks etc.). The activities performed in class encourage interaction and break up a passive attitude often resulting from teaching methods relying purely on transmitting knowledge.

Scenario 3: These systems enable to check on students in order to discover what interests them and make connections between the provided knowledge and their centres of interest, to make

them ponder on the presented topics. Therefore, to complete a quiz at the beginning of a course, in order to revise some notions covered in the previous lesson, either in or outside the classroom, can bring some dynamism to the course, as well as become an efficient revising tool. In flipped class sessions, it is also common to propose questions after a brief presentation of a particular topic, by allowing students to vote individually, followed by period of discussion in pairs, before relaunching the quiz and commenting on the progression of the results.

Type of systems

The convergence of technological habits, intolerance towards boredom and the preference shown by students for interactivity via activities such as quizzes, has encouraged the development of voting tools for use in the classroom. Ranging from physical solutions (clicker) to applications to be downloaded on the mobile phones, a professor can choose among a number of possibilities to embed this type of activity in the classroom.

Some drawbacks of the physical systems encompass the purchasing costs, the physical storage and availability issues. Moreover, the hardware can become damaged and at times the buttons become unreliable for counting votes. As for the on-line systems, these often require a computer. Driven by such shortfalls, designers have developed applications for smartphones, sometimes for free. However, most of them require a dedicated application to be downloaded on the student's smartphone. The Cyberlearn survey reveals that only 37% of the students wish to use their smartphones for learning purposes.

Concerning the professor, the voting activity is designed on a computer, whatever the selected option. At the end of the voting, a graph displays (sometimes dynamically, in real time) the results in a presentation tool (such as PowerPoint) or any other selected system.

E-voting

One of the activity at the HES-SO Cyberlearn e-learning centre consists in developing products useful to its community or more widely for the global academic community. We decided to embed the voting activity into the LMS Moodle in the form of an activity like any other (quiz, homework, etc.) for various reasons. Firstly, we selected Moodle as it is the LMS used in our university (4,000 courses online, 18,000 users) and it is one the most used open-source in tertiary education. Secondly, when designing his course, a professor may encounter difficulties to embed the voting activity in his global pedagogical concept, while having to implement and monitor it in another system. E-voting for Moodle enables the professor to stay in his course space when creating and monitoring the voting questions, as well as displaying the results. Therefore, the student faces a system coherent with the Moodle space he is accustomed to.

E-voting for Moodle displays voting results on a graph dynamically. A latency time span can be defined before the results are displayed, therefore avoiding students to be influenced by the results of other participants. After the course, e-voting for Moodle enables the professor to

access the recorded data by quiz or by use, in order to evaluate how the class participants have integrated his questions. The answers remain anonymous.

Technical aspects

E-voting is a Moodle plugin will be made available for free to the community via Github.com on October 2015. Once downloaded, the administrators of the local Moodle platform can deploy the plugin in their own system, following the installation documentation available.

For the time being, e-voting is available in French, German and English and the plugin can support any other languages. Cyberlearn will maintain e-voting for Moodle and make it evolve to meet the needs of the community.

E-voting functions as follows:

- In the corresponding course, the professor creates an e-voting activity.
- He creates the questions and the type of replies, just like in a traditional quiz activity.
- When the activity is launched in the classroom, a QRcode and a web link are generated.
- Using an application for scanning the QRcode (for instance i-nigma, whose advantage is that it can scan QRcodes without having to be placed directly in front of the barcode), which must be install first on the smartphone, the students scan the code which transforms their mobile into a clicker. According to the number of possible answers for the question displayed on the beamer, the mobile screen (smartphone, phablet, tablet) is divided into the same number of voting options.
- The professor defines a latency time span before displaying results on the chart (immediately, after 10 seconds etc.).
- The students vote.
- The professor stops the activity.
- The results are dynamically displayed on a graph.
- The professor can close the activity, discuss about it or/and launch it again.
- Later, the professor can consult the voting records for each quiz to improve the questions e.g.

If the students have no mobile peripherals available, they can type the link displayed under the QRcode in their browser of their laptop.

Another advantage of this system is that no Facebook connection is needed, no specific user account has to be created, nor any personal data is recorded.

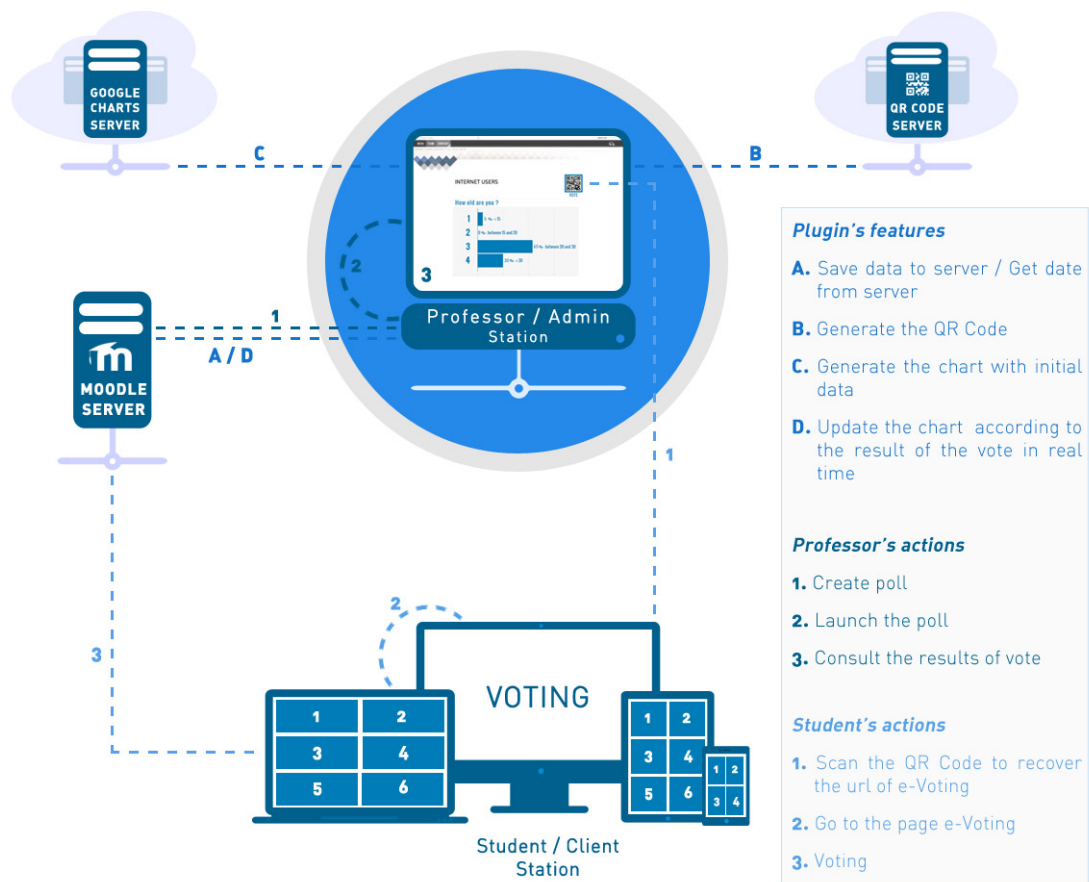


Figure 1. Overall functioning of e-voting

E-voting and e-learning

It is interesting to point out that e-voting can also be used for distance learning courses, in an asynchronous use or inside MOOCs.

Indeed, quite simply, when a e-voting activity is launched at a specific moment, it generates the QRcode and the link which the participants attending the distance learning course can to scan in order to vote. In an asynchronous use, it is also possible to launch a question and to leave it open for a week or more and see the results change as long as the votes fall.

Other example, in MOOCs, the activity can be monitored via Moodle to collect data on the course, to start a new week for a course, to gather feedbacks on course resources, etc.

Conclusion

The voting systems in the classroom or distance learning represent an asset when animating large classes, increasing interactivity, decreasing the participants' disengagement or help the professor to transform the students' initial concepts on the course content. The potential of voting in the classroom, as fun, pedagogic and didactic, constitutes one of the tools, which can transform the teaching process in order to meet Digital Native requests and habits, while at the same time engaging them in the presented topics. If a number of voting systems are

available on the market, the e-voting activity in Moodle, open source and free, enables a non-intrusive, simple and pleasant way to embed this type of activity in the teaching process.

The technical evolution used to collect the answers to the questions in the classroom, serves a fundamental pedagogic aim: engaging students to become the actors of their own learning transformation. Xenophon, a Greek author born in 430 BC, already claimed at the time: “Asking a question is teaching”. An activity such as e-voting for Moodle modernises the process while maintaining its usefulness and its pedagogical wealth.

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To find out more about e-voting on Moodle, test or download the plugin, please contact the author or Cyberlearn@hes-so.ch.



PRE-TERTIARY LEARNING ANALYTICS SYSTEM WHICH SUPPORTS EQUAL OPPORTUNITIES

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Abstract

In this paper we elaborate the design of pre-production National Learning Analytics (LA) and Data Mining System. Research and reports about LA System (LAS) development lag on both the national (regional) and individual (school) level. Our approach to the design consists of the following five phases: objectives setting, user needs analysis, data availability analysis, dashboards development (goals settings and defining dashboard functionalities) and specification of the tender. To increase the usability of LAS the involvement of users is essential and for the student's dashboard it is important to reflect diversity of student body and to support equal opportunity concept. LAS is developed with the bottom-up approach. The design process consists of several rounds of user consultations with a special focus on the interests of learners. Consultations start with focus groups and panels followed by the relevance evaluations. Finally, targeted users give feedback on the pre-production functionalities of each dashboard. Further development needs to acknowledge the challenges of collection and protection of data, interpretation of results and continuous adjustment to meet the users' needs. Additionally, LA interventions, by design, must account for the diversity of the student body.

Introduction

By definition of Learning Analytics (LA) students and support for their learning, motivation and success are at the very heart of LA. Namely, learning analytics has been 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” (Siemens, 2012).

In this paper we will present the design for Learning Analytics pre-production system development for pre-tertiary educational sector in Croatia with the special emphasis on the dashboard design phase and how LA can support equal opportunities. The methodology and the approach presented in this paper is developed in the scope of the project “E-schools: Establishing a System for Developing Digitally Mature Schools (pilot project)” (E-schools) (CARNet, 2016). The project is due to run from 2014 to 2022 with a budget of EUR 180 million, where 85% of funding comes from EU funds and 15% from national and local budgets. The coordinating body of the project is the Croatian Academic and Research Network – CARNet and the University of Zagreb, Faculty of Organization and Informatics

(FOI) is one of the project partners. The overall goal of the “E-schools” pilot project (2016-2018) is to establish a system for the development of digitally mature schools through the pilot project and the evaluation of the application of information and communications technologies (ICT) in the educational and operational processes of 150 schools in the Republic of Croatia (CARNet, 2016). One of the project results is the development of Learning Analytics and Educational Data Mining System for pre-tertiary education system in Croatia and that process will be elaborated in this paper. FOI, as a project partner, is responsible for the research and design of scope and functionalities of Learning Analytics System (LAS). In Croatia LAS is essential to support students and teachers to enhance learning and teaching outcomes, schools to embrace more autonomy and national authorities to set, monitor and evaluate the strategic development.

State of the art – From needs analysis to a dashboard

In this literature review we give a short overview of research about the framework for introduction of learning analytics with the emphasis on primary and secondary schools and how LA can support diversity of needs and equal opportunities for students. A framework for setting up learning analytics services in support of educational practice and learner guidance, in quality assurance, curriculum development and in improving teacher’s effectiveness and efficiency based on six critical dimensions of learning analytics is presented in (Greller & Drachsler, 2012). The stated six dimensions of the proposed LA framework are: stakeholders (students, teachers, learners, other), objectives (reflection, prediction), data (open, protected), instruments (technology, algorithm, theories, other), external constraints (conventions, norms) and internal limitations (competences, acceptance). Authors’ conviction is that only the consideration of all six dimensions in the design process can lead to optimal exploitation of LA. Additionally, it listed problem areas that influence the acceptance of LA such as data ownership and openness, ethical use and the danger of abuse, as well as the demand for new key competences to interpret and act on LA results. Further, (Scheffel et al., 2014) based on the results of the Group Concept Mapping study conducted with experts from the field of learning analytics, authors proposed a framework of quality indicators for learning analytics. Proposed framework includes the following five criteria and quality indicators (Objectives, Learning Support, Learning Measures and Output, Data Aspects and Organizational Aspects). The aim of the proposed framework is to provide a means to capture evidence for the impact of learning analytics on educational practices in a standardized manner.

In order to ensure the use of educational data for LA in an acceptable and compliant way and to overcome the fears connected to data aggregation and processing, (Drachsler & Greller, 2016) described the instrument for educational institutions to demystify the ethics and privacy discussions on LA. The developed eight-point checklist named DELICATE (Determination, Explain, Legitimate, Involve, Consent, Anonymize, Technical, External) shall be applied by researchers, policy makers and institutional managers and institutional managers to facilitate a trusted implementation of learning analytics. The research (Greller & Drachsler, 2012) was used by authors of (Rodríguez-Triana, Martínez-Monés, & Villagrà-Sobrino, 2016) and applied to a primary school classroom. In this paper authors indicate that

the main barriers which had to be faced in the new educational context were legal and ethical issues related to identity and data ownership as well as the potential benefits of applying LA in primary education. Additionally, research from (Sancho, Canabate, & Sabate, 2015) contextualizes the goal of the PILAR project (Smart Learning Analytics Platform to enhance Performance in Secondary Education) in the wider panorama of learning analytics with references to the situation in the Spanish context. Authors considered the implementation of learning analytics as a promising way that can timely provide teachers with the information needed to detect motivation issues early.

Further, (Mittelmeier, 2015), used Social Network Analysis and LA methods to explore the role of social networks in classroom participation and attainment for ethnic minorities and international students, highlighting replicable interventions that can help promote social cohesion in the UK. The significance of such successful interventions can contribute to the increase in areas such as social cohesion, student engagement, intercultural awareness, and opportunities for more equal societies. An interesting study of policy frameworks and processes of ethical review are given in (Willis, Slade, & Prinsloo, 2016) where cross-institutional review of three universities (the University of South Africa, the Open University in the United Kingdom, and Indiana University in the United States) provides an opportunity to compare practices, values, and priorities. As a result there is proposal for the typology of different ethical approaches to LA that can be consulted.

Finally, even though there has been a lot of learning analytics research published since 2010 there are very few that deal with pre-tertiary education and especially with the development of LAS on the national or regional level and not just level of an individual school. Therefore, there have been limited benchmark possibilities for designing the pre-tertiary LA national system for “E-schools” project in Croatia.

Development of LA system for pre-tertiary educational system in Croatia

Within the “E-schools” pilot project the design for development of Learning Analytics system for pre-tertiary education was prepared and until now it has reached a pre-production design phase. The approach consists of the following phases: (a) setting overall objectives and vision (in this preparation phase of the project and the process of adoption of the Strategy of the Education, Science and Technology (2014) (Ministry of Science, Education and Sports of the Republic of Croatia, 2014), all the stakeholders for pre-tertiary education participated and the goals were discussed and recognized); (b) user needs analysis (developed the methodology for needs analysis for learning analytics system in pre-tertiary education and implemented it in Croatia as presented in (Divjak & Vondra, 2016)); (c) data availability analysis (analysis of the available data sources – a very demanding process due to fragmentation and incompleteness of data bases, data ownership issues, interoperability challenges, ethical concerns and integration of data collecting online and in physical school environment); (d) dashboards development (setting aims for each dashboard and designing dashboard functionalities with user evaluation of examples of dashboard design and functionalities) and (e) tender specification. The results of the performed user needs analysis were the basis for defining

functionalities of dashboards. The main outcomes of the six phases are presented in Table 1. 628 representatives of users participated in relevance and assessment phases, of which 164 were primary and secondary schools students.

Table 1: The main outcomes of the six phases

Phases	Results
1. Scope identification phase	Identified four goals Identified 6 target groups: 1) Students/pupils and their parents, 2) Teachers, 3) School management and support (principal/ pedagogist / psychologist), 4) Local and national education authority (School founders/ Ministry/ Agencies for Quality Assurance), 5) Policy making bodies and researchers and 6) Project partners on "E-schools" project.
2. Users' questions collection phase	Collected questions per target groups: students 48, teachers 90, school management 52, Educational authorities 87, Policy bodies and researchers 60, project partners 29
3. Relevance survey phase	Collected answers on question relevance per target groups: Students 116, teachers 39, school principals/ pedagogists /psychologists 32, local and national authorities 50, policy bodies and researchers 21, project partners 4
4. Data analysis phase	Performed descriptive statistics and prioritization and identified the most important questions that are interesting for each target group (presented below)
5. Consistency evaluation phase	Confirmed consistency with the identified goals of introducing LAS to pre-tertiary education in Croatia

The most relevant questions which present students' interest and were gathered during the needs analysis phase are related to comparison of the student's achieved competencies and competencies required in the labour market; comparison of student's achievement and the preconditions for enrolment into secondary school/higher education; teachers' performance; risks students have in achieving their goals; how students can improve their performance; impact of various factors on student's achievement (such as social status of a family, school equipment and design, working atmosphere, school practice, team work, absences from school, time spent on independent work) and the impact of various factors on the achievement of competencies.

Today, teachers face different challenges in classroom and should balance between different requirements from students who are culturally and linguistically diverse, who have different educational background or socio-economic status and students with other disabilities in learning. Concerning learning analytics as a promising tool that can help in assessing and handling diversity in learners' background and performance, we will present below the dashboard for students, developed according to the results of performed needs analysis.

Dashboards design

The fourth step of model for the development of LA system in pre-tertiary education is designing dashboards for identified target users. According to (SOLAR, 2011) the dashboard is the sense making component of the LA system, presenting visualized data to assist individuals in making decisions about teaching and learning. Here we will present the main functionalities of dashboard for students. Dashboard for students is very essential and fundamental because it answers the most important questions coming from students and it is a starting platform for generation of five other dashboards for other users groups. In

dashboards for other users groups, personal data about students are not going to be available with exception of a teacher dashboard.

The aim of the dashboard for students and parents is data collection, data analysis and visualization adjusted to students in order to achieve better results (learning outcomes) in educational sense and to raise their motivation for learning and learning self-regulation. The dashboard provides data about opportunities for the development and support to every student. Students have a central place in order to grasp all information about themselves, their teachers and school including personal development space and a parent corner. “Me” area consists of three parts: awareness and reflection, predictions and interventions. The description of the basic dashboard element and the reflection on support diversity and equal opportunities are given in the Table 2.

Table 2: Main elements of student’s dashboard

Dashboard element	Description	Support diversity and equal opportunities
Success and progress:	Review of student’s success and progress – overall student’s grade average, grade average per subject, obtained badges. Review of student’s grades for previous school year.	Allows teacher to address individual student needs and implement personalized differentiated instruction for every student. Student has opportunity to follow their progress. For this functionality preparation of students and teachers is essential in order to interpret and use data and analysis for motivation and planning and avoid negative connotations and consequences.
Me and others:	Comparison with other students in classroom (statistically aggregated), in school and students from other “similar” schools according to different factors (e.g. average grade, students’ activities, number of absences).	Provides teacher insight into students’ cooperation, students’ preferences on group work and identifies disconnected students. Finally, performed Social Network Analysis on students’ activities allows teacher to timely react and create comfortable working atmosphere in classroom regardless of diversity issues.
My network:	Students’ position according to centrality measures in different networks (e.g. team work, informal communication, sharing documents, activities at different systems such as LMS, activities at forum, group membership etc.).	Students and teachers can assess student workload and balance it over time. Students with help of teachers and parents can develop planning and decision making skills. Teachers and school support staff are able to identify students at risk according to different criteria and then focus their attention and interventions to students at risk.
My obligations:	Students’ past, current and future activities such as homework, test, self-assessment, essay presentation etc.)	Every student can ask teachers or support staff for help without sharing their problems with classmates or even talking in person with them.
How am I doing:	Early warning system. Review of possible risks that could threaten students’ success (e.g. negative grades, absences from school, warning from teachers).	Allows teacher to assign tasks to every student and give recommendations depending on their needs and also to recommend special support (for example for a student with disability).
My needs:	Allows students to request help from teacher/pedagogist/psychologist.	
Tasks and recommendations:	Review of tasks and recommendations assigned to student by teacher.	

Further, students can set some educational goals for themselves and then trace their achievements using gap analysis or obtaining badges (Personal development part). There is also the Survey module that can be used to ask students to assess or evaluate the school and teachers and also their own motivation, attitudes and needs.

Discussion

Basic functionalities

The national LAS in Croatia has been planned to have rather wide objective starting from supporting diversity of students and teachers in enhancing learning and teaching outcomes, then boosting schools to embrace more autonomy and national authorities to set, monitor and evaluate the strategic development in pre-tertiary system. Although from different aspects, all user groups focus on students' success, students' problems, i.e. potential risks and their needs, special educational needs, which gives impression that students really are at the very centre of the whole LAS development. However, based on the literature review and needs analysis, we realized that there are several issues that have to be considered with special attention. Therefore, in addition to the presented dashboards, we predicted three additional modules within LAS architecture: Consent System, System for Warning and Intervention and Success Planner.

Privacy and ethical issues

As evident from the performed research review, legal and ethical issues related to data control and data ownership can become the main problem in the process of LAS implementation, especially when underrepresented and disadvantaged groups of students are involved. In order to facilitate trusted implementation of learning analytics (Drachsler & Greller, 2016) and taking into consideration that the largest user group of LAS is underage, we planned the Consent System within LAS. The Consent System, regarding points Consent and Anonymise from the checklist DELICATE (Drachsler & Greller, 2016), will allow users to see the way their personal data have been used (what data, for what purpose, on which locations they are stored and which system uses them). The Consent System will also allow users to give or refuse their consent for using personal data, or part of it, for specific purpose. Informed consent and the procedures of opting-in, opting-out are necessary but not enough for LA. LAS should address the needs of a variety of underserved groups of students, including individuals from less privileged backgrounds, those having some form of disability or those who temporally have health or family issues, to prevent potentially harmful effects of using student data.

Prediction

Motivated by the potential and opportunities that LA offers, we planned the System for Warning and Interventions. The prediction elements are incorporated in several functionalities such as Successor and How am I doing. Additionally, authors (Yeonjeong & II-Hyun, 2015) state that "descriptive dashboard" which they developed was not recognized as significantly usable from students' aspect. Some of the problems are derived from the fact that students do not know how to interpret the presented data. Except on the system level, teachers can also consult and guide students through their learning process but by using prediction elements incorporated in LAS students can get timely and adequate support also in semi-automatic ways. As for the further development, a careful process of data interpretation as well as the education scenarios shall be further designed to give students and teachers

possibilities to use the information meaningfully. Additionally, special attention should be given to incorporate approaches that ensure encouragement and recommendations, and not just quantitative data that only send pessimistic or optimistic signs.

Success Planner

The final system which supports LAS is Success Planner. We predict to embed Success Planner in LAS in order to encourage students' reflection on their learning goals, desired success and competencies that want to acquire i.e. to develop their metacognition skills and approaches. In that way, in an early phase of their educational process, within Planner we strive to give students the sense of where they are, where they can be and how to get there.

Interpretation of the results

Finally, we will shortly discuss the potential hazards threatening within the implementation of learning analytics because as it is stated in (Willies, Slade, & Prinsloo, 2016) data interpretations are subject to biases. A potential danger of using educational datasets for the purpose of learning analytics stems from the misinterpretation of LA results presented within dashboard but also pedagogically sound use of interpretation for supporting student's success and overall well-being. As stated in (Greller & Drachsler, 2012) the data analysis could have dramatic (and unwanted) consequences if not used with the necessary care. Concerning the fact that this system, together with regular upgrades, is predicted to be used by half a million of underage students (pupils), this issue should be taken very seriously. The correct interpretation of data presented within dashboard is a basis for conclusions and decision making which follows analytics process. This implies the development of skills and competencies for all users of the LAS.

Conclusions

The research presented in the paper deals with designing national learning analytics system for pre-tertiary level based on the E-school project that is underway in Croatia. Design and implementation of such a system has been demanding and complex as the available research on learning analytics system for primary and secondary schools. In the case study presented in this paper we put a strong emphasis on needs analysis of identified user groups. There are six main user groups but the central ones are students and teachers. The main objectives emerging from the users' requirements are to support students' success, to allow early identification of students at risk based on available data, to allow educators to friendly monitor students' success, progress, needs and timely intervene to prevent students' failure. The central part of Learning Analytics System is Data Analysis System. Very important part of the LAS is the Consent System that allows students and teachers finer control of how their personal data is used. The System for Warning and Intervention helps students and teachers to deal with risks, and finally Success Planner enables the development of students' planning competencies and other metacognitive skills. Special consideration is given to supporting diverse student body and providing equal education opportunities for all to ensure effective teaching and learning strategies and access to students' support. Ethical decision making

about the design of LAS, as well as the ethical conduct of use of LA are key to this project but also to every LA project that involves children, adolescents, and young adults (presumably unable to give their own informed consent formally at some age) of different socio-economic, ethnic, cultural and religious backgrounds, and from different geographical regions/countries.

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ADAPTIVE LEARNING AS A TOOL FOR SUPPORTING DIVERSE STUDENTS WITH THRESHOLD CONCEPTS AT A DISTANCE

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Overview

A key aspect of the learning experience for students is the need to consolidate and absorb what they are learning. To do so, they need space and time in their learning, and additional support to overcome any aspects of their learning that they find particularly challenging. A number of researchers have identified the idea that ‘threshold concepts’ exist across many subject areas which require students to make a transformative, irreversible and integrative step in their learning (Land & Meyer, 2010).

This paper concentrates on an example of a first level undergraduate engineering module and the challenges of teaching the key mathematical concepts needed to a diverse audience of engineering students with varying levels of mathematical ability.

The paper outlines how the project team went about identifying the threshold concept, planning an adaptive learning approach to supporting students and then talks about the findings from this initial work. We then go on to discuss how we are considering developing the approach for future cohorts of students.

Identifying the threshold concept

The diversity of mathematics skills in enrolling engineering students has been the focus of several studies (Bahr, 2011; Tolley et al., 2012). The academic team have supported students on a previous engineering module at The Open University meaning that they already had some good evidence on the areas of study that students struggled with, and undertook some additional analysis work with the tutors from this module to confirm these. As a result of this work, the team identified several areas of mathematical anxiety for engineering students that may represent threshold concepts including:

- rearranging equations;
- vectors;
- trigonometry;
- algebra;
- calculus.

Evidenced by poor understanding and performance during their second level study, as well as perceptions of tutors teaching at higher levels, it became clear that ‘rearranging equations’ was a key threshold concept that some students had never surmounted. In reviewing the findings,

the team settled on the concept of rearranging equations as being the key barrier for many level 1 engineering students.

Planning the support

Having identified the threshold concept, the team worked with the Technology Enhanced Learning department in the university to design paper prototype solutions that could support students with getting through this threshold.

The module design was already building in regular formative self-assessment opportunities for students to test and practice their maths knowledge and the teaching activities around this particular concept were again to be based on the use of three such formative online quizzes. Core to the approach was devising a hand-holding, supported design that enabled struggling students to draw on additional resources at key points to help with their understanding. This involved presenting resources that described and outlined the concepts using various types of approach, including visual on-screen tutorial clips. As these students are part-time distance learners, the design also sought to include the tutors at a key point to help any students who simply couldn't grasp the concept, despite having engaged with all of the supporting resources.

This process went through several iterations on paper to ensure that what was ultimately built was going to be practical for the students and tutors but also technically possible within the VLE systems available to the university.

The design

Having identified a workable solution, the next step taken was to produce a working prototype and to test this with real students. Two groups were invited in and provided with instructions to help them step through the quizzes.

Core to the design at this stage was a sequence of online quizzes consisting of 5-6 linear algebraic equations for the students to solve. The first quiz included straightforward equations based subject areas the students have already covered, and the subsequent quizzes carefully built up the complexity for the students; introducing powers and algebraic fractions. The aim being to (a) gently guide students through the process and build their confidence, and (b) to enable any support from a tutor to identify precisely which aspects of the concept the students struggled with.

Testing revealed that the fundamental approach to the design worked. Some of the testers were able to complete all three quizzes unaided, whilst 2-3 struggled at specific points in the quiz. What was also evident was that having three attempts at each question enabled them to work out where they had made a mistake and to correct it.

The challenge for the team at this point was to support the students with the 'syntax' required for answering the questions, and a decision was needed as to whether this would be a viable option in the live module. Supporting two small cohorts of testers with the syntax is

manageable, whereas supporting 1000+ students on a live module is a very different and more costly matter.

Final design

In resolving the student issues, the final product consisted of three multiple choice online quizzes with conditionality attached to prevent the students from moving onto the next quiz until they successfully completed the previous quiz. This basic model is outlined in Figure 1 below.

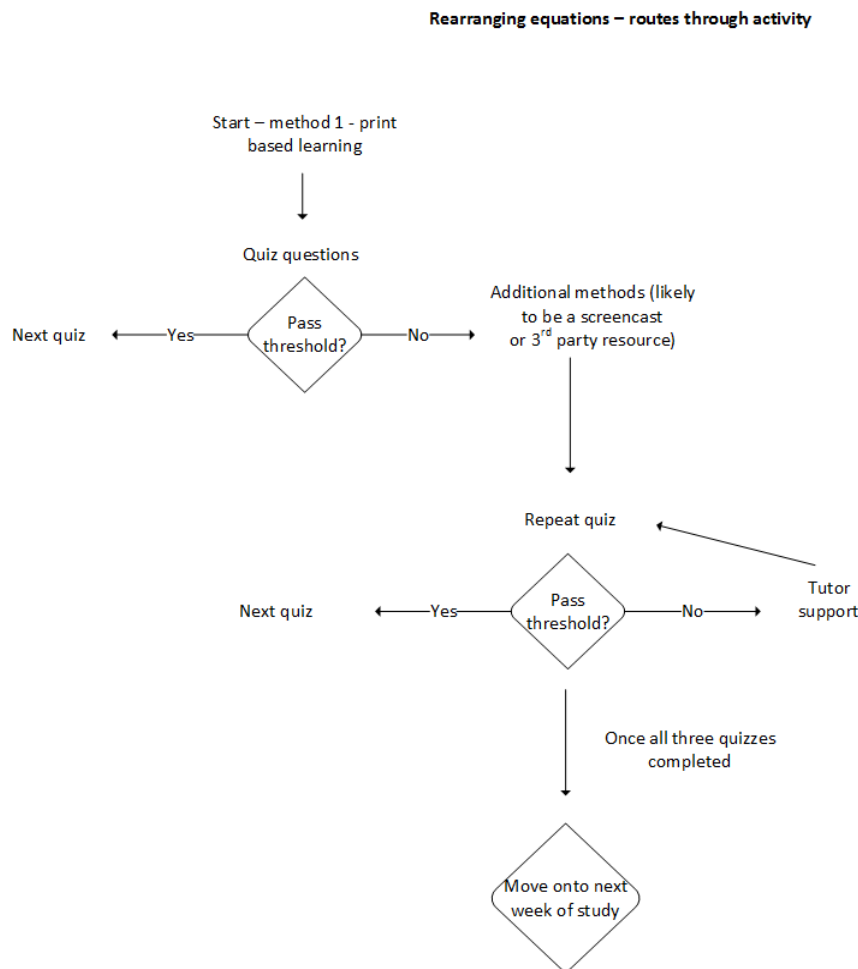


Figure 1. Pathway for adaptive learning content around rearranging equations

Students have three attempts to complete the quiz (with single attempts at each question), and after each attempt the system assesses their results. If they've passed they can move onto the next quiz, if they haven't they are steered to the relevant content for that attempt. So after attempts 1 and 2 this provides additional resources. Whereas after attempt 3 they are guided to the tutor to get additional support. The student's behaviour and performance is monitored by tutors during the process.

An example of the type of feedback provided to students is highlighted in Figure 2.

Where next? - 1st attempt

As you got less than four of the questions right on this quiz you need to look back over some of the materials provided earlier in the module.

Try looking back through section 3.2 of the Part 1 book and Study session 3.2 'Scientific models' and watch the tutorial clip on 'Rearranging equations in the form of $a = b \times c$.' in week 3. There is also a video clip in the additional resources area of week 3.

Re-visit questions 1-8 of Week 3 Practice quiz and ensure you can work out each answer and the method used to do so.

Figure 2. Example of quiz feedback

Findings and reflections

This system worked and catered for the 1000 students on this cohort with no apparent technical problems, so the solution is a scalable one that we can apply and develop at scale. In total, we found that 500+ students attempted the quizzes, and the quiz was followed by an intervention from their tutor to discuss performance and give, when required, additional focused support.

The next steps

Having successfully delivered this model for the first presentation of the module, we are keen to see another cohort go through it in this year before reviewing all of the data and anecdotal evidence ahead of making changes for the next year of study which starts in October 2017. These are likely to include a wider range of equations being available in the quiz.

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TOWARD A MOBILE OPEN AND SOCIAL LANGUAGE LEARNING PARADIGM

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Introduction

With the widespread availability of broadband access to the Internet, the use of online multimodal learning resources has increased significantly. E-Learning has provided an opportunity for courses to be structured around these resources, together with communication tools like chats and forums. However, the great majority of these courses are run on “closed” institutional platforms, where general access is impossible. The Web has gradually evolved into a social infrastructure where most tools and services either have a component where users can engage in discussions or give their opinion, or provide links to the main social networks. The popularity of this infrastructure has led people to want to apply it to their learning needs. Gradually, online courses are beginning to move away from closed platforms onto open ones, where social interaction between the students has become a key element in the learning process. As awareness grows of the existence of such courses, the number of students taking them, or signing up to take them, has dramatically increased in the last decade. Hence, massive open social learning has become an educational phenomenon that is receiving a great deal of attention within the expert educational community (Kop, 2011).

The application of massive open social learning to the domain of languages has only just begun, and existing research highlights both successes and problems still to be solved (Barcena et al., 2015). One key problem here is that developing second language capabilities is not purely a knowledge-based process but one that requires considerable interaction with other (preferably, but not necessarily native) speakers. The opportunities for such communication in massive open social learning exist but are limited to the current nature of the learning design (which oscillates between very tightly controlled interaction related to a given task, which limits autonomous learners, or completely unstructured interaction, where less competent learners can easily feel lost or isolated) and the need for the learners to be sat in front of their computers.

Mobile technology is becoming a standard part of life and it has been estimated that by 2020, 80% of all adults in the world will carry some form of it around with them (Evans, 2014). Many people have mobile devices these days but do not have a computer, so the results of the research presented in this article will offer an opportunity for a very large number of people to learn a second language using mobile devices. Furthermore, potentiating the role of mobile devices helps to further blur the boundaries between standard online learning activities, i.e.,

digital learning, and what has been termed digital living (Read & Barcena, 2015). This refers to an increase in the flexibility of how people mix their learning with their everyday activities and highlights the benefits of this combined approach.

In the SWITCHED-ON project (The empowErment of maSsive open social language learning through mobile TeCHnology: harnEssing interactions, transcenDing bOuNdaries), the authors are analysing the affordances of open social learning, in the widest sense, for second languages. This ongoing project is funded by the Spanish Ministry of Economy and Competitiveness (Programa Estatal de Fomento de la Investigación Científica y Técnica de Excelencia, Subprograma Estatal de Generación del Conocimiento; ref. no. FFI2016-80613-P). In this work, mobile technology (including MALL) is conceived to be not just a tool that can be used for undertaking certain tasks (in an unstructured and loosely controlled manner), but as the main way in which second language learners can interact and carry out their learning effectively (Barcena & Read, 2014; Barcena & Read, 2015; Read et al., 2015). The hypothesis underlying the work in this project is that given the complex, hectic and mobile nature of 21st century societies, open social language learning can take place with a backbone defined by mobile technology. This will represent a new paradigm that is both inclusive for a wider range of language learners than is the case with current open online courses, and is more effective, since it blurs the boundaries of everyday life with learning. It is envisaged that this will happen through the combination of mobile online interaction with integrated supportive MALL practices. In this article, an initial exploration of some of the issues related to the conceptual space of possibilities for such a paradigm are discussed as a step toward its formalisation in a systematic and controllable manner.

Massive open social language learning through mobile technology

Open online courses have been around almost as long as the Internet itself, some of them with very large numbers of learners. However, it was not until 2008 that Dave Cormier actually explicitly used the term MOOC for a massive open online course (Cormier & Siemens, 2010). This educational modality attempts to promote free learning for a large number of people with a shared interest, by removing initial limits of access and attendance, and in some cases, offer credits and/or certificates at very low cost at the end of the course. It is not surprising, therefore, that despite the conflict of interests with the objectives of formal educational institutions and the many criticisms raised in the literature (Romeo, 2012; Jackson, 2013), MOOCs are having a significant impact upon the online educational community (with hundreds of thousands of people undertaking these courses).

MOOCs did not just appear from thin air as some new educational revolution, but represent a natural evolution of previous initiatives. One of the most important differences emerging in the literature is that between what are referred to as xMOOCs and cMOOCs. The former are similar to standard online courses but with larger student numbers. They represent the great majority of existing courses, since they are quite often launched as a continuation of previous e-Learning courses. The latter (connectivist MOOCs) are based upon principles of learning communities with users actively contributing content and constructing knowledge, where the

key activities are remixing, repurposing and the co-creation and curation of content and interaction (Cormier & Siemens, 2010). xMOOCs promote participant diversity, in the sense of transmitting the same message to thousands, whereas cMOOCs focus more on diversity, with activities and resources developed and distributed in many different ways. The majority of MOOCs for languages (henceforth, LMOOCs) developed to date are xMOOCs, which arguably present a fundamental limitation related to the very nature of second language learning (henceforth, 2LL). Thus, if successful language learners are expected to assume a protagonist role in their own learning, on the basis that knowledge is can be self-constructed rather than transferred to learners, they require the opportunity to *build* strategies and connections that are significant for them at a given moment in time, in an *adaptive* manner. However, given the intrinsically social nature of verbal communication, negotiating meaning, engaging in group work, providing mutual assistance, and constructing and sharing new knowledge and skills *collaboratively* with others have all been widely praised in the 2LL literature (e.g. Warschauer & Kern, 2000). Although peers' production is bound to contain inaccuracies and the validity of their feedback, therefore, may not always be reliable, 2LL is no longer restricted to the idea of the continuous individual imitation of the model, 'flawless' performance of a single teacher (and/or set of materials). Nowadays, the ultimate objective of language learning is generally accepted to be proficient engagement in intelligible, empathic, and effective verbal performance, in a varied set of contexts and situations, with different types of interlocutors (Council of Europe, 2001). Therefore, the design approach used in effective open social language learning must contain cMOOC-like elements to provide the interactional degrees of freedom necessary for users to really develop their 2LL capabilities.

Previous experience of the authors with different types of LMOOCs have let us identify their potential problems, including the unmanageable size (e.g., how to provide feedback and scaffolding), problems of attributing authorship of assessment, and the high degree of student dropout (e.g. Read, 2014), among others. Furthermore, Barcena and Martín-Monje (2014) have discussed other potential difficulties, such as the changing role of teachers in LMOOCs (where they move away from being an instructor to being a facilitator, therefore not being able to directly interact in a personalised way with the large number of students present), the problem of how to provide effective feedback with such an unbalanced teacher-student ratio, and the difficulties of managing a heterogeneous student group composed of people with different levels of language communicative competences and learning digital literacy, styles and goals. There is also no clear business model. However, 2LL can be seen to be eminently practical and dynamic, and as such, falls in the middle of the scale of 'intrinsic MOOC suitability', since it is both skill-based and knowledge-based. This requires a network of capabilities (competences, skills and data) to be finely intertwined as learning progresses (Barcena, 2009). Such learning requires both cognitive involvement (using high-order mental skills) and social interaction (with more or less competent speakers of the target language) (Read et al., 2010). Experience gained so far is enabling the concept to be refined empirically, by focusing on what works best, in terms of factors like the average number of hours a course requires, the prototypical profile of the students, etc., as well as basic instructional design issues such as selecting suitable methodology and supporting technology (where options are

available) (Martín-Monje et al., 2013). However, regardless of the conceptual and terminological confusion related to these courses, experience shows that they are popular with students, in terms of their numbers, course statistics and student/teacher satisfaction (Martín-Monje et al., 2013). Arguably, the popularity comes in part from the lack of associated cost and the flexibility of access and commitment that MOOCs offer. Unlike other initiatives related to OERs (Open Educational Resources), the essential learner-centeredness and social orientation of these courses are also generally found to be both stimulating and rewarding by the students. Formats are still being explored, intense CPD (Continuing Professional Development) being seen as optimal.

In LMOOCs, specifically, the *quantitative factor*, i.e. the potentially large numbers of learners, typically ensures sufficient *critical mass* to allow for varied input, lively forums, and rich peer interaction (e.g., plenty of linguistic issues to comment on, people to help out with queries), and even the possibility to distinguish more advanced students in gamified courses (where it is useful to provide them with additional monitoring roles [Barcena et al., 2015]). Hence, online social tools and platforms, if correctly structured and managed, can combine the best of both formal and informal learning to harness the possibilities for the development of 2LL competences, especially the productive and interactive ones. Therefore, open social language learning can be proposed in order to potentiate effective student interaction and enable them to communicate in the target language (with [non-]natives), using the same (meta-)cognitive strategies as they would in authentic communicative situations (e.g., reasoning, contrasting, enquiring, justifying, reflecting, etc.). This arguably requires the whole process to be structured and contain mechanisms that prevent the students from internalising erroneous language while providing some degree of flexibility and adaptability, and keeping motivational levels up. In order to provide such a design in effective open social language learning, reproducing a *standard* xMOOC would lack the proactive and interactive features necessary for developing second language competences. Yeager et al. (2013) identify four types of activities in cMOOCs that can increase proactivity on the part of the learners and facilitate interaction (which can be undertaken to some degree in the target language according to their level): aggregation/curation (gathering links to existing resources), remixing (producing new documentation, undertaking blogging, etc.), repurposing/constructivism (where users arguably build their own internal connections) and feeding forward (where new content, resources, summaries, etc., are shared with others). In this project, applying the complete cMOOC philosophy (of students freely exploring a large conceptual space of online resources and related social media in an almost *ad hoc* fashion, largely improvising activities as they go) is not seen to be the most effective way to gain competence in general in the target language. Once students have obtained basic structural foundations (vocabulary, grammar, pragmatics, social cultural knowledge, etc.), a progressively more communication-based approach is seen to be more appropriate for framing the learning (Knight, 2003).

Since the early 90s, mobile devices have increasingly become a part of everyday life. With the advent of the smartphone and the development of open mobile operating systems like Android, there has been a ‘democratization’ of such devices, and the associated lowering of

costs means that an ever-growing sector of society now has access to such phones and perhaps tablets. It is not only the devices themselves that have improved with time, but also the underlying network technology that they use for communication. It is not surprising, therefore, that mobile data services can be obtained from telecommunications companies to offer access to the Internet when one of the ever-growing number of open Wi-Fi hotspots cannot be found. As Evans (2014) notes, “The world is mobile!”, an assertion supported by data such as the 4-6 billion downloads of apps on iOS and Android devices, over 50 social messaging apps that have had more than a million downloads on Google Play, over 14 billion messages sent on WhatsApp a day, around 400 million photos shared on social networks each day, the fact that almost 70% of Facebook daily users connect from mobile devices, and the estimate mentioned above that by 2020, 80% of the world’s adult population will have a smartphone. Given these data, it is easy to see the relevance that mobile devices have for learning. They represent an important step towards ubiquitous information and community access and, as such, contain great potential for the way in which online education can be undertaken, which users are beginning to explore. This is not a question of researchers trying to get learners into Web 2.0 environments from their mobile devices, because the learners can already see their benefits. This is a bottom-up revolution where the learners themselves are pushing the teachers to use technology, not the other way round. This change of habits reflects basic human behaviour: if we are used to using a tool for some purpose, and happy to do so, then we may try to use it for other purposes as well.

It is reasonable to expect that if people are studying something, or even already on a course, then they will try to use a mobile device to carry on with this activity when possible (Kukulska-Hulme et al, 2007; Pettit & Kukulska-Hulme, 2007). This premise is implicit in a great deal of the research being undertaken on mobile learning (henceforth, ML) and, specifically in the context of languages, in MALL. Crompton (2013) defined ML in general terms as “learning across multiple contexts, through social and content interactions, using personal electronic devices”. Traxler (2005) defines ML as “any educational provision where the sole or dominant technologies are handheld or palmtop devices”; Kukulska-Hulme and Shield (2008) define it as “learning mediated via handheld devices” that is available flexibly, and may be either formal or informal. Specifically, in terms of MALL, they note the application of such devices for new types of 2LL, emphasizing continuity or spontaneity of access and interaction across different contexts. Since learners are using their mobile devices to access educational resources online anyway, then exploring the access of LMOOCs from these devices should be the next logical step.

Given the widespread adoption of mobile devices, it is just a question of time before most, if not all, major LMOOC providers prepare their courses and related tools for mobile delivery. Even MOOC platforms that do not support mobile access and use directly may actually offer content and resources than can be downloaded indirectly to a computer and then transferred to a mobile device. It should also be noted that given the wide range of mobile-compatible Web 2.0 tools that are available these days, it is questionable whether an actual MOOC platform is really required to offer massive open social language learning to students. The

authors argue that mobile devices offer three affordances for open social language learning that can complement the learning experience. Firstly, as portable course clients, offering the learners context-free and context-sensitive access to their courses, thereby enabling them to continue their studies in a flexible way, making the most of the time and locations they have available as they move around every day. Such access will promote frequent interaction, and in the process, communication and collaboration. They do not need to wait to have a computer handy, but can check to see if, for example, some other learner has commented on something they have said in a forum or on some annotated recording they have made or curated from a given source of social media. Secondly, as mobile sensor-enabled devices, modern smartphones provide an enriched way for the learners to interact with the world around them, recording sounds and language, taking photos, obtaining geographical data, etc. Such interaction can complement standard online learning activities (e.g., find a certain type of object, take a photo of it, label the parts of the object in the photo and upload it to the course for your fellow learners to work with), and can also be used in immersive augmented reality learning scenarios, where language scaffolding can be provided just-in-time for real world interaction in the target language, and the results captured on the mobile device for later analysis in subsequent learning activities. Thirdly, modern mobile devices are powerful small handheld computers based around an extendable architecture of apps that can both provide general tools to be used to complement open social language learning, and specific MALL apps that can train language competences and be used either as part of a course or as some kind of complementary activity (Godwin-Jones, 2011).

Regarding the first of these three affordances, mobile devices as LMOOC clients, de Waard (2013) presents a comprehensive list of twenty strategies for improving interaction (not specifically for 2LL), when the learners connect from a mobile device. Since many of these strategies revolve around language use, particularly those related to the human learning environment, they are relevant for open social language learning, although not specifically for mobile access to a given course. Regarding the second affordance, as mobile sensor-enabled devices, for some time it has been argued that 2LL should be authentic or highly realistic (Kilickaya, 2004), based on real world situations and scenarios. Carrying around a modern smartphone is like the digital equivalent of a Swiss army knife; it is like carrying around a photo/video camera, an audio recorder, an eReader, an audio/video player, and so on. These functions are particularly useful for immersive 2LL experiences, where the learner finds him/herself in a country that uses the target language, since his/her target language use can be thus scaffolded in a just-in-time way by providing the necessary resources as and when needed. Regarding the third affordance, that mobile devices are powerful and extensible app-based small handheld computers, it can be noted that the different online app stores for the main mobile device operating systems, namely iOS and Android, have hundreds of apps that can be used, to a larger or smaller degree, for 2LL. It should be noted, however, that up until now, the impact of such apps on the development of the related language competences has been almost negligible. A problem with these apps is that although they could form part of a coordinated 2LL program, they are not currently used as such and lack the methodological framework that a skilled language teacher would provide. There is scope for such apps to be

used as part of an LMOOC, since they provide another instance of how the learning experience can be moved out of the online environment.

It would appear to be the case that mobile open social language learning is, indeed, feasible and would improve the experience significantly. The authors' work in SWITCHED-ON aims at exploring the conceptual space of MALL and open social language learning and how the three affordances of mobile technology can empower their combination for large student numbers. However, regardless of the benefits of using mobile devices with such courses, to enrich the learning process and extend it into peoples' everyday lives away from the limited time they have access to desktop computers, it is still the case that mobile access is desired first and foremost because it reflects the way people live today, and will arguably facilitate the use of such courses for people who do not have access to other means. In the authors' experience, 2LL is most effective when a scaffolded spiral approach is used, moving people from teacher-led to self-directed learning, and back again; combining an individual learning stage with subsequent social-constructivist ones (Barcena, 2009). In the case of LMOOCs, teachers are not typically present once the course starts to adapt the activities to the progress of the learner. Therefore, the paradigm developed in this project is intended to be applied to plot the possible learning paths of individual open social language learning courses and provide adequate and relevant scaffolding. Indeed, there are many ways in which learning scenarios can be structured to move people through the LMOOC, back and forth to and from the real world, using mobile technology, so further research is needed to explore and theorise about the space of possible conceptual designs.

Conclusion

The emergence of MOOCs was as an important step forward in providing open education, including foreign languages, to the large number of people who, for diverse reasons, are not able to attend conventional taught classes or participate in closed online courses. However, given the current diversity of LMOOCs, the authors argue that it is more appropriate to be thinking in terms of open social language learning in general, since there are many different ways to harness existing technology to facilitate 2LL which includes but goes beyond the standard MOOC formats, and that the boundaries between what is a course and what is not, are not always so clear or relevant. The distinction between xMOOC and cMOOC will clearly play out differently on different classes of devices, e.g. mobile versus desktop, owing to differences in their technical affordances and their social context, and the assumption that cMOOCs require a dedicated delivery technology may be premature. If MALL is the application of mobile technology for language learning, then given the potential of such technology to increase both the access of people to 2LL and also provide them with complementary tools, we can begin to define and explore the concept of mobile open social language learning and its research validity. It has been argued here that mobile devices complement open social language learning as portable course clients, portable sensor-enabled devices, and app platforms. To the best of the authors' knowledge, only incipient work has been done until now to apply mobile devices to specific tasks within online courses but no systematic analysis has been undertaken with a view to specifying a 2LL paradigm. In the

SWITCHED-ON project, the authors are studying the general affordances of mobile devices for open social language learning, using the arguments presented here as a starting point, to characterise a novel paradigm for 21st century second language learning.

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TEACHER ROLES IN A BLENDED LEARNING MATERIALS ENGINEERING MASTER PROGRAM: “IT’S NOT A NEW ROLE, IT’S A NEW WAY!”

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Introduction

Engineering education is characterized by laboratories, mathematical foundations and design tools. These pillars of engineering education do not seem to be ideal for online education as the field lags behind other fields in adopting online education. Laboratories are for instance hard to implement online due to the need of direct operation of instruments. Likewise, course materials requiring use of mathematics have traditionally not been as easy to implement as topics that require only text-based instructions (Bourne et al., 2005). Real laboratory sessions have also shown to be more motivated for engineering students than virtual simulations (Stefanovic, 2013). In spite of this, there is increasing evidence of use of blended and online learning in engineering education. For example, online self-study environment to supplement the classroom instruction in engineering courses in graphical communication (Sun et al., 2014), virtual laboratories and simulation environments (Balamuraithara & Woods, 2007; Bourne et al., 2005) and online platforms for developing learning networks for global engineering (Meikleham et al. 2015).

The School of Engineering at Jönköping University, the Swedish foundry association, the research institute Swerea/SWECAST and twelve foundry industries cooperate to develop a blended learning one-year master program in product development in materials and manufacturing. As previously performed courses have been given on campus, teachers needed to take on new roles as blended learning teachers. In this paper, we present the initial results from a study that aims to investigate the perceived roles of university teachers in a blended learning materials engineering master program.

Teacher roles in online learning in higher education

Blended learning combines face-to-face instruction with computer-mediated instruction (Bonk & Graham, 2006). Means et al. (2009) defines online learning as learning that takes place partly or fully over the Internet. When online learning is combined with face-to-face instructions, it equals blended learning. The teacher role can be defined by authorities in the educational organisation, but also as teachers' individual perceptions. The role of teachers in distance education has been defined as the teachers' experiences and their reflections over these experiences, as well as different metaphors to describe the actions included in the role

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(Inglis, 2006). Certain competencies, which includes skills, knowledge, and attitudes, are needed to produce the desired outputs of the workplace. These competencies can be organized into distinguishable roles (Williams, 2003).

Even though research sometimes sees teacher functions in online learning as an extension of campus teaching (Alvarez et al., 2009), it is obvious that the role of the campus classroom teacher is different from the role of a teacher in online or blended learning (Bennett & Lockyer, 2004). Coppola et al. (2002) found that university teachers viewed themselves as being in a transition from “subject expert” to “performance coach” when introduced to an online learning situation. This change was linked to the styles of interaction with students and other teachers, changes in instructional design, course management as well as in control and assessment of the teaching and learning situation. From this, three specific university teacher roles were derived: the cognitive role, the affective role and the managerial role.

Williams (2003) defined four major dimensions of using information and communication technology (ICT) in teaching and learning; communication and interaction, instruction and learning, management and administration, and use of technology. The communication and interaction dimension included competencies such as collaboration and teamwork, writing skills, questioning skills, editing skills and negotiation skills. Instruction and learning required the competencies of knowledge of the distance learning field, skills in developing of collaborative, student-focused learning environments, adult learning theory, facilitation/discussion skills, presentation skills and evaluation skills. The management and administration dimension included, among other things, knowledge of support services, organizational skills, and planning skills. The fourth dimension of technology required basic technology knowledge, but also technology access knowledge and knowledge of multimedia.

Alvarez et al. (2009) outlined three roles based on the task that university teachers perform in online learning; designer/planning role, social role, cognitive role. The designer/planning role refers to tasks carried out in the planning, follow-up and organisation of the teaching and learning process, as well as anticipating enough actions to promote communication with students and among students themselves. The social role includes competencies required to intervene in the learning process in a positive way and to promote an encouraging atmosphere. The instructive role refers to the teacher as a cognitive content expert.

Hsieh (2010) performed a qualitative interview study of online instructors from Australia, Canada, China, United Kingdom, United States and Taiwan with the purpose of exploring universally held perspectives on online teaching from different online instructors around the world. Three emergent, shared perspectives of online teachings were found; interactive activities, evaluation criteria, and self-expectations. Interactive activities meant how students interacted with each other, with the online instructor or with online tools or systems provided in the course. In the perspective of evaluation criteria, interactivity, student engagement and assessing student competence were focused. The perspective of self-expectations meant that the online instructors regarded online assignments as not just a teaching job, but had as a

strong sense of commitment to create a better learning environment for students was evident. In a review of studies on pedagogical roles and competencies of university teachers by Munoz Carril et al. (2013) the authors found that roles were defined in several terms with different meanings and nuances, but that the basic roles were: technologist, administrator or manager, the assessor role and the pedagogical role.

Hung and Chou (2015) examined students' perceptions of instructors' roles in blended and online learning environments in a survey study of 750 Taiwanese university students. The survey instrument was validated into the five constructs of course designer and organizer, discussion facilitator, social supporter, technology facilitator and assessment designer. Students in both online and blended learning environments perceived the course designer and organizer dimension to be most important, followed by the dimensions of technology facilitator and discussion facilitator. Students in online learning held discussion facilitator to be an even more important role than blended learning students.

Table 1: Teachers' perceptions of roles in online and blended learning

Authors	Role categorization
Coppola et al. 2002	Cognitive role Affective role Managerial role
Williams, 2003	Communication and interaction Instruction and learning Management and administration Use of technology
Alvarez et al. 2009	Designer/planner role Social role Cognitive role
Hsieh, 2010	Interactive activities Evaluation criteria Self-expectations
Munoz Carril et al. 2013	Technologist Administrator or manager Assessor role Pedagogical role
Hung and Chou, 2015	Course designer and organizer Discussion facilitator Social supporter Technology facilitator Assessment designer

Methods

The purpose of the study was to investigate the perceived roles of university teachers in blended learning in the advanced level courses of Component casting, Advanced materials technology, Modelling and simulation of castings, Analysis of casting defects, Material testing and characterization and Environmental impact assessment. Semi-structured interviews were

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conducted with the six course responsible teachers. The interview transcripts were analysed by inductive content analysis (Graneheim & Lundman, 2004).

Findings

From the interviews, four main categories and ten subcategories were identified. The categories and their subcategories are presented in Table 2 and described in detail in the following text.

Table 2: Categories and subcategories of teacher roles from the interviews

Category	Subcategory
Interaction	Discussion focus instead of lecture focus Lack of immediate student response
Administration	Course development and planning Time-consuming administration Scalability
Online distribution	Record video lectures The use of OERs Managing quality assurance and examination
Trying new things	Tools Teaching approach

Interaction

The category *Interaction* included the two subcategories Issues related to interaction centred around the positive experience of having a discussion-focus instead of lecture-focus and the negative experience of lacking immediate student response. The interviewees described how they had realized the benefits of including students in discussions instead of simply informing them about different topics. One interviewee said:

"... I believe that we can stop having traditional lectures. That is the consequence of this, to find a structure where students can study when they can and want to. And then you get this other type of dialog. Maybe you should only have extra math help, so you can spend time on solving problems instead, just that and then skip the lectures totally."

One negative aspect of the new way of interaction was the lack of immediate student response. The interviewees described it as very different to record a lecture in the studio compared to giving a lecture in classroom full of students:

"Yes, it is a fairly different way to work, because normally when I lecture I can sometimes see if the students, or if those that are listening, are engaged and interested and sometimes you realise also that now I said something that they did not really follow. Sometimes you can see that they start to think "what did he say now?". Then you can clarify that "this was how I was thinking". But

you see it in another way. Now, you did not know when you were standing there talking if they would be able to understand it when they listen."

Administration

Several interviewees mentioned tasks and issues related to administration. These focused on the course development and planning, allocation of work and roles, time-consuming administration and scalability. The interviewees stressed the importance of planning the course development. This included course information to the students, scheduling of participating lecturers but also arrangements in the recording studio. Several interviewees found the new format to be rather time-consuming. This could be related to the involvement of different actors, such as guest lectures and company visits. One interviewee said:

"Well, it got harder of course to get it all together. We had quite a lot of individuals. We had people that that interviewed, we had people that gave guest lectures, we had two visits at the companies and things like that which felt like it resulted in a whole lot of more work. You spent a lot of time, prior [to the recordings], on establishing meetings to coordinate with all actors."

Scalability was also discussed by the interviewees who had reflected upon the possibility of providing the course to more students:

"And that was something that I realized that when you scale up to include more students. On campus, we have had more than double the number of students on the course. We have had 50 students instead of 20. And then this problem with examination grows. It takes a lot of time."

Online distribution

The online distribution of the course and the practicalities of recording video lectures, using OERs and ensuring the quality of examinations were discussed by the interviewees. During the recording of the lectures, the lecturers improved their presentation skills and learned basic recording skill like how to use prompters and what to wear. The project aimed to use OERs to incorporate previous knowledge and material in the courses. However, the interviewees found it difficult due to time-constraints, lack in quality and/or simply not finding any OERs in their area:

"It had the right content, but not the right presentation if you want this to be something that should be used to sell the business in the future. Then it should not be warm, hot and dirty, instead it should be clean, nice and environmental friendly..."

The online distribution also appeared to create both challenges and opportunities in regards to quality assurance and examination. One interviewee experienced problems in transforming laboratory assignments:

"What I thought about during the course, was that we are used to have laboratory assignments, and to transform them into reasonable assignments. I believe that we did not really succeed with that, let see what we can do more."

Trying new things

The interviewees also stressed that involvement in the course was a positive experience that made them consider new ways to carry out teaching. They mentioned that they had learned new things that can be incorporated in other courses, both regarding tools and teaching approaches:

"This have been totally new for me, everything from technology to thinking in a new way, so thinking a bit wider, not just stand there and lecture but also think in different ways and so. It feels as if I have learned a lot of things that you can bring into other courses also, even those that you are giving at the company and to make them a bit more exciting and a bit more interesting."

Conclusion

To describe and discuss teacher roles in blended and online learning can be valuable to clarify what is expected by teachers in transition from campus teaching to online learning. The roles found in our study are consistent with findings from previous research regarding interaction, administration and the learning and management of technological tools. However, roles involving the social support dimension were missing. Further research should include a larger number of interviews to further deepen and clarify the content of the roles and what competences are needed to fill them.

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COLLABORATIVE ONLINE LEARNING AT A DISTANCE – A CASE STUDY AND DEVELOPING THE KNOWLEDGE BASE

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Overview

The pedagogical benefits of collaborative activity have been well recognised. It helps students to develop critical thinking skills, reflective abilities, team working skills and enable transformative learning by co-creation of knowledge (Pallof & Pratt, 1999). For subjects that require students to “... examine, assess and synthesise multiple perspective to resolve ill-structure problem” (Posey & Pintz, 2006), collaborative activity is seen as an integral part of teaching. Over the years, educators at The Open University (OU) have developed sophisticated online virtual laboratories, gamification and animation opportunities and a suite of tools to choose from to deliver and support collaborative online activities. However, academic teams at the OU continue to face many challenges in designing, delivering and supporting successful online collaborative activities.

In seeking to better support academic teams with delivery and support for online collaborative activities, the TEL Design team at The Open University produced a guide to good practice on collaborative online activities last year. This guide explains the purposes of online collaborative activities and makes explicit why they are beneficial. It outlines that we can deliver effective collaborative online activities by understanding the impact of online collaboration, making activities meaningful, paying attention to/catering for diversity and careful design and using appropriate tools for collaboration. It also provides exemplars on guidance for students, tutor support and assessing students’ online collaboration (Open University, 2016).

This paper looks at a specific case study of how the good practices outlined in this guide can be used to achieve enhanced collaborative experience for learners with different social-cultural backgrounds and personal circumstances.

Methodology

Case study methodology is used here to illustrate how we design our digital pedagogy to manage diverse learners’ needs in participating online collaboration. Focusing on a multi-disciplinary second level module, this paper will explain how we went about investigating the barriers that our students encountered when participating in an online collaborative activity. We will also elaborate on how the process of redesigning corresponds to a number of good practices featured by the guide to online collaborative activities.

Background

The guide was produced in August 2016, drawing on the real world experiences of several Open University academics and practitioners in designing and supporting collaborative activities, alongside some of the research available in the field. It aims to draw these sources together, alongside real-world examples to provide an easy to use and accessible guide for Open University staff.

The second level module in focus for this paper was launched in October 2012. This module features an online collaborative activity which assimilates a role play in the context of climate change debate. It also gives students an opportunity to create a position paper informing the direct of government policy in promoting green technology.

Process of investigation

By October 2014, we had sufficient data to conclude that many of our students struggled with this activity. To understand the issues, we carried out:

- an investigation using a number of Learning Analytics;
- a real-time project to seek student and tutor feedback;
- a mapping exercise to examine student workload throughout the module;
- an investigation to pinpoint when students withdrew from the module.

Students participating in the real-time project indicated difficulty keeping up with workload, which corroborated the student survey carried out in 2012-2014. The workload mapping pinpointed the study weeks for the online collaborative activity as particularly challenging. This mapping could not pinpoint workload for individual students but does provide an estimated anticipated workload for those weeks, for which there is evidence that this is an important factor for student retention (Toetenel & Rientes, 2016). These weeks also require the students to engage with an online activity that akin to a role play and collaborate on a position paper. For many students, this is the first time that they are required to work on an online collaborative activity.

Tutors indicated that having 10 calendar days to produce a collaborative output remotely was demanding for the students. It is also high risk as it relied on IT to align the permissions of the sub-forums with those for the synchronous audio tool. A questionnaire designed to survey the tutors' understanding of learner experience helped us to ascertain a different stakeholder's view. This added richness to our understanding of learner experience.

With the above data, we redesigned the block with the collaborative activity rewritten to even out workload, streamlined the forum structure to facilitate easy synchronous discussion and provide additional support for those who lack confidence in their digital skills. The collaborative activity was timetabled to take place towards the end of the learning unit with a warm-up activity prior to the bulk of the collaborative tasks. Furthermore, we communicated with students the intensity and requirements of this activity far in advance. We also sent out communications, recognising the time constraints and emotional challenges that some of our

students might face as well as explaining the focus of the assessment was reflection of the experience rather than the quality of the position paper. In these communications, we explained explicitly how participating in this activity would enhance their employability. The tutors were fully briefed and guided through the changes to the activity and the module chair was on hand to answer queries throughout the activity.

We have received some data on the outcome of these interventions and are in a position to share some early analyses.

How this overlaps with the guide

The guide references three core stages to delivery of effective collaborative online activities: designing the activities, supporting the activities and providing feedback to students.

In addressing the issues for this second level module, we have had to retrospectively fix issues relating to all three of these stages. This can be seen as a good example of continual improvement, but is also reflective of where our understanding of collaborative activities was in 2012 when the module started. With the development of the guide, and the real-world experience of modules such as this one, we have now been able to develop our understanding and the internal knowledge base about collaborative activities and ensure that new module teams are able to start from a far stronger starting point.

Conclusion

The lessons from the experience with this module align well to the guidance. The module has found that it's important to:

- keep any supporting infrastructure as simple as possible;
- to ensure that any triggers for action by staff are clear;
- to provide choice for students in how they can collaborate;
- to provide clear warm up activities for the students to practice collaborating;
- to provide sufficient time, especially where it represents a dramatic shift in the style of learning on the module;
- to provide effective and clear guidance to the students.

These findings all marry up with the findings in the guidance, so we can see a good linkage between real-world experience and the guide. It also aligns with some of the findings of key studies in the field (Brindley et al., 2009; Zheng et al., 2015).

Additionally for this particular module, it is clear that the preceding curriculum does not fully embrace or provide students with experience of collaboration. As such, it is over a year into their study experience before some students first have to collaborate in a meaningful way with fellow students. Dealing with a diverse student population engaged in multiple qualifications makes this issue particularly challenging, as some students will have had plenty of exposure to these types of activities whereas other students won't, depending on their qualification choice.

For those who haven't had exposure to collaborative activities, the introduction of them now at level two can challenge their expectation of distance learning.

Looking ahead for the future of collaborative activities in The Open University, we have very strong foundations now and a clear knowledge base to develop from. Our next challenge is to pick up on the issue of development of the student skills throughout their study and to ensure a full and clear progression rather than the current on/off experience dependent on the module.

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A MATTER OF DISTANCE – STEPPING INTO THE “DANCE” OF PRACTICE THROUGH EPORTFOLIOS

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Introduction

The overarching project under consideration in this paper is that of supporting international students' transition into university culture in Australia through the development of knowledge, skills and dispositions. In this context the concept of distance shifts from distance learning to *distance load* where students face many levels of distance in their transition to university. This paper suggests that a reconceptualisation of ePortfolios through practice theory may prove useful in addressing distance load. An ePortfolio reconceptualised as rehearsal and performance space, a supportive environment where students can metaphorically step in and out of *the dance* of learning, offers a conceptual frame for a personal journey, an apprenticeship into new ways of knowing, doing, and being, and an acculturation into practices and learning communities. It is proposed that by engaging with curriculum through an ePortfolio, informed by social practice theory, students not only develop skills and knowledge, but also more evolved dispositions that begin to embody technology as a valued and integral part of learning in a way that can be carried forward into their social and civic life. In conceiving of educational practice through the lens of practice theory, it is posited that the skills and knowledge (required) to actively engage in a society (characterized by digital technology) are learned and embodied through practices

Context

UTS:Insearch Sydney is a provider of quality pathway education programs that prepare and support students to enter into and thrive in the Australian university environment. Students participating in the UTS:Insearch Foundation Studies Program are international students who are in transition from an overseas school system to an Australian university system. These students stem from a range of sociocultural backgrounds and come with a diversity of skills, language competency and digital literacies, including English as a second language. With them they carry an array of social and cultural practices, including education, with varied exposure to technologies, some never having used a computer. As a result the student cohort presents varied learning needs that call for inclusive teaching practices and technologies. Beyond the obvious need of language acquisition, these students require support to transition from predominately teacher centred learning (silent observer and individual study) to independent learning (self regulated active participation and collaboration) through the development of both academic and soft skills. These students are preparing to enter into

academic dialogue, and a *university culture*, one that values critical engagement, analytics, creativity, innovation and technology; a culture that international students require an acculturation into. The need for acculturation draws out attention to social practices and highlights concepts of distance for students transitioning to university.

Concepts of distance

Distance education has traditionally been defined by considerations of learning across geographic distance and or asynchronous distance mediated through technology enabled learning (Gunawardena & McIsaac, 2005; Peters, 2001). Distance presents a powerful geographic divide in Australia however advances in communication technologies and travel have lessened the perceptions of distance both locally and globally. Distance education in Australia grew out of the extensive radio network established to support the Royal Flying Doctor Service to communicate with remote communities across vast distances. The School of the Air was established in 1950 and was one of the earliest forms of distance education for remote communities in Australia. In 2005 there were more than sixteen schools of the air covering more than 1.5 million square kilometres (Australian Government, 2016). Across educational fields technology has become mainstream collapsing notions of time and distance and rendering many technological approaches to learning, previously the remit of distance education, as everyday. As technologies have become more ubiquitous, they have been adopted in many educational settings (Gunawardena & McIsaac, 2005), to support the anytime anyplace conception of learning and the peripatetic learner (Sherringham & Stewart, 2010). However distance education involves broader forms of distance learning; those that relate to *learning distance*.

Distance in the context of learning can be considered through many frames. At a social level distance can be considered as a process of induction within which participants gradually move from peripheral observation to more central participation in communities of practice (Lave & Wenger, 1991). On a developmental level there are varying degrees of distance for the learner in terms of where they are in their learning and where they need to be; these degrees exist across activities, at different moments in a learner's development and also through variance between the individuals in a student cohort (Vygotsky, 1978). At an interaction level distance can be considered in terms of pedagogic distance (Peters, 2001). Pedagogic distance refers to the distance between the teacher and the student and can be characterized by the intensity of interaction between the roles of teacher and student (Oliver & Trigwell, 2005). For example, low intensity interactions may be representative of more self-guided learning and reflection whereas high intensity interactions may be more dialogic and scaffolded.

In addition, students bring to each learning opportunity a store of prior learning practices, from both formal education and informal life experiences, that all carry dispositions, attitudes values and ways of knowing, doing and being. These include experiences of and dispositions toward learning, including the tools and technologies associated with this learning. Therefore, there is a need to recognise and considered not only social, developmental, and pedagogic distance but also past learning practices including their tools and technologies. These

background differences create distance between past and desired learning experiences and also between the learners and their peers.

International students, particularly in Pathway Education, face *distance load*, that is to say, the learning distance for them is greater. They are not only experiencing the transition from secondary to tertiary education they are also dislocated physically from their family and friends, they are isolated through language, they are in a foreign cultural setting, and in an unfamiliar learning landscape. They are transitioning from embodied sociocultural practices with their inculcated dispositions to “other” ways of knowing, doing, and being where what is valued as exemplary performance, what is taken up as tools and technologies of practice, may vary greatly from their existing terms of reference and their existing learning practices.

Concepts of Practice

Within social practice theory, practices are seen as distinct and recognizable entities consisting of coordinated arrays of activity and performances that involve embodied ways of knowing and doing; with their supportive tools, background knowledge or competence, dispositions, tacit “rules” and norms, and motivational states (Bourdieu, 1984; Schatzki, 1996; Reckwitz, 2002; Rouse, 2007). Practices bring structure and meaning to activity through tasks, projects, desired ends and motivations (Schatzki, 1996; Reckwitz, 2002). According to Schatzki (1996; p.89) practices can be broadly grouped into two categories. Firstly *integrative* practices, being those that constitute particular domains in social life such as farming, in professional life such as designing, and in socially instituted practices such as the practice of education. Secondly there are *dispersed* practices, such as reading, questioning, examining, explaining or writing. In each type of practice, bodies and understandings are disciplined in different ways and attuned to different subtleties (Sherringham & Stewart, 2010).

As newcomers enter into a practice they do not yet embody the dispositions that value particular kinds of striving, nor do they yet recognize the subtleties of expert performance or the pleasures of accomplishment and intrinsic motivation associated with that practice (Sherringham & Stewart, 2010). Over time, through the process of learning, newcomers are opened up to feeling and performing in new ways as they are inducted into the practice. They come to understand what is valued and strived for, to new ways of knowing and doing that are gradually embodied to form background understandings. These dispositions are structuring and intrinsic to the performances of the particular practice and in the development of pleasures and motivations derived from that practice. It is this meaning and pleasure that practices bring to human activity and agency that positions them as the site of learning, and as such positions learning as a process that is constituted in and of practices. Practice theory, however, is under represented in the theorizing of learning and education design (Sherringham & Stewart, 2010; Hager et al., 2012). A conception of learning as constituted in and of practices draws our attention to the dispositions, embodied ways of knowing and doing, including tools and technology, which learners carry with them and enables a discernment of the “distance” in learning that students need to traverse. It also draws our attention to the types of transitions students are negotiating in the process of acculturation

into new practices and practice communities when dispositions and “ways” may need to shift (Warde, 2004).

In referring to *practices* the project draws upon “a body of theory that builds on 20th century phenomenological, hermeneutic, anthropological and sociological arguments. This emergent theoretical direction, which references influences from (late) Wittgenstein and Heidegger, gained impetus in the wake of Bourdieu’s Outline of a Theory of Practice (1972), Giddens’s Central Problems in Social Theory (1979) and MacIntyre’s After Virtue (1981), and has been further mobilised since the turn of the century in the texts of Theodor Schatzki (2001), and Andreas Reckwitz (2002)” (Sherringham & Stewart, 2010).

As we learn, each new learning experience introduces us to or deepens our experience of and participation in practices. When we learn to speak we learn through the practices of accomplished speakers, who model an orchestrated practice of spoken, bodily communication. These accomplished speakers break down language to sounds, words and gestures and their associated meanings, slowly building vocabulary, phrase formation, sentence structure and expression as our language practice becomes more accomplished. As we are introduced to the practices of reading and writing this accomplishment becomes more developed. As we enter different language practices we need to negotiate new ways. For students overtime the practices of speaking, reading and writing become enmeshed in the practice of communication. A student moving into higher levels of education will need to refine the practice of communication, developing and integrating new dispersed practices such as argumentation, expression and creativity. Entering into University a student will need to develop the knowledge and skills associated with academic writing which, depending on which domain of professional life one is getting an education in, will have its own type of voice, ways of knowing doing and relating. These dispersed practices, when formalized in social institutions, all form part of the project of “getting and education” within the practice of education and as part of this project learners embody ways of knowing, doing and relating that they will take into their “civic life” (Kemmis et al., 2012).

This process of “getting an education” when likened to an apprenticeship, whether explicit or not, offers a way into practices that provides learners with a conceptual model of ways of knowing and doing, highlighting what is valued, and what constitutes desired performances. Through the framing of learning as an apprenticeship students are engaged in a scaffolded induction into practices within which they are able to recognize learning as a process, and indeed to self monitor their own learning (Collins et al., 1991). In an apprenticeship, the learner is generally made aware of the end result or product they are aspiring to. They are first guided through the simpler activities and concepts, building to the more complex. They are provided with modelled behaviours and exemplar performances. Their performances are scaffolded, observed, evaluated, corrected they are encouraged through feedback and also challenged to improve. This process structures ways of knowing, doing, relating and valuing within the particular practice being learned (Collins et al., 1991). This form of structured learning supports a student’s development whilst also enabling them to develop self-monitoring strategies. They come to measure how well they are integrating the skills and

knowledge associated with the practices being learnt, building a conceptual model of expert performances (Lave, 1991). This model acts as an “advanced organizer for students initial attempts” and an “interpretive structure for making sense of feedback” supporting the move toward increasingly independent learning and practice (Collins et al., 1991). In addition this learning takes place in a sociocultural context where group members are striving for similar goals, ways of knowing, doing, relating and valuing. Learners can observe peers *in practice* helping them to recognize differing levels of performance. This immersion in a sociocultural context builds an appreciation of the shared pleasures and motivations that are associated with improved performance providing the potential to develop community.

The pleasure and motivation derived from performance in practices alerts us to the engagement and dedication practices can bring forth. In the context of education Kemmis et al. (2012) uses the analogy of practice as a *type of dance* that you can step into and out of. Through our learning experiences and throughout life we are entering into a world of coalescing practices, that can be stepped into or out of in different ways, as we try new things, develop skills and knowledge in new areas. For example each dance represents a set of background understandings, some specific to the dance form, other specific the genre of dance and others universally held by all who dance. The ability to step out of one dance and into another developing and carrying dispositions from one to the next, and recognising the various dance forms, and their origins, as interconnected and interacting with teachers as co-participants in the dance. Using the metaphor of dance conjures up images of social exchanges, interactions, self-expression, engagement, colourful mixings of mind and body, rehearsals, timely and disciplined feedback, attuning to expert performance through effort and precision.

Providing students with a rehearsal space and a stage for learning enables a metaphorical bounding of the “dance”. This bounding identifies a safe space within which students can focus their efforts, where they can rehearse, perform and choreograph their learning with support and guidance. Like the dance studio with its mirrors, learning environments require opportunities to *see, model* and reflect on ones performance and to see, model and reflect on the performance of others. These environments offer equipmental and technological support, like the bar, and the sprung floors, to steady and protect, the sound system to fill the room with music. Exemplars to guide the dancer such as choreography to give structure and the teacher to demonstrate, provide guidance for refinement, and emotional connection to the performance until the performer and performance are ready for the stage. Resources, like backdrops and props providing rich tapestries and signifiers of contextual meaning. Adding the analogy or metaphor of “dance” brings further richness to conceptions of learning and how it may be supported. It draws attention to role the learning environment plays in supporting this process of induction, attunement, and the cultivation of a disposition for ways of knowing and doing “the dance”.

Stepping into the dance

Drawing on the above concepts a framework for a learning environment begins to emerge. Firstly, conceptions of distance highlight the need for a socially conceived learning environment that addresses variance in levels of development, engages students through appropriate and varied degrees of interaction and scaffolds and supports students to reduce the distance load. Practice theory highlights learning as constituted in *practices* and draws attention to the acculturation into practices and how this process, akin to apprenticeship, highlights what is valued within practices including knowledge, skills, tools and technologies. Further practice theory provides useful metaphoric frames for conceiving of a sociocultural site for learning and performance, as a rehearsal space where practice is as a dance that can be stepped in to and out of and where learning is ‘choreographed’ and accompanied by an “orchestrated arrangement” (Kemmis et al., 2012).

In the context of Insearch, learning environments need to be considered in concert with the Insearch Model of Learning. This model responds to student needs through a series of approaches to learning and teaching with one of the key approaches being that of student-centred technology-enabled learning where technologies, including software, are taken up to enhance and or extend student learning. The model therefore suggests the consideration of a digital learning environment. A digital learning environment offers the potential to address distance, variation in the student cohort, provide a supportive space for students to go to rehearse and develop their learning practice, whilst also offering a vehicle for students to develop the skills and knowledge to actively engage in digital technology.

ePortfolios as a way to step into the “dance”

A review of the literature on ePortfolios reveals emerging and powerful evidence, from theorists, educators and learners, on their transformational potential to promote learning, and support learners transition (Love et al., 2004; Jafari & Kaufman, 2005; Yancey, 2009; Ballantyne, 2012). Further they have been shown to address learning across various fields / domains and literacies including language acquisition (Watson & Doolittle, 2011). When well designed and intentionally integrated into the curriculum through education design, ePortfolios improve students grasp and comprehension and can transform their worldview (Watson & Doolittle, 2011, Gunn & Steel, 2012). What the review also revealed was that the conceptualisation of an ePortfolio through social practice theory and the consideration of *distance load* are stepping into uncharted waters. Joint Information Systems Committee (JISC), EDUCAUSE, the International Journal of ePortfolio, and conference proceedings such as EDEN, amongst others all provide extensive coverage of the topic.

On the surface the ePortfolios will not look that different to other ePortfolios; they will have a similar architecture, they will incorporate public areas containing background, social and aspirational information and private areas where students will incorporate work and receive feedback, there will be exemplar sites developed for student reference. Like other ePortfolios the aim is to bring together the curriculum as a global model and to provide tangible links between the elements thereby acting as a form of conceptual map of where students are and

where they are heading acting as a target and guide for rehearsal and performance of students (Collins et al., 1991). Unlike most ePortfolios the work will be seen as formative with a focus on improvement not on assessment. The intention of the ePortfolio is to provide a site for both rehearsal and performance (a construction zone Jafari & Kaufman, 2006) that is integral to the curriculum.

The ePortfolio as a living learning environment enables students of diverse skill levels and from diverse backgrounds to identify and connect with their learning and development through examples of their work over time, demonstrating knowledge and skills as they are developing. Whilst not assessed, the work developed is linked to assessment criteria, the students’ self assessment, reflection, and feedback from faculty and peers. Live feedback sessions with teachers, integral to the curriculum, support the development of both the students’ learning, their work, and their ePortfolios through the development of digital literacies. Peer support is facilitated through technology and peer review workshops (which adopt reciprocal teaching strategies) where students work together to assist each other by way of technical know how, dialogue, and feedback to refine their understandings and skills. Also and importantly guest spots enable feedback from family and friends at a distance.

The ePortfolio as a technology for the extension of educational practice, acts as an enabling learning environment and *practice tool* supporting the development of shared knowledge, skills, dispositions, motivations and pleasures through shared experiences and aspirations encouraging communities of practice to form (Lave, 1991). The ePortfolio as a learning environment broadens opportunities for learning in and out of the classroom that enhance interactions between teachers and students, students and peers, students and the curriculum, students and technology, students and self. Such engagements promote the experience of variety and choice leading to learner discernment or the application of new knowledge and skills in both reflective and relational ways developing students’ personal knowledge frameworks (Oliver & Trigwell, 2005). Through these mediated interactions students are acculturated into academic learning practices, and through the positioning of the ePortfolio as a *practice tool* inherent to learning, students come to value digital technology as an integral part of the *project* of getting an education in contemporary society.

This type of learning environment provides both a structured and heuristic *apprenticeship* model within which students develop their knowledge and skills. Framing the environment as a rehearsal and performance space provides powerful metaphors for the students to grasp. These metaphors, it is argued, will enable students to see the learning environment as a dynamic space where the focus is on the *dance* of learning, which they can *step in to* and *out of* finessing their knowledge and skills both with the guidance of others and independently. Conceiving of the environment as a space where students can rehearse, refine, and improve their performances motivates students to re-examine their performances and provides impetus for learning as the students learning becomes more visible and their sense of identity as a learner and a member of a learning community evolves.

First steps

As a first phase for the introduction of the ePortfolio the concept of *distance load* and the frame of a social rehearsal space from practice theory have been tested in the “crucible of practice” (Gunn & Steel, 2012) using action research to capture the specifics of practice and to test theory in practice. A pilot project was run in the subject Multimedia over a two semester period in 2016 involving 18 staff and 160 students across two separate cohorts of students. Students identified the ePortfolio as a personal space and a personal project that they (the student body) would be undertaking together. They welcomed the opportunity to reflect on their learning, through the portfolio and the portfolios of other students. They saw the ePortfolio as an extended opportunity to gain feedback from teachers and peers. They enjoyed the ePortfolio as an avenue for expression and to connect their learning with other aspects of their lives and to other students. They immediately recognised that it helped them to navigate the course, organise their work and to pull their ideas together. They took pride in their ePortfolios and felt they made their achievements more evident. Some found the original platform for the ePortfolio challenging although they enjoyed that it was dynamic, *alive*. The implementation of the ePortfolio to the whole of Program is more ambitious and will see its integration into every subject without exception. This implementation will involve further framing of the ePortfolio as a rehearsal space within which students can participate in the educational dance of learning to close the distance and improve performance.

Conclusion

Conceptions of distance in learning highlight the distance load faced by international students preparing for study in a university culture. Practice theory draws attention to acculturation into practices and the centrality of this process to learning. Through acculturation, dispositions can be shaped to new ways of knowing and doing and subsequently the values, pleasures and motivations attached to these become embodied. In preparing students for academic study, practice theory provides rich metaphors for the conception of an ePortfolio, as both a scaffolded and heuristic sociocultural site for rehearsal and as a performance space where students can step in to and out of the dance of learning. Through this sociocultural conception of an ePortfolio students are enabled to discover and learn something for themselves and about themselves whilst participating in a community of practice that will support students learning and the inculcation of habits of mind and body. These habits of body and mind are developed through the integrated use of the ePortfolio as a learning environment, and in so doing technology becomes an extension of and synonymous with learning and in turn, with social and civic life.

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THE IMPORTANCE OF OPENNESS WITHIN DIGITAL LITERACY

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The importance of Digital Literacy in European policy

Equipping European citizens with the digital competences required by today's knowledge society is at the core of the EU strategy, as shown by a number of initiatives undertaken by EU institutions. In 2006, the European Parliament and the European Council recognized Digital Competence as one of the eight key competences that every European citizen should master (EC, 2014); and – together with language, literacy and numeracy – as one of the four foundational skills for learning. Furthermore, enhancing Digital Literacy is one of seven pillars in the European Commission's 2010 Digital Agenda for Europe. More recently, in 2011 the European Commission launched a project called DigComp to develop a Digital Competence Framework, which resulted in 2014 in a proposal for a taxonomy of Digital Competences for all European citizens (Ferrari et al., 2013), that is now being developed also for educators (DigCompEdu). Beyond this, work is being done at the EU level including the definition of indicators for the “safety” domain, the review of the DigComp framework on a regular basis regarding updated skills/competence needs, the identification of the digital skills requirements of different jobs and the expansion of the survey of schools on ICT in education on problem-solving (<https://ec.europa.eu/digital-agenda/en/pillar-6-enhancing-digital-literacy-skills-and-inclusion>).

Digital Literacy: a permanently evolving concept

Digital Literacy means different things to different people, along a *continuum* that goes from instrumental skills in the use of ICTs, to productive and creative competence and efficiency, to social and participation attitudes. Further, Digital Literacy seems clearly transversal to all domain of activity of a contemporary citizen, who should be able to make a “confident, critical and creative use of ICT to achieve goals related to work, employability, learning, leisure, inclusion and/or participation in society” (Ala-Mutka, 2012; p.1). To further complicate the picture, reading the body of research that has emerged in recent years in the field, one gets exposed to concepts such as information literacy, 21st Century literacy and Media Literacy, which are all connected to the idea of *being able to meaningfully act in a digital society*, still tackling the problem from different angles. For example: is Media Literacy, intended as the basic capacity to be able to make sense of messages coming from the – increasingly digital – media that surround us, a part of Digital Literacy, or is Digital Literacy that component of Media Literacy that has to do with decoding and interacting with digital media?

In the last years the European Policy Network on Literacy (ELINET) has been advocating for a holistic view of Digital Literacy that goes well beyond the capacity to use ICT devices (Lemos & Nascimbeni, 2016), in line with the approach adopted by Jisc in the UK: “Digital literacy looks beyond functional IT skills to describe a richer set of digital behaviours, practices and identities” (Jisc, 2014). Specifically, ELINET noted that, even if policy and practice are clearly moving from the original concept of Digital Competence (intended merely as the capacity of use ICT) to a more holistic idea of Digital Literacy that encompasses digital citizenship and media literacy, still, the two concepts are sometimes used interchangeably, and this is creating some confusion.

In order to move towards a shared understanding of Digital Literacy, a first question to be tackled is the relation between Literacy – in the classic meaning – and Digital Literacy: is digital literacy just literacy in a new format? Along with Chase and Laufenberg, the ELINET position is that “digital literacy is not a new literacy. This is to say, if digital literacy is simply reading and writing in a digital environment, there is no need for the new terminology. (...) Let us then accept digital literacy as a genre, a format and tool to be found within the domain of standard literacy, rather than a concept standing at odds” (Chase and Laufenberg 2011: 535) and that the ICT revolution bring new problems and possibilities into the picture: “To read digitally, students and teachers must learn to read beyond the printed page. They must learn to read across all those platforms which they can use to create.” (Chase & Laufenberg, 2011; p.536). An important differentiation between classic and digital literacy has to do with the concept of *transliteracy*: to read and write digitally, one must learn to create and interpret texts in diverse modes (such as static and moving images and icons, spoken and written language, screen layout), and to navigate texts across diverse digital platforms which offer a variety of learning opportunities, formats for creation, and spaces for expression that were not previously available. A second important theme is that Digital Literacy, being a complex and socio-culturally sensitive issue, should be regarded as a set of social and sense-making competences associated with interacting with a range of digital devices, where the central issue is about the diverse literacies needed to communicate and collaborate with others and to find and make sense of the available information. Digital Literacy is in fact much more than the capacity to use ICT tools, and it should rather be considered as a set of competences associated with interacting with digital tools, where the central issue is about communicating and collaborating with others and making sense of the available information (Lankshear & Knobel, 2008).

Introducing openness as a core component of Digital Literacy

In order to support this holistic understanding of Digital Literacy, one needs to take into account the change in knowledge production, management and consumptions that we have been witnessing in the last couple of decades, mainly connected with the pervasiveness of ICT (how should the concept of reading and writing adapt to a society where knowledge supports are being constantly and increasingly dematerialised?) and with the raise of social online practices (how to deal with the need to be able to work with less and less words, as Twitter or Five Sentences are pushing us to do?) (Five Sentences is “a personal policy that all email

The Importance of Openness within Digital Literacy

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responses regardless of recipient or subject will be five sentences or less.” See <http://five.sentenc.es>). In an increasingly connected society where sharing is becoming in many cases the norm, we believe that a fundamental component of Digital Literacy should be “the capacity to work in the open”, sharing beyond our circles the knowledge we produce and making use of knowledge produced by others, in a transparent and traceable way. Learn how to work (but also play, communicate and participate) in the open implies a fundamental changes in daily practices that deals with online identity building, trust dynamics and knowledge management capacity, and has a terrific potential for change, since it can help us (and our societies) to enable meaningful participation, to produce visible progress and to build on the *openness momentum* (OpenMatt, 2016). “The value creation of tomorrow is born out of the mobility of people, knowledge, and energy. People operate from within their social networks with the same objective of goal sharing. Knowledge is also shared, and results in new value creation.” (Moravec, 2013; p.233). We cannot dream of open societies, open innovation and open education if we do not acquire the basic capacity to adopt open approaches in our daily activities: acquiring these basic capacities means becoming openness literate.

In order to understand whether (and to which extent) *openness-related competences* are included in existing Digital Literacy approaches, we will briefly analyse two well-known Digital Literacy frameworks: the one by JISC, the UK national agency in charge of ICT in education, and the one from the Mozilla Foundation – a pioneering institution working on the relation between internet and society. What these frameworks do is basically to regroup in a logical way all the components that need to be there if we want to have digitally literate citizens. Without going in details into the way the different components are described in the two frameworks, we have been looking for the potential impact of these frameworks in developing the capacity to “work in the open”, by searching for the way each component of the frameworks (being a skill, an area of activity, or something else) is thereby declined in terms of sharing, open licensing etc.

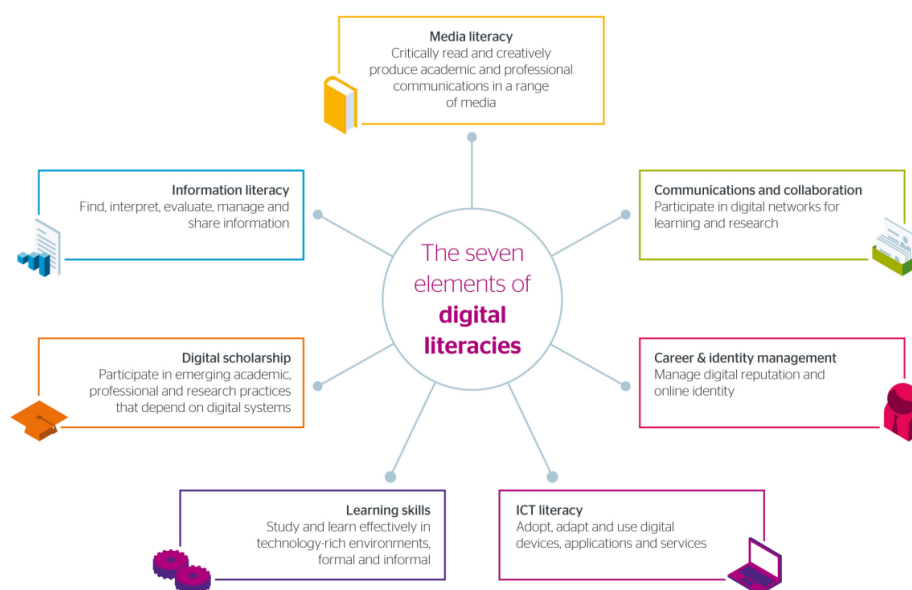


Figure 1. The seven elements of digital literacy (Source: Jisc, 2014)

The seven elements of the Jisc Digital Literacy framework presented in the above figure depict a holistic view of Digital Literacy and include some important elements that are normally absent from the classic narratives of Digital Literacy, such as Identity Management and Digital Scholarship. Further, the model has the merit to decisively move away from an understanding of Digital Literacy in terms of ICT skills, that is present as just one of the seven components of the framework. Still, the framework considers communication and collaboration as one of the seven dimensions and not as an activity that is by nature transversal to all the other components, and by doing so it somehow fails to represent that in contemporary society every activity – especially but not only when mediated by the web and social media – potentially embeds some kind of collaboration and communication and therefore is permeated by some kind of *sharing culture*, that should better be represented as a transversal dimension.

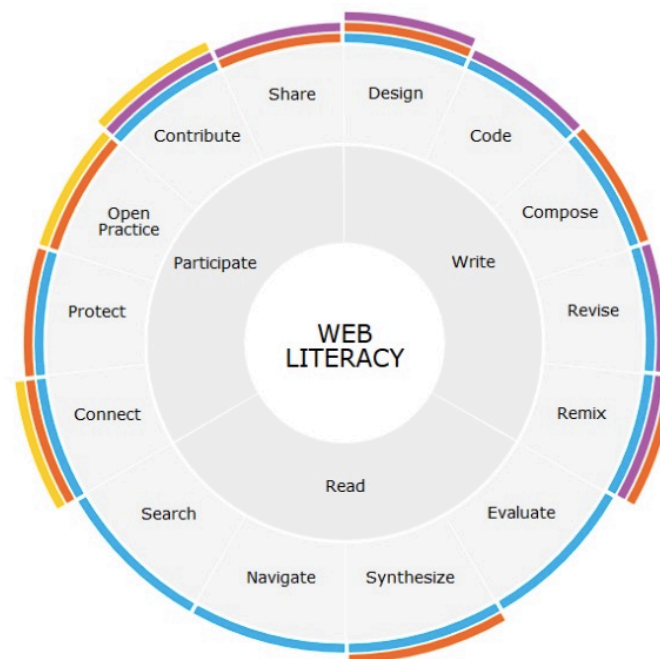


Figure 2. Web literacy as seen from the Mozilla Foundation (Source: Mozilla Foundation, 2016)

The Mozilla Web Literacy Framework crosses the “activities” (presented in the above figure) with four so-called 21st century skills: problem-solving, communication, creativity and collaboration, and by doing so it embeds collaborative activities across all the components of the framework, as proven by the fact that most of the activities in the model (such as for example Remix, Revise, Share and Connect) are by definition collaborative activities. Still, it also refers to *Open Practices* as a stand-alone area of activity, defining it as “Using and contributing web resources to keep the web transparent and universally accessible to all” (Mozilla Foundation, 2016). Again, having such a category risks to pass the message that openness-related competences are confined to one specific dimension of Digital Literacy, losing its transversal importance. On the other hand, “new media literacies should be seen as social skills, as ways of interacting within a larger community, and not simply an individualized skill to be used for personal expression” (Jenkins et al., 2006; p.20).

Apart from these minor critiques, an in-depth analysis of the two frameworks reveals that they are fully in line with the holistic understanding of Digital Literacy that is required to build active and participative citizens that we have presented at the beginning of the paper.

Openness within Digital Literacy for educators: the DigCompEdu framework

Such a holistic view of Digital Literacy is particularly important in the education field, where using ICT can be understood as both instrumental to general learning purposes and as an area of reflection per-se. By using ICT in any subject, teachers and pupils can in fact develop the necessary ICT skills that today's society requires and at the same time they can build competence in areas such as critical appraisal of sources and an understanding of the social significance of digital technology (Sobi, 2013). Along these lines, we argue that being able to *work in the open* should not only be a fundamental literacy requirement for citizens, but also a prerequisite for teachers at all educational levels, especially if we want our schools to work in a connected way, learning across cultures and through collaboration. Already in 2006, Jenkins noted that collaboration is potentially the most radical element of new literacies, and might have an important impact on the transition from education to working life: "Schools are currently still training autonomous problem solvers, whereas as students enter the workplace, they are increasingly being asked to work in teams, drawing on different sets of expertise, and collaborating to solve problems" (Jenkins et al., 2006; p.20).

A number of national competence frameworks exists that focus on defining what should be the digital competences of educators in contemporary societies, most of these being based on the UNESCO ICT Competency Framework for Teachers (UNESCO and Microsoft 2011). An important recent development in this domain is the DigCompEdu project by the Joint Research Centre of the European Commission in Seville, that aims to develop a digital competence framework for educators at European level, with the aim to inform and reinforce national initiatives in the field under a common umbrella.

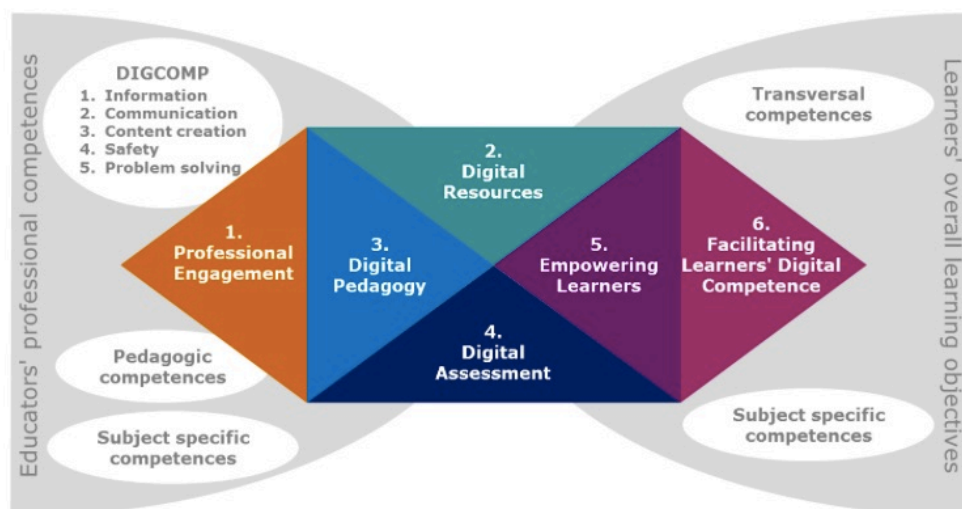


Figure 3. The DigCompEdu framework (Source: JRC Seville, 2017)

As shown in the figure above, the framework, that at the moment is undergoing a public consultation, aims to “bridge” the needed competences of 21st century educators (on the left in the figure) with the learning objectives of the learners (on the right), and suggests to do so by working the competences needed: (a) to work effectively in an ICT-rich professional environment (b) to find, create and share digital resources, (c) to effectively use digital tools for teaching and learning, (d) to enhance learning assessment through ICT, (e) to empower learners and to foster learners-centred strategies through the use of digital tools and (f) to create digital literacy among learners, in terms of active citizenship and media literacy.

By reading in details all the 23 competences connected with these six areas, which are all described in terms of sub-activities and proficiency descriptors, we find that collaboration (among teachers, with students, with parents and with other stakeholders) inspires the whole framework. This is a fundamental prerequisite for such a framework to be able to enhance open culture among teachers and ultimately to build that capacity to *work in the open* that we have described above. Hopefully, when this framework will be launched, it will be able to inspire national and institutional teachers’ training initiatives to move away from activities centred on learning how to use ICT towards activities aiming at understanding what kind of collaborations can be fostered by ICT, regardless of the technology we might adopt, and what this means for both teachers and students in terms of knowledge ownership, transparent collaboration and open digital identity management.

Conclusions: how to introduce Openness within Digital Literacy in education

The DigCompEdu seems to be an important step in the right direction for stakeholders to understand the importance of embedding openness as a key feature of collaboration within Digital Literacy practices. Still, research need to further inform present and future policies in this evolving field, along three interrelated dimensions of literacy practice (Green & Beavis, 2012). First, an *operational dimension* that includes the skills and competences that enable individuals to read, write and interact across a range of platforms, tools and media (here again the transliteracy concept), including making meaning with and from diverse modes such as spoken and written language, images, sounds, videos. Second, a *sociocultural dimension* that refers to developing a repertoire of digital literacy practices in specific social and cultural contexts, such as constructing and/or maintaining effective social, educational and/or professional relationships online. Third, a *critical dimension* that recognises that meaning-making resources are selective and often operate as a means of social control and social exclusion (Spitzer, 2016). This last point is particularly important for two reasons. First, because the risks for physical and mental health connected to the use of the internet and social media are seldom studied from a literacy perspective. Evidence seems to suggest that there is a growing number of children and adolescents who have had negative experiences whilst using the web (Holloway et al., 2013; Spitzer, 2016), even if observers tend to disagree on the reasons for this (Boyd, 2014). Online risks include personal data management, privacy issues, online reputation management, internet addiction, cyberbullying, reduction of attention span (Sparrow, Liu, & Wegner, 2011) and consequent decline in learning performance

(Livingstone, Mascheroni, & Staksrud, 2015). Second, because improving Digital Literacy levels would be a cost effective way to support the integration of minority communities such as for example migrants: online resources would build on their current digital skills and competences, support literacy acquisition in the new country, as well as direct them and others to wider community resources such as classes and local libraries.

In conclusion, we argue that contemporary Digital Literacy initiatives, building on efforts such as the ones by jisc, Mozilla or the European Commission, should aim at transforming citizens – and educators – into critically literate actors able not simply to participate competently in digital practices but also to transform these practices actively and creatively, in a collaborative and open way.

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THE POWER OF FEEDBACK IN ONLINE LEARNING: HOW TO INCORPORATE INTERCULTURAL INTELLIGENCE WHEN COMMUNICATING EVALUATIVE COMMENTS

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How do cultural differences impact the way we give and receive feedback in online learning environments? The goal of this paper is to explore: (a) the notion of intercultural intelligence; and (b) culturally appropriate and effective ways of using feedback. Cultural norms and expectations vary widely in communicating evaluative messages. This paper focuses on recent literature on theories and practice that address relevant skills and understanding required for enhancing informal and formal feedback in online learning environments. The main focus of the paper is to examine how cultural and contextual factors influence communicating feedback. A key objective of this exploration is to understand different norms around power relations, face giving and saving, communication styles such as high and low context, and identities. In addition, the literature review portion will include some of the latest research on feedback, communication and sociolinguistic ideologies. The main purpose of the paper is not prescriptive, but collaborative and exploratory.

Whether we are aware of it or not, we are constantly involved in exchanging and responding to feedback in personal and professional settings. Our social life is filled with feedback: performance reviews, program evaluations, proposal comments, nonverbal communication, online and offline meetings, etc. Feedback plays a significant role in our everyday life as it affects our behaviour, decision making, and relations. The results of feedback are essential for learning and can have lasting impacts on identities, relations and attitudes. Current literature provides useful insights into the importance of feedback.

However it fails to recognize its complexity as a unique form of communication and often ignores key cultural differences around managing feedback. The biggest mistake in handling feedback stems from the assumption of similarities. For example, clear and explicit delineation of what is wrong with someone's work can be regarded as a true sign of deep respect in certain contexts. However, the same can be interpreted as rude, offensive, demotivating and humiliating in others. This is because people do not hold exactly the same beliefs, customs and expectations. In technology-mediated learning environments, non-verbal cues and other contextual factors add another level of complexity in communicating feedback

As our workplace becomes increasingly globalized, we need to understand and develop culturally appropriate and effective feedback skills that empower others and achieve results. In online learning environments, collaborative learning and effective feedback communication

play a crucial role in affecting student participation, engagement and learning outcomes. By drawing on recent research on the notion of growth mindset and intercultural competence, we will be able to consider innovative ways to create more inclusive online learning. This paper examines Eurocentric tendencies reflected in research and incorporates studies that involve non-Western value systems. The paper includes suggestions on how to:

- identify different theoretical models and research on feedback;
- apply cultural and contextual approaches to giving and receiving feedback;
- build trust and credibility across cultures; and
- harness technology to achieve culturally appropriate and effective communication

The literature review offers perspectives from a variety of disciplines, such as psychology, anthropology, and intercultural communication, and insights into the role of culture in technology-mediated communication with respect to feedback.

ICT SUPPORT FOR THE THESIS PROCESS: A CASE AS A LITERATURE REVIEW

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Introduction

Thesis supervision is one of the most complex and problematic pedagogical methods (Connell, 1985). Hansson and others discuss this complexity and show that the core activities of supervision require (an estimated) four to five times more effort per individual student than the payment/time allocated (Hansson, Larsson, & Wettergren, 2009). These authors also discuss the nature of thesis supervision and argue that large part of the process is dependent on communication. Communication is time-consuming and hence may be one of the reasons for this problematic state of affairs; maintaining the quality of communication is a challenge. The Department of Computer and Systems Sciences (DSV) faced this challenge when several theses were reviewed by the Swedish Authority of Higher Education (Bider & Jalali, 2016). The DSV had initiated a project to implement an ICT supported system for the thesis supervision process in 2011 in order to address the issue of quality. Sci-Pro, the thesis supervision support system, was launched in 2011 and has grown into a mature system during the last six years. There is a lack of comprehensive studies of ICT support systems; the aim of the current study is to conduct a literature review of the published articles about the DSV thesis supervision system to explore how ICT can support the thesis supervision process. The results of this study therefore offer benefits to individuals who intend to develop or use ICT support for the thesis process.

Methodology

This study was conducted as a literature review, and was limited to a particular project initiated by the Department of Computer and Systems Sciences. Research papers were selected only if the article concerned the Sci-Pro system. Google Scholar and Stockholm University Library search tools were used to collect published papers. We found 34 papers on the Sci-Pro system from between 2009 and 2017. One of the authors initiated the conceptual design, and the other a study of the development of thesis support information systems from a design science perspective. The Discussion section includes a summary of the published papers on Sci-Pro, and the conclusion shows how ICT can provide support and where this is applicable.

Discussion: Summary of Published Papers

The concept of developing a thesis support system first appeared as a design concept, published with the title “Open and flexible ICT: support for student thesis production –

design concept for the future” (Hansson et al., 2009). This paper discusses the importance of supervisor feedback, and shows that a supervisor’s time is a limited resource. These authors therefore suggested that information and communication technology could be used as a tool to enhance supervision, and proposed an innovative organisational model. The overall aim is to propose a design concept for a flexible and semi self-adaptive ICT system for the mass-individualisation of supervision in the thesis process at various levels. The authors suggested the features of a new ICT-based model for the thesis process including supervision pathways, hyper-video, chatterbots, anti-plagiarism methods and social learning. The design aim was to use ICT technology to facilitate higher quality face-to-face meetings with the supervisor and between peer students. The model included a concept called *supervision-pathways* which involved six phases: a research plan, background and methods, a data collection method, data collection, data summary and data analysis. They suggested enhancing the quality and efficiency of each of these phases, including both face-to-face meetings with peer students and supervisors and online collaboration and social integration. A model called *Structured and Flexible Process* guides and helps students, generating a personalised project plan using ICT tools including hyper-video, content creation and Web 2.0 collaborative technologies. The paper proposed a conceptual framework that can support the thesis supervision process.

The next study was published in 2010, and extended the conceptual framework proposed by the previous study. The article was entitled, “Sci-Pro: improving universities” core activity with ICT supporting the scientific thesis-writing process (Hansson, Collin, Larsson, & Wettergren, 2010). The proposed system was called Sci-Pro, an acronym for the SCientific PROcess. The system was expanded, introducing the five stakeholders of students, supervisors, the university, business and society, and showed how the proposed system benefits all involved (Figure 1). The Sci-Pro system expanded the previous conceptual system (Hansson et al., 2009) to include administrators, business, and society. The paper also shows how the features of the conceptual design (Hansson et al., 2009) can be implemented within the Department of Computer and Systems Sciences. This paper emphasises Sci-Pro as a system that enhances creativity, innovation, productivity, flexibility, communication, and administrative support.

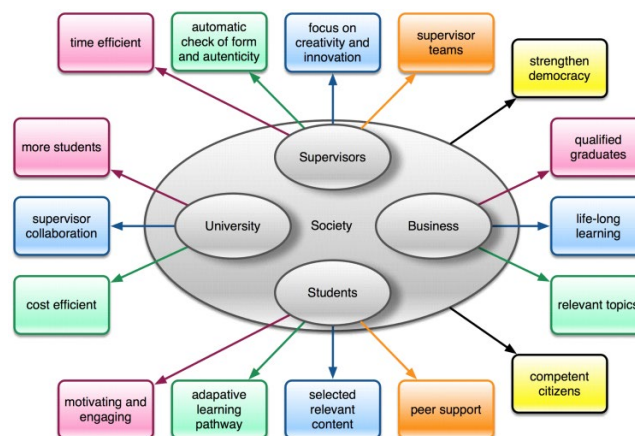


Figure 1. Target groups and major benefits of the Sci-Pro system (Hansson et al., 2010)

In 2011, another study was conducted on the trend towards increasing number of students in higher education as a challenge for supervision (Larsson & Hansson, 2011). This study highlighted the use of contextualised topical hyper-videos, automatic assessment and plagiarism detection and multilingual support from sub-titles in the hyper-video episodes as possible ICT-enabling tools that could enable the mass individualisation of the thesis-writing process with fewer resources. The next version of the Sci-Pro system brought several further improvements to the thesis supervision process. The paper was entitled “Quality processes in technology-enhanced thesis work: Negotiating knowledge interests and providing process support online” (Hansson & Moberg, 2011); it showed how the thesis support system functioned within DSV, and introduced several new concepts. The key feature of this version is the match module, which matches students with supervisors based on the interests of each. Both students and supervisors can publish ideas on the Idea Bank. Students publish their ideas on the system using keywords that relate to certain research areas within the DSV. These keywords are assigned to supervisors, and the matching system is updated with the currently available supervisors, the number of students they are ready to supervise and the educational level they are prepared to supervise (Bachelor’s or Master’s). Supervisors can also publish ideas to the system, in addition to students. The Match function helps supervisors and students to select ideas in advance, and projects can then be started before the planned date. The system also reduces the workload for administrators. The authors also argue that meta-supervision support reduces the workload of supervisors. Meta-supervision support means that comprehensive guidance is provided by IT resources, so that the supervisors do not need to repeat the same information to new or additional students. A peer review system is also introduced, as a tool whereby students review work done by peers; this reduces the workload and enhances the quality of the thesis.

A comprehensive study of the project initiation phase was conducted by Bencherifa (2012), which proposed a framework for idea creation and display to related stakeholders and inclusion of external parties into the process. Bencherifa (2012) shows how ICT can be used in the project initiation stage and introduced the concept of the Idea Bank, with more details of ways in which integration with the thesis supervision process can be achieved. A further study was then conducted on the evolution of the Idea Bank (Hansson, Moberg, & Peiris, 2012), which compares three versions of the Idea Bank module. Although the Idea Bank was considered to be a useful concept, fewer ideas were contributed by supervisors; many student ideas had been submitted by the end of 2012, but ideas from supervisors were scarce. In view of the low number of supervisor ideas, the DSV introduced a new policy whereby each supervisor was required to create three thesis topics for the Idea Bank, making the Idea Bank richer. In 2015, the same study was conducted, expanding the scope with more data. The study found that the number of supervisor ideas had increased between September 2012 and December 2013. The study also suggested four types of matching methods and compared their advantages and disadvantages. The four matching methods were student selection, supervisor selection, automatic matching and administrator matching. The authors argued that students and supervisors choosing each other based on mutual interests (without a middleman or administrator) was the best procedure from a motivational perspective (Hansson, Moberg, &

Peiris, 2014). Until 2012, expanding supporting functions were gradually developed for Sci-Pro.

One of the objectives of the thesis supervision system is plagiarism prevention. Larsson and Hansson (2012) conducted a study of how an ICT support system can be used to address this issue. They show how Sci-Pro can support the prevention and detection of plagiarism. They argue that transparency and fairness within the process are factors which can have a positive effect on the supervisor–student relationship regarding the prevention of plagiarism. In addition to prevention, Sci-Pro includes an application programming interface (API) for communicating with a commercial (third party) text-matching tool for the detection of copied text. The final thesis is automatically sent to the text-matching software system when the student uploads it. The report from the text-matching system is stored in Sci-Pro, and examiners and supervisors are able to view the report. Assessment is a critical issue in education, and particularly in the thesis process, in comparison with traditional courses which use structured examinations. Formative assessment methods are more effective than summative methods, although the implementation of formative assessment presents a challenge, since it requires more time and resources than the summative assessment methods (Peiris & Hansson, 2013). The Sci-Pro system addresses this challenge, and one study has shown how Sci-Pro supports the implementation of formative assessment methods in the thesis supervision process using ICT support (Peiris & Hansson, 2013). The study discusses how the various tools that are implemented in Sci-Pro can be used for this assessment.

Mobile phones are becoming increasingly popular and advanced, even in developing countries. According to the World Bank, even low-income countries have a mobile subscription rate of 93% (World Bank, 2015). A study conducted in order to explore students' perspectives of using Sci-Pro as a mobile app for thesis supervision found that about 95% of the respondents (from the DSV) used mobile applications for higher education and believed in the utility of mobile applications in supporting learning within higher education. More than 70% of the respondents thought that a Sci-Pro mobile app would add value to their thesis process (Aghaee & Larsson, 2013).

Two primary objectives in the development of Sci-Pro were reductions in supervisor time and enhancements in quality. Video- and text-based learning resources were included as tools to achieve these objectives. Students, as the primary stakeholders in ICT-based thesis support systems, use these resources; it is therefore worthwhile to study the usefulness of Sci-Pro system e-resources from the student's perspective. A study was conducted to investigate learners' perspectives on the usefulness of structured e-resources in reducing barriers to finding information related to the thesis process using Sci-Pro (Aghaee, Hansson, Tedre, & Drougge, 2014). This study was conducted using an open online survey, carried out in 2012–2013, from the students' perspective. This study evaluated the usefulness of Sci-Pro resources (video- and text based), dividing them into three categories. The first category of basic resources covers the essentials, and more than two thirds of learners indicated that this was useful. The second category, additional resources, included resources which support deeper research skills and the gaining of additional knowledge for producing higher quality theses,

and was reported as being useful by more than half of the learners. The third category covers a particular type of information related to a higher academic level, and was reported as useful by this particular group of learners. In general, this study shows that learners have a very positive attitude towards learning support systems similar to Sci-Pro. The majority of participants (96% of learners at both Master's and Bachelor's level) believe that these resources are useful in learning about the thesis description, structure and process, and are important for the thesis initiation and writing process. This study also shows that the use of Sci-Pro with a set of structured e-resources facilitates self-directed learning, and allows learners to find the required information independently. Thesis support systems therefore enable students to avoid the waiting time required to obtain general information from their supervisors and can reduce the time spent searching on the Internet. One of the main objectives of designing Sci-Pro was a reduction in the supervision workload (Hansson et al., 2009) and the results of this study showed that one of the main objectives of Sci-Pro system had been achieved.

Students complete a thesis as an individual or in pairs; they therefore experience a lack of peer interaction within the course of the thesis, in comparison with the traditional classroom environment. It appears that it is difficult for students to meet physically, since they are working on their thesis independently. ICT support systems can therefore be used as a platform to enable peer interaction. Two bachelor students initiated a project to develop a peer review system in 2011 (Kjellman & Peters, 2011). They implemented a system to develop a process for online written peer reviews, extending the Sci-Pro web system with peer-review functionality, thereby supporting the thesis process. A further study of the use of ICT support for peer review conducted by Aghaee and Hansson (2013) used data collected from the Sci-Pro peer review module. As these authors stated, the peer-review system is entirely student-driven, and thus saves time for supervisors by creating a direct interaction between students without input from supervisors. This paper describes an online peer-review system known as Peer Portal and the results of its use in enhancing the quality of Bachelor's and Master's thesis manuscripts. The overall results show that about 40% of the students reported excellent or good peer reviews. The results also show that the quality varies considerably, and the authors suggest structuring the peer reviews by introducing a rating system. They conclude that Peer Portal is valuable, since it is student-driven and brings benefits for students, supervisors and the department. In 2016, Aghaee and Keller (2016) conducted another study with the purpose of investigating learners' perceptions of the usefulness of an ICT-based support system (ICTSS) for peer interaction and the factors influencing the quality of the peer interaction. The results show that learners believe that establishing a culture of using ICTSS for peer interaction facilitates synchronous and online asynchronous communication, enhances collaborative learning, and improves the quality of theses. The majority of the learners reported that support for online and in-person peer interaction through the use of an online ICTSS was a useful facility.

Although the system includes many functions, its success depends on its usability. As a way of understanding usability, a study conducted in 2012 (Aghaee, Larsson, & Hansson, 2012) analysed the significant issues raised by Sci-Pro users. All of these were connected to the core

issue of a lack of comprehensive instruction for using the existing information in the system. Aghaee (2015) conducted another study, expanding the scope of the previous one, and identified six main categories of problems thesis initiation, info-mail, technical issues, exemption, supervision and final seminar. From a consideration of these categories, Aghaee suggested two strategies, the first relating to communication and second to instruction. From a communication perspective, the author suggested enhancing learner-learner interactions, learner-instructor interactions, and learner-content interactions, and highlighted the importance of the clarification of responsibilities, roles and expectations for both learners and supervisors. This author also suggested integrating the existing information system as a strategy to enhance both communication and the motivation of students. From an instruction strategy perspective, the author suggested constructing scenarios using screen captures or short videos to demonstrate the navigation and use of the system. He also suggests motivating supervisors to develop templates for unifying the supervision process and to use the system for the transfer of primary knowledge to students. In summary, this study suggests that the usability of the system can enhance the procedures and functions that are related to communication and instructions.

Another study was conducted in 2015 from an information systems perspective, entitled “Limiting variety by standardizing and controlling knowledge intensive processes” by Bider and Jalali (2016). According to the authors, the Sci-Pro system standardises and controls the process in a flexible way. As these authors discuss, there are three goals within the thesis process, including assessment, knowledge creation and learning. From an assessment perspective, they conclude that Sci-Pro has a positive effect on assessment, and recommended conducting further investigations to assess the achievement of other goals, knowledge creation and learning. In general, these authors argue that that the Sci-Pro system improves the average quality of a thesis. They also suggested adding more templates which take into account the types of research approaches, as a strategy to enhance student satisfaction.

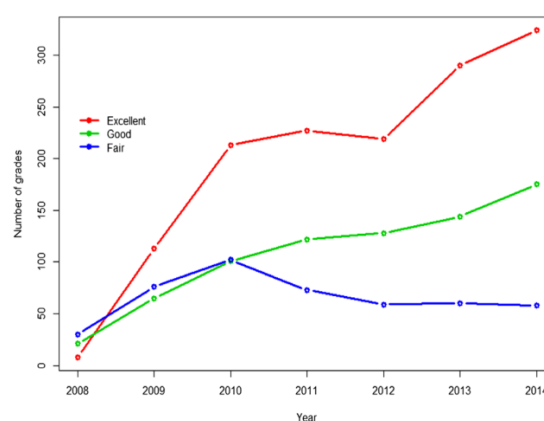


Figure 2. Changes in grades after implementation of the system

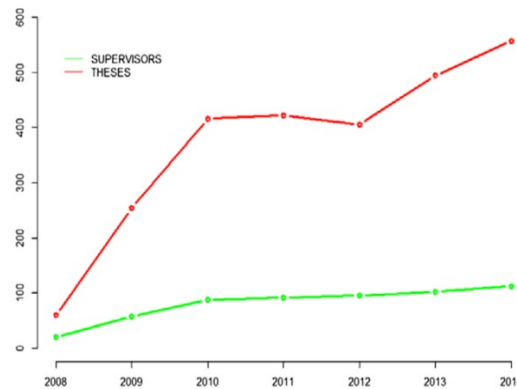


Figure 3. No. of supervisors and theses after implementation of the system

A study was recently conducted to investigate the quality and efficiency of the thesis process in the DSV (Karunaratne, Hansson, & Aghae, 2017). This study investigated the change in the quality and efficiency of thesis supervision after introducing the Sci-Pro system within the DSV. The results show that thesis quality has progressively increased throughout this period, as shown in Figure 2. Not only are current theses of much higher quality than before the change processes were implemented, but the number of low-quality theses has also significantly decreased during this period. The authors also show that the completion rate of theses has progressively increased. From an efficiency perspective, the study shows that there has been a significant increase in supervisor productivity and, on average, five more theses are completed per supervisor per year.

Conclusion

The thesis support system was introduced with the aim of developing an open and flexible ICT support system (Hansson et al., 2009). The system not only introduced ICT support but also suggested a procedural change. The project was developed with the idea of improving the quality of theses by implementing an open and flexible ICT system. The use of ICT in thesis supervision can offer benefits beyond those to students and supervisors; the university, business and society as a whole can also benefit from an ICT support thesis supervision system (Hansson et al., 2010). The concept of the Idea Bank provides a framework for idea creation, display to related stakeholders and the inclusion of external parties (including businesses) into the process (Bencherifa, 2012). As a type of direct user, thesis course coordinators (administrators) can also use the system for administrative activities. For instance, the concept of the Idea Bank reduces the workload for administrators, providing a tool for the selection of ideas by students and supervisors (Hansson & Moberg, 2011); (Hansson et al., 2012), meaning that administrators are required to match fewer projects. The removal of the middleman from idea-matching also motivates both students and supervisors alike (Hansson et al., 2014).

Supervisors and examiners are required to spend considerable time detecting plagiarised text. The Sci-Pro system shows how to integrate text-matching systems with thesis supervision, in order to address this issue (Larsson & Hansson, 2012). Sci-Pro also makes the thesis process transparent. Larsson and Hansson (2012) argue that the transparency and fairness of the

process enhance the supervisor–student relationship in a positive way in terms of the prevention of plagiarism. Another area that can benefit from a thesis support system is assessment. Peiris and Hansson (2013) show how Sci-Pro supports the implementation of formative assessment methods within the thesis supervision process using ICT. ICT can also be used as a tool in the thesis process for peer interaction. An online system can support a peer review scheme, since students work on their theses individually. Sci-Pro demonstrates how peer review can be implemented in both a pedagogical and technical sense. The introduction of a peer review system reduces the supervisor's workload, and peer reviews provide feedback to students. However, since not all the reviews are of good quality, Aghaee and Keller (2016) highlight strategic solutions for developing the pedagogical and technical aspects when developing a peer review system.

When exploring the use of ICT in the thesis process, the student's perspective is crucial. Students find the e-resources provided by the ICT system to be useful when learning about the thesis description, structure and process, and report that these systems are important in the thesis initiation and writing process (Aghaee et al., 2014). These authors also argue that an ICT support system facilitates self-directed learning and reduces the supervisor's workload. Furthermore, the thesis support system should focus on enhancing communication (interaction) and instructions for the use of the system. Students report that their motivation increases if the thesis supervision system is integrated with other information systems. The development of a thesis support system that can be accessed from mobile phones will also enhance student engagement. Aghaee and Larsson (2013) studied students' perceptions of this issue and showed that a Sci-Pro mobile application adds value to the thesis process. Bider and Jalali (2016) discuss how the Sci-Pro system standardises and controls the process in a flexible way, showing that the Sci-Pro system has improved the average quality of the thesis through the use of an ICT support system. An ICT support thesis supervision system has increased not only the quality but also the efficiency of the thesis process within the DSV (Karunaratne et al., 2017). A study of the DSV thesis supervision management system shows that ICT can support both the thesis process and the end product. The literature shows how ICT can be used to enhance the efficiency of the thesis process, its quality and the effectiveness of the product, thereby benefiting industry and business.

Concluding remarks

A review of the above papers shows that ICT support thesis supervision systems can enhance the efficiency and effectiveness of the thesis process, standardising and controlling it while maintaining flexibility. ICT support systems reduce the workload of supervisors and administrators, and motivate students by supporting self-directed learning. The prevention and detection of plagiarism is another dimension that can be considered as an area for development. From a process perspective, an ICT system can support the entire thesis process, including initiation, supervision and assessment; from an interaction perspective, an ICT support system enhances student-supervisor, supervisor-supervisor, and student-student interactions. An ICT support thesis system can also be used as a tool for garnering real world issues from business and society and as a channel to share the knowledge generated. As a

whole, an ICT-based thesis supervision system can offer benefits not only to students and supervisors, but can help to enhance university-industry collaboration and thereby benefit society as a whole.

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FROM FRONTIER LEARNING TO BLENDED COMMUNITY LEARNING: A PHENOMENOGRAPHY OF INFORMAL LEARNING IN RURAL COMMUNITY INFORMATICS

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Introduction

“The skills and knowledge required to take an active part in a society characterised by digital technology are embedded, learned, and practiced in people’s daily lives” (EDEN17, Conference Scope). However, disparities in relation to both the quality and intensity of use of digital information and communications technologies between those with higher levels of education and the less well educated (European Commission, 2008) in addition to reports that “privileged social groups enjoy a seamless integration of different types of learning that is denied to the disadvantaged” and marginalised in society (Colley, Hodgkinson & Malcolm, 2003; p.109) point to the existence of a learning divide – a term used to refer to inequalities in education related to the existence of a digital divide (European Commission, 2008; Sargant, 2000; White, 2011). Like Australia, therefore, many countries and communities are working on strategies to build the capacity of their citizens for active participation “in an information society that includes a concept of civil society as a target for skills development, engagement, decision-making, and societal cohesion” (Taylor, Schauder, & Johanson, 2005; p.4). Such strategies include the Learning Communities movement, in which towns, cities, and communities adopt a “learning-based approach to community development...with a framework in which lifelong learning is the organising principle and social goal” (Faris, 2005; p.31) and grass-roots community technology (Community Informatics) initiatives that seek to leverage digital Information Communications Technologies (ICTs) and the Internet in the interests of supporting the achievement of community development (Gurstein, 2001) and digital inclusion (Alamelu, 2013) goals. This paper draws on the author’s doctoral study into community volunteers’ informal learning experiences in the context of their involvement in a hybrid Learning Community-Community Informatics project called GraniteNet situated in the rural town of Stanthorpe in South-East Queensland, Australia, to generate new insights about the diverse forms of learning in which people engage as they use digital technologies to learn with and from each other in the context of Australian rural community and associational life in the digital era.

Conceptual Framework and Methodology

The author concurs with Merriam et al. (2007; p.430) that “informal learning contexts, including social action and community-based learning, are where much of adult learning

takes place... [and that as adult educators and researchers] we need only see them as sites for learning” to be able to explore and better understand, and make visible, the dynamics and complexity of informal adult learning. Thus, as a third sector Community Informatics and Learning Community initiative aiming to harness the possibilities presented by digital technologies and the internet for enhanced social connectivity, community networking and participation in lifelong learning, GraniteNet affords a rich case study of the nexus between community-based ICTs and informal community learning in an Australian rural context. *Third sector* is a term used to refer to the not-for-profit, voluntary or community sector of social and economic activity to distinguish it from the other two sectors – private enterprise and industry on the one hand, and the government, or public sector, on the other (Schauder, Johanson & Taylor, 2006). The study experiments with phenomenography – a qualitative research approach traditionally used to investigate learning from the learner’s perspective in the context of formal education (Marton, 1988; Marton & Booth, 1997) – as a methodology to investigate informal learning in a community setting with a socio-technical focus. The term *socio-technical* refers to “the mutual constitution of social relations and technologies” whereby “technological artefacts are enmeshed in our activities and our connections to other people” (Tuominen, Savolainen, & Talja, 2005; pp.338-9). A “socio-technical environment” (Fischer, Rohde, & Wulf, 2009; p.77) is therefore an environment in which these relations and “dependencies” (Tuominen et al., 2005; p.339) are thematised, such as GraniteNet. Using a structured phenomenographic interview procedure, respondents’ conceptions (a conception is broadly defined as “the meaning people ascribe to what they experience” (Barnard et al., 1999; p.215)) and experiences of learning were probed in order to illuminate three different learning aspects adapted from Marton (1988; p.5):

1. The experience of the learning process;
2. Different ways of understanding the content learnt;
3. Describing conceptions of the world around us (in this case, GraniteNet as the learning context).

Together, these learning aspects constitute the study’s conceptual and analytical framework (see Figure 1).

From Frontier Learning to Blended Community Learning: A Phenomenography of Informal Learning in Rural Community Informatics

Catherine Arden

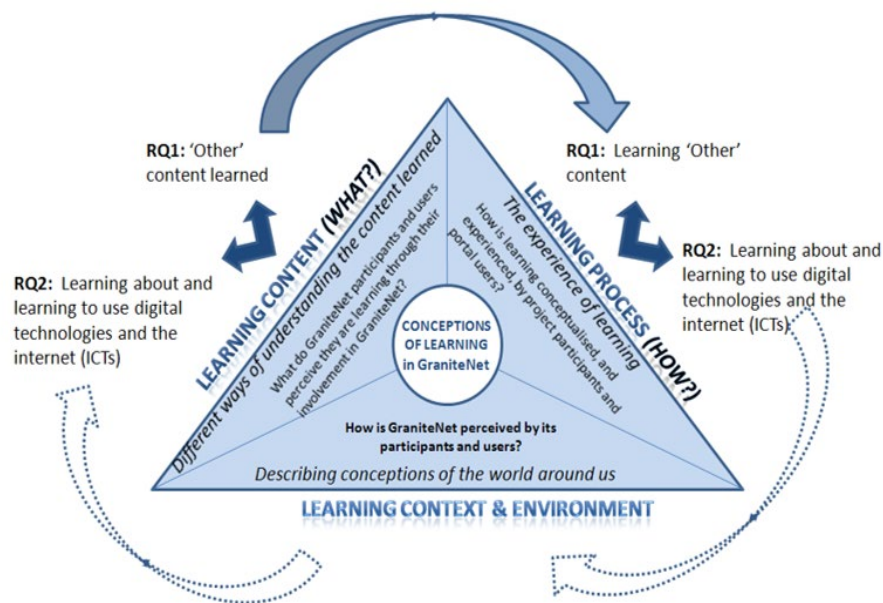


Figure 1. Holistic conceptual and analytical framework incorporating what/how framework (adapted from Marton, 1998; Marton & Booth, 1997).

Structured phenomenographic interviews were conducted with a purposive sample of 20 individuals drawn from among the members of GraniteNet's diverse communities and networks of interest and practice. Consistent with sampling conventions in phenomenographic studies, the emphasis is on heterogeneity (rather than representativeness) of the sample (Akerlind, 2002). Figure 2 highlights the heterogeneity of the sample with respect to the diversity of respondents' characteristics, including age, gender and cultural and linguistic background in addition to the nature and length of their involvement in GraniteNet.

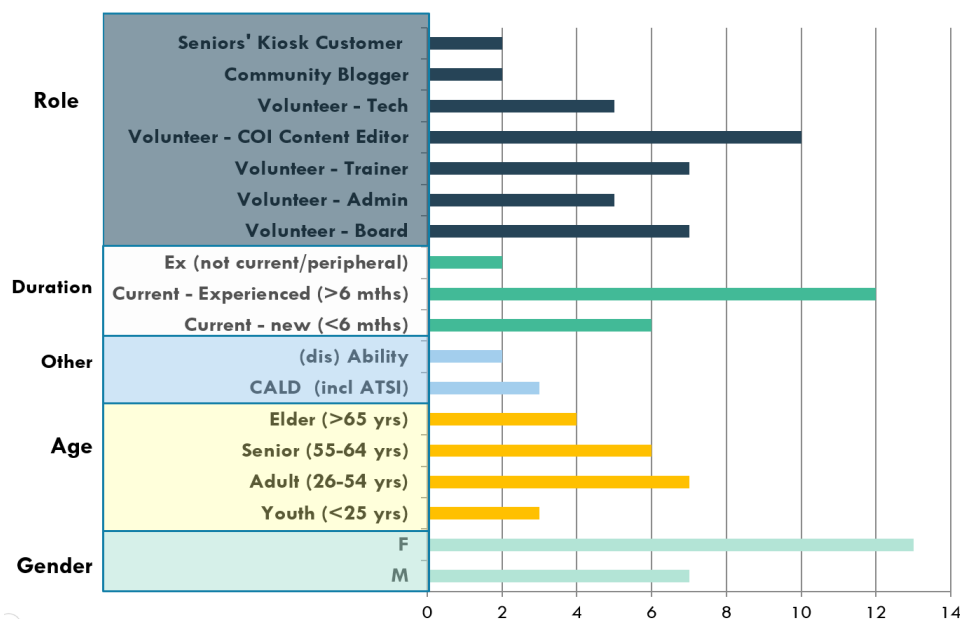


Figure 2. Respondent characteristics: Age, gender, cultural and linguistic background, disability or impairment, and nature and duration of involvement in GraniteNet

Findings: Diverse conceptions and experiences of learning in GraniteNet

Phenomenographic analysis of interview transcripts and respondents' mind maps revealed seven distinct and logically related conceptions of learning in GraniteNet (see Table 2), reflecting the range of qualitatively different ways GraniteNet participants and portal users perceive and experience learning in the context of their volunteering activities in GraniteNet's face-to-face, virtual and hybrid learning and working environments including: governance and management of the community-based organisation; delivery of community technology services to the local community; and development and/or use of the community portal. These seven categories of description coalesce into four distinct groupings, each of which reflects a particular perspective of GraniteNet as the learning context and environment: a Seniors kiosk Customer Perspective, a Community of Practice Group; a Communities of Interest Cluster; and a Community Development Cluster. Consistent with phenomenographic research conventions, the meaning of the conception of learning in each category – in terms of how learning in GraniteNet is actually experienced by respondents adopting that particular conception – is reflected in each category's title.

Table 2: Categories of Description, Groupings and Perspectives

1. The <i>Frontier Learning</i> Conception	<i>('Seniors' Kiosk customer' perspective)</i>
2. The <i>(Community)Service Learning</i> Conception, with three subcategories: 2A <i>Altruistic</i> Conception 2B <i>Vocational</i> Conception 2C <i>Leadership</i> Conception	} <i>Community of Practice Group</i>
3. The <i>Community Information Literacy/Social Inclusion</i> Conception	
4. The <i>Blended Community Learning</i> Conception	
5. The <i>Digital Stewardship/Enterprise Learning</i> Conception	} <i>Communities of Interest Cluster</i>
6. The <i>Building Community Technology Capacity</i> Conception	
7. The <i>Learning Community</i> Conception.	
	} <i>Community Development Cluster</i>

These seven categories constitute the study's phenomenographic outcome space, which represents a snapshot of the collective learning consciousness of GraniteNet at a particular point in time in its history. In phenomenography, no single category or conception represents the perspective of any one individual; rather, the categories describe the range of variation in ways of seeing and experiencing learning reflected in the data, any number and combination of which may reflect an individual's way of seeing and experiencing the phenomena in question at a particular point in time. Overall, the findings reveal the precise nature of learning in GraniteNet to be primarily dependant on:

- the nature of the particular community organisational volunteering role that the individual is performing at the time, and related to this, whether they are experiencing learning in GraniteNet from the perspective of a Customer, Provider, shared Customer/Provider or Developer perspective;

- whether the individual's participation is situated in community volunteering activities occurring primarily in a face-to-face organisational setting, in a blended or hybrid face-to-face –virtual setting that “combines digital interactions with offline encounters” (Field, 2005; p.140), or indeed, primarily in a web-based environment;
- the individual's age; that is whether or not they are a younger community volunteer (Livingstone & Scholtz, 2010; Schugurensky et al., 2010) and “digital native” (Prensky, 2001) or alternatively a “third age learner” (Hazzlewood, 2003; p.1) and “digital immigrant” (Prensky, 2001; p.1).

What are people learning? Significant and valuable learning across seven content domains

Significant and valuable learning was discovered for respondents in a diverse range of content areas, or domains, as shown in Table 3. In addition to the categories traditionally used to describe learning content in formal education settings (such as knowledge, skills, and attitudes, for example), the descriptions of the learning content in Table 3 use “much more far-reaching categories” (Illeris, 2006; p.74) to reflect the breadth and depth of meanings, understandings, and dispositions inherent in respondents' own expressions of their learning.

These findings confirm those reported in the literature on learning in associational life and volunteer work that emphasise the variety of learning opportunities afforded by small-scale voluntary and community-based organisations “across the spectrum of adult learning” (Kerka, 1998; p.1) along with the breadth, depth, and significance of this learning for learners (Field, 2005; McGivney, 2006; Schugurensky, Duguid, & Mundel, 2010). The findings also show significant, valuable, and pervasive learning for GraniteNet volunteers at the intersections of particular content domains afforded, in part, by GraniteNet's organisational characteristics and culture as a Community Informatics and Learning Community initiative.

Table 3: Significant and valuable learning across seven domains of learning content

Content Domains	Specific Content	Conceptions of learning in GraniteNet
1. Technology/Socio-technical	<ul style="list-style-type: none"> Digital literacies (basic and more advanced) including learning about and learning to use digital technologies for a range of purposes (Digital) Community Information Literacy GraniteNet Content Editor Skills Set Web design/development Programming skills Technology stewarding Community Informatics 	Cat 1: Frontier learning conception Cat 2: (Community) service learning conception Cat 3: Community Information Literacy/Social inclusion conception Cat 4: Blended community learning conception Cat 5: Digital stewardship/Enterprise learning conception Cat 6: Community technology capacity-building conception Cat 7: Learning community conception
2. Learning	<ul style="list-style-type: none"> Understanding and facilitating adults' (digital literacy) learning Meta-learning (learning about one's own learning), including digital meta-learning Community Information Literacy (learning about one's own and other people's information needs) (Blended) Community learning Informal learning Action Learning/Action Research Lifelong learning 	Cat 2: (Community) service learning conception Cat 3: Community Information Literacy/Social Inclusion conception Cat 4: Blended community learning conception Cat 5: Digital stewardship/Enterprise learning conception Cat 6: Community technology capacity-building conception Cat 7: Learning community conception
3. Community	<ul style="list-style-type: none"> Civic engagement/participatory democracy Local community knowledge (Community Information Literacy) Blended community learning Community Informatics Community Development Community Learning 	Cat 2: (Community) service learning Cat 3: Community Information Literacy/Social inclusion conception Cat 4: Blended community learning conception Cat 5: Digital stewardship/Enterprise learning conception Cat 6: Community technology capacity-building Cat 7: Learning community conception
4. Special Interest	<ul style="list-style-type: none"> Knowledge and skills in the specialised domain of the Community of Interest (CoI) (includes digital technologies/computing and local community as special interest areas) 	Cat 3: Community Information Literacy/Social Inclusion conception Cat 4: Blended community learning Cat 5: Digital Stewardship/Enterprise learning
5. Vocational	<ul style="list-style-type: none"> Vocational competencies and literacies (various occupational fields) Career development learning Enterprise learning 	Cat 2B: (Community) service learning conception – Vocational emphasis Category 5: Digital Stewardship/Enterprise Learning conception
6. Personal/Relational	<ul style="list-style-type: none"> Self-efficacy, self-confidence, personal agency, personal development Generic and 'soft' skills (such as interpersonal and communication skills, social competence, social literacy, social awareness) Leadership 	Cat 1: Frontier Learning conception Cat 2: (Community) service learning conception
7. Organisational/Associational	<ul style="list-style-type: none"> Organisational knowledge and know-how Participatory democracy Organisational governance, management, administration (community-based) Organisational development 	Cat 2: (Community) service learning conception

How are people learning? Multiple learning processes under the umbrella of social participation

The data show this learning to be first and foremost a function of people's social participation (Wenger, 2009) or interaction (Illeris, 2006) in the context of their community volunteering in GraniteNet's hybrid socio-technical learning and working environments. Against this backdrop of learning as social participation, the data reveal multiple learning processes reflected in conceptions and experiences of the process of learning across all categories in the study's outcome space. A learning process is understood here as an activity involving the learner's agency in acquiring, knowing, and making use of the learning content (Marton & Booth, 1997), although this may occur incidentally, "as a by-product of another activity" (Mezirow, 2000; p.5) that may or may not involve intentional learning. Learning may also be experienced as an individual or a collective phenomenon, but is always practical (practical learning is understood here first and foremost as learning "that is about action in a pragmatic manner in order to achieve certain goals and behaviours" involving "primary rather than secondary experience" and "using practical knowledge" developed through this experience in the context of "practical living in the everyday" (Jarvis, 2009; p.11)) and predominantly relational in nature. Relational learning is learning primarily with and through interactions with others and with things in the physical, socio-technical environment. As such, learning can be seen as "emerging in the relationships that develop among all people and everything in a particular situation" (Fenwick & Tennant, 2004; p.56) and can therefore be viewed through both a socio-cultural and a social constructivist lens (Booth, 2008). Learning processes include observation, imitation and benchmarking; practice (as repetition or overlearning); problem-solving, trial-and-error (Hager & Halliday, 2006), "trying out" (or deliberative learning) (Eraut, 2004); performing allocated or self-initiated tasks and fulfilling particular roles in the community of practice (Wenger, 1998); learning through communication, cooperation, participation and exchange in networks of interest and practice (Fischer, Rhode, & Wulf, 2009); learning through helping others to learn; and learning through collaborative problem-solving, experimentation and inquiry, self-directed research, deliberation, and reflection in and on action (Schön, 1991). Learning in GraniteNet also includes browsing for, sharing and evaluating information for learning (Informed Learning) (Bruce, 2008a), learning through the construction of artefacts (reification) and learning through information and knowledge exchange, networking, connection, construction, and bricolage (Wenger, White, & Smith, 2009). The term *bricolage* is used in the literature reviewed for this study to refer to improvisations in technology-rich environments as "tinkering through the combination of resources at hand" to solve real-world technology-related problems (Ali & Bailur, 2007; p.5)

Learning at the intersection of the Community, Sociotechnical and Learning domains: A spectrum of community sociotechnical literacy practices

As shown in Table 3, learning in the Technology/Socio-technical, Community and Learning domains is central to the experience of learning in GraniteNet and can be theorised as a spectrum of community socio-technical literacy practices, as illustrated in Figure 3. Critical to

this theorising is the recognition that in the digital age, the social contexts in which literacy practices are embedded are essentially socio-technical contexts; that is, “combinations of social relations and information communications technologies” (Resnick, 2002; p.649). Situated within this broader socio-technical context, GraniteNet is seen as a socio-technical learning environment, with learning experienced both as acquisition of generic skills and as a function of social participation (Wenger, 2009) in communities and networks of interest and practice (Fischer et al., 2009). At the foundation level of the spectrum is the practice field of interpersonal communications, as reflected in the Frontier Learning conception of learning in GraniteNet in Category 1. Here, socio-technical literacy practices focus on the practices of using technology to communicate with significant others in a network society and digital world, where “the mutual constitution of social relations and technologies takes place because technological artefacts are enmeshed in our activities and our connections to other people” (Tuominen, Savolainen, & Talja, 2005; p.330). Moving up from the relational to the associational level in Figure 3, the practice context is the GraniteNet technology hub Community of Practice, as reflected in the three emphases in the (Community) Service Learning conception (Category 2). Here, participation in a broader range of literacy practices includes learning about one’s own and others’ digital literacy needs and experiences in addition to learning about and learning to use digital technologies to contribute to the helping organisation in the interests of digital and social inclusion by supporting older adults’ digital literacy learning. Digital literacy learning at the associational level is therefore both embedded in and a function of social networks and cultural practices, with knowledge linked to human agency in terms of “people’s ability to act, participate, and make appropriate and informed decisions in socio-technical environments” (Fischer et al., 2009; p.77).

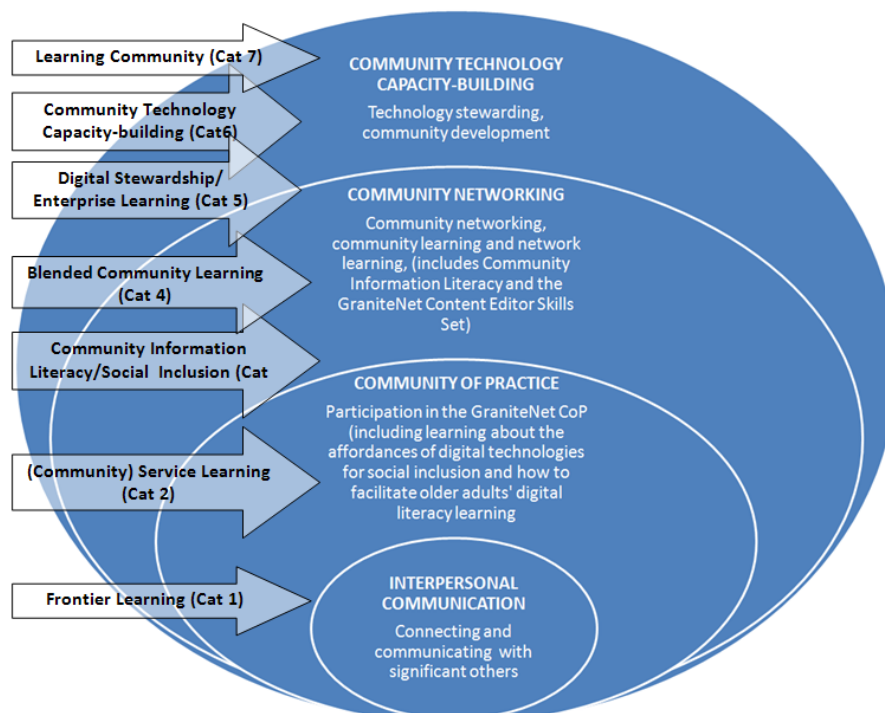


Figure 3. A spectrum of community socio-technical literacy practices

Moving up to the Community Networking level in Figure 3, participation in the hybrid socio-technical environment of the GraniteNet community web portal as reflected in the two conceptions in the Communities of Interest cluster involves socio-technical literacies for community networking, information-sharing and (blended) community learning. Learning in the Blended Community learning conception as learning to be a community group Content Editor, learning in the specialised domain of the Community of Interest and learning in community with others. With respect to the conception of the learning content in the Blended Community Learning conception, a primary focus is on learning to be the Content Editor for one or more community groups, which involves creating, uploading and updating content on the group's webpage using the ModX Content Management System (CMS) and managing communications for the group/s on the GraniteNet community portal. In the Community Information Literacy/Social Inclusion conception in Category 3, for example, the GraniteNet community portal is seen as a lifeline for people who are marginalised to connect with their local community through access to, and sharing of, local community information. As community connections are made, links forged with local community services, community groups and associations, and digital Community Information Literacy skills developed for the purpose of sharing information via the community portal, opportunities are afforded for active participation in local community associational life in which physical and virtual interactions and activities become mutually reinforcing. Thus, this study's findings contribute to our understanding of the information practices of an "informed citizenry" (Bruce, 2008b; p.6) by illuminating the "information practices that enable people to use information effectively" (ibid.) and to "learn with and from each other" (Bruce, 2008a; p.vi) in the context of community and associational life. Further, as part of the spectrum of community socio-technical literacy practices, these findings provide support for theorising about learning that emphasises positive correlations among people's social networks and relationships, their participation in civil society and associational life, their use of information for learning in socio-technical environments and their engagement in informal, community and network learning (Bruce, 2008a; 2008b; de Laat & Schreurs, 2013; Field, 2005; Fischer, Rohde, & Wulf, 2009; Kavanaugh et al., 2009).

In the top layer of the diagram are literacy practices for community technology capacity-building (reflected in the three conceptions in the Community Development cluster), including technology stewarding (Category 5), community technology capacity-building (Category 6) and a community learning as a "learning-based approach to community development" (Faris, 2005; p.31) (Category 7). Learning content at the intersection of learning in the Community, Technology-Sociotechnical and Learning domains of learning in GraniteNet reflected in these three conceptions of learning from the "Developer Perspective" takes community information practices to the next level of community technology capacity-building, as a set of transformative and emancipatory socio-technical literacy practices. These practices require new kinds of literacies, including technology stewarding, as "a flexible understanding about how digital habitats can serve the learning of communities" (Wenger, 2009; p.184), along with an ability to envision new opportunities and possibilities for the

community web portal. It also requires a practical understanding of how technology can be used to support community development (Community Informatics), including learning about the affordances of digital technologies and the internet for supporting lifelong learning. Bruner's (2012) theory of informal learning as "generating and testing possibilities" or "cultivating the possible" (p.29) is particularly pertinent to theorising about learning and socio-technical literacy practices at the community development level.

Conclusion

The above findings contribute to knowledge about the experience of informal community learning from the learner's perspective, and specifically, learning embedded in social participation in rural community volunteering and associational life in the digital era. It is further argued that the findings contribute to understandings about the nature of learning in geographic learning communities, generating new insights about "how knowledge is shaped and shared in communities" (Bishop & Bruce, 2005; p.6) and in particular, about the effects of socio-emotional and socio-technical factors in these interactions. As such, new insights are generated about the nature of informal adult learning that contribute to an "emerging view of learning" that enables us to "learn to think more creatively and productively about learning in all of its manifestations" (Hager, 2004; p.15). Related to this are new understandings and insights generated about informal learning as a phenomenon linked to adults' growing capacity for metacognition and reflexivity in the interests of understanding and furthering their own learning. Overall, these findings confirm that under the right conditions, digital technology can be used to "support sustainable environments where learners gain new perspectives on their learning, share and learn collectively, and master their own drive for learning" (Eden17, Conference Scope).

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DIVERSITY: A BLESSING OR A CURSE FOR ONLINE COLLABORATION?

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Introduction

Online collaboration and communication through social networks, free knowledge exchange and informal learning online are playing an important role in today's society. Emerging technologies, that are ever-changing, combined with the complexity of the problems that the 21st century poses, requires collaborative efforts from people with diverse skills, that are able to adapt and learn whilst working on the problem at hand. These skills are referred to as fluencies (Crockett et al., 2011).

Many educational theorists understand the importance of these fluencies and concur on the same principal: collaboration, digital literacies, citizenship, and the ability to problem solve are all critical skills in the 21st century. Without these skills the youth today will be unable to adapt to the rapidly changing landscape in a globally connected world (National Education Association, 2012).

In accordance with the above, The European Commission, is promoting various initiatives aimed at increasing training in digital skills for the workforce and for consumers; modernising education across the EU; harnessing digital technologies for learning and for the recognition and validation of skills; and anticipating and analysing skills needs (European Commission, 2016).

For these reasons, the authors, independently and without any prior knowledge of each other, joined a learning experiment: the Open Networked Learning (ONL162: <http://onl162blogroll.blogspot.se>) course for several months in the autumn of 2016. We were randomly assigned to the same Problem Based Learning group (PBL) and collaborated online. Our group, was part of a Community of Inquiry, (COI) consisting of more than 100 students and 25 facilitators. We worked synchronously and asynchronously.

Our motivation for joining the ONL course was common curiosity, professional development and a strong believe that an international learning experiment would provide us with valuable skills needed to succeed in our various professions in today's society.

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As a group we were diverse due to different educational and cultural backgrounds, occupations, philosophies, languages, characteristics that determined our approaches, communication styles, learning styles, as well as previous experiences. Despite this, we agreed on common goals besides achieving the individual ones. In this way we created a synergy and not only did we learn the obvious course content, but we learnt beyond this; we learnt about group dynamics and creativity, as well as how to collaborate despite these differences and how to make these become our strengths.

Therefore, we believe diversity matters when collaborating in an educational context, as it brings to the group the “multi-perspectiveness” that is needed when looking at complex problems (Herrington & Herrington, 2006). Herrington and Herrington (2006), advocate this as an essential learning element when it comes to authentic learning tasks, especially when dealing with online environments. Furthermore, they believe that there are multiple roles to support the construction of knowledge, as it helps to articulate tacit knowledge and make it more explicit. This can only be done through diverse group members, where you have those that are perhaps more expressive, as was the case in our group.

Purpose

Was diversity a curse or a blessing for our group? We were diverse, yet there was commonality as well. How did we balance between togetherness and diversity? We want to share our experience and the knowledge gained with the participants of #EDEN17.

What do we mean with diversity?

Diversity in our PBL group came from Sweden, Cuba, Sudan, South Africa, Australia, Netherland, five women, two men, young, old, academic, entrepreneur, educator, mom, dad, etc. Some of these differences could be easily noticed, others were subtler. For instance, our learning styles, ability to focus, stress threshold, energy level, diligence or innovative capacity, these were not overtly obvious.

What kind of diversity matters?

We are going to use the Community of Inquiry (COI) framework as a paradigm. The COI model (Garrison, Anderson, & Archer, 2000) includes the cognitive, social and teacher presence. These elements overlap and contribute to the learning experience. Additionally, we are going to add and discuss the impact of the emotional feedback (Stenbom, Hrastinski, & Cleveland-Innes, 2016).

Cognitive

“Cognitive presence relates to the design and development of instructional materials, enabling students to construct and confirm meaning through related reflection and discourse” (Garrison et al., 2000)

The course design provided synchronous and asynchronous activities for those who preferred discussing in large communities and for those who choose to reflect alone. There was

flexibility and freedom but also good human support and structure, clear instructions and deadlines. Moreover, the ONL encouraged networking. Every member of the group was given the possibility to lead the group and decide over the group presentation, to take notes and schedule meetings. We could choose between different digital tools that suited better our purposes, pace and abilities. We had space and time for self-reflection and for dynamic discussions.

Social

Different cultures, languages, genres, ages, races, religions etc. Some of these components will not impact the group collaboration as much as the cognitive component.

"Social presence relates to the establishment of a supportive learning community, providing a venue for communication within a trusted environment where students can express individual identities and establish social relationships" (Garrison et al., 2000)

In this regard, the ONL course design allowed and encouraged networking through membership in the bigger and smaller Google+ communities, tweet chats, Webinars, etc. Networking was important during the course and once the collaboration has been established. Peers' support and positive reception towards everyone's input was also very important for developing relationships and to achieve successful collaborations. While the group contributed with trust, support, inspiration, encouragement, joy, sense of belonging and commitment. And we discuss group rules, for more clearness about online behaviour and communication.

Teacher

Taking the cognitive and the social elements together, this take us back to the COI framework and the third element: the teacher's presence (here referred to as the facilitator's presence). There is a substantial overlap between the three elements but both, facilitator and co-facilitator bring together all the elements in order to have a successful collaborative environment and learning experience. Here, we go deeper into different stages of group process (Wheelan, 2010) and other applying theories.

Summary

The poster will make clear and visible how we think about the following questions:

- Was diversity in our group a curse or a blessing?
- What do we mean by "diversity" (gender, knowledge, skills, access internet, talents...)
- What kind of diversity matters the most in educational context? (social, cognitive, emotional, ...)
- When was diversity a curse? When was it a blessing?
- What was needed to make it a blessing?

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- What is the role of the individual group members for happy online and collaborative learning?
- What is the role of the facilitator and co-facilitator?
- What elements make online collaboration with a diverse group effective?
- Theories applying to our experiences



Figure 1.

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RESEARCH TRENDS OF INSTRUCTIONAL TECHNOLOGY DISSERTATIONS IN TURKEY

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Introduction

Every planned research study begins with the analysis of previous studies and gains a new form by their help. The capacity to be able to conduct a research is crucial for graduate students to survive in their future. While graduate students try to fulfil academic requirements and to have a career advancement beyond the university, they should develop skills of research and utilize higher order thinking processes (Liu & Breit, 2013). Also, during PhD programs, they receive training on how to apply various research methods, and the variety of available methods makes it possible for students to investigate many research problems in the field. The literature indicates numerous differences between quantitative and qualitative methods in each of step in the research process, including identifying the research problem, reviewing the literature, collecting the data, analysing the data, and reporting the results (Creswell, 2008). Garrison (1991) argues that in order for learning to be meaningful, the cognitive process needs to involve critical thinking that is grounded in the analysis, synthesis, and assessment of newly acquired knowledge. When applied to mastering research methods, this argument means that students need to be in charge of their learning and take an active role in determining the context within which they acquire new content (Edwards & Thatcher, 2004).

Theoretical Framework

In 1920's, Instructional Technology (IT) viewed as Instructional Media. In 1950's IT was defined as a process. It is important to examine the research studies and doctoral dissertations based on their methodology and topics to understand the future of the IT field. When we look at the research studies, Caferalla (2005) determines the topics of computer based instruction, instructional design, simulations, games, television and video are very popular and there are a few numbers of experimental studies. In addition, the number of media comparison studies have decreased and the attention was in qualitative studies in these years (Caferalla, 2005). As Brown and Green (2014) explained; online learning, mobile devices, and social media studies continue to gain in popularity in IT. From the sampling aspect, generally, target groups are K-12 and higher education students in the recent studies (Brown & Green, 2014).

Karadag (2009) showed that thematic orientation of doctoral thesis in the field of education in Turkey was majorly on the subjects of attitude and achievement and the level of methodological qualification was not proper and the level of mistakes in studies made was quite high. These findings show that there has been important qualification problem in product of doctoral thesis made in the field of education in Turkey. Göktaş et al. (2009) state that the researchers evidently have not acquired enough experience in the practice of different research methods, which might be useful for studying and overcoming many current educational research problems. In addition, they determine that the most frequently studied samples subjects were undergraduate students and teachers. This result showed that the researchers mostly directed their research toward undergraduate level, as this provides an easy to reach sample population and convenient sampling procedures.

Erdoğan and Çagiltay (2009) have investigated 248 Master's and doctoral theses in Educational Technology and reached the conclusion that research studies in this area have been limited in scope, and have mostly been produced by only a few universities. In addition, they also found that these studies display several methodological weaknesses and there is a tendency for the studies that compares different medium to provide better learning (Erdoğan & Çagiltay, 2009). Şimşek, Özdamar, Becit, Kılıçer, Akbulut, and Yıldırım (2008) have also analysed dissertations in IT field for last decade and found that generally, experimental studies have been preferred and the sample has been chosen from K-12 students. Achievement and perception tests were the popular data collection tools among studies and there are a few studies explain validity and reliability issues and the others have serious problems (Şimşek et al., 2008).

While graduate students try to fulfil academic requirements and to have a career advancement beyond the university, they should develop skills of research and utilize higher order thinking processes (Liu & Breit, 2013). In this manner, to be successful in the process of conducting research; Sockalingam, Rotgans, and Schmidt (2011) determine that identifying a high quality research problem should be “relevant, realistic, engaging, challenging, and instructional (built upon prior knowledge)” (p.3). Based on the literature, this study is related to the research trends in terms of topic, research methods and research preferences in terms of sample selection method, sample size and sample level.

Purpose

The aim of this study is to analyse the dissertations which were published between 2002 and 2015 in IT field in Turkey. Thus, dissertations (accessible ones) were selected and their contents were analysed according to specified criteria. In this respect, the main and sub-research questions are given below:

- What are the general research trends in dissertations conducted in IT field in Turkey?
 - Which topics were studied?
 - Which research methods were used?
 - Which type of data were preferred?

- What were the sample levels?

Significance

Generally, educational researchers utilize previous studies and they gain key findings to develop their conceptual and theoretical frameworks (Karadağ, 2009). It is crucial to conduct a research study with the basis of the other studies in the literature since technology always change rapidly and scientist should be aware of all the differences and similarities from past to present. From the academia perspective, if it can be possible to examine the doctoral dissertations in our country, we may draw a general picture of Instructional Technology (IT) field and detect the trends and the situation for new studies.

Methodology

The study employs a document-review approach that evaluates the population of 197 dissertations (accessible ones) between 2002 and 2015. To gain insight into the dissertations in IT field in Turkey, this study has been conducted as a content analysis study. As stated in Fraenkel, Wallen, and Hyun (2012), content analysis has a large applicability in educational research and “a passport to listening to the words of the text and understanding better the perspective(s) of the producer of these words” (Berg, 2001; p.242). This technique can provide us “more about the social context” and its’ impacts (Cohen, Manion, & Morrison, 2007).

Scope of the Study has planned according to following criteria:

- From the first dissertations (2002) in IT field to 2016.
- Instructional Technology field covers Computer Education and Instructional Technology (CEIT) and Educational Technology (ET) departments in Turkey.
- Seven universities which have doctoral degree program in IT field.
- Online accessibility to full of the dissertations.
- Only the authors of the dissertations own statements have been accepted as data source.

Data Collection

From total 242 theses, only 197 of them were allowed to read full paper (Table 1). So the accessible ones were reviewed based on the year, topic, purpose, sample size, research design/model, sampling method, and instrumentation. Analysis of the data was based on descriptive statistics. Only open to access dissertations were included, the others which are not given permission to access were excluded. During the content analysis process, five doctoral students have worked together in order to achieve a reliable classification of the theses. Sets of the dissertations were classified due to their universities. Disagreements were discussed and resolved, and then the rest of the papers were classified by collaborative work between the researchers. Also, expert views were taken for validity issues.

Table 1: Number of thesis in each IT department and university in Turkey

Universities	Computer Education and Instructional Technology-CEIT (146 / 170)			Educational Technology-ET (51 / 72)			Sum of CEIT & ET PhD theses
	# of accessible PhD theses	# of unaccessible PhD theses	# of CEIT PhD theses	# of accessible PhD theses	# of unaccessible PhD theses	# of ET PhD theses	
Anadolu	36	4	40	0	0	0	40
Ankara	0	0	0	28	20	48	48
Atatürk	14	1	15	0	0	0	15
Gazi	15	5	20	23	1	24	44
Hacettepe	20	4	24	0	0	0	24
Marmara	1	0	1	0	0	0	1
ODTÜ	60	10	70	0	0	0	70

Results

After examining 197 dissertations regarding topic, the researchers found 20 categories. As seen in the Figure 1, the results showed that online learning (29.9%) and ICT integration (11.7%) has been the most popular topics in IT dissertations in Turkey.

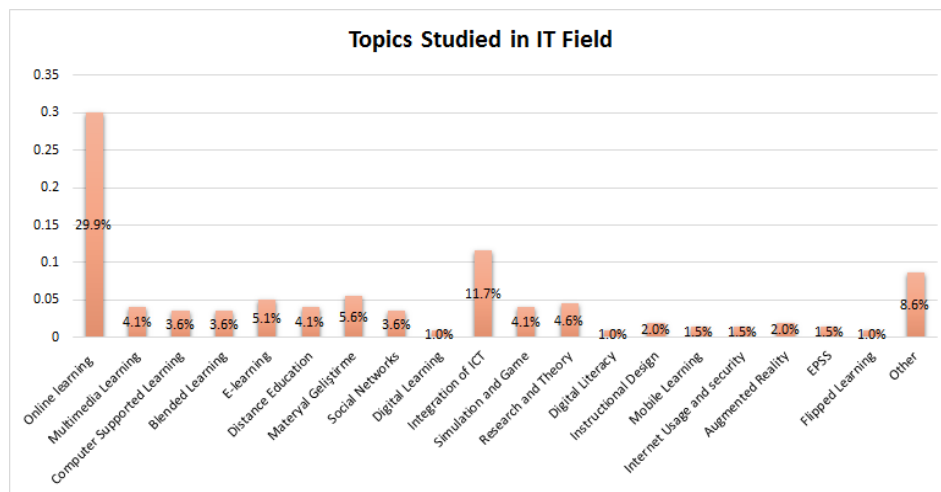


Figure 1. Preferred topics in PhD Dissertations in IT Field

As seen from the Figure 2 experimental (30.5%) has been the most used in dissertations and in order, the other popular methods in order are mixed method (26.4%), and case study (12.7%). These research methods were always popular in the past of the field as mentioned in the literature part but especially in recent years majority of doctoral students prefers case study. After 2008, design based research (9.6%) and action research (8.7%) have become more popular in IT field in Turkey and there is a trend to use qualitative research methods unlike past of the field.

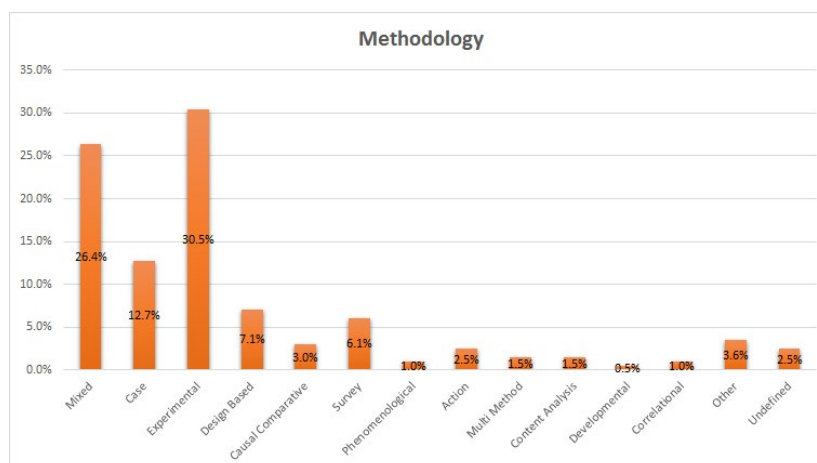


Figure 2. Preferred methods in PhD dissertations in IT field

In majority of examined dissertations, both qualitative and quantitative data (52%) have been collected and it seems like using one type data is less preferred (Figure 3). This finding can be explained by the researchers' concerns of validity while gathering the data and also it could be related with the nature of the research. At the same time, we can interpret this finding due to the researcher's methodology that they had used.

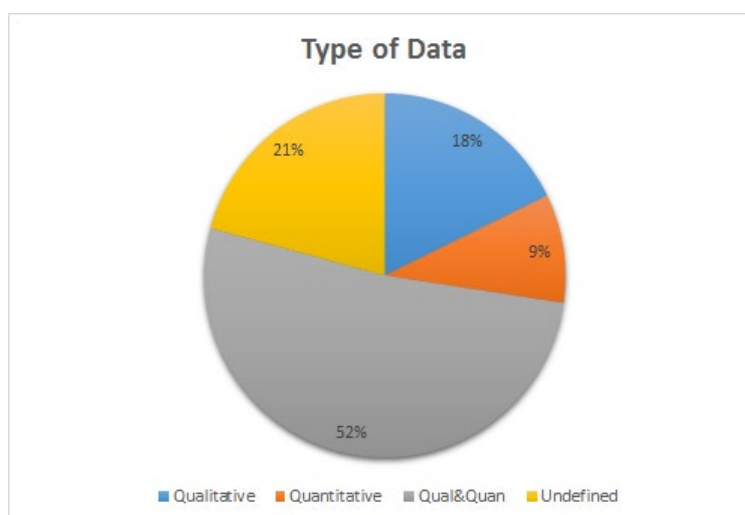


Figure 3. Type of Collected Data

Figure 4 shows that sample levels which have used in IT dissertations and it is clear that the researchers mostly tend to study with undergraduate students from Faculty of Education (44.7%; 44.7% of the dissertations, undergraduate students were preferred), teachers (12.8%) and elementary school students (6-8) (11.3%). This tendency may be related to that these students are more accessible for the researchers in a university campus or as another reason, researchers have used these participants since research question or topic require him/her do so.

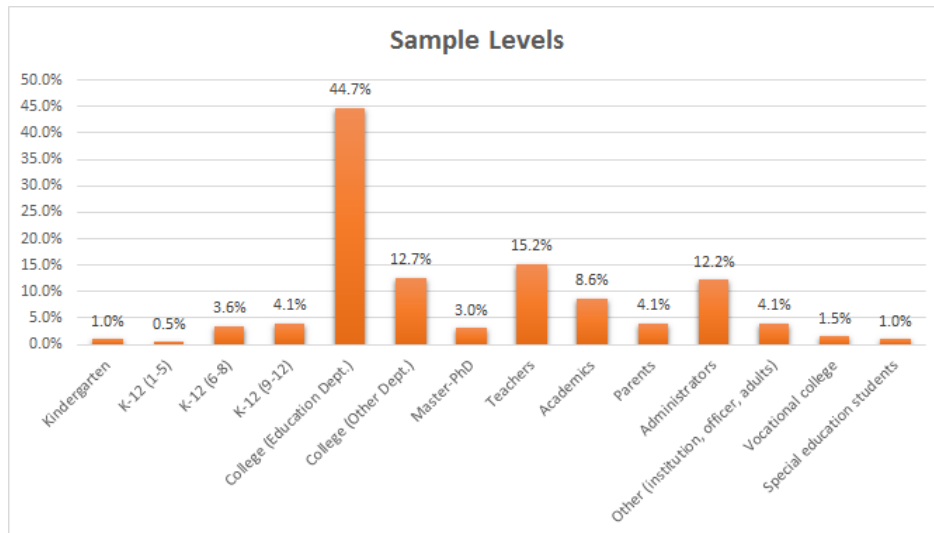


Figure 4. Sample levels in dissertations in IT field

Conclusion

Total of 197 dissertations conducted in seven Turkish universities between the years 2002-2015 were subjected to content analysis. The results showed that most of the dissertations were written based on the topics of online learning and ICT integration. Erdoğan and Çağıltay (2009) have stated that the topic of the dissertations aspect; there is a tendency for the studies which compares different instructional medium to provide better learning. In a similar vein, through the new technological and pedagogical innovations; flipped learning, mobile/multimedia learning and virtual environments have gain popularity in the scope of dissertations for the last years.

Regarding the research methods in dissertations, the popular ones are experimental and mixed methods. The reason for the predominance of this methodology may be general tendency in the world. Şimşek et al. (2008) found experimental studies have been preferred and the sample has been chosen from K-12 students in their study. In addition to this finding, mixed method is most popular in IT dissertations and as a sample level, undergraduate students had been mostly participated to studies. However, Yıldırım and Şimşek (2005) state that researchers in social sciences had a tendency to employ quantitative methodology in their studies for these years. However, based on our study, there is a growing trend to use more qualitative methods like case study, design based research or developmental research. There is still lack of using some methodologies in IT field (phenomenological, ethnography, historical), research methodologies that enables to use qualitative and quantitative data (case, design based, multimethod) to design more comprehensive research studies are began to selected and as a result, this trend can lead to use different methodologies in the future.

Göktaş et al. (2012) indicated that the most frequently studied sample subjects were undergraduate students and teachers in Turkish researchers' articles which we have similar findings in our study. Like in articles, most preferred group of population in dissertations are undergraduate students in college of Education Department and the teachers. Besides being related with the scope of the studies, sample selection strategies could be derived from the idea

of reaching the most convenient and reachable data. However, this sample selection tendency could be resulted in the lack of researches in different fields like kindergarten or special education.

To conclude, this study has some implications for our field. For instance, results of this study may be useful for future researchers in understanding the changing landscape of research methodologies in IT field. Since researchers learn not only how to conduct research differently, but also how to take apparently opposite paradigms and combine them into a complementary research design. Therefore, examining research studies in different ways can provide new questions and untouchable topics or different ideas.

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“I WISH I HAD MORE TIME” – MENTOR TEACHER NARRATIVES OF REFLECTIVE PRACTICE: A CASE FOR ONLINE MENTORING

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Theoretical framework

Processes of mentoring for teaching in primary and secondary schools has been transforming simultaneously with the structural changes in teacher education in Hungary (Act CCIV of 2011 on National Higher Education). Educational policy provisions are being introduced to make the mentor teacher certification mandatory for mentors working with pre-service teachers in schools during their practicum. Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth and its communication document Rethinking Education: Investing in skills for better socio-economic outcomes (EC, 2012) as well as the national acts and provisions of education in Europe, including Hungary (Kotschy, Sallai, & Szőke-Milinte, 2015), encourage creating new ways for understanding the importance of teachers' reflective attitude, and these exclusively focus on mentors and mentees in teacher training. Supplements and explanatory documents related to the legislation of education largely deal with the expectations from and duties of a reflective mentor, however, these focal documents still barely engage in conceptual know-how or in-depth components of mentors' reflective practice.

It is broadly accepted that mentoring relationships aim to support novice teachers, basically, in three aspects: help novices to survive the induction part of their career, to develop teaching competences, and to define and identify their teaching lives (Fairbanks, Friedman, & Kahn, 2000; Marble & Raimondi, 2007). As the result of successful mentoring relationship, novices tend to develop a more positive outlook on teaching and stay longer in the profession (Long, Hall Conway, & Murphy, 2012). The two-semester formal mentor training in Hungary focuses on raising pedagogical awareness for mentoring strategies, administrative and statutory duties, conflict management, expectations, roles and functions in mentoring, but importantly, it aims to prepare for reflective practice in order to support continuous professional development (Donnelly & Watkins, 2011; Korthagen, 2004; Schön, 1983). Reflection, as Korthagen (2001) claims, is “the instrument by which experiences are translated into dynamic knowledge” (p.53) and it facilitates growth competence (p.47), that is, the ability to develop professionally in an ongoing manner guided by internally directed learning.

Mentoring in teacher education is “one of the most important strategies to support novices learning to teach” (Wang, 2001; p.52) and helps to improve confidence, self-esteem, and the

ability to problem-solve (Mathur, Gehrke, & Kim, 2013). Further, guided reflective teaching practice is crucial for trainees to become teachers or even good teachers (Taggart & Wilson, 1998; Korthagen, 2004). The mentor thus has specific responsibilities at the various stages of the learning cycle, which includes, for example, the cyclical routine of exchanging ideas and reflections on the teaching experience, observation and analysis, conceptualization, and experimentation. However, ideally, reflection on one's actions is integrated in each cycle with the aim to support trainees in their deep learning.

Integrated reflection as well as the whole mentoring process put huge workload on mentors and mentees and require expended extra time from both. Observing, following, reflecting on, planning and cooperating with novices reportedly impact mentors' work-life balance and have an influence on the quality and extent of collaboration (Hobson, Ashby, Malderez, & Tomlinson, 2009). Effective mentoring and useful reflections are realized where mentors and novices are provided with extra time for releasing and timetabling of contact sessions (Bullough, 2005).

In general, researchers focusing on mentor teachers' mentoring strategies, identity and learning through mentoring frequently outline the conflict of time and workload. Efficacy and professionalism are often measured in time that a mentor can and would dedicate to his or her mentee; availability for formal and informal discussion is one of the most desired characteristics of an ideal mentor according to mentees (Johnson et al., 2005; Cain, 2009; van Ginkel et al., 2016; Lejonberg et al., 2015). Informal discussions, released or non-contact time are recognized as equally essential factors for mentors and beginners in order to result in higher effectiveness, and among other articulated recommendations, researchers almost always include giving appropriate time frame for implementation, completion and management of mentoring process (Arends & Rigazio-DiGilio, 2000). Online mentoring, that is, "the use of email or computer conferencing systems to support a mentoring relationship when a face-to-face relationship would be impractical" (O'Neill, Wagner, & Gomez, 1996; p.39) can provide further opportunities for a well-managed mentoring process, as the interaction between mentor and mentees can be maintained at any place and time that is convenient to them. In addition to extending limitations of time and space, asynchronous communication channels allow for more thoughtful interactions between mentor and mentee (Wade, Niederhauser, Cannon, & Long, 2001); and e-mentoring provides greater anonymity and privacy (Hew & Knapczyk, 2007).

Methods

Mentoring for reflective practice may take different forms and can rely on various strategies; these are however embedded into certain conceptualizations of *mentoring for teaching*. This study thus is an initial exploration of how mentors think about and interpret the mentoring process. In particular, we focus on how mentors conceive of the issue of time commitment for their mentoring activities. In doing so, we problematize whether and how online mentoring could be integrated into these activities, in the Hungarian context.

This study is the exploratory first stage of a large-scale survey study that is scheduled for 2017-18 and investigates mentoring practices embedded in Hungarian institutional practices. To kick start the survey design process, we conducted semi-structured interviews ($n = 10$, 7 women, 3 men) with highly qualified, senior mentor teachers from various Hungarian institutions (primary and secondary schools). The duration of the interviews was at least 2 hours each, which adds up to 20 hours of interview material. On the interview data we performed an exploratory analysis in the phenomenographic tradition (Marton & Booth, 1997): research was carried out on the basis of inquiring about mentors' individual interpretations of their mentoring experience. The interviews were designed with predetermined questions and developed according to the mentors' conversation and answers. In all cases, the interviewer encouraged the mentors to further explain and dwell on topics they wanted to elaborate, in some instances, the interviewer asked for further explanation. The interviewer never evaluated or exerted pressure on the mentors, she was open and focused exclusively on the world of the mentor, on the feelings, beliefs, values, experience of the mentors' reflective practice in order to allow the interviewee think aloud. Results of this analysis, that is, the outcome space (Prosser & Trigwell, 1999) will guide us in understanding how mentors describe the mentoring practices, with a special attention to the issue of 'time' and how they conceive of time commitment in mentoring processes (short-term engagement with a need for immediate outcomes vs. mid-term or long-term investment with a slow or delayed outcome). Through this inquiry we will further explore the potential of integrating online mentoring practices in Hungarian mentors' practices and use this qualitative data for designing the survey tool.

Findings and conclusion

We found agreement among mentors about the importance and meaningfulness of mentoring and the responsibility it encompasses. However, the narratives of different mentoring aspects clearly highlighted the conceptual diversity regarding time and relatively flexible perceptions of its necessity and sufficiency. The conception and interpretation of time in mentoring diffuse according to the mentoring experience, major and even according to gender. At one end, more experienced mentors ($5 \leq$) and especially those, who work with novices regularly (at least once in a semester) seemed more aware of time constraints of the mentoring process. They try to stay focused on timetabling, but for the pressure of the system, they often feel guilty of resolving mentoring duties of routine and not dedicating enough time to reflect on unique or problematic situations. At the other end, "novice" mentors are rather frustrated of finding insufficient time for pre- and post-lesson reflection sessions, and have a constant feeling of incompleteness. However, neither experienced nor less experienced mentors find enough time for frequent self-assessment. In this small sample, taught subject is another variety in the collective meaning of time in mentoring: elementary teacher ($n = 1$), secondary literature and linguistics ($n = 3$) as well as language teachers ($n = 4$), P.E. teacher ($n = 1$) and science teacher ($n = 1$) dedicate time to different areas of professional development in novice teachers' career, and these variants are identified and categorized during the analysis as disciplinary and pedagogical developmental motivations. We found similar diffusion in case

of male and female mentors in the current small sample. Females tend to be less purpose-centric with regard to time and use discussion sessions for gradual development. They rather apply time management techniques learnt from the mentor trainings, while men are more regardless of time, interested rather in the realization of the purpose appointed in a holistic approach. This second-order time perspective in which the mentoring process is described by the mentors is largely understood as a core contradiction in reflective practice of mentors hence, in each case, interviewees admitted they find available time insufficient for the global development of novices' professional identity (Korthagen, 2004). Time constraints and the potential frustrations caused may hinder processes of mentoring and can impact the mentor-mentee relationship in negative ways. How could then strategies of online mentoring help to resolve these internal and, eventually, interpersonal conflicts? What could be useful ways of integrating online mentoring strategies into Hungarian mentors' practices?

Previous empirical studies of online mentoring in teacher training suggest that there are possible benefits of using digital or electronic tools for mentoring. These studies also reinforce the different implications for the mentors' strategies (Heaton Shrestha et al., 2009). Therefore, we asked mentors about how digital tools are or could be embedded in their pre- and post-lesson discussions, administrative duties and formal and informal communication with mentees, teacher educators, or the university. Previously, the policy review and the literature review informed us that the Hungarian pre-service teacher training is not supported by any digital frameworks. There is no official digital platform for mentors, mentees and teacher educators, or the university for managing the process. Communication, consultations and discussions are designed to be carried out in person and official documents are requested in printed form to be submitted (Kotschy, Sallai, & Szőke-Milinte, 2015). Consequently, with the aim to widen the horizon of recommended and demanded mentoring activities we asked the mentors to go into details about their experience and conception of consultations supported by information technologies or telecommunication. Regardless of age, gender or major, mentors use some kind of digital tool for communication, and three of the most experienced mentors (10 ≤) frequently give extensive reflection online as a kick-off for further discussions. E-mails are used by each mentor as a time saving tool for reviewing lesson plans and consulting technical details (e. g.: location, time, necessary equipment), and three frequent Facebook users apply messenger for communication, one of the language teachers use Viber mainly for fixing appointments. Age, experience or gender do not show any significance in the frequency of e-mailing, but it is rather determined by the individual practice of using information technologies and the mentee's needs. Nevertheless, mentors who are frequent users of the Internet (using social media, mobile apps, teacher resources regularly) seemed to be open, and expressed interest toward comprehensive and integrative digital applications for supporting mentoring, three of them suggested using some kind of digital mentoring framework to integrate and simplify mentoring, which would contribute to a better service offered to the mentees. Two mentors, teaching literature and linguistics, use e-mails for consultation, but are in doubt about finding more time for "out-of-school time" mentoring.

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On the whole, private emails, phone calls, and messages are used in mentoring but mentors feel abandoned in this issue as well as concerning their time-management.

These initial findings serve as key reference points and will be taken on board in the survey design process. In fact, we plan to investigate more thoroughly the frequency, the length, and the content of these mentoring sessions – with and without information technologies. As for the content, we are particularly interested in the structure of these mentoring discussions, the (reflection) questions or the protocols mentors use, and how these contents are channelled back to mentees' classroom practice. Additionally, mentors' use of social media sites and online communication tools will be further explored and these channels of communication will be evaluated based on mentors' and mentees' professional needs.

We acknowledge the limitations of this small-scale study and underline that it is an entry point into a large-scale endeavour. We will, nevertheless, share a detailed description of mentors' reflections on their practice, particularly, on their conceptualizations of 'time' as a crucial dimension of it. We will elaborate on how face-to-face and online mentoring could be aligned to each other to serve the purpose of meaningful induction of pre-service teachers. Additionally, we will also reflect on those findings that orient our thinking in designing the survey tool for the large-scale study.

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EMPIRICAL AND THEORETICAL CONTRIBUTIONS ON THE NATURE OF DIVERSITY ACROSS ANALOGUE-DIGITAL TIMESPACES

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Introduction

While there is no dearth of scientific literature in the area of identity, a common point of departure in dealing with it is from philosophical, policy studies and/or political science points of view. Another routine manner in which identity gets approached in research is through sector framed domains that build upon identity categories like gender, ethnicity, class, functional dis/abilities, nation-state, etc. Disciplinary framed fields such as education, special education, health sciences, including the multidisciplinary fields of language and communication studies, disability studies, gender studies etc., have focused the concept of identity in a range of ways. Such an interest often tends to be discussed in terms of what can be called “identity sectors”.

Many institutional settings such as K-12 education, higher education, care services, including special interest groups, in geopolitical settings across the global North and South provide enclaves that encompass people of *all* ages, gender, class, race, functional abilities, etc. Furthermore, digitalized platforms create new opportunities where anyone with an internet connection and a device to access the net, including an interest in some domain, can become a member of specialized groups. While this is also the case in everyday life contexts inside and outside institutional settings, certain institutions across the global North-South (for instance, governments, company boardrooms) tend to be homogenous as far as identity markers like gender, ethnicity, functional ability etc are concerned.

Project REID – revisiting and reimagining identity across sites

This paper takes a point of departure in the Swedish Research Council supported project REID, “Rethinking Identity”, developed by the research group CCD, Communication, Culture and Diversity in Sweden in collaboration with NTNU, Trondheim, Norway. This paper aims to highlight the salient results of the project presented in the new Springer volume (2017) “Identity Revisited and Reimagined. Empirical and Theoretical Contributions across Time and Space”. The empirically framed theoretical results presented in the volume explore dimensions of life inside and outside institutional settings, including digital spaces, that allow for dynamic viewings of human identity processes and the nature of diversity across timespaces. Going beyond traditional identity sectors explicitly, the volume as a whole both

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revisits and reimagines identity positions in settings across the global North-South on the one hand, and across analogue-digital settings on the other hand. They thus traverse across face-to-face and digital sites, bringing with it dialoguing in the current age of ubiquitous virtual communication and globalization. Highlighting the need to recognize decolonial perspectives, the use of concepts like the “global North” and “global South” attempt to frame all geopolitical spaces, including Nordic nation-states like those of Norway and Sweden, in terms of contexts where marginalization and colonial power hierarchies have existed and continue to exist. This then goes beyond understandings of nation-states in terms of historical coloniality, and opens up for a recognition of current ways in which identity positioning’s and marginalization processes get played out across the globe.

The majority of the research reported in the volume “Identity Revisited and Reimagined” have developed from further reviewed and revised versions of selected peer-reviewed drafts presented and discussed at the international conference-workshop “Revisiting Identities, REID” organized by the CCD research group and in collaboration with NTNU, Trondheim.

This paper presentation at the EDEN 2017 conference in Jönköping, Sweden will be structured into three parts. Part one will introduce the theoretical framings and will include a historical backdrop against which identity research has developed. Issues related to the nature of diversity across analogue-digital timespaces will be highlighted here. Part two will discuss the four central themes in the volume: (a) “Conceptual Framings of Identity in a Multifaceted World”; (b) “Making, Undoing and Remaking: Performing Identities”; (c) “Politically Framed Identities in Embodied Interaction”; and, (d) “Identity Work in Institutional and Technology Mediated Environments”. The final Part three of the paper presents two critical readings of the entire volume: (a) the first of which is related to identity, peace and conflict mediation and is offered by professor Joseph Lo Bianco, chair of Language and Literacy Education, Melbourne Graduate School of Education, University of Melbourne, Australia, and (b) the second offers sociohistorically framed reflections on the scholarship presented in the volume by senior professor Roger Säljö from Gothenburg University, Sweden.

Theoretical empirical explorations of identity and diversity across digital-analogue timespaces

In addition to going beyond bounded identity fields and challenging static and demarcated descriptions of identity, this paper builds upon the contributions in the volume, taking a point of departure in theoretical and/or empirical explorations of the ways in which human beings position themselves and get positioned across sites in different practices. Taking a social practice perspective, this body of scholarship builds upon the premise that both institutions and individuals are shaped by the “living and daily doings” of members of institutions in different settings. Taking the points of departure in the complexities that characterize and shape both individuals and communities – past and present, engaging with the increasing pace of change and diversification that interfaces at global, geopolitical and local scales, this paper thus explores and explicates the performance, living and doing of identity positions

across digital-analogue timespaces. It takes an intersectional stance with the aim of exploring the ways in which micro as well as multi-scalar analyses of naturally occurring human communication and behaviours contribute to our understanding of identification processes; the ways in which more recent dialogical and social theoretical-analytical frameworks allow for attending to the complexity and dynamics of identity processes; the ways in which institutional settings, media settings, community of practices and affinity spaces provide affordances and obstacles for different types of identity positions; and the ways in which shifts in identity positions can be traced across digital-analogue timespaces (in for instance, interactional and/or historical data). In other words, this paper explicitly focuses sets of individual ongoing or recently completed studies that discuss results specifically from a social practice perspective, representing different domains and disciplines that build upon interactional and/or historical analyses where identity positions and processes are centre-staged.

Secondly, it explicitly discusses methodological and conceptual issues of relevance in the light of present day diversification, including virtual and physical mobility across timespaces. Together, the contributions challenge demarcated fields of study and conceptions of identity *as* gender, identity *as* functional disability, identity *as* race, identity *as* or based upon language groupings etc. and discuss the need to centre-stage diversity *as* normalcy, (instead of in terms of neologisms and superlatives like “super-diversity”, “hyper-diversity”, “newcomers”, “newspeakers” etc.). Furthermore, the empirically pushed scholarship we upfront in this paper offers theoretical and methodological discussions illustrating global North-South perspectives. Finally, an important and unique contribution of the work we discuss is mainstreaming not only marginalized areas of study (for instance the area of disability and differently-abled studies, gender studies) but also bringing into the mainstream voices of marginalized scholars (including scholars with diverse experiences within scholarship).

Theme 1: Conceptual framings of identity in a multifaceted world

Theorizing issues related to identity from a range of ways, four studies presented in four chapters contribute to the first theme and present conceptual framings related to identity in and across spaces, interactions, methodologies and mobilities. Going beyond essentialistic bounded understandings of identity, or the novelty ascribed to human diversity across analogue-digital spaces in the 21st century, the individual studies highlight the many-ways-of-being (particularly Chapter 1 and 4), the embodiment and resistance or counter positionings (particularly Chapters 2 and 3) and the contextualization of performances of identity (all four chapters) in and across timespaces. They contribute to furthering our understandings of “normal diversity” (compare with “super/hyper-diversity”, “newcomers”, “newspeakers”) and theorize identity in a multifaceted world.

In Chapter 1, “Many-Ways-of-Being. Identity As (Inter)action” Sangeeta Bagga-Gupta, Julie Feilberg and Aase Lyngvær Hansen call attention to how identity gets framed in both everyday media contexts and research contexts across time and space. Their chapter

challenges specific ways-of-being that get fossilized in traditional identification categories across contexts. Bagga-Gupta, Feilberg and Hansen focus identity positions and research on aspects of identity, by taking a point of departure in the geopolitical spaces of Norway and Sweden, including virtual spaces and academic global spaces. Focusing identity discussions by representatives of “Generation Z” (among other sources), the chapter aims to illustrate key conceptual dimensions prevalent in contemporary human and social science theories of identity. The work presented in this chapter builds upon an understanding of identity as interaction and multiple ways of being, where diversity is a corner stone concept. The chapter aims to (a) tweeze out commonsensical understandings as they are represented in mass-media texts; (b) trace a brief historical development and focus of research on identity in some Scandinavian contexts; and finally, (c) highlight the ways decolonial perspectives can (potentially) shape academic work on identity.

David Block in Chapter 2, “Positioning Theory and Life-Story Interviews: Discursive Fields, Gaze and Resistance”, offers a working model for making sense of life-story interviews, including embodied interactions that transpire during them. This model extends positioning theory and makes use of the concept of discursive fields as a backdrop. Block argues that we need to take an approach to life-story interviews which moves beyond an exclusively micro level analysis (examining, for example, the minutest of features of spoken language, such as pronoun use or accent) or an exclusively content-based analysis (which, in essence, plays the story told in the interview back to the reader). Instead he proposes that we take seriously that interviews are social events, sociohistorically embedded in multiple phenomenological layers. His point of departure is that while this view of interviews is by now fairly well accepted in principle, many narrative researchers continue to fail to take it fully into account. The chapter does not aim to make available concrete recommendations about how to incorporate this more socially sensitive view of interviews into narrative research; rather it aims to further discussion in a debate opened long ago by scholars such as Jerome Bruner, who wrote about interviews as social events, sociohistorical embedded in multiple phenomenological layers.

The chapter builds upon a life-story interview except, which Block argues is interpretable only if we take an expansive approach in the analysis. Block discusses positioning theory as a means through which we can make sense of interactions that get played out during interviews. He develops an extension of positioning theory with the aim of understanding interviews as social phenomena, drawing on authors such as Judith Butler, Mikhail Bakhtin, James Paul Gee, Karl Marx and Michel Foucault. The interview excerpt data used functions as a tool to which the author adds layers in order to substantiate his emergent model of analysis. The chapter presents salient issues that arise in all research where life-story interviews are used.

In Chapter 3, “Refusing What We Are: Communicating Counter-Identities and Prefiguring Social Change in New Social Movements”, Paul McIlvenny points to the need (a) for revisiting and challenging how we conceptualize identity and (b) for rethinking studies of discourse and identity. In this chapter, he uses Ethnomethodological Conversation Analysis (EMCA) to examine how counter-identities are achieved and made accountable in interactional practices

of a mock protest event. McIlvenny highlights that protests by a range of new social movements have been studied extensively, but that few studies have focused on the communicative practices and mediated actions in which new identities and forms of subjectivity are discursively produced. In this chapter, he deploys and investigates what Michel Foucault called “counter-conducts”, practices in which alternative modes of being governed are performed. By questioning the conduct of their conduct, participants simultaneously question the relationship of the self to itself, playing with and risking identity in the process. The case study presented in the chapter analyses video recordings of a “United Nations weapons inspectors” protest theatre event that took place in 2003. Using EMCA, McIlvenny examines how counter-identities get played out in the interactional practices of the prefigurative protest event. McIlvenny argues that such an approach helps document the ways in which fields of visibility and modes of rationality are sequentially and categorically organized in the contingent accomplishment of counter-identities.

In Chapter 4, “Center-Staging Language and Identity Research from Earthrise Perspectives. Contextualizing Performances in Open Spaces”, Sangeeta Bagga-Gupta uses the phenomenon of moonrise-sunrise metaphorically to explicate two perspectives that highlight the ways in which communication and identity are commonly approached and/or understood. Represented by moonrises, the first position highlights a relatively less “visible” norm that nevertheless potently shapes these understandings. Bagga-Gupta highlights that this dominant default norm is marked by a monolingual – monocultural or monoethnic perspective. It is “naturalized” in Eurocentric global North discourses and is often not made visible in either mundane discourses or the academic literature. In contrast, the more visible second position, represented by sunrises, highlights the common human condition vis-à-vis communication and identity. Bagga-Gupta argues that the latter position paradoxically gets marked as the deviant, marginalized, not-normal in global North discourses. Position 2 gets framed in academic discourses and commonsensical thinking through concepts like bi/multi/pluri/translingualism, bi/multiculturalism and multiethnicities. Recent terminology that has emerged within European literature on globalization, framed by migration flows into European geopolitical spaces (and digitalization) include concepts like super/hyperdiversity. Bagga-Gupta argues that the more common human condition of diversity gets deviantly framed, marking and making visible (albeit as the not-normal) multiple language varieties and membership in multiple cultures and ethnicities. The chapter illustrates how these two positions represent normative global North discourses where communication, identity, including culture are approached through, as well as reduced to, technicalities and essentialistically framed epistemologies. Such understandings are critically relevant for the organizing of institutionalized learning for children and adults across geopolitical spaces in general, and in global North contexts like those of Sweden more especially.

Going beyond these two hegemonic positions and informed by decolonial alternative epistemologies, Bagga-Gupta centre-stages a third perspective wherein language-use or *linguaging* and *identiting* or *identity-positionings*, including *culturing* represent dynamically

different ways of approaching and/or understanding human behavior and the human condition. Drawing upon the iconic images taken by the crew of Apollo 8 in December 1968, the phenomenon of “Earthrise” is deployed to substantiate such an alternative position. Bagga-Gupta illustrates how the phenomena of earthrise contrasts in significant ways with moonrise and sunrise conceptualizations of language and identity.

Theme 2: Making, undoing and remaking – Performing identities

The second theme builds upon the research presented in three chapters that *empirically* focus upon the vulnerable, open and fluid nature of identity (discussed under theme one) in different contexts. Here the (re)making and (un)doing of identity performances are centre-staged. These studies illustrate the ways in which human identity gets fossilized, constructed but also challenged by offering data-pushed examples.

In the first contribution to this theme, Chapter 5, “Co-Constructing the Adolescent’s Identity: Agency and Autonomy as Interactional Accomplishments”, Marina Everri and Laura Sterponi draw attention to the complexity and situatedness of processes where identity development gets played out. By focusing on the communicative exchanges between parents and adolescent children they demonstrate how multiple identities are contingently performed, invoked, contested and negotiated. Drawing on recent linguistic anthropological reflections on identity and discursive psychologists’ theorizing on social positioning, Everri and Sterponi examine the dynamic and multifaceted enactment and transformation of identity in social interaction. They suggest that agency and autonomy, key dimensions of adolescent identity development, do not emerge solely from the individual but are co-constructed and transformed in interpersonal exchanges. They support these theoretical propositions through the discourse analysis of two family cases. Here they illustrate the discursive co-construction of adolescent agency and autonomy as being continuously negotiated rather than being non-linear. The examples presented in the chapter highlight that families oscillate between different interactional configurations, with individual family members claiming, declining, reclaiming certain roles and competencies vis-à-vis other members of the family. In addition to illustrating the value of bridging the gap between different disciplinary perspectives, Everri and Sterponi demonstrate the analytic purchase that a micro-examination of social interaction offers to adolescence and developmental psychology research.

In the next contribution under theme two, “Rethinking Identity in Adult Language Learning Classrooms”, Jenny Rosén focuses the performatory dimension of adult language learners’ identities in institutional spaces. Learning a new language, Rosén argues, involves transformation and investment of identities, since people negotiate not only who they are, but also who they have been and who they are becoming. In this chapter, she investigates how participants in a Swedish language learning program, Swedish for immigrants (SFI), use their multiple linguistic resources in the negotiation of identity in situ. The chapter aims to explore how participants in this specific setting use their (multi)linguistic resources in the negotiation of identity generally and gender and national belonging more specifically. Rosén traces the

development of the SFI program since the 1960s and its organization in Sweden. The chapter combines a sociocultural framework that emphasizes the relationship between learning, participation and identity with a post-structural, intersectional understanding of identity. Grounded in an ethnographic framework, Rosén uses the work of Sangeeta Bagga-Gupta, Francis Hult, Ron Scollon and Suzanne Wong Scollon on a multi-scaled approach, which includes national policy of the SFI program and, interactional data from a SFI classroom. Rosén highlights how language learning is embedded in the socialization of students into certain values and norms which are perceived as specifically Swedish, tied to the geopolitical spaces of Sweden. She also shows how the participants constitute and negotiate meaning about the world and who they are through language-use. How linguistic and institutional identities in the classroom intersect and enforce the unequal distribution of power is another important contribution of this chapter.

The final contribution to theme two introduces the concept of *Before-and-After stories* as a special kind of story where the narrative structure serves as a means for identity construction. On the basis of two interview narratives Julia Sacher in “The Passage of Time as a Narrative Resource in Constructing a ‘Better’ Self” illustrates how these kinds of stories consist of three phases in which narrators position different facets of their selves in different ways. Crucial to the analysis is the observation that the passage of time – in most instances a rather inconspicuous aspect of telling a story – is utilized to advertise personal change for the better. Drawing on methods from the social constructivist paradigm (such as discourse analysis, positioning analysis and interaction analysis), Sacher reconstructs how contrasting facets of individual selves serves as a means of doing implicit face-work while avoiding self-praise at the same time.

Theme 3: Politically framed identities in embodied interaction

The third theme brings together three chapters that, in different ways, explore identity construction in political/public contexts.

In the opening Chapter 8 titled “From Political to National Identity. Changes in Social Practices in the Region of Zanzibar”, Sigrun Marie Moss argues that people sort other people into categories, and define themselves into groups they feel part of and distance themselves from groups they do not belong to. She also highlights that identity constellations influence emotions, cognitions and behaviour towards in-group members and out-group members, and shifts in group identity are accompanied by changes in social practices that express these identities. Taking anthropological tenants as points of departure, Moss describes how a shift from polarized political identities to a shared nation-state identity is mirrored in changes in social practices on the semi-autonomous archipelago Zanzibar, off the coast of the geopolitical spaces of Tanzania. She makes the case that there is a dearth of research on such processes in intergroup conflict, and that uniting under a shared overarching identity has been emphasised as a way of overcoming intergroup conflict. Moss also builds on the premise that given that people increasingly see themselves as members of a singular (national) identity, this influences

emotions and behaviours towards (and evaluations of) former outgroup members. The analysis builds upon extensive fieldwork and interviews with members of the population including political leaders in the community. The chapter illustrates how people talk about reconciliation processes in relation to the conflict and how these shape social practices in the community.

Ellen Andenæs discusses embodiment related to professional identity in Chapter 9, “‘She didn’t know I’m black, you see’ – Practices, Body Signs, and Professional Identity”. Andenæs contrasts the common conceptualization of professional identity as the image people build up based on the way an individual performs a job, related to particular kinds of knowledge and competencies that are shared with colleagues, with identity as being embodied. She discusses the latter in terms of complex relationships between competencies and bodies. This chapter presents research based upon an interactionist, practice based approach to professional identity. The research focuses Norwegian nursing homes where the employees were ethnically diverse and were represented by an unusually high proportion of males on the one hand, and residents were overwhelmingly white ethnic Norwegians. Thus, how the bodies of nurses are perceived by the patients, and how such interpretations figure in negotiations of nurse’s professional identity positions are centre-staged. Issues related to identity conflict are reported to be common in that it was not unusual that some residents rejected nurses whom they disliked or distrusted. Andenæs discusses this by taking Dorte Marie Søndergaard’s work on “body signs” relating it to the nurses’ appearance i.e. their skin colour, accents, and markers of gender. The study focuses on how nurses account for such situations in research interviews, and on the nature of identity work their accounts accomplish.

The final chapter that contributes to theme three, Chapter 10 “The Complexities of Deaf Identities”, addresses the dynamic processes of deaf identity formation. Irene W. Leigh theorizes identity by deploying intersectionality and identifies gaps in research on deaf identity formation. She notes the importance of recognizing the fluid and dynamic nature of identities that are shaped through biology, cognition, sociohistorical contexts and language choices. Leigh’s point is that knowledge of the fact that an individual cannot hear does not automatically confer a deaf identity to the individual. In contrast to stereotypical perceptions of deaf people as a homogenous group, she calls for the acknowledgement of the existence of different groups of deaf individuals, all of whom can and do claim different deaf identities. Life experiences, including those related to parent influences, school environments, exposure to deaf people, attitudes about deaf people, and cultural environments shape the specific deaf identity that deaf individuals have the possibility to become part of. The chapter also focuses identities related to ethnic background, sexual orientation, and additional disability status among other individual characteristics – none of which exist in isolation. These multiple layers intersect with one another and with deaf identities in unique dynamic, rather than static, ways, argues Leigh.

Theme 4: Identity work in institutional and technology mediated environments

The final theme in the volume builds upon the research presented in four chapters that empirically focus the making and shaping of identities in technologically mediated environments at work and in educational contexts.

Chapter 10 by Elisabeth Keating constitutes the first chapter under this theme. In “Identity and Culture Clashes in Cross Cultural Virtual Collaborations” the point of departure is the taken for grantedness among members of a community with regards to the relationships between identity and culture, even as they expertly manipulate them interactionally. Contexts where the negotiated nature of identity can be challenged, however, illuminate varied and conflicting ideas about identity, and cross cultural collaborations, where dissimilar ways of talking and different models and interpretations meet. Keating deploys Erwin Goffman’s concept “spoiling” of identity and Harold Garfinkel’s word on ritual status degradation when she describes identity conflicts in cross-cultural virtual collaborations where professionals from across the world work together. Her main point is that without some attention to how cultural patterns influence identity practices, those working in global teams can inadvertently spoil others’ identities or participation in the status degradation of others.

Keating argues that the performance of identity is a fundamental aspect of human society and that identity is “talked into being” in interactions with others. This negotiated nature of identity, however, can be challenging in cross cultural interactions, where dissimilar ways of talking and different models and interpretations meet. Keating highlights that communication technology has made it routine for members of certain professions to work together from different cultural locations in sparsely furnished virtual spaces where it is not always clear that multiple systems of identity are in play (or at work). The chapter analyses one such context, engineers working in virtual collaborations. Keating shows how differences in the way cultures organize identities, (for example, along priority axes of self versus social role identity) are influenced by cultural ideas of the person.

In Chapter 11, Johan Hjulstad, highlights which of a person’s multiple intersecting identities are most prevalent, and what they come to mean. These, he argues, constantly shift across various discourse contexts. The chapter “Identity Negotiations in a Visually Oriented Virtual Classroom”, explores some of the identity negotiations performed by sign language learning students in a video conferencing classroom. These students come together in a distance education program which has the explicit aim of strengthening student’s “deaf” identity. The chapter illustrates how a seemingly simple exercise has a powerful effect on what “deaf” identity means for hearing non-signing friends from the students’ local classes: through working with a teaching plan on “friendship”, where the signing students plan for and invite hearing friends, to the re-negotiation of what ‘deaf’ comes to mean in the inclusive setting of a local school.

The chapter explores identity negotiations by Norwegian Sign Language (NSL) learning students in a video-only mediated environment (VME). Hjulstad asks how mainstreamed deaf students can reach the goal of learning NSL so that it can form the basis of a positive subject formation and identification with positive dimensions of the signing community in the geopolitical spaces of Norway. By investigating a “friendship” teaching plan and the invitation of hearing non-signing classmates to the distance education virtual classroom, Hjulstad illustrates how the embodied interactional organization of participation gets cooperatively crafted and sustained through simultaneous co-occurring influences. He highlights the dynamic, changing, and complex ways in which identity negotiations are accomplished by the participants in the VME, and how the identity of ‘deaf’ is re-negotiated in unique ways. The chapter raises a number of implications for issues of identity development, the role of technology, and inclusive education.

In the third chapter under theme four, “‘Janne X was here’. Portraying Identities and Negotiating Being and Belonging in Informal Literacy Practices”, Annaliina Gynne presents a study where young people’s identity work and informal literacy practices are examined in two separate but intertwined settings: in a bilingual school context and at a social network site. The study draws on ethnographic data, and the concepts of language and identity-as-agency are explored from a discourse analytic perspective. Here Gynne argues that portraying identity positions and negotiating being and belonging is possible in and through practices where multiple aspects of communicative repertoires and modalities are employed.

Drawing on sociocultural approaches and (n)ethnographic data, the study aims to expand understandings dealing with identity work and heteroglossic languaging, including informal literacy practices, in settings across the offline-online continuum. Through analysis of data sets consisting of video recordings, photographs and screen grabs, Gynne illustrates the ways in which interactions, agency and social positionings emerge at the intersection of people, discourses, spaces, practices and technologies.

In the final chapter that contributes to theme four Elina Tapio, focuses on the conflicting discourses in relation to English language learning by deaf Finnish sign language signers. The chapter titled “‘I do this all the time!’ – Turning Points in Understanding Language Learning”, Tapio documents how a deaf Finnish sign Language signer, Hanna, suddenly realizes that what she herself has taken for granted – that she has limited resources for language learning – is not true at all. Hanna’s revelation is based on her own daily communication practices and opens up for a new understanding of herself and her linguistic resources. The hegemonic discourse in deaf education highlights that deaf sign language learners have limited resources for language learning. Tapio contributes to recent empirical studies of communication-practices among signers and challenges this view. Through the case study of Hanna, she illustrates how an individual becomes aware of the conflict between a dominant, authoritative discourse – the perspective she has adopted from others – and the contrasting practices with English in her everyday life. This moment of revelation, a rupture of taken-for-grantedness

during an interview, leads to new self-positionings. Tapio argues that such moments of self-revelation offer possibilities for reverse discourses where new identity spaces can emerge.

Two critical readings of identity and diversity

Joseph Lo Bianco, professor and chair of Language and Literacy Education, Melbourne Graduate School of Education, University of Melbourne, Australia, authors his critical reading of the research presented in the volume in the Foreword through a focus upon identity, peace and conflict mediation. He highlights that the volume breaks new ground in approach and content, and suggests that this is summed up in title of a *revisiting* of the approaches to identity scholarship with the intent of *re-imagining* the object of analysis. According to his critical reading, the studies presented represent a wide range of research, approaches, settings and problems that are held together by a common emphasis of combining empirical documentation with refined thinking. He highlights that the revisiting takes the reader across the Global North and Global South, to and in virtual worlds, as well as settings of immediate physical and spatial contact between actors and in an array of kinds of identity, including the various ways that ability, physical and otherwise, is marked and constructed in social life.

Lo Bianco suggests that traditionally, identity scholarship has been framed by static concepts and non-dynamic understandings of the individual self, relations between individual and group, and the dynamic interplay of the multiple groups and identities that individuals negotiate and affirm/deny in various interactions. He highlights that the volume aims to transcend this limitation by making complexity and diversity a central element of analysis.

Building upon the fact that communication is always involved, Lo Bianco points out that all the chapters in the volume represent a challenge to analyses of identity that make use of demarcated fields of study, whether of gender, race, or language grouping, and instead turn the spotlight to identity as a social practice, negotiated and enacted in encounters, always interactional though often framed by inherited (historical) formations. He suggests that one of the important things the volume can teach us, is about struggle in the social and public life of communities where demands for recognition of differences are present, and where these differences are represented, displayed, negotiated, accommodated or repudiated. What we need to learn from researchers of identity is a response to the new kinds of conflict, struggle and demands in today's world, between citizens and states and their autonomous institutions, networks and discourses. These new kinds of conflict are widespread; there is immense conflict at the sub-national level all across the world in which something like identity is present, prominent, and problematical, he stresses. The boundaries of conflict are less and less about nation and territory, though there are too many conventional conflicts as well, and more and more conflicts within nations and networked across them. These problems give rise to the critical importance of research on identity, and have brought about new thinking about conflict and conflict types. Some conflicts are network based. Network conflicts involve a struggle for power beyond state actors alone, such as in Syria currently. Their newness, Lo Bianco says, resides in the hybrid forms they take and the globalization of the identity

formations that instantaneous communications and the multicultural realities of most nation states make possible.

Joseph Lo Bianco highlights that research, knowledge accumulation and reflection and dialogue must play their proper roles towards producing peace. When scholarship reflects on issues so critical to the conduct of social and political life, divisions between ‘theory’ and ‘practice’ worlds need to be overcome. The reflected, reflexive and nuanced considerations of phenomena in the academy, on topics such as identity, and the daily practical tasks of tackling identity conflicts and problems in civil life, work, and education, need to be brought into interaction with each other, he stresses. Identity is a topic of today, for the world of today, with consequences for aspirations of equality, participation and intercultural communication that motivate many of us in our work as both scholars and citizens. Lo Bianco highlights that the innovative work of scholars who offer hope for new ways to work with problematical concepts needs to be connected quickly and substantively to the work of practitioners in a range of fields where identity problems pose serious challenges to institutional or civic life. We need the kind of steady, sobering, historically attuned and globally oriented scholarship the volume offers, on identity and its complexities, to take into our classrooms, research projects and civic life. He highlights that currently there can hardly be a more urgent task than for researchers to revisit and reimagine identity, and to then engage with policy makers about the new formations that constitute our social selves, and participate in the design of the practices and understandings of an improved civil life for all.

In the Afterword of this volume, Roger Säljö, Senior Professor from Gothenburg University, Sweden presents a critical historically framed view on cultural experiences, identities and diversification in the hands of researchers, and especially researchers within social sciences. He highlights that a critical perspective in the social science research domain emerges first (at least in European spaces) in the wake of the enlightenment and the French revolution. Even though philosophers and scholars of various backgrounds had taken an interest in human conduct and life conditions since the ancient Greeks, through inquiries into areas such as moral philosophy and various branches of theology, it was during the late 18th and the 19th century that the ideas of an empirical social science in the modern sense were shaped and institutionalized as disciplines, Säljö underlines. Through the writings of Auguste Comte (1830-1842) and others, the ideas of a scientific approach to studying society, with the aim of covering the laws that regulated social life, were articulated and, he maintains, spread globally. Based on this epistemology, researchers were required to study society by limiting their attention to what was directly observable to the senses, and seek explanations in terms of cause and effect, mechanically. As a consequence of this type of research, they would provide valuable insight into how to predict human behaviour and how to organize society through the scientific principles of social engineering.

Late 19th and 20th century scholars (i.e. Max Weber and Georg Simmel) pointed however to the limitations of staying within such a narrow paradigmatic worldview since this type of research left many important issues (like i.e. issues of cultures, values, minds and the role of

collective acts in the lives of humans) outside the realm of scientific inquiry. Today in the 21st century these legacies of positivism continue to exist and influence our lives inside and outside research. Säljö stresses that many alternative philosophical perspectives and epistemologies have been developed with the explicit ambition of broadening the role of research using systematic exploration and analysis of social action. He maintains that the Chicago school of sociology (Bulmer, 1984), has played an important role, when it comes to empirical social science research. Säljö calls for returning to their methods and research approaches when studying processes of diversification and identity transformation. What these members of the Chicago school (inspired by i.e. the pragmatist John Dewey and the founders of symbolic interactionism, George Herbert Mead and Herbert Blumer) saw, when they did research on social life, was based upon the consequences of a radical restructuring of large groups of people in the wake of industrialization. The unequal distribution of wealth created conditions, where in a short time period, enormous fortunes were built up by successful industrialists, while their workers lived in poverty with miserable and insecure working conditions, poor housing and health care, and lacked other physical and social resources. The schooling offered to large proportions of the children, especially those of migrants, was limited and low in quality, and in most cases whatever was offered in terms of education was not relevant to the needs of children who, in many cases, did not even speak the majority language.

What members of the Chicago school experienced, Säljö goes on to stress, were the consequences of a social diversity due to migration and urbanization. The Chicago school scholars realized that social research would have to adopt different methodological and theoretical premises if it would have anything interesting to say about the state of their geopolitical settings. Large-scale surveys based on the language and ideals of mainstream society were not deemed enough to produce data that would give insights into the dynamics of urban life and the conditions of the homeless, the immigrants, the elderly, those who suffered the consequences of alcoholism, or, more generally, those who were marginalized in an increasingly diverse society.

In contrast to the natural sciences, which commonly adhered to strict laws and rules, and often contained large-scale surveys based on language backgrounds and ideals of the mainstream society, the social sciences have focused on qualitative research, with a large spectre of methods – observations, interviews, narratives and going from looking at individuals to seeing them as parts of society. Säljö here critically raises the issue of what a society is. He refers to society as a construction and points to the fact that we should rather look at the communities in society, communities which are contexts, in which people develop their worldviews, identities, values and practices. Communities are organic and offer interactional settings. He asks scholars at large to, in line with the work presented in the volume, to look at people's living and daily doings, and at the social complexity that people are part of. This he points out is what the contributions in the volume do: look at people's living and daily doings, and the social complexity that they are a part of in different contexts.

Empirical and Theoretical Contributions on the Nature of Diversity across Analogue-Digital Timespaces

Sangeeta Bagga-Gupta, Aase Lyngvær Hansen

Today, in a world of globalization, migration, virtualization and diversification we see the need to revisit and reimagine identity positions in different settings. Of the many arguments and results presented in the volume, Säljö highlights three central points that need emphasizing. The first point is *the acceptance of diversity and diversification as productive base lines of social inquiry*. In many areas and disciplines, this might be a challenge, since they on many occasions build on stereotypes and hegemonic conceptions of people and social practices. Säljö reflects on his own research area (pedagogy) where he has observed the dominating tendency of a narrow Eurocentric theoretical perspective on human development. Furthermore, tests related to intellectual development were, for a long time, constructed as a capacity for abstract forms of thinking, and the implication was that reasoning in terms of abstract logic, should be the target for the mature mind. Säljö raises a critique vis-à-vis assumptions regarding cognitive, social and other forms of development results in designs and practices that end up portraying non-Western populations as performing poorly. This is pertinent not only in cross-cultural research on human development (as many studies have highlighted previously), but is also problematic given the analogue-digital intersections of current human existence.

The second point is *the necessity of analysing processes of social change by linking the individual and the collective level*. Interactional practices and joint activities make up the glue that simultaneously creates continuity and transformation of the ways in which we lead our lives. A third and important point is that we as researchers have to be *cautious in our claims and sensitive to the categories and explanations we rely on in our work*. Analytical frameworks never tell the full story, Säljö cautions. They will always be partial, and what we claim to find is relative to our conceptualizations and methodological procedures. We will never be able to critically scrutinize how identities emerge, are remade and performed, unless we are willing to acknowledge that they are embedded in societal and institutional practices, and assumptions of what it means to grow up, or to act in specific settings. This, he highlights, is illustrated in the contributions to the volume, where both virtual as well as physical encounters are analysed.



THE VIRTUAL CLASSROOM FOR EDUCATIONAL ACTIVITIES: UNDERSTANDING INFRASTRUCTURES FOR LEARNING

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Abstract

Online learning is a reality for higher educational institutions around the globe. Since the beginning of the 21st century, many universities in Sweden have begun to offer online courses at a variety of levels completely online, including synchronous meetings. This study aims to contribute by investigating (a) how space, in terms of educational infrastructure with a range of affordance for learning, is co-created by the participants in a open online course and (b) how a range of activities are mutually shaped by the course design and by the learning space(s) where the course is offered. The data we focus upon come from project KSSL (combination course for students and lifelong learning) and consist of recordings of online seminars from a course in Pedagogy in higher education. The seminars were conducted through Adobe Connect, a multimodal environment which offers synchronous oral communication, with cameras for (limited) access to paralinguistic cues, and textchat. Students' texts and the transcriptions of the asynchronous discussions in the course homepage are part of the data along with the course homepage, as well as tracking of the social media presence of the course in Facebook and Twitter. By using an (n)ethnographic approach, the analysis highlights the ways in which learning spaces as infrastructure shape and are shaped by the range of activities that are part of the course, but also by the openness of the space itself, which affords the emergence of alternative pathways for participation and thus, we argue, for learning.

Introduction

As online learning is becoming more and more a part of our everyday lives (at least in the global North), we are endowed with the possibility of engaging in communication everywhere we go and with whomever we wish to, without bothering about logistical issues. Students engaging in online courses like the one focused in the present study (an open, online course offered by a Swedish university) do not need to physically commute to the location of the institution providing the course. In the virtual space of the online course, there is no common locality beyond the pieces of local spaces that individuals can enter (Messina Dahlberg, 2015). Such disrupted space is what frames (in terms of constraints and affordances) participation and learning in online communities. The openness, flexibility and high potential for inclusion are indeed characteristics that have made online education very appealing for a range of different institutions and for a variety of reasons: they aim to open their doors to a wider range of cohort of potential students, and to “educate the masses”, offering online courses open for everyone with an internet connection. Big scales projects like MOOCs (Massive

Online Open courses) are the result of a long process of digitalisation of education, from distance courses where almost only written texts were sent back and forth between students and tutors, to other kinds of texts, which afford participants to communicate multimodally and (a)synchronously through digital technology. Thus, we argue, online educational practices are required to become more flexible for larger student cohorts who are (im-)mobile for a range of reasons. Some are constantly on the move for reasons other than studying, yet still want to be able to attend weekly online lessons; others prefer to stay at home (Messina Dahlberg, 2015). Learning spaces need to address heterogeneity with regard to how the online virtual classroom can be framed in terms of a space for learning and a space as infrastructure (Edwards, 2012; Thomas, 2010).

Participants in the data-set focused upon in this paper have access to a range of semiotic resources and literacy practices e.g. videoconferencing platform, forum discussion, social media practices. From a sociocultural perspective (reference), it is neither interesting nor fruitful to see the semiotic and the technological dimensions of learning as separate entity or as a fusion of the two. Such a socially oriented position recognises interaction and the deployment of tools (including digital technologies) as a central and fundamental dimension in processes of socialisation and identification of individuals. That entails an understanding of learning as a dimension of human life that cannot exist in a social vacuum or in some neutral fashion (Messina Dahlberg & Bagga-Gupta, 2016). Rather, a central tenet behind this view is a conceptualization of the human mind as hybrid “half analogizers, with direct experience of the world, and half symbolizers, embedded in a cultural world” (Donald, 2001; p.157). Culture is, thus, a link between the two modes, the sensory-cognitive system of the brain and the symbolic one (Donald, 2001). This linking is instantiated through the use of symbolic systems and language, being the tools of tools (Vygotsky, 1978), in a process called mediated action.

A sociocultural perspective on learning centre-stages communicative practices and the use of tools as the conditions that shape the ways in which human beings understand and relate to the world out there allows us to frame educational activities as: (a) socially oriented, (b) not bounded to individual’s biological conditions and c) distributed across networks of activities across time and space (see Hutchins, 1995; Resnick, 1994, Rogoff, 1990). Here, we argue, language and thought are in symbiotic relation to one another. From that follows that learning (in terms of creation of knowledge and a broader repertoire of experience) is only visible in the interaction among people and their cultural tools. Hence, a focus on the communicative aspect of the education experience is needed in order to create and design learning environments that allow learners to participate in meaningful ways in education.

This study aims to contribute by looking at a) how space, in terms of educational infrastructure offering a range of affordance for learning, is co-created by the participants in a open online course and b) how a range of activities are mutually shaped by the course design as well as by the learning space(s) where the course is offered.

Theoretical and methodological approached

The ability to access large amounts of information has had huge repercussions on how we think about learning and instruction. The concept of social learning used by Lankshear and Knobel (2011) and Buckingham Shum and Ferguson (2012) frames an understanding of learning as a process that occurs in and through social interaction. While their take on social learning clearly stems from a Vygotskian perspective, what is interesting for the aim and key issues of this study is how the concept of social learning emphasises access not only to educational content but to other people who share similar interests in that content: “It is within and through shared practice that meanings—significance—ideas, categories, evidence, tools, tests, techniques, and all the other things that constitute knowledge come into being” (Lankshear & Knobel, 2011; p.218). Bliss and Säljö refer to the symbiotic nature of interaction between individuals, tools and artefacts and social practices: “we shall be striving to develop a new theoretical framework which can account for, and thus attempt to explain, the nature of this interaction in order to better understand the role of context and situation in thinking, learning and reasoning” (1999; p.10). However, shaping (and (re)searching) environments in which a shared and collaborative practice is implemented can be a challenge for both (educational) social platform designers and educational institutions. The study of such challenges is one of the main interests in computer-supported collaborative learning (CSCL) research (see for example Suthers et al., 2010; Suthers & Rosen, 2011; Suthers et al., 2013, Kjellström, 2009). Nevertheless social learning, and its extension, online social learning, is also interested in the “non-academic contexts in which it may take place (including the home, social network, and workplace) and the use of free, ready-to-hand online tools, with no neatly packaged curriculum or signed-up peer cohort” (Buckingham Shum & Ferguson, 2012; p.9), thus adding an important dimension in the scholarship of CSCL. Here the concept of ‘orchestration’ is used to frame the ways in which, similar to instruments in a musical score, the single educational components enhance one another and provide space to one another (see e.g. Koschmann, 1996; Järvelä et al., 2015; Guribye, 2015; Thomas, 2002). Also in the classroom, to orchestrate is a useful metaphor to address the use and combination of a palette of methods to shape the appropriate pedagogical environments for learning. Following this line of thoughts, along with the pedagogical framings in the course, the infrastructures for learning are also shaped by the choice of learning platform in terms of how a course can be envisaged and designed. Also the competence of the instructors, access to support and the support itself are framing factors in the course design and implementation, along with the students’ prior experience in curriculum-based courses (Guribye, 2005; 2015). All the dimensions outlined above are equally constitutive of the course (infra)structure and affect its structure, including the affordances and the constraints therein.

The virtual classroom as learning space – the KSL project

The data we focus upon come from project KSL (combination course for students and lifelong learning) and consist of recordings of online seminars from a course in Pedagogy at basic level offered by a university in Sweden. The aim of the project is the creation of a course design in terms of space as infrastructure that would entail the possibility to include both

students regularly enrolled in a course, together with an open version of the same course (an open track), similar to a MOOC. This, in turn, would allow enrolled students and the participants in the open track to constantly meet, discuss and create networks, thus opening up the doors of the course to other groups in society. The course, of the duration of ten weeks, is envisaged in terms of a series of recorded lectures, synchronous meetings, participation in forum discussions and text production. The content of the course deals with basic concepts in educational philosophy as well as the study of Education as practice. The course material (lecturer, links to open education resources, texts etc.) is made available through an open homepage. A learning management system is used by the enrolled students for asynchronous communication between students and instructors as well as in concomitance with the assessments of the course final task. The four seminars (open for both enrolled students and the participants in the open track) are conducted through Adobe Connect, a multimodal environment which offers synchronous oral communication, with cameras for (limited) access to paralinguistic cues, and textchat. The environment also includes a notepad and a whiteboard where documents can be uploaded and commented on. Students' texts written in advance for seminar discussions as well as transcriptions of the asynchronous discussion from the course homepage are part of the data. The study also includes the analysis of the course homepage as well as the Facebook page and the Twitter posts related to the course hash tag.

Preliminary findings and discussion

In the course included in the KSL project, the creation of a space for learning that would accommodate a combination of the open and closed tracks in the course has been a challenge in a range of different ways. Firstly, the course has been reframed to attend to the openness of the course and the creation of lectures and other material that could be framed in terms of reusable learning objects (RLOs). Secondly, the design and implementation of the course entailed the orchestration and collaboration across different communities within the university (both faculty members and staff at the coordination and communication office). Finally, the heterogeneity and fluidity of the course and the spaces involved imply that alternative methodologies are needed in order to investigate and follow the mobility of people, texts, tools and ideas across a variety of sites. By using an (n)ethnographic approach, the preliminary analysis highlights the ways in which learning spaces as infrastructure shape and are shaped by the range of activities that are part of the course, but also by the openness of the space itself, which affords the emergence of alternative pathways for participation and thus, we argue, for learning.

The questions that are brought to the fore by this course design are however still many and we are only at the beginning of this journey. What are the implications for learning (also in terms of lifelong learning) of the combination of enrolled students and the open track participants? What are the ways in which the encounter of these two course forms (now merged in one) affects the collaboration across sites, mediated by digital technology? Social learning analytics (Buckingham Shum & Ferguson, 2012, Messina Dahlberg, in press) offer valuable tools to map the interaction in such online collaborative sites. Suthers et al. (2010, 2013) propose an analytical framework that accounts for the co-occurrences between what they frame in terms

of events, activity, uptake and contingency in the study of human interaction. Contingencies are here framed in terms of “how acts are manifestly related to each other and their environment” (Suthers et al., 2010). Such a focus on the importance of context in terms of the sequentiality of the utterances and their relation to their environment is relevant also to our interests in mapping and investigating the range of activities that are focused upon by the participants in the course (both enrolled and in the open track). Similarly, a focus on communicative practices and their sequentiality in space and time is crucial for understanding the organization of interaction in online (a)synchronous environments (see also Trausan-Matu & Rebedea, 2010; Dascalu, Trausan-Matu & Dessus, 2013). To conclude, we argue that one of the main contributions of this paper lays in its focus on the situated, but also fractured, activities of the participants in the KSSL project and the combination course included in it. A study of the tensions and contradictions in terms of what we call the geography of the learning spaces in higher education, are at the core of the project in terms of its openness but also partial closure between the enrolled students and the participants in the open track. This, it is suggested, will also illuminate the ways in which spaces are constituted by and for learning in terms of the creation of infrastructures that are stable but, at the same time, fluid and easily accessible for global participation.

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DROPOUT IN AN ONLINE TRAINING FOR IN-SERVICE TEACHERS

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Introduction

High dropout rates are a problem in online learning (Lee & Choi, 2011). Student dropout has been described and analyzed in the contexts of whole study programs (Grau-Valldosera & Minguillón, 2014) and single online courses (Lee & Choi, 2011). Determinants of learner attrition and persistence with online training have been shaped in various models with different levels of complexity (e.g., Lee & Choi, 2011). It appears to be a complex phenomenon depending on numerous factors (e.g., Lee & Choi, 2011). In addition to features of the online training course and the learning conditions, Lee and Choi (2011) strongly suggested that learner characteristics influence the decision to persist in an online course or to drop out. Therefore, we explored the extent that learners dropping out at various stages from an online training for in-service teachers differ from successful learners in domain-specific prior knowledge, motivation, learning skills, computer attitude and computer anxiety.

In the context of complex learning environments and online learning, the domain-specific prior knowledge is known to influence program usage, information processing and performance often in a straightforward way (Amadiou, Tricot, & Mariné, 2009). Studies from hypertext research reported prior knowledge having a positive impact on a diversity of performance measures (Amadiou et al., 2009; McDonald & Stevenson, 1998; Stiller, 2003; 2009; 2015). Students having higher prior knowledge can more easily study because of having less new information connected to prior knowledge. Consequently, learners might experience a lower level of work load and be less threatened by learning difficulties. Thus the level of prior knowledge might influence a learner's decision to drop out.

Intrinsic motivation refers to engaging in behaviours, because the acts are inherently interesting or enjoyable (Ryan & Deci, 2000). Intrinsic motivation is also connected to high-quality learning (Ryan & Deci, 2000). Motivation is one of the most frequently studied variables in relation to dropout, and it was shown to be correlated to course persistence and dropout (Castles, 2004; Grau-Valldosera & Minguillon, 2014; Hart, 2012; Hartnett, St. George, & Drone, 2011; Ivankova & Stick, 2007; Osborn, 2001; Park & Choi, 2009; Parker, 2003). Learners who are intrinsically motivated might have an advantage in preventing learning difficulties. Their greater involvement in deeper learning might contribute to reduced dropout rates.

Self-regulated learning is a key component of successful online learning (Barnard et al., 2009) comprising, according to Pintrich (1999), the use of cognitive and metacognitive learning

strategies and resource management strategies. Metacognitive strategies, time management and creating a supporting learning environment are considered to be particularly relevant for online learning (Lee, Choi, & Kim, 2013). Metacognitive strategies include the planning, monitoring and regulation of cognitive processes (Pintrich, 1999). Resource management strategies are self-management strategies that support learning in general and shield against external disturbances and other detrimental influences (Pintrich, 1999). The strategies of time management (i.e., assigning adequate time periods to learning) and learning environment strategies (i.e., creating a supportive learning environment) belong to this category. Higher levels of these learning skills might contribute to reducing dropout. It was shown that management skills are significant predictors of dropout (Lee, Choi, & Kim, 2013), especially managing time effectively and having comfortable conditions for studying (Castles, 2004; Hart, 2012; Holder, 2007; Ivankova & Stick, 2007; Osborn, 2001; Shin & Kim, 1999).

Computer attitude and anxiety might influence a learner's decision to drop out by affecting learning. Attitudes consist of affective, conative and cognitive components (Richter, Naumann, & Horz, 2010). Computer anxiety is considered to be a trait, which comprises both cognitive and affective components such as feelings of anxiety and worrisome thoughts (Richter et al., 2010). Negative computer attitudes and computer anxiety might disturb learning because of negative emotions and thoughts associated with the computer, such as disturbing thoughts about the computer malfunctioning or even crashing. The limited studies investigating the effects of computer attitudes on course dropout have found positive effects of positive attitudes on course usage and persistence (Bernard et al., 2004; Stiller & Köster, 2016). Only two studies have investigated computer anxiety and course dropout / persistence. Long et al. (2009) presented no differences in drop-out rates between employees of a U.S. Midwest-based landscaping company who completed an online course, and Stiller and Köster (2016) showed that dropout employees had a higher level of computer anxiety than successful learners.

Research objectives and expectations

An online training in media pedagogy for in-service teachers was used to explore course dropout. We examined whether student dropout is influenced by prior knowledge, intrinsic motivation, learning strategies, computer attitude, and computer anxiety by simply comparing the identified group of dropout learners and the group of persistent learners in respect of the learner characteristics. We assumed that dropout is more likely when a learner has a lower level of prior knowledge, intrinsic motivation as well as learning skills, more negative attitudes towards computers, and a higher level of computer anxiety.

Method

Participants

The data was collected from the students who registered for the online training "Media Pedagogy for Teachers". The training addressed teachers of primary schools (*Grundschule*), secondary general schools (*Hauptschule*), intermediate schools (*Realschule*) and grammar

schools (*Gymnasium*) in the German Federal State of Bavaria (see Federal Ministry of Education and Research, 2016 for details on German classification of schools). Students were recruited by promoting the training offline via flyers at these type of schools throughout Bavaria. Participants are described in the results section.

Description of the online training

The online modular training was based on instructional texts without a fixed schedule. Each module was modelled on the Nine Events of Instruction (Gagné et al., 1992). We paid attention to providing a motivational, stimulating learning environment, a high level of self-instruction, and an effective and efficient information presentation. The content consisted of authentic problems, using multiple contexts and multiple perspectives for learning. Given the lack of a social context (i.e., the need to cooperate and communicate with other learners), participants had a high level of flexibility in terms of time management. Support for students was provided via email, online chat by using text, and phone

The training consisted of eight modules (e.g., “Everyday life of children and adolescents” and “Generation SMS – the use of mobile phones by children and adolescents”). Students who completed at least one module successfully could request a training certificate listing all completed modules. A successful completion of any module was calculated with a workload of 60 to 90 minutes. In addition, an introductory module informed students about content, technical requirements, course organization, and self-management for successful online learning. Registration and participation was free.

The starting point of the course was a Moodle portal. The students could freely decide how many of the modules they wanted to study and in which sequence. Each training module had a linear structure represented by six screen pages: module profile, case example, test of domain-specific prior knowledge, instructional unit, module evaluation, and final module test. The module profile gave an overview of the content and the teaching objectives. The case example represented a real life problem with the purpose of fostering student curiosity and the learning of relevant content. A test of prior-knowledge was used for activating prior knowledge and for providing feedback about the student’s current level. The instructional unit comprised an instructional text and optional supporting material. The final module tests consisted of 15 multiple-choice items that evaluated factual knowledge learned in the training, the result of which was provided as feedback to the student. Learners were required to answer at least 50% of the items correctly to have successfully completed a module, otherwise a module was completed but failed.

Procedure and means of measurements

The training was offered from October 2009 to July 2010, which was during the regular German school year. Everybody who was interested in the course could register. After registration, the students’ login directed them to the introductory module. Before starting the training, the participants were asked to provide demographic information and to respond to various items that assessed learner characteristics. After completing the first questionnaire, the

eight course modules were accessible. A prior-knowledge test was presented before each module, and after completing the module, participants completed a final module test.

After providing socio-demographic characteristics, participants' motivation to participate in the online training was assessed with the Interest/Enjoyment scale of the Intrinsic Motivation Inventory (Ryan, 1982). Subsequently, their attitude towards computers was examined, which focuses on the personal experience with using the computer as a means for learning and working. The negative component, in the sense of the computer being regarded as an uncontrollable machine, was measured (Richter et al., 2010). A high score expresses a low negative attitude. Computer anxiety was then measured by assessing cognitive and affective components (Richter et al., 2010). Additionally, the three exemplary persistent strategies of self-regulated learning were assessed (Griese et al., 2015): meta-cognitive learning strategies (planning, monitoring, and regulating), time management, and learning environment. The domain specific prior-knowledge test at the beginning of each module was assessed with a 5-item multiple choice test (score range 0-5). Each item comprised four answers of which at least one was correct.

Prior knowledge was scored as percent correct and a mean was calculated across the number of tests completed (from 1 to 8 possible scores). Means were calculated for all other scales. A high score of all measures expresses a higher level of the feature in focus except for computer attitude which indicates a low negative attitude.

Table 1: Means and standard deviations as well as the potential score range of the used measurements are shown

	Number of items used for assessment	Number of assessments an individual score is based on	M	SD	Range	Cronbach's alpha
Interest / Enjoyment	7	1	4.00	.62	1-5	.84
Computer attitude	9	1	4.23	.59	1-5	.80
Computer anxiety	8	1	1.77	.63	1-5	.82
Metacognitive strategies	11	1	3.43	.61	1-5	.81
Time management	4	1	2.47	.90	1-5	.83
Learning environment	6	1	3.99	.68	1-5	.80
Prior knowledge	5	1 to 8	48.71	16.34	0-100	.27 to .65 ⁽¹⁾

⁽¹⁾ Range; Cronbach's alpha was calculated per each module

Results

Registrants included 318 in-service teachers who answered the first questionnaire (see Table 2), and one record contained missing data. More female (56%) than male teachers (44%) enrolled in the training. The mean age of teachers was 39.6 years (SD = 9.7, range from 21 to 70 years, n = 317). Most teachers worked in an intermediate school (41%) and a specialised upper secondary school or a grammar school (24%), followed by primary school and secondary general school (10% each), and other school types (15%). The following groups

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of dropout and persistent learners could be identified: (a) dropout group of absent students (no prior knowledge tests were completed), (b) dropout group of viewing students (completed at least one prior knowledge test but no final module tests), and (c) persisting group of studying students (completed at least one final test). According to these three groups of registered teachers (see Table 2), the sample resulted in 50% dropout students (absent and viewing students) and 50% studying students. Almost 30% of studying students completed only 1-2 modules, and almost half completed the full eight modules.

Table 2: Demographic characteristics of the registered in-service teachers, dropout and persistent groups

		No. (%) of registered students	No. (%) of absent students	No. (%) of viewing students	No. (%) of dropout students	No. (%) of studying students
Sex	Total	318 (100.0)	63 (19.8)	96 (30.2)	159 (50.0)	159 (50.0)
	Female	179 (56.3)	31 (49.2)	40 (41.7)	71 (44.7)	108 (67.9)
	Male	139 (43.7)	32 (50.8)	56 (58.3)	88 (55.3)	51 (32.1)
Type of school	Primary school	32 (10.1)	5 (7.9)	7 (7.3)	12 (7.5)	20 (12.6)
	Secondary general school	33 (10.4)	7 (11.1)	12 (12.5)	19 (11.9)	14 (8.8)
	Intermediate school	130 (40.9)	21 (33.3)	40 (41.7)	61 (38.4)	69 (43.4)
	specialised upper secondary school / grammar school	76 (23.9)	19 (30.2)	18 (18.8)	37 (23.3)	39 (24.5)
	Other than listed	47 (14.8)	11 (17.5)	19 (19.8)	30 (18.9)	17 (10.7)
No. of	0	167 (52.5)	63 (100.0)	96 (100.0)	159 (100.0)	8 (5.0)
successfully completed modules	1	27 (8.5)				27 (17.0)
	2	19 (6.0)				19 (11.9)
	3	13 (4.1)				13 (8.2)
	4	6 (1.9)				6 (3.8)
	5	12 (3.8)				12 (7.5)
	6	3 (0.9)				3 (1.9)
	7	3 (0.9)				3 (1.9)
	8	68 (21.4)				68 (42.7)

The dropout group (absent and viewing students combined) and the studying group were compared in reference to sex, age, type of school, and the learner characteristics of interest. Effect sizes d were computed as the difference between the means of the persistent and the dropout groups divided by the standard deviations of the sample (see Table 1). Effect size d for Chi-square tests were calculated from the Chi-square values (see Elis, 2010). Group differences were found for sex ($\lambda^2 = 17.50$, $df = 1$, $p < .001$, $d = .48$) and age (see Table 3), but not for type of school ($\lambda^2 = 6.90$, $df = 6$, ns , $d = .13$; calculation of d was computed using $\lambda^2 = 1.38$, $df = 1$ after merging the intermediate school and specialised upper secondary school / grammar school into one group and the other three school types into another group). The studying students were on average more than four years younger than the other groups, and the viewing students were the oldest in the sample. Finally, no differences were found between

the groups in motivation, computer attitude and anxiety and time management, but use of meta-cognitive learning strategies and creating an adequate learning environment was lower for dropout students than for studying students. In addition, prior knowledge scores were lower for the viewing students than for the studying students. Generally, only small effects were found.

Table 3: Means and standard deviations of the student groups, Welch test results (one-sided) and effect sizes *d* are shown

	Absent students M (SD)	Viewing students M (SD)	Dropout students M (SD)	Studying students M (SD)	Welch-t	df	p	d
Age	40.7 (11.0)	42.6 (9.1)	41.8 (9.9)	37.4 (9.0)	-4.14	311.7 1	.001	-.45
Intrinsic motivation	4.05 (.63)	3.92 (.65)	3.97 (.65)	4.03 (.58)	.83	312.8 4	ns	.10
Computer attitude	4.17 (.53)	4.28 (.58)	4.24 (.56)	4.22 (.61)	-.31	313.7 8	ns	-.03
Computer anxiety	1.78 (.60)	1.69 (.62)	1.73 (.61)	1.81 (.65)	1.18	314.7 8	ns	.13
Metacog. strategies	3.34 (.70)	3.36 (.64)	3.35 (.66)	3.50 (.55)	2.18	304.9 4	.015	.25
Time management	2.56 (.93)	2.36 (.86)	2.44 (.89)	2.51 (.90)	.69	315.9 6	ns	.08
Learning environment	3.89 (.63)	3.92 (.78)	3.91 (.72)	4.07 (.62)	2.19	308.4 9	.015	.24
Prior knowledge	--	44.14 (17.95)	--	51.47 (14.67)	3.38	170.4 2	.001	.45

Discussion

The dropout groups of absent and viewing students appeared to be somewhat older and tended to be more male than female. They also possessed less prior knowledge, metacognitive skills and skills to arrange an adequate learning environment. No differences were found in intrinsic motivation, computer attitude, and computer anxiety between dropouts and students who persisted in studying. No explanation for the age and sex differences emerged in this study. In contrast to the literature, successful learners in this study appear to be younger than dropout students (cf. Yukselturk & Bulut, 2007). Our results pertaining to learning skills, however, are in line with former research on learning performance (Amadiou et al., 2009; McDonald & Stevenson, 1998; Stiller, 2003; 2009) and learning management skills (metacognitive strategies and strategies concerning the learning environment; Castles, 2004; Osborn, 2001; Shin & Kim, 1999), but we did not find that time management was essential in contradiction to other studies (Hart, 2012; Holder, 2007; Ivankova & Stick, 2007; Lee & Choi, 2011; Osborn, 2001; Shin & Kim, 1999).

Overall, computer attitude and computer anxiety were not indicative of dropping out. This result is not consistent with evidence from other studies (Hauser et al., 2012; Saadé & Kira, 2009; Stiller & Köster, 2016). One reason for the null finding could be that these student characteristics interact with the type of learning materials used, module performance tasks,

and computer mediated communication. When learning, communicating and performing involves a more intensive use of the computer as was the case with Hauser et al. (2012), Saade and Kira (2009) and Stiller and Köster (2016). These studies all included a more intensive use of computers combined with partially a more complex computer mediated communication and more complex learning activities. Thus, negative computer attitudes and computer anxiety might then be more disturbing when studying. In the present study, studying was mainly reduced to reading a paper-based script (we assumed that most teachers printed the pdf files and studied them) or on-screen texts and assessing learning performance via recognition tests (i.e., multiple choice tests about factual knowledge). This method combined with negative computer attitudes or computer anxiety might not lead to higher levels of disturbances while learning, thus not being relevant for a learner's decision to drop out.

In general, the act of dropping out remains a complex phenomenon. Our results suggest that various learner characteristics are connected to dropping out. Although readers should be careful in generalizing the results, learning management skills seem to be a good starting point to set up interventions against dropping out. Other features, such as age and sex, could inform educators as to whom an effective intervention should be offered when a threat of dropping out is detected.

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SECONDARY TEACHING AT A DISTANCE: A NEW ZEALAND CASE STUDY

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Introduction

New Zealand is a sparsely populated country and with a population of just over 4 million, there are on average only 17.6 people per square kilometre (Wikipedia). It is thus not surprising to find that many schools in New Zealand are very small, particularly in the rural areas. In Hattie's (2002) study on the comparative achievements of students, he divided all New Zealand schools by size into four quarters, and 25% of them only had a roll of between 1 and 67 students. At the secondary level, due to the small size of many schools, there is limited availability of specialist teachers to teach senior secondary courses. Until recently, students who were unable to take classes in their own schools would usually take distance courses offered by the New Zealand Correspondence School (<http://www.tekura.school.nz/about-us/our-history>). Established in 1922, the Correspondence School now provides courses from early childhood through Year 13. While increasingly being supported by digital technologies, these courses by and large are self-study courses.

In the mid-1990s, a few rural high schools began to form into networks to facilitate cross enrolment of courses supported by digital technologies. Students in a network school would be able to take distance courses offered by other schools within the network (Stevens, 1994). More clusters of schools have been formed since and one of the pioneer clusters was the OtagoNet, which used video-conferencing technologies and a community approach to provide real-time learning for students in the South Island of New Zealand. For a typical OtagoNet sponsored distance class, there was a one-hour video-conferencing session and three hours of self-study per week throughout the school year. Teachers were recruited and trained to use technologies to support their teaching and classes were offered through a teacher's home school (Lai & Pratt, 2009). In collaboration with university researchers, some OtagoNet teachers used the knowledge building approach (Scardamalia & Bereiter, 2006) in their teaching (Lai, 2015). OtagoNet has become a leader of distance teaching in New Zealand and in 2013 it expanded and merged with other networks to become a national organisation. Renamed NetNZ, it started to offer online courses for students all over New Zealand. There are now 54 secondary and area schools associated with NetNZ and in 2017 it offers over 80 National Certificate of Educational Assessment (NCEA) level classes in science, math, languages, technology, social science, art, and health and physical education subjects (The New Zealand's National Certificates of Educational Achievement (NCEA) are national qualifications for Year 11 to 13 students. There are three levels in NCEA, and each has its

achievement standards (AS) assessed through internal and external assessments. New Zealand secondary students are assessed nationally based on these standards.). Small in scale, it was estimated that in 2016 there were over 2,000 online students enrolling with clusters of networks, and about 700 of them enrolled in NetNZ courses (K. Pullar, personal communication, December 2, 2016). With the rapid increase of Internet connectivity, many NetNZ courses now use Google handout to conduct class sessions.

There is great potential for distance and online teaching to grow in New Zealand, particularly at the secondary level. For example, distance courses could be offered to urban students providing them a more personalised choice, and allowing them to complete a high school qualification online, similar to what countries such as the U.S. did (Tonks, Weston, Wiley, & Barbour, 2013). To realise this potential, there is a need to have a deeper understanding of how distance teaching is practiced by online teachers, since distance online teaching should not be seen simply as a reproduction of face-to-face teaching (Lai, 2014). Unfortunately, little research has been conducted in New Zealand to document why teachers become online teachers, how they feel about online teaching, and how they can be better supported. The purpose of this paper is to fill this knowledge gap.

The study

The purpose of this study is to investigate how distance online teaching is supported in New Zealand at the secondary level, using NetNZ as a case study. As part of a larger project investigating the pedagogical and cultural practices of New Zealand online teachers, this paper reports findings from a preliminary analysis of data collected in December 2016 to investigate specifically (a) why New Zealand teachers engage in distance teaching and how they feel about teaching online; and (b) what professional development and learning is needed to support and sustain online teaching.

An email was sent to all 48 NetNZ teachers in December 2016 who taught classes in 2016, inviting them to participate in an online survey. The email included information about the study and a link to a questionnaire on a Google form. The questionnaire had 44 closed and open-ended questions. 32 teachers successfully completed the questionnaire and the response rate was 67%. We understand response rates of online surveys are often much lower than paper surveys (Vehovar & Manfreda, 2008) so having two-third of the NetNZ online teachers completing the questionnaire was considered satisfactory. Data collected from the Google forms was exported into SPSS for analysis. Both quantitative and qualitative analyses were conducted. For the purpose of this paper, the analyses were primarily descriptive, although group differences based on gender and teaching experience are also reported.

Findings

The respondents

Of the 32 respondents, 15 (47%) were male, and 17 (53%) were female. In 2016 NetNZ offered over 60 high school courses, including science, maths, languages, technology, arts, humanities

and social science, and Health and physical education. The courses taught by the respondents were well represented, as can be seen from Table 1.

Table 1: Courses taught by the respondents

Science	Physics, Chemistry
Maths	Mathematics, Calculus, Statistics
Language	Te Reo Maori, Chinese, Japanese, French, Spanish
Technology	Computer Science, Design and Visual Communication, Crafting History, Graphics
Humanities and Social Science	Classical Studies, Geography, History, Media Studies, Accounting, Psychology
Arts	Performing Arts, Art History, Performing Arts, Drama
Health Education	Physical Education

The majority of the respondents were experienced teachers, having on average taught for 22 years, but their online teaching experience was much limited, having on average of only 5 years of experience. Table 2 is a breakdown of teaching and online teaching experiences of the respondents by gender.

Table 2: Teaching Experience by Gender

	Average number of years of teaching	Average number of years of online teaching	Self-rated as very experienced or experienced online teacher (in %)	Self-rated as very experienced or experienced digital technology using teacher (in %)
Female	18	4	47	29
Male	26	7	80	60

As can be seen from Table 2, on average the male respondents had more teaching as well as online teaching experiences than female teachers. When teachers were asked to rate their online teaching experience naturally a much larger proportion of the male teachers (80%) rated themselves as very experienced or experienced, as compared to only 47% of the female teachers giving the same ratings, and 60% of the male teachers rated themselves as very experienced or experienced technology using teachers, as compared to 29% of the female teachers providing the same ratings. It is interesting to note that online teaching experience seemed to correlate with digital technology using experience, with the more experienced teachers being the more experienced technology using teachers. However, when chi square tests were conducted to test gender differences, no significant differences between the two groups of teachers in terms of online teaching experience or technology use experience were found.

Why did NetNZ teachers choose to teach online?

In the questionnaire there was an open-ended question asking the respondents why they had become online teachers. Of the 28 NetNZ teachers who responded to this question, there were three main reasons as to why they taught online classes. The most frequently reported reasons were personal ones (43%), with most of the respondents in this category reporting that it was

an opportunity to develop themselves further as a teacher. The following are some typical comments.

Opportunity arose. I was interested in being involved. Was interested in extending myself and doing something different (P23, female, 16 years of teaching experience).

Good to experience a different way of teaching (P4, male, 15 years of teaching experience).

To push my limits and discover new ways to teach and learn (P22, female, 13 years of teaching experience).

I enjoy the challenges unique to the online environment (P8, male, 36 years of teaching experience).

For over one-third (36%) of the respondents, there was institutional pressure for them to take up the role as an online teacher. Initially the lack of enrolment in their classes was a major reason, even though some teachers eventually found other reasons to sustain their online teaching. For example,

I started teaching online because I was asked to replace the online teacher who was retiring. I continue to teach online as I enjoy the contact with a variety of students, the challenges of teaching and learning environment and the continual learning that it provides me with (P24, female, 7 years of teaching experience).

I enjoy it; but it is a requirement of my position within the school (P18, female, 16 years of teaching experience).

I teach online because I come from a small school and I could see the advantages of being able to access courses that we are unable to deliver due to numbers, timetables and other similar issues (P29, female, year of teaching experience not provided).

Not enough numbers to run a normal class in my school so decided to teach online to be able to do this (P17, female, 14 years of teaching experience).

For the rest of the respondents (21%), the primary reason for taking up online teaching was to provide learning opportunities for their students who otherwise would miss out.

Everyone should have the opportunity to learn [subject] even if they have no access in their area. I believe students should not be restricted by what their socio means leaves them (P12, male, 5 years of teaching experience).

To provide students with additional options beyond the limitations of their own school (P6, male, 37 years of teaching experience).

How did NetNZ teachers feel about online teaching?

In the questionnaire there were 5 items which were designed to measure the attitudes of the teachers towards online teaching. The internal consistency of this subscale was tested and it was found that it had a Cronbach's alpha co-efficient of .689, showing an acceptable level of internal consistency (Clark & Watson, 1995). The following table summarises the responses of the NetNZ teachers towards online teaching.

Table 3: Attitudes of NetNZ teachers on online teaching (in percentage)

	Strongly agree/agree	Neutral	Strongly disagree/disagree
I enjoyed teaching my 2016 online class	88	13	0
Online teaching is interesting	94	3	3
I am more successful in online teaching than on-site teaching	10	68	23
I have more flexibility in online teaching than on-site teaching	55	39	6
I prefer teaching online than teaching on-site	19	59	22

While almost all NetNZ teachers found online teaching interesting and they enjoyed teaching their 2016 classes, when comparing with on-site teaching, the respondents did not have a clear preference between the two modes of teaching. However, proportionally more teachers considered that they were more successful in on-site teaching than on online teaching.

It is interesting to see whether there were any gender differences on how NetNZ teachers felt about online teaching. Chi square tests were conducted and no significant differences were found. However, when the respondents were divided into two groups, the less experienced (with online teaching experience of 1-3 years, $N = 14$), and the more experienced (with online teaching experience more than three years, $N = 18$), it was found that the more experienced teachers felt more successful in teaching online classes than the less experienced teachers ($X^2(3, N = 32) = 7.975, p < .05$) in 2016. Of the other four items, no significant differences were found.

Have NetNZ teachers been well supported and what professional development and learning would they prefer in the future?

In the questionnaire there were two questions on how teachers felt about the efforts and support needed for teaching online classes. As can be seen from the following table, over two-third of the respondents reported needing more time and effort to teach an online class and over one-third of them needing more support in teaching their online class. No significant group differences were found in terms of gender and online teaching experience.

Table 4: Effort in online teaching (in percentage)

Item	Strongly agree/agree	Neutral	Strongly disagree/disagree	Gender difference	Experience difference
It takes more time and effort to teach an online class.	69	25	6	No	No
I need more support to teach an online class than an on-site class.	41	38	22	No	No

In terms of support provided by their home schools and NetNZ, only just over half of the teachers (52%) strongly agree or agree that their online teaching has been well supported by their home school. However, 87% of the respondents considered that they were well supported by NetNZ.

In the questionnaire the teachers were asked to indicate what aspects of online teaching they would need to develop further. The following table summarises the responses of the teachers.

Table 5: Professional development needed by NetNZ teachers (in percentage)

Topic	Less experienced online teachers	More experienced online teachers
How to organise and structure my online class	23	22
How to develop my class as a community of learning	71	67
How to develop online materials	43	50
How to assess my students online	43	11
How to support my online students socially	43	39
How to develop my online students as self-regulated and independent learners	64	72
The pedagogical models underpinning online teaching and learning	43	28

As can be seen from Table 5, the majority of the respondents required knowledge to develop their classes into a community of learning, and how to develop their students as self-regulated and independent learners. About half of the respondents also would like to learn how to develop online materials. For the less experienced online teachers, they required more professional development to understand the pedagogical models underpinning online teaching and learning. Chi square tests were conducted and there was a significant difference between the two groups in terms of the need to know how to assess online students, with proportionally more less experienced online teachers needing this professional development

($X^2(1, N = 32) = 4.223, p < .05$). No significant differences were found in any of these items between female and male teachers.

The respondents were also asked how they would prefer to engage in professional development and learning to enhance their online teaching. Table 6 summarises their preferences.

Table 6: Forms of professional development NetNZ teachers preferred (in percentage)

Forms of professional development	Less experienced online teachers	More experienced online teachers
Attend workshops	79	83
Take part in an on-going online community	64	61
Self-study	57	28
Enrol in postgraduate courses	21	11
Peer-supported group discussions	14	72
Team teach	29	17
Working with an expert teacher	43	28

As can be seen from Table 6, the majority of NetNZ teachers preferred attending workshops run by experts, and taking part in an ongoing community of practice. A larger proportion of less experienced online teachers preferred doing self-study with resources provided by experts and worked with expert teachers on a one-to-one basis than the more experienced teachers. For more experienced online teachers, proportionally more of them preferred regular face-to-face peer-supported group discussions. Chi square tests were conducted and no significant differences were found between the two groups. There were also no significant gender differences on the forms of professional development that the respondents preferred.

Discussion and conclusion

In this paper, findings from a preliminary analysis of a study investigating why NetNZ teachers engaged in online teaching and how they could be better supported was reported. While almost all the NetNZ teachers enjoyed online teaching, only a small proportion of them indicating a strong preference for online teaching, and few of them felt that they were particularly successful in online teaching as compared to on-site classroom teaching. There was a clear gender difference in online and technology using experience, with female teachers having less experience than male teachers. However, the lack of technology using experience did not seem to be a barrier for the female teachers to teach online. In terms of why teachers engaged in online teaching, while institutional pressure in terms of the need to provide students with more course options and increasing class sizes were important factors, proportionally more teachers in this study gave personal reasons such as the willingness of stepping out from one's comfort zone and developing different teaching skills as reasons for engaging in online teaching. These reasons may have implications for future recruitment of online teachers. For the NetNZ teachers, they were keen to learn how to develop their classes as a learning community, develop learning materials, and how to develop their students as self-regulated and independent learners. Support on how to assess online students should be

provided to beginning online teachers. For future professional development, most NetNZ teachers preferred to attend workshops run by experts, although they were also keen to participate in an ongoing community of practice. While less experienced teachers would like to work with an expert teacher on a one-to-one basis, more experienced teacher would like to take part in regular face-to-face peer-supported group discussions as a form of professional development.

While this study contributes to the online teaching and learning literature and its findings would be of interest to online educators, there are some limitations in this study. Firstly, the questionnaire sample was small and respondents all came from one online distance teaching organisation. Thus, findings of this study may be difficult to generalise to other contexts. Secondly, data gathered in this study were self-reports, which no doubt would be affected by the respondents' backgrounds and their differing experiences in online teaching. Due to the limitations on time and space, only a small number of the questions in the survey have been analysed and reported in this paper. Further analyses on the data would be needed to provide a more in-depth understanding of online teaching and learning in New Zealand.

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WHY OPEN EDUCATIONAL RESOURCES ARE ESSENTIAL IN ELEARNING

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The free sharing of open educational resources (OER) can be seen as essential for promoting the creation of content usable in elearning. OER can be effective in reducing the knowledge divide that separates and partitions societies. Educators worldwide continue to face significant challenges related to providing increased access to high quality learning, while containing or reducing costs. New developments in information technology, especially with tablets, phablets, mobile phones and different gaming devices, highlight the shortcomings and challenges for the traditional education community, as well as those of more flexible providers, such as open universities. Such developments have the potential to increase access and flexibility in education by rendering it ubiquitous. Basic education for all continues to be a goal that challenges – and will continue to challenge – many countries. OER for elearning, can be used to overcome many of the obstacles faced by both learners and educators.

This growing trend toward ubiquitous computing using the power of networks and mobile devices has opened the door for learners and instructors to access the world's knowledge from almost anywhere, at anytime. The internet houses the world's treasure of knowledge. In this context the role of OER in providing learners and teachers with learning content and applications and educational applications is becoming increasingly more relevant. It can be argued that OER are essential in educational contexts. Commercial applications and content come with use limitations that include digital locks and legal prohibitions.

Permissions

Besides enabling remixing and alterations in support of relevant pedagogy for learning, OER, with their explicit permissions, can also reduce costs by providing reusable elearning applications at no cost, thus increasing access to quality learning opportunities (Openstax, 2014; Miao, Mishra & McGreal, 2016). Their usefulness is primarily supported by the open licensing afforded by OER. Authorization to change, adapt, distribute, and augment become realistically possible with open licensing as provided by Creative Commons licences or by releasing the materials into the Public Domain (Creative Commons, 2016).

Technical Controls

Publisher can technically control how, when, where, and with what specific brands of technological assistance licensees are able to access their applications. Moreover, the owners also deliberately cripple the devices on which their applications are used to ensure that only

their “approved” uses are possible. This is often problematic for disabled users. The visually impaired, for example are denied use of a text to speech function and in many cases cannot even increase the text size. Moreover, many commercial systems still disable highlighting, annotating, hyperlinking, etc. -- these features are important for educational uses.

Different formats are nearly always problematic when mixing and mashing materials. OER can be changed and altered for use in different formats without permission. Hyperlinking is a normal learning activity that is often disabled in commercial applications. The devices are often purposely crippled by the application owners, or commercial standards are used so that content and applications cannot be ported to other devices. Permissions of all kinds also need to be re-sought for tampering with the material for re-use, re-purposing or mixing, even if fair dealing allows for it. This can become an impractical burden putting a real damper on any attempts to provide learning for all. Universal accessibility also requires that applications provide reliable and consistent service. Of particular concern for the disabled, proprietors also disable the ability of audio readers to access the content. Audio readers are becoming popular especially for people with visual disabilities and with commuters on long trips (Elibra, 2012).

Online learning becomes problematic when altering, augmenting or adapting is not permitted. commercial publishers wish to control and restrict the formats, devices, geographical regions and other circumstances that users may want to make use of the educational application. The proprietors wish to lock in and control their customers. Many, if not most use DRM (Digital Rights Management) restricted formats.

DRM (Digital Rights Management)

DRM software enables the tracking of users and protects content. It is used by copyright owners to control, limit and restrict how users can use their materials (Subramanya & Yi, 2006). It is sometimes referred to as TPM (Technological Protection Measures) (Parliament of Canada, 2005). These restrictions extend to both the hardware and the software. DRM can limit the devices that you are able to employ in accessing the educational application. It can restrict you to using the proprietor’s website and purchasing the proprietor’s materials, determining how, when, where you can use the application, and with what devices. DRM has even been used to prevent lawful licensees from accessing their own purchased applications. The DRM blocks legitimate users from porting their content to other devices; in many cases, DRM has been used to delete the legally purchased products from legitimate devices. And, DRM continues to prevent market competitors from participating and effectively stifles much innovation (Electronic Frontier Foundation, 2012). Online learning is particularly affected by DRM. Online learning environments need flexibility and cannot live with commercial restrictions that limit the capabilities of digital media.

Open learning is also based on trust among the participating students and instructors. As they share resources, the participants must have confidence that their personal information is not used for purposes other than those of learning and sharing with other students and the teacher. Companies using DRM have a history of open ended and indiscriminate collection of

private information for unauthorized purposes, using DRM to disclose personal information for inappropriate purposes (The Canadian Internet Policy and Public Interest Clinic, 2007). And with licences, companies have the right to invade your computers and networks without notice, and to disable software for any real or imagined license infraction.

Licensing

These commercial licences (that users must accept in order to access the content or applications) are also a major impediment to online learning. These licensing restrictions can add needless complications to downloading applications and content, sometimes making it so difficult that users simply give up (Subramanya & Yi, 2006). Fortunately this practice is not endemic. Format shifting, as has been noted is made technically difficult, and this is reinforced with restrictive licensing that prohibits the practice. Even if one wants to retain the same format, commercial applications are licensed to only one computer (“for use solely on this device”) (EBIA, 2016), so learners who switch computers even with the same operating system are often restricted from doing so, or at a minimum they must contact the owners and request special permissions and/or register with a company.

These licences also include clauses limiting downloads of content to one time on one computer for one user – and it is non-transferable “for your use only”. Because the online environment as well as traditional classrooms are considered public places under copyright law, you cannot distribute or broadcast such licensed content among students or even lend a device to them. Licenses prohibit, not only copying, but also modifying, removing, deleting, and augmenting (improving). This stipulation along with the “sole device” stipulation effectively negates any attempts at online learning using such software, even if institutions are prepared to pay, pay again and keep paying for the same licenses until they expire. And, if institutions don’t keep paying they may no longer be able to access data or records linked to that product. Licenses also prohibit the transfer of content to other students when teachers wish to use a variety of devices with different groups of students in later semesters.

For those educators who wish to avail themselves of any fair dealing (or fair use) rights, these licenses can effectively negate them along with the right of first sale that normally allows buyers to resell their purchases (EBIA, 2016). The license represents a contract agreed to by the licensee to not avail themselves of their fair dealing rights or first sale rights. Contract law can trump fair dealing, as it trumps ownership. Watter (2016) refers to this as the post-ownership society.

Geographical Restrictions

The predicament of an iPad owner in Luxembourg puts the question of geographical restrictions in a clear light. Even though he would like to legally purchase an application, he cannot because it is not available in his country. He can find material on pirate sites, but he wanted to buy legally and could not. Another commentator, talks about user “anger” noting that geographical restrictions using DRM are “the most pressing issue” (Adin, 2010). Google’s “Geographical Constraint” error message along with YouTube’s “This video is not available in

your country” are notorious examples of this, when users get an error message when they attempt to download books or videos that are not licensed in their country. For instructors, of course a legal purchase is mandatory, so in many countries they are effectively excluded from using much relevant applications (MobileRead, 2011). For borderless online courses from institutions that deliver lessons to many different countries, the restrictions effectively prevent them from using this content. The copyright owners, in effect, are encouraging piracy through these geographical controls that prohibit legitimate uses.

Conclusion

So, the technological and legal restrictions placed on commercial games can effectively render these applications unusable in many educational contexts. In order to address this, educators should consider using openly licensed applications that are becoming more widely available.

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ROADMAP FOR THE FUTURE OF OPEN EDUCATION IN AUSTRALIA

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Background

Australia has a long history in open education both as an early pioneer and in delivery at scale, successfully facilitating access to a university education for millions of students from diverse backgrounds that could not access traditional campus-based education. Looking back over the changing definitions, changing channels and changing purposes provides a landscape for consideration of new directions in Australian open education. Open has morphed through three phases: (a) free of location or time constraints; (b) free of pre-requisites; (c) free of cost.

Australia currently lags the rest of the world in the third phase, fostering use of cost-free open educational resources and courses. This is an anachronism in the context of a higher education sector and an overall economy that has moved decisively into a digital plane.

The previous two phases were supported and facilitated by government strategy and substantial funding. So far, the third phase has no vision or backing at the national level. Sir John Daniel, in a study for the Commonwealth of Learning and UNESCO about national policies identified Australia as one of the countries without a national policy. Whilst the Australian government has put resources and support behind its aspiration to facilitate open access and reuse of Australia's *publicly funded research resources* via the Australian Government's Open Access and Licensing Framework (AUSGOAL) the reform process has not significantly moved to *embrace educational resources*.

The benefits of open education for Australia include:

- economies of scale through collaborative co-production of learning resources;
- opportunity to raise quality of learning at decreased time and financial cost;
- provision of learning materials that are richer, and more appropriate to the contexts and styles of learning of an increasingly diverse student community;
- opportunity to provide learning to diverse disadvantaged communities globally; to the remote and regional areas of Australia;
- promote greater collaboration between Universities in fostering peer review and collegial development of learning materials;
- greater levels of transparency into the teaching process.

Open Education can also play an important role in positioning Australian higher education on the global stage through showcasing the expertise contained within our Universities.

Project OpenEdOz

In 2014, the Australian Government Office for Learning and Teaching funded a national project called OpenEdOz (openedoz.org) which produced a roadmap towards a national policy for open education. The project involved three important partner institutions; each of which provided key expertise needed for the successful completion of the project. The partner universities were: Charles Sturt University (lead), the University of Technology Sydney, and the University of Tasmania.

The project team, composed of five members from the universities above, were guided by the project's reference group and the evaluator, who were OEP experts recognised nationally and internationally (for more information about the project team, visit the website (<http://openedoz.org>)).


The project conducted think tanks and sourced case studies which might provide signposts for national action.

From analysis of 22 case studies of open education practices and outcomes from the Think Tanks, the project derived three key recommendations for national action (see final report, 2016).

1. Approve a national strategy to leverage contemporary information technology for improving productivity of higher education through use of Open Educational Resources.
2. Fund a national body to drive the strategy development.
3. Engage relevant national organisations in implementation of elements of the strategy as per the OpenEdOz National Roadmap.

Case Study Analysis

In order to better target the types of case studies that would be of benefit to the project, a Theme Matrix was developed and continuously modified as case studies were developed (see theme matrix: <http://openedoz.org/case-study-themes-2/>). The initial themes were derived from international literature and projects on OER policy including 2012 Paris OER Declaration (2012), Commonwealth of Learning (2015), Policies for OER Uptake project (POERUP, 2014), and Open Education Quality Initiative (2011). The top 11 OER themes that emerged from this analysis were: (a) Student Voice; (b) Institutional Strategy; (c) National Policy; (d) Student Co-creation; (e) Course offered as OER; Degree design based on OER; (f) Module based on OER; (g) Credit Transfer; (h) Accreditation of informal & non-formal learning; (i) Open Licensing and (j) Open Textbooks. The Case Study Theme Matrix in Figure 1 shows the themes and sub-themes by case study institution. It is available on the project website (<http://openedoz.org>).



	Charles Sturt University	Charles Sturt University	University of Tasmania	University of Tasmania	University of Technology Sydney	University of Technology Sydney	University of Technology Sydney	Higher ED Standards Project	Swinburne University	University of Southern Queensland	Western Sydney University	University of Wollongong	BCampus	Thompson Rivers University	HEALJISC	Canterbury University	Otago Polytechnic	University of Rwanda	Africa Nazarene University	University of Capetown	Tacoma Community College
STUDENT VOICE Lower costs, Access to university																					
INSTITUTIONAL STRATEGY Access to content expertise, New markets, Staff training																					
NATIONAL STRATEGY Province/state policy Lower cost of entry to low SES students																					
STUDENT CO-CREATION Authentic learning experience, Student Voice																					
COURSE OFFERED AS OER Philanthropic mission, New markets, Teacher voice																					
DEGREE DESIGN BASED ON OER Lower costs for university Staff training, Role of Libraries																					
MODULE BASED ON OER International curriculum Teacher voice																					
CREDIT TRANSFER Standards & Quality Transnational Accreditation Framework																					
ACCREDITATION OF INFORMAL & NON-FORMAL LEARNING Standards & Quality, Competency-based assessment, RPL																					
OPEN LICENSING Moral position Role of Libraries																					
OPEN TEXTBOOKS Lower costs for students																					

Figure 1. Case Study Theme Matrix

National Roadmap

Twenty-five individual strategies that could contribute to national action are provided in the OpenEdOz National Roadmap which has ten signposts: Awareness, Students, Teachers, Standards, IP & Copyright, ICT Infrastructure, Research, Discoverability, Collaboration and Sustainability.

The National Policy Roadmap is intended to directly support the Australia federal government to take advantage of the full potential of Open Education for the Australian higher education sector. The project team hope that this Roadmap will further inform national level decision makers of the issues to consider while engaging with Open Educational Practices. We also hope this roadmap will encourage the development of OEP focused policies and regulations at national levels, so that the Australian higher education will be able to fully take advantage of the already globally recognised opportunities of OEP. In addition, national education bodies need to be fully engaged as the drivers of Australia's an Open Education Strategy for universities. We have invited them to place OEP firmly on their agenda but to do so with a practical and deep understanding of what constitutes "open".

Table 1: Excerpt from National Roadmap

Signpost	Contributing Strategies
Advocacy	1. Organise Australian summits, conferences, workshops and develop/collect resources to raise awareness of the importance of open education at the intersection of university business models and university knowledge transfer/social justice commitments
Students	2. Define new Open Education Literacies as part of Digital Literacies and Information Literacies
	3. Research and evaluate student real use and understanding of open resources and open courses in particular their expertise in creation and their understanding of academic integrity in acknowledgment of open sources
Teachers	4. Review foundation teaching courses for university teachers to facilitate understanding of open educational practice and model best practice by using open content in the courses
	5. Weight awards and grants towards teachers' adaptation and use of OER (versus development of new OERs)
	6. Encourage and reward the diversity of academic teaching-related roles that flow from potential disaggregation of university services e.g. assessment and RPL expertise
	7. Foster community of practice for open resources developers and build their understanding of Open Design
Standards	8. Review institutional strategic plans, course policies and RPL policies in light of impact of open content and student-driven degrees on degree pathways, course coherence, evidence of meeting standards
Intellectual Property, Licensing & Copyright	9. Intellectual property in education and widely disseminate understanding of the reform
	10. Facilitate wider use of Creative Commons licensing – refer universities & academics to forthcoming OLT Toolkit
	11. Promote and prepare for libraries role in curating both open and closed resources, in particular student-created open resources
	12. Promote development and adoption of open textbooks
	13. Establish national support for peer review of open educational content
ICT Infrastructure	14. Accelerate roll-out of broadband access to regional areas in order that no learner is disadvantaged in open use of high quality digital resources by university courses
	15. Provide access to a free open platform for delivering open courses
	16. Underpin portfolio degrees and student mobility by confirming national collaboration on Digital Student Data Project as per Groningen Declaration
Research	17. Facilitate on-going educational research and benchmarking on open education and open design in conjunction with international projects
Discoverability	18. Build on Australia's progress with Open Access for research outputs by adding mechanisms, metadata and rewards for sharing educational resources
	19. Create <i>open librarian</i> roles and <i>open educational developer</i> roles for working with academics to discover, evaluate and adapt OERs
	20. Build on past experience nationally and internationally that discoverability is best enhanced via discipline-based approaches
Collaboration	21. Foster national and international partnerships for open education and revisit potential broader role for Open Universities Australia
	22. Support collaboration across professional groups e.g. librarians, educational technologists, academic developers
	23. Foster OEP as a platform for Regional Development
	24. Establish productive partnerships with museums and galleries in curating content for openness
Sustainability	25. Promote OERs as supportive of universities' sustainability goals including efficiencies in production of digital learning resources

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TOWARDS PRIVACY ISSUES IN PERSONAL LEARNING ENVIRONMENTS: A CONCEPTUAL MODEL OF PLE PRIVACY

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Introduction

Higher Education has been enriched by an increasing diversity demanding inclusive practices (Kaur, Noman, & Nordin, 2016), among which technology enhanced learning (TEL) has emerged as paramount for more student-centred (personal) learning. This personal learning involves changing the nexus of power and control from institutions and teachers to learners, e.g. students being able to orchestrate the different educational tools, resources and content (Buchem, Attwell, & Torres, 2011). It occurs causally in informal learning settings, and can be connected to parts of the formal learning process. The learning happens in an open and social environment of the web -social media, social networks and community of practices- and contributes to expanding the possibilities of personal learning to collective and social learning (Camacho & Guilana, 2011). Personal Learning Environments (PLE) as an approach to technology enhanced learning emphasizes the shift of control and ownership from the educator or the designer of a learning environment to the user or the learner, bestowing decision making and choice upon the learner, especially the choice of the learning tools and the use of these tools for learning (Buchem, Tur, & Hoelterhof, 2014). According to the PLE approach each learner designs a unique learning environment to support and enhance individual learning, collecting a wide variety of personal data related not only to the private life, but also to the student learning profile. Especially young people share their private lives online, providing huge amounts of data while older generations are fighting to keep private, among others because they do not fully understand the public nature of the Internet and its implications (Barnes, 2006). While more and more private data is created and shared on the Internet, more and more enterprises, government agencies and marketers are collecting personal data. Barnes (2006) names this situation “a privacy paradox” since many users and learners are not aware of how their private data is used or misused and they are not taking steps to protect their personal data from being used by others. At the same time, it is possible to use the data created and shared on the Internet for educational purposes, for example by means of learning analytics and recommender systems to support individual learning processes.

The term *data* can be defined as meaningful information that can be stored and recorded for further processing (Data Protection Act, 1998) and also as representation of information that includes a personal identifier (Woo, 2010). The term *personal data* is related to the data used for identification of individuals (Data Protection Act, 1998). Personal data contains any opinion expressed by individuals or expressed by other individuals towards the first ones. Personal data can be divided to *ordinary* and *sensitive*. Ordinary data presents the main information about any individual like: name, address, phone number and sensitive data describes person from political, ethnic, religious, criminal, etc. point of view, including biographical information, facts, opinion (Data Protection Act, 1998). In the context of PLE, sensitive data includes also learning background, student's profile, progress, shared documents or opinion. The unauthorised disclosure of personal data is normally considered a breach of privacy, although what is personal data and hence data privacy is a matter of dispute in an online context. Sociological theories consider privacy as part of social life. In the past people experienced social life in relation to small, often local communities, while with the advent of the Internet social life is becoming increasingly networked with access to much larger, distributed and more loosely defined social connections (Rainie & Wellman, 2012). From this perspective, the practice of personal information sharing can be considered as part of social participation and social learning.

By addressing the problem of privacy in Personal Learning-Environments in this paper, we are focusing on privacy of ordinary and sensitive data in context of digital, social learning. The emerging research questions are:

- What kind of personal data is required to support organisation and management of learning in a Personal Learning Environment?
- What kind of personal data should be shared and with whom to support learning achievements and personally successful learning?
- How can student's data privacy be guaranteed in PLEs, if it is to be connected to analytical tools applied for educational purposes?

This paper discusses several issues related to privacy in different types of PLEs such as: informal Web 2.0 / Social Media PLEs, mobile PLEs, ePortfolio-based PLEs, badges-driven PLEs, PLEs connected to formal learning process in higher education in the context of self-regulated learning. This is a first attempt to identify the relationship between privacy and PLEs and between privacy and students' learning control. A conceptual model of privacy in PLEs is developed to present current factors influencing on privacy.

Web 2.0 / Social Media PLE

The conceptualisation of PLE has been carried out through two main strands of research as observed by Fiedler and Völjätaga (2010; 2014). The main one has been about its technical nature, and the second one, has been about the pedagogical aspects that need to be addressed when implementing PLEs in different learning contexts. The former integrates diverse issues such as the ones arisen through Web 2.0 / Social Media based PLEs; the latter is mainly based on the self-regulated aim (Dabbagh & Kitsantas, 2012). In the context of social media, the PLE

approach is addressed to tackle the lack of student control and sense of ownership observed in institutional VLEs, such as traditional Learning Management Systems (LMS). Thus, social media has been observed to give students the opportunity to control and own not only the tools as tangible elements but also the processes or the intangible ones (Buchem, 2012; Buchem, Tur, & Hölterhof, 2014). Therefore, Web 2.0 / Social Media based PLEs, and especially where social networks have a predominant role, become environments where learners can bring together individual, group and multiple communities learning spaces. In these spaces, multiple levels of publicity and privacy can be established, considering a more comprehensive approach that takes into account the fact that there are common aspects in the way people perceive the privacy of their information (Razavi & Iverson, 2007). Hence, a PLE can contain collective spaces, accessible only to collaborators, specific people or open publicly, and private individual spaces and other individual spaces, which are accessible to certain people or completely public (Coll & Engel, 2014). However, challenging as it may be, privacy has not given much attention in either of the two strands of the PLE research, although it has been discussed as a critical issue in the context of Web 2.0 / Social Media studies. Especially Social Networking Sites (SNS), such as Facebook and Twitter, create privacy problems that may make users more self-consciously (Blank, Bolsover, & Dubois, 2014). Pew research for example shows that in 2013 50 percent of Internet users were worried about the information available about them online, compared to 30 percent in 2009 (Rainie et al., 2013). The other types of PLEs present many of the privacy issues related to Web 2.0 / Social Media, since they integrate some of its elements.

PLE and Higher Education

There are different good practices of PLEs usage in Higher education – as bridge between formal and informal learning. iPLE environment is proposed in Salinas and Marín (2016) consisting of Learning Management System (LMS), Web 2.0 tools and ePortfolio. Students have possibilities to take advantages of these three elements to construct their PLEs. The opinion of students reveals problems with organisation of personal data. Another study reports successful connection between social LMS and PLE using bookmarking tools for knowledge creation and sharing (Hölterhof & Heinen, 2014). The study from Saz, Engel, and Coll (2016) reports on an iPLE experiment with the Elgg platform that brings together academic and social environments. Two directions for knowledge transfer are possible: from LMS to PLEs and from PLEs to LMS. Then the emerged question is related to the private data flows in these two directions – what and where data is shared, stored and processed. A specially developed social media platform Graasp for university students is introduced in Benson, Morgan, and Tennakoon (2013) with features for arrangements of collaborative spaces, recommendations in context and management of privacy. Mechanisms for privacy management are introduced to protect users from unauthorised access to the social shred items. Users express their need to control the privacy in spaces and their profile.

ePortfolio-based PLE

Web 2.0-based ePortfolio has been an interesting educational implementation of research aimed at incrementing students' awareness of their PLE (Gewerc et al., 2016). In this context, social media has been argued to impact the ePortfolio construction – see for example, implementations based on blogs (Tur & Castañeda, 2016) or social networks (Gewerc et al., 2016) – and its open nature has been observed both as a potential and a limitation (Tur & Urbina, 2014). In parallel, it has also been claimed that in order to maximise the learning effect of the use of an ePortfolio-based PLE, the student's personal space requires having some proprieties as privacy, property and permanence (Rodríguez Ilera et al., 2014). Privacy in the case of PLE is related to the control that the learner has on the publication of the content. E-portfolio users can store their own artifacts and evidences in a private way until they decide to publish the content on the web or provide access to the teacher. However, privacy issues have not been addressed in the exploratory studies on ePortfolios, in which learning is enhanced by an open environment for collaboration and peer-feedback.

Mobile PLE

Further development of the PLE approach has been carried out with the use of mobile technology (Attwell, Cook, & Ravenscroft, 2009; Conde, García-Peñalvo, Alier, & Piguillem, 2013; Humanante-Ramos, García-Peñalvo, & Conde-González, 2015). Mobile devices have been recently claimed as powerful tools for contextual and ubiquitous learning. The development of geolocalisation, navigation and communication apps has empowered the possibilities for learning everywhere. However, this has an important drawback derived from privacy issues, since these apps capture personal data during browsing, trace Web habits, look into contact lists, and gather phone numbers and the unique ID number of the personal phone, among others. Currently, this aspect is becoming an increasing topic of concern since many businesses take advantage of the information obtained through mobile apps.

Open / Badges and PLEs

Recently, the question related to educational badges used in learning has emerged. Educational badges have been used to increase learning motivation. Different types of badges can be designed and issued according to the student profile, e.g. based on the background, prior and current knowledge, learning activities and learning performance (Abramovich, Schunn, & Higashi, 2013). Open Badges may be used to support (a) recognising skills, achievements, experiences, practices, memberships, engagement on individual, peer and community levels, (b) assessing learning including summative, formative and transformative assessment, (c) motivating learning and providing orientation, (d) studying learning based on the information contained in a badge such as what the badge represents, criteria, evidence, issuers, earners (Buchem, van den Broek, & Lloyd, 2016). Since issuing and earning of badges includes tracking of student progress, participation activities, learning outcomes, learning systems may be designed to process data related to the personal profile of every learner, including personal data. This learner-related data opens new opportunities but also creates new questions about data privacy.

Learning Analytics and PLE

Learning analytics could be used to improve learning through the information that can be obtained, but more importantly in the PLE context, it can also provide learners with recommendations in their learning based on earlier learning activity (Fournier, Kop, & Sitlia, 2011). For that purpose, not only data from a formal learning context is required, but more importantly, information from the outside of the institutional context, where learners are in an informal and personal learning context (PLE). This new context involves using distributed services across multiple learning scenarios and, consequently, new methods of data collecting and interpretation, for instance, Social Network Analysis (Casquero, Ovelar, Romo, & Benito, 2014; Fournier, Kop, & Sitlia, 2011). Evidently, these learning analytics methods can raise uncovered data of privacy issues related to the gathering of information that the learner is creating and sharing across multiple learning scenarios.

Privacy Model in PLE

Based on the different types of PLEs and their specific privacy issues, we propose the PLE privacy model to conceptualise privacy on different levels. Figure 1 summarises the main factors that have impact on privacy in PLEs. The model includes two levels of privacy control – learner-driven and institution-driven privacy control. Learner-driven privacy control is especially relevant in Web 2.0 / Social Media PLEs as well as in mobile PLEs, which are usually applied to support informal learning. Informal learning with PLEs gives more flexibility to learners to organise and control their private data. At the same time, learners in informal learning context are at a higher risk of disclose and misuse of private data, such as using default privacy setting in registration to Social Media, posting risqué pictures or excessive sharing of own and other users private data. In contrast to that, institutional PLEs limit learners' possibility to control their privacy, but instead of that they protect learners from inappropriate usage of their private data, e.g. by introducing certain regulations, such as Social Media Guidelines or keeping private data locked in an LMS. In the centre of the model, ePortfolio-based and badges-driven PLEs connect informal learning and formal learning contexts and require a both learners and institutions to apply common data privacy principles. An important question here is related to the connections between data privacy in formal and informal learning contexts and in data permeability.

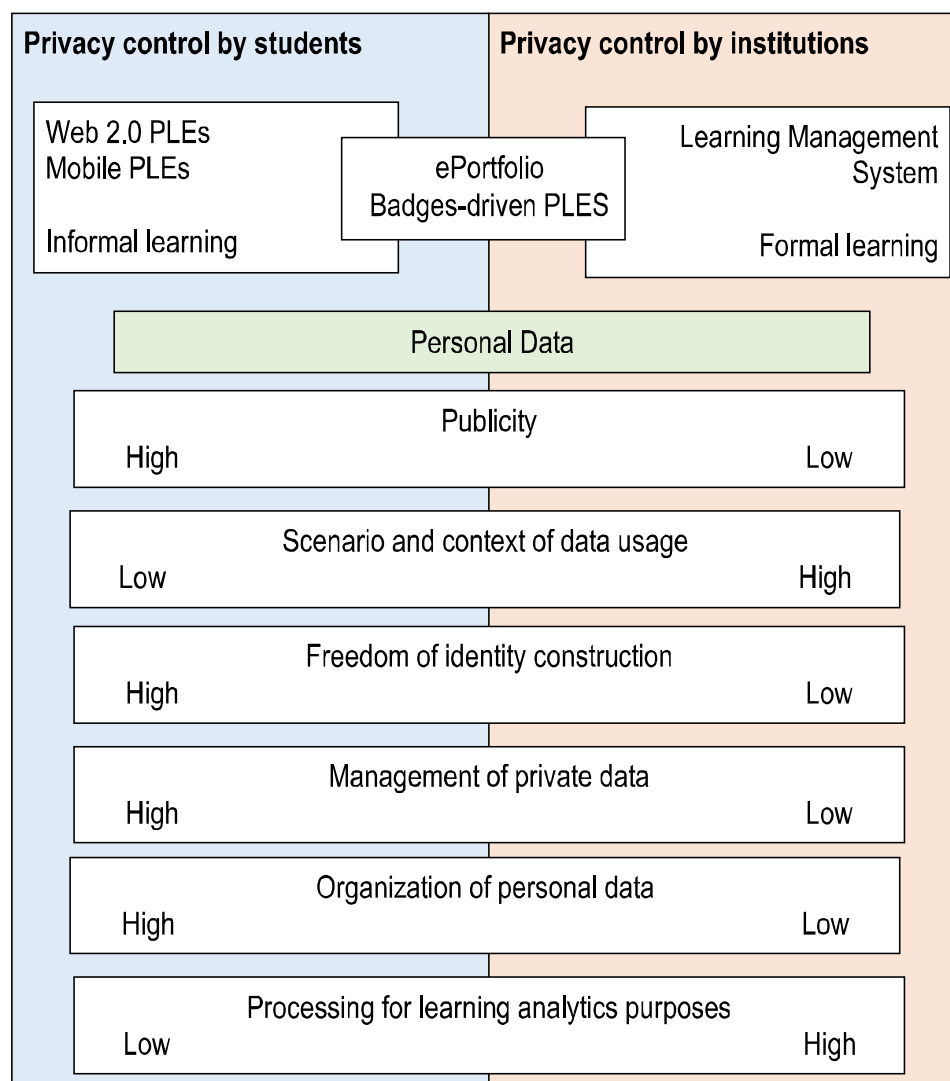


Figure 1. The PLE Privacy Model

The proposed PLE privacy model shows that the data privacy could be controlled more or less by students as well as by the training institutions. The main factors that reflect on the data privacy are extracted from the above described PLEs different implementations and they can be explained using a scale from low to high. The meaning of the factors is summarized as follows:

- **Publicity:** Publicity in PLEs means how much information is shared by students and universities and it is available for public usage outside the purposes of the educational process. It can be seen that Web 2.0 and Mobile PLEs are characterized with high publicity, because of the nature of the web and mobile applications which usage drives students to generate content – sharing information, communicating in social networks, annotating, etc. In contrast of that, when the personal learning process is organized in LMS, the shared information is closed in the training institution and the publicity is low.
- **Scenario and context of data usage:** PLEs organized in the web utilizes learning scenarios consisting of learning in open groups of interests, learning in community of

practices, learning in social networks that leads to the low level of privacy and usually it is a self-directed learning. PLEs that are part of the formal learning space are more closed just to the pointed learning groups by an educator and the PLEs are used in support of formal learning in well-defined educational scenarios according to a given course curriculum.

- Freedom of the identity construction: The possibility for students' identity construction is higher in the PLEs which purpose is to facilitate informal learning, because the students have freedom to prepare their own profile according to the specific learning interests and used tools/applications/services. This possibility is lower in the institutional PLEs, because the students' identity is forming from their participation and achieved results during given classes.
- Management of private data. The private data are with high possibility for management in Web 2.0 and mobile PLEs where students decide how to arrange the personal information. In university PLEs such freedom of private data management is not allowed, because of the strongly regulated principles and rules of the institutional learning environment.
- Organization of personal data: What kind of personal data will be hidden, shared or stored, kept or deleted, it depends of the students' understanding and this data organization is controlled by students. In the university settings the organization of personal data is low controlled by students, this process is typical for educators.
- Processing for learning analytics purposes: The control on the personal data usage for the purposes of learning analytics is low in web-based and mobile PLEs, because the students' data are utilized in many cases without their permission. In contrast of that, the training institutions have policies for personal data delivery to the third parties or applications where such data are analysed.

Conclusions

This paper provides an overview of existing PLE types in the context of data privacy to reveal several problems related to data privacy. The model summarizes the current situation of personal data usage in PLEs and could be used in the form of a recommendation tool explaining the possibilities for personal data sharing, organization and management and the influence of this fact on the data privacy. As learners need more tools to organise and control private data, there is a need for more research related to data privacy in Personal Learning Environments. One of the key directions in this emerging research may be the question of effective mechanisms for a responsible use and sharing of own and others private data in different media, learning systems, services and applications to enhance self-regulated learning in the context of growing diversity in Higher Education.

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SUSTAINABILITY AND DISTANCE LEARNING: A DIVERSE EUROPEAN EXPERIENCE?

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Abstract

Higher Education (HE) is experiencing disruption from technologies, demographics, the globalizing world and longer life expectancy. Historically Higher Education has had a legacy of being seen as the requirement for an educated “elite”, there has been a policy ambition set in various countries (including the UK) for it to become the expectation for much wider segments of the population as a whole. As students become “everyone” and learning becomes “all the time” Distance Teaching and Research Institutions have a tremendous opportunity but there are also many disruptions and barriers to overcome.

Innovations in the way we work, changes to the environment and the effects of globalization create deep and urgent requirements for people in all professions and vocations.

Higher Education institutions have an important role within Education for Sustainable Development and sustainable lifestyles; one of the important goals and targets of the United Nations Sustainable Development goals for 2030.

Higher Education can contribute to sustainability in many ways – social, technical and environmental; globally and locally. In particular distance-learning universities due to the flexibility in the learning process, use of technologies, and inter-disciplinary approach to teaching and learning, constitute key factors in education for sustainable development. But what will this contribution look like?

In this paper the responses from senior leaders in four major European distance-learning universities are presented, compared and discussed. The tentative conclusions draw out some strategic imperatives for sustainable higher education in the twenty first century.

Introduction

Open Learning can be argued to be centrally concerned with two of the great issues of our time: sustainability and disruptive technologies.

Firstly, sustainability. As this encompasses a rather broad spectrum of ideas, we follow the Brundtland Commission in understanding sustainability as to meet:

“the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland & Khalid, 1987)

In this definition sustainability necessarily includes the qualities and availability of higher education in a global setting of educational need, this setting includes the challenges of globalisation. The importance of informed sustainability in a global setting was made manifestly clear in the recent cut and thrust evident at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21) deliberations in Paris in December 2015. The Brundtland Commission was set up in December 1983 and chaired by Gro Harlem Brundtland. Formally known as the World Commission on Environment and Development (WCED), its mission was to encourage countries to pursue sustainable development together. The background was that the concern which the UN General Assembly had at the perceived deterioration of the human environment and natural resources. To bring countries together in collaboration for sustainable development, the UN established the Brundtland Commission.

Secondly, disruptive technologies are on the one hand providing the global learning community with the potential for more and more access to the wisdom of world scholarship and yet on the other hand are disrupting the very models which are attempting to deliver this learning. Massive Open Online Courses (MOOCs) are one surpassing example for opening up education that have received prominence beyond higher education. However, the added value of MOOCs to legacy educational systems has hitherto remained controversial.

Caught between the requirements of sustainability and the challenges of technological disruption we seem to be, as Manuel Castells puts it in his 2001 book, in a state of “informed bewilderment” (Castells, 2001). Or, as John Naughton – Senior Research Fellow in the Centre for Research in the Arts, Social Sciences and Humanities (CRASSH) at the University of Cambridge and Emeritus Professor of the Public Understanding of Technology at the Open University puts it in his seminal book: “From Gutenberg to Zuckerberg”, concerning the impact of the internet:

“fears are so widespread and diverse that they almost defy summarizing, but the main themes include: a conviction that the network is reshaping our intellectual, social, economic and political landscape in unpalatable ways, a belief that ubiquitous networking is changing our conceptions of art and entertainment – and blurring the distinction between news and entertainment; a perception that the Internet is fragmenting our culture into bite-sized chunks, overwhelming us with data, eroding personal privacy, polarizing our politics. The network, we are told, is creating a world of atomized, isolated individuals who would sooner send an email to a colleague in the next-door cubicle than lean over to talk to her” (Naughton, 2012; p.31).

Distance learning Universities would appear to have a potential to address a large population of students but this potential is vulnerable to the radical changes and disruptions evident in

the application of digital technologies (e.g. Massive Open Online Courses or MOOCs). Also, HE institutions face an unrelated but equally profound set of opportunities and disruptions related to innovations in the way we work, changes to the environment and the effects of globalization.

The dynamics of technology and work-place innovation combine in what has been called the Knowledge Society or KS. If HE participation in the KS then it is important to be clear on use of terms. What is the KS? There are lots of definitions. For example Afgan and Carvallo (2010) describe the KS:

“as a human structured organisation based on contemporary developed knowledge and representing new quality of life support systems. It (the KS) implies the need for a full understanding of distribution of knowledge, access to information and the capability to transfer information into a knowledge.”

The key themes of the definition are that the KS is based on contemporary knowledge and comes with *new quality life support systems*. Therefore, KS is not just society fundamentally based on knowledge. It implies a support system of knowledge, *knowledge supporting human life*. We will return to this idea towards the end of this paper.

If the KS is unfolding, then *who* is participating? If knowledge is a good thing then clearly we all should be participants. But, recalling the totemic work of Arendt on Totalitarianism (Arendt, 1950), slower and more deliberate rationalism may not lead to glorious participation. If the KS is like one of its famous predecessors; Industrial Society then it may well encompass all and take no prisoners. But there are grades of participation and engagement. This can be thought of from a number of ideological positions. For example:

1. those who own the means of Knowledge production and those who own nothing other than a potential to buy (possibly a Marxist interpretation) or,
2. the trade of knowledge in a benign and free market (more of a Classical Economics interpretation) or,
3. knowledge as a common right and a resource open to all according to need (a socialist interpretation?) or,
4. knowledge as a technical product available by diverse means (which we do not know or care about so long as we have them) and at diverse costs (which we also do not know about and only care if we cannot afford them) – a technical/ mechanistic interpretation.

But which, if any of these positions will come to dominate the knowledge landscape? Our hope was that the interviews we were to conduct would give us some indication of the strategic mind-set.

Distance Teaching (DT) could be argued to be particularly relevant and responsive to the specific challenges of KS. First, Distance Teaching can apply technologies to allow human interactions through the web and allowing a self-regulated learning process (Narciss et al.,

2007). Second, Distance Teaching is crossing boundaries of space and time for Life Long Learning. Third, Distance Teaching enables flexible/customized ways of education and graduation for everyone despite constraints. Due to these characteristics, Distance Teaching can also allow an inter-disciplinary approach to teaching and learning, what constitute key factors in education for sustainable development (ESD) (Lozano et al., 2013).

With these thoughts in mind we have undertaken interviews at four major European DT universities: the Open University in the UK, UAb, Universidade Aberta in Portugal, UNED, Universidad Nacional de Educacion a Distancia (the National Distance Education University) of Spain, and FernU, FernUniversität in Hagen in Germany. The universities stand for a plethora of innovation in Distance Teaching over the last decades. With regards to their past achievements these universities represent a key contact point to forecast the further development in Distance Teaching. The aim of our interviews was to discuss and reflect what role and strategies these European Distance Learning (DL) universities have to challenge sustainable development in the next two decades.

Questions and Method

Our interview involved asking the Vice Chancellors or Rectors of the four selected universities (OU, UAb, UNED, FernU) several questions relating to the sustainability of the DL model and the likely impact of current disruptions in the future. Through an email process over several weeks the authors arrived at six questions which we agreed provided the strategic leaders in each institution to set out their thinking on the key areas of long term vision, perspective on change, the link between HE and sustainable development, the impact of MOOCs in particular on the learning process, the place of the University in the provision of HE and the importance of a sense of place in the delivery of HE. Specifically, our six questions were as follows:

1. What is the current strategic vision of the University to meet the challenges of the next 20 years?
1. Is it “business as usual” for HE or can we expect to see dramatic change?
2. How does the University’s strategy contribute to the specific international challenge of sustainable development in its many guises?
3. What are the likely futures for MOOCs?
4. Is distance learning going to remain the preserve of a few specialized agencies or do you think it will become more widely provided by other agencies?
5. As country and language boundaries change – how important is a sense of place to the University?

As background we should note that the four universities in this study represent over six hundred thousand students across Europe.

The interviews were transcribed and a qualitative content analysis conducted. Most important ideas/quotes were summarized in the results.

An Overview of the Responses

What follows are a selected overview of some of the key responses to our questions.

Question 1: What is the current strategic vision of the University to meet the challenges of the next 20 years?

About this question several complementary ideas were raised by the respondents. The responses indicated that the leaders of the four institutions appeared comfortable with global and transboundary future challenges. Key responses included:

- Open University, UK: "... a community that is available to learners throughout their lifetimes and to try to do that globally";
- UNED, Spain: "initiatives should move beyond institutional or even national boundaries";
- Universidade Aberta, Portugal: "higher education system needs to be re-organised as a network of knowledge with interdependent institutional and social";
- Fern Universität, Germany: "Starting to think from the learner's perspective".

The complementarity of focus in the responses indicated optimism regarding the potential for global, boundary-free institutions, providing learning relevant to and primarily orientated from the perspective of the learner (a rhetoric captured in the term "Student centred learning").

Question 2: Is it 'business as usual' for HE or can we expect to see dramatic change?

Distance-Learning HE institutions, with their focus on technology-based learning would appear to be in a continuous process of changing and innovation. This overview is highlighted by the Universidade Aberta Rector when he suggests the need is to "embed the use of technological innovation", a view amplified by the UNED Rector: "universities will undergo significant transformations".

Further changes and challenges can be expected. FernUniversität noted that the university will need to be open to disruptive change: "we will have different roles" and the Vice Chancellor of the Open University noted that: "support could be delivered to more people at lower cost". This reference to the cost of HE needs to be seen in dynamic relationship to the cost-cutting which is possible with the adoption of mass technologies.

Question 3: How does the University's strategy contribute to the specific international challenge of sustainable development in its many guises?

The use of online technology can have an important role within education for sustainable development, namely for sustainability knowledge, assessment practices competences and outcomes assessment (Azeiteiro et al., 2014). All the respondents' seemed to agree with this sentiment and gave suggestions of how DL universities can embrace Sustainability in its different ways and domains:

- FernUniversität, Germany noted that: “everyone that graduates from a university has been confronted with ways to make our world more sustainable”;
- The Vice Chancellor of the Open University, UK noted that Distance Learning outcomes: “contribute to human capital which will be one of the most important ways of ... tackling issues of sustainability”;
- The Rector of UNED, Spain noted the need for a translation of rhetoric into realities: “we should do more to translate these kinds of declarations into real actions” and the Rector of Universidade Aberta, Portugal noted the need to be: “innovative in reducing the carbon footprint”.

Question 4: What are the likely futures for MOOCs?

MOOCs are a recent phenomenon, although given their impact, their usefulness and role within the education process is controversial. Questioning their future was considered important in these interviews. Different opinions were highlighted, the most important were:

- The Universidade Aberta, Portugal suggested that MOOCs could encourage wider adoption of education in that they were: “a ‘trigger’ and a way for the wide dissemination and adoption of educational innovation”;
- Open University, UK focused on the catalytic potential of MOOCs: “I don't mean, ... free degrees or anything like that at this stage but you can see where learning that is free at the point of use starts to become a component of more substantial qualifications”;
- UNED, Spain suggested that MOOCs have a transitional importance in that: “MOOCs will not be the future, but the future will not be understood without them”
- Finally, FernUniversität, Germany suggested that one size does not fit all. MOOCs have a place but this place needs to be considered and planned: “MOOCs need to be embedded in a learning environment where individuals can benefit from them”.

Question 5: Is distance learning going to remain the preserve of a few specialized agencies or do you think it will become more widely provided by other agencies?

With the advent of the internet, worldwide traditional universities are trying to add distance learning in their educational systems, justifying the importance of this question. The senior leaders engaged in our interviews generally agree on the convergence between distance learning and face to face teaching:

- Most strikingly the Rector of the Universidade Aberta, Portugal identified the: “convergence taking place between traditional universities and the open and distance learning” and the Vice Chancellor of the Open University, UK noted with regard to Distance Learning: “it's got to become more widely provided”;
- Emphasising the point, the Rector of UNED, Spain argued that: “the days are numbered for the rigid division between campus-based universities and distance and on-line universities”;
- and FernUniversität, Germany suggested: “The golden mean of blended learning combines the benefits of distance teaching and face to face teaching in higher

education”. It would appear that models of educational delivery need to be mixed and integrated.

Question 6: As country and language boundaries change – how important is a sense of place to the University?

For DL institutions geography and culture may not be seen as a barrier or border. Senior Leaders had a range of observations:

- For the Universidade Aberta in Portugal the issue of place is key and is centred around the importance of language: “still need to have a place. For U. Aberta, that place is the Portuguese language with its 400 millions speakers”;
- At the Open University in the UK the focus was more on place as in a building in which to deliver education. As the Vice Chancellor notes a university: “may not necessarily be a building in the centre of town”. (This suggests that location is less important and, indeed in the UK the Open University has recently begun to close regional centres.);
- For the UNED in Spain this sense of the lack of importance in a given place is shared. How important is a sense of place? The Rector responds: “not among the believers in a virtual world with only virtual relationships”;
- Finally at FernUniversität in Germany the Rector again points to the questionable value of a sense of place: “But I am not convinced that an actual geographical point of reference is necessary to achieve this feeling”.

Discussion and Conclusions

The pressure to be sustainable and to act responsibly in a global context set against the powers of disruptive technologies can combine to provide a complex system much in need of coherence. Distance teaching and Distance Learning via internet technologies are a complex system and their contribution to what some call the Knowledge Society is at once both obvious and unclear.

In our interviews with the strategic heads of four of Europe’s leading DT universities we gained wide ranging and occasionally contradictory insights. For the long form version of the four interviews contained in this paper please refer to the Editorials of Open Distance and E-Learning, Editions: Volume 31, Numbers 1, 2 and 3 and Volume 32 Volume 1. In this paper, we look only at what we consider to be our key findings.

Whilst it is true that there was much agreement among the leaders on the essential need for change and transition there did not seem to be an understanding that there was a strong role to be played in policies around concepts of sustainability. Concerns relating to the student learning experience and the importance of institutional resilience seemed more evident than any vision of a key role in sustainable development or deeper visions of global existential issues. DT and DL did not seem to be seen as key players in sustainable development. Maybe this was born out in that geography seemed to be less important. The physical place was diminished but language and communities of practice seem to rise in strategic importance as

the HE DL institutions figure out how they will mark the boundaries of their actual and potential student communities. But the future of the HE institution itself is seen to be under some questions with leaders reflecting on the convergence of agencies delivering the teaching and, in passing noting that this may well end up as a blend of private and public providers. Indeed, *blended education* might be a phrase which we see repeated again and again as the HE providers of DL blend face to face with virtual, blend various forms of internet technologies and blend delivery mechanisms with private agencies for optimum economic performance and logistic efficiencies. If these optimum and logistic improvements are real or rank as illusion is yet to be seen. Our four leaders agreed that educational delivery is in transition and that there is no clear view as yet as to what the final model will look like (if there is to be a final model or if DL is rather to follow the metaphor of the airport – constantly under renewal) but it does seem that, important as they are MOOCs are a stepping stone to the future but not the future.

Across Europe, these four institutions, delivering HE to over six hundred thousand students struggle with disruptions which were not included in the initial vision of their foundation. The sustainability of HE distance delivery is now in question as disruption to workforce and wider political changes call into question the globalisation which lies at the core of true distance education. Education *sans frontier*? All four institutions show remarkable similarities but also some major variations in response to the six questions and the realisation of the Knowledge Society which lies at their core. We might summarise with the observation that sustainability is, by and large, yet to be seen as much more than the narrow sustainability of the individual institutions life cycle of educational delivery. HE DL is not seen in this survey as a profound lead agency in delivering a sustainable world. However, the struggle to master the challenges of technology and the need to meet the aspirations of the student body in a rapidly changing world will surely mean that issues of global sustainability will rise up the distance learning agenda.

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EFFECTIVE STRATEGIC DECISION MAKING ON OPEN AND DISTANCE EDUCATION ISSUES

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Abstract

Strategic decision making about education and open and distance education (ODE) issues requires analytic approach supported by a suitable method. The Analytic Network Process (ANP) meets all the requirements of decision making in higher education (HE), but it is very rarely used in practice because of its weaknesses. The weaknesses are related to the complexity of the method and demand on resources in the process of implementation. An upgraded ANP method that combines the ANP with the Social Network Analysis (SNA), which diminishes some of the weaknesses of the original ANP, is presented in this paper.

Introduction

Current ODE and e-learning challenges are related to diversity of student body, open learning environments, learning analytics, labour market needs, specific characteristics and demands that come from users, changing users' attitudes, behaviours and roles (The NMC Horizon Report, 2017). Bates predicts (Bates, 2014) disappearance of online learning as a separate construct, then that multi-mode delivery will be concentrated in fewer institutions but with more diversity and with multiple levels of service and fees, that it is coming an end of the lecture-based course and written exam, establishing the final implementation of lifelong learning with new financial models, that systematic faculty development and training is crucial, that all that provoke devolved decision-making and organizational models, more difficult issues with student privacy, data security and student online behaviour. Dealing with those challenges requires strategic decision making. Using appropriate methodology for strategic decision making (DM) is crucial to make effective decisions.

The research presented in this paper has been prepared in the scope of the project "Development of a methodological framework for strategic decision making in higher education – a case of open and distant learning implementation" (HigherDecision) supported by Croatian Science Foundation (web: higherdecision.foi.hr). The primary goal of HigherDecision project is to develop a complete methodology for strategic decision making and monitoring of its implementation in HE. Two basic components of the project are: (a) Development of methodological framework for strategic DM and monitoring of its implementation; (b) Application, adjustment and evaluation of methodology on the example of decision implementation on ODL and e-learning.

In our previous research, we investigated decision making methods and methodologies used in the decision making in HE and/or ODL. We defined characteristics of decision making in HE and analysed DM methods in order to be applicable for decision making in HE and particularly suitable for the area of ODL and e-learning.

The specific objectives of this paper are:

- to discuss the most suitable methods for strategic decision making in HE, and
- to present upgraded ANP method for strategic decision making illustrated with an example of using the upgraded ANP method on an e-learning problem.

Previous research

In the scope of the project HigherDecision we have investigated which decision making methods and methodologies are used in the decision making processes in higher education connected to ODL (Kadoić, Begičević Ređep, & Divjak, 2016). Results show diversity of methods, methodologies and approaches used in the strategic decision making on ODL that proves complexity of the topic and variety of approaches. The most frequently used method was the Analytic Hierarchical Process (AHP) which is the most well-known multicriteria decision making method.

In the second phase of our research we defined characteristics of decision making in HE (Divjak, 2016) and created a list of characteristics of DM methods in order to be applicable in the area of HE and ODL (Divjak & Begicevic, 2015). In Table 1 we list several decision making methods and assess how they fit HE and e-learning/ODL demands (Divjak & Begicevic, 2015; Wudhikarn, 2016).

Table 1: How different decision making methods fit HE and e-learning/ODL demands

HE and e-learning/ODL demands	ANP	AHP	Promethee	Electre	Topsis
Problem structuring	+	+	-	-	-
Multi-criteria method	+	+	+	+	+
Modelling influences between Decision making elements	+	-	-	-	-
Qualitative scale (criteria)	+	+	+	+	+
Quantitative scale (criteria)	+	+	+/-	+/-	+/-
Group decision making	+	+	+/-	+/-	+/-
Sensitivity analysis	+	+	+	+	+
Risks and opportunities	+	+	+	+	+
Benefits and costs	+	+	+	+	+

Based on the obtained results shown in Table 1, our conclusion is that the most suitable decision making method for strategic decision making in HE and e-learning/ODL issues is the Analytic Network Process (ANP). The ANP is a Multi Criteria Decision Making (MCDM) method introduced by Saaty (2001) as a generalization of the AHP method. The AHP method is one of the most widely exploited MCDM decision-making methods in cases when the decision (the selection of given alternatives and their prioritizing) is based on several tangible and intangible criteria (sub-criteria). However, many decision problems, especially in HE and

ODL, cannot be structured hierarchically because they involve the interaction and dependence of higher-level elements in a hierarchy on lower-level elements. Therefore, creation of a network of elements is needed (Begićević, Divjak, & Hunjak, 2009). The basic structure of the ANP is an influence network of clusters and nodes contained within the clusters (Saaty & Cillo, 2008). This characteristic differentiates the ANP from the AHP. Priorities in the ANP network are obtained in the same way as in the AHP by using pairwise comparisons and judgments. The first step in an ANP application is to group the criteria that influence decision in clusters. The next step is to do pairwise comparisons using judgments based on the Fundamental Scale (1 to 9 scale of absolute numbers) (Saaty, 2001) and deriving priorities as the eigenvector of the judgment matrices. The main steps of the ANP are briefly described in the following section, but a detailed outline can be found in (Saaty & Vargas, 2006). Furthermore, in sections 4 and 5 we have listed the main ANP disadvantages and proposed the ANP upgrade that eliminates some of the identified disadvantages. In section 5 we have discussed and illustrated with an example why upgrade of the ANP is more usable for decision makers in HE and e-learning/ODL than original ANP.

The Analytic Network Process (ANP)

The basic elements of the ANP are clusters and nodes (criteria) contained within the clusters. A network has clusters of elements, with the elements in one cluster being connected to elements in another cluster (outer dependence) or the same cluster (inner dependence). In outer influence one compares the influence of elements in a cluster on elements in another cluster with respect to a control criterion and in inner influence one compares the influence of elements in a group on each one (Begićević et al., 2009). The main steps of the ANP illustrated with the example of a problem structured in two clusters are (Saaty & Cillo, 2008) as follows.

1. Decision making problem structuring

Decision making problem structuring – identification of alternatives and criteria and grouping criteria into clusters (in Figure 1. there are two clusters k1-k2 and k3-k4-k5); the influences between criteria (nodes) are defined (dotted arrows); alternatives from cluster a1-a2-a3 are connected with all criteria (solid arrows).

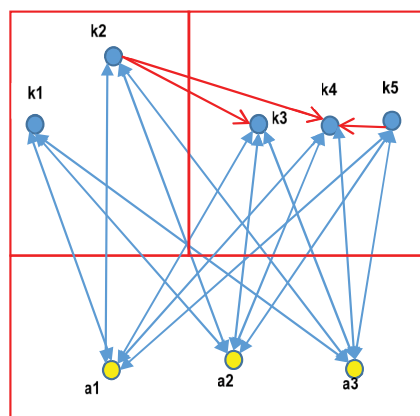


Figure 1. Structure of decision making problem (clusters and alternatives)

2. Construction of the supermatrix

Construction of the supermatrix – two-dimensioned matrix that indicates criteria and alternatives rows and columns (Table 2). In cells are weights of criteria and priorities of alternative (calculated in Step 3). Problem shown in Figure 1 has one supermatrix because the problem is simplified – two criteria clusters are parts of one control criteria.

Table 2: Unweighted supermatrix

	C	k1	k2	k3	k4	k5	a1	a2	a3
C	0	0	0	0	0	0	0	0	0
k1	0,4	0	0	0	0	0	0,4	0,3	0,8
k2	0,6	0	0	0	0	0	0,6	0,7	0,2
k3	0,3	0	0,4	0	0	0	0,5	0,1	0,4
k4	0,3	0	0,6	0	0	1	0,15	0,3	0,3
k5	0,4	0	0	0	0	0	0,35	0,6	0,2
a1	0	0,2	0,5	0,3	0,4	0,3	0	0	0
a2	0	0,7	0,1	0,1	0,2	0,4	0	0	0
a3	0	0,1	0,4	0,6	0,4	0,3	0	0	0

3. Pairwise comparisons

The data to fill supermatrix is calculated by pairs-wise comparisons of cluster elements. Criteria and alternatives are compared by using Saaty's scale of relative importance. The scale has 9 values (degrees): 1 means that two elements are equally important, 3 means moderate importance of one element over other, 5 means strong importance, 7 means demonstrated importance and 9 means absolute importance (intermediate values 2, 4, 6 and 8 as well as real numbers between 1 and 9 are used) (Saaty, 2008). When making comparisons, we have to pay attention on inconsistency ratio (number that describes if transitivity relation has been satisfied).

Comparisons needed in our example (Figure 1):

1. Comparisons of elements in each criteria cluster: k1-k2 and k3-k4-k5. Criteria weights are visible in Table 2, column C, rows k1-k5;
2. Comparisons of criteria that are influenced by same criteria k3 and k4 are compared to k2 (results are shown in column k2, rows k3-k4). k5 influences (only) k4 which means that in column k5, row k4 1 is written;
3. Comparisons of criteria values per each alternative; in each cluster. 6 pairwise comparisons should be made: comparing criteria k1-k2 in pairs with respect to a1, a2 and a3; then comparing criteria k3-k4-k5 with respect to a1, a2 and a3. Results are shown in Table 2 in columns a1-a3, rows k1-k5;
4. Comparisons of alternatives with respect to each criterion. Results are shown in columns k1-k5, rows a1-a3.

4. Comparisons on cluster levels

The goal of this step is to get weighted supermatrix (Table 3) which consists of eigenvectors (sum of all values in each column equals 1). In our example we have to do:

1. Comparison of clusters k1-k2 and k3-k4-k5 with respect to goal in order to get cluster weights which will normalize column C;
2. Comparison of clusters k1-k2 and k3-k4-k5 with respect to alternative cluster (a1-a2-a3) in order to get cluster weights which will be used to normalize columns a1, a2 and a3;
3. Comparison of cluster k3-k4-k5 with cluster a1-a2-a3 with respect to k3-k4-k5 in order to get weight which will be used to normalize column k5;
4. Comparison of cluster k3-k4-k5 with cluster a1-a2-a3 with respect to k1-k2 in order to get weights which will be used to normalize column k2.

Table 3: Weighted supermatrix

	C	k1	k2	k3	k4	k5	a1	a2	a3
C	0	0	0	0	0	0	0	0	0
k1	0,2	0	0	0	0	0	0,2	0,15	0,4
k2	0,3	0	0	0	0	0	0,3	0,35	0,1
k3	0,15	0	0,2	0	0	0	0,25	0,05	0,2
k4	0,15	0	0,3	0	0	0,5	0,075	0,15	0,15
k5	0,15	0	0	0	0	0	0,175	0,3	0,1
a1	0	0,2	0,25	0,3	0,4	0,15	0	0	0
a2	0	0,7	0,05	0,1	0,2	0,2	0	0	0
a3	0	0,1	0,25	0,6	0,4	0,15	0	0	0

5. Calculating limit-matrix

When we multiply matrix from Table 2 with itself and repeat that procedure, after final number of steps we get matrix that by multiplying does not change anymore. That is a limit-matrix. There are two possible situations: limit matrix with circular influences between elements and limit matrix without circular influences between elements. In the first case, a multiplying must be used to get matrix in which all values in the same row are equal (those are final criteria weights and alternative priorities). In the second case, the Cesaro formula for calculating criteria weights and alternative priorities must be used.

6. Sensitivity analysis

Analysis that shows how a change in input parameters influences the output parameters (Saaty, 2001). In terms of the ANP, input parameters are comparison values in steps 3 and 4. Output parameters are criteria weights and alternative priorities. In this step, we slightly (for 5 %) change input values and observe what happens with output variables. We are especially interested in observing alternative with highest priority – whether it is going to stay with highest priority after the changes of all input variables occur ($\pm 5\%$).

Disadvantages of the ANP

Despite many advantages, some disadvantages cause low rate of the ANP practical implementations. Here are some recognized disadvantages for using the ANP:

1. Saaty's scale is not big enough (Saaty & Vargas, 2006);
2. The ANP is mainly used in nearly crisp decision applications (Ayağ & Samanlioglu, 2016);
3. Large number of comparisons – solution to that problem is introducing ratings of alternatives instead of pairwise comparisons (Saaty, 2008), but then we get less precise results (Saaty & Vargas, 2006);
4. Questionable understanding of comparisons of two criteria with respect to the third one (our example: in 3a. step we have to compare k3 and k4 with respect to goal, but in 3b. step we also have to compare k3 and k4, but this time with respect to k2 – that is often confusing);
5. Comparisons of clusters are also often very confusing and not understandable (our example: in 4a. step we have to compare two clusters with respect to goal, and in 4b. we also have to compare the same cluster, but now with respect to cluster a1-a2-a3). People often do not differentiate between those two comparisons and do not know how to include influences between clusters when forming judgement;
6. High complexity of the method in general and in comparing with the AHP. The AHP covers only some of the ANP steps. In the AHP, we do not care about influences between criteria, which makes the first step much simpler. In our example, if we want to use the AHP instead of the ANP, there is no need to conduct 3b and 3c steps, as well as 4a, 4b and 4c. That also makes the AHP much simpler. Additionally, it makes the AHP a more often used method than the ANP.

The ANP upgrade

The ANP upgrade has focus on using the advantages of the SNA (Social Network Analysis) to diminish disadvantages of the ANP. Both methods are based on graph theory that enables their combination.

Basic elements of the SNA in light of the graph theory are nodes/vertices (elements) and ties/edges/loops (connections, ordered or unordered pairs of nodes). Graphically, nodes are presented as points and ties as lines or arrows depending on the type of a tie (directed or undirected tie). Furthermore, ties can be unweighted (binary) or weighted. Binary tie has just the information if two nodes are connected, whereas weighted tie has additional information on intensity of connection between two nodes. In terms of the SNA, there are two basic types of analysis: centrality measures and substructures in network. We will focus on centrality measures because they can be helpful when calculating criteria weights. Centrality measures are related to nodes and they show importance of a certain node. There are three basic measures (Knoke & Yang, 2008):

1. *Centrality degree* is the simplest centrality measure. It equals to the number of ties that are connected to a particular node. In directed graphs, we differ between centrality indegree (the number of ties that “come in” certain node) and centrality outdegree (the number of ties that “come out” from certain node).
2. *Closeness centrality* is a centrality measure that calculates how close a certain node is to all other nodes. Calculation of this measure is based on geodesic distances (a shortest path between the nodes) between observed node and all other nodes. Characteristics of node with high closeness centrality are: fast access to all other nodes and high influence on other nodes.
3. *Betweenness centrality* is a centrality measure that represents the degree of which nodes stand between each other. In other words, the betweenness centrality counts how many shortest paths between each pair of nodes of the graph pass by a node.

The ANP upgrades presented in this paper are based only on the three main centrality measures and it was developed by using *design science research process* paradigm (Hevner & Chatterjee, 2010). In accordance with this approach, we have defined several types of ties for the purpose of upgrading the ANP. They are described as follows and illustrated here by the example explained in the Demonstration.

- *Domination ties* are ties between nodes that come as a result of comparing criteria, alternatives and clusters by using Saaty’s scale. Influences between criteria are not considered (analogy with the AHP). Figure 2 describes the example from the section 3. There are five criteria clusters and, as it was presented in section 3, step 3a, we have to do pairwise comparisons of all criteria. In terms of the SNA we got weighted directed graph.
- *Influences between criteria as ties in network* – In the first step of the ANP we make decision making problem structure. We list all criteria as well as influences between them. Also, we have to measure those influences. The example is presented in Figure 3. Red lines represent influences between criteria (influences do not have to exist between all criteria). The difference between our upgrade and original ANP is visible in this step: in the original ANP we would have to do pairwise comparisons of all elements that are influenced by the same node and in our method experts do not make comparison because only data about influences between criteria in weight calculation are included.
- *Influences between criteria resulted from alternatives as ties in network* – Now we analyse each alternative and compare criteria with respect to values of alternatives. In our example, a certain alternative has excellent value on criteria 2, but very low value on criteria 1 – that means that we draw tie between node 2 and 1. In Figure 4 additional ties are shown (when compared to Figure 3) – those are ties which came as a result of comparing criteria values per each alternative. This step contains no significant difference related to the original ANP method.

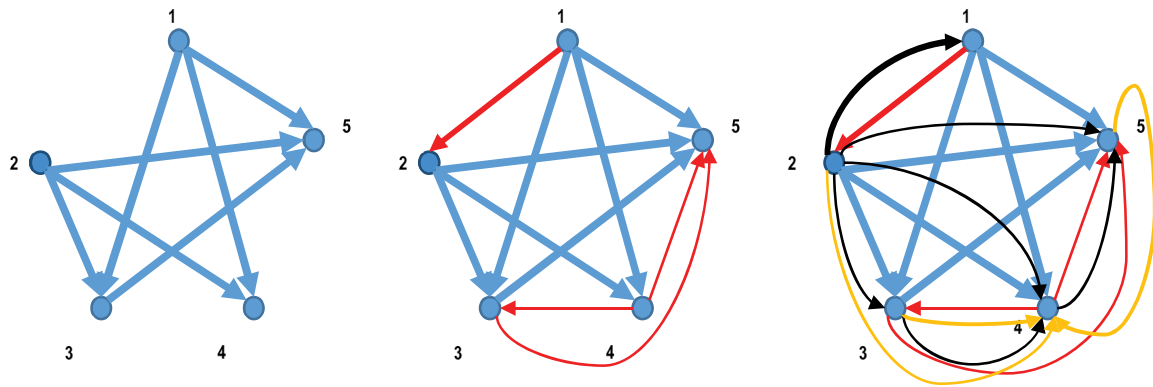


Figure 2., Figure 3. and Figure 4. Types of ties in upgraded ANP

- *Alternative domination ties* – We will get final weights of criteria from Figure 5 by calculating and normalizing centrality measures for each criteria. Then we make alternative network and draw ties between nodes with respect to real values of alternatives per each criteria. After that it is possible to calculate global priorities and decide. In Figure 5 there are two alternatives and dominations between them per each criterion.

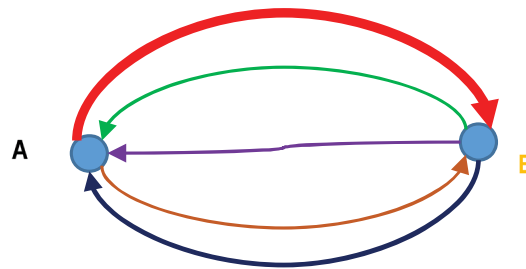


Figure 5. Alternative domination ties

In situation with more clusters (step 4 from section 3), in the original ANP method, we would have to compare clusters in pairs with respect to goal (in example step 4a). The clusters would also have to be compared with respect to other clusters depending on existence of ties between cluster criteria. In the upgraded ANP, we would have to compare clusters only with respect to goals. Ties between clusters will be incorporated to clusters' weights with centrality measures.

Demonstration

In order to demonstrate the method, we selected a problem of comparing popularity of Edmodo and Moodle (data taken from: <http://www.capterra.com/learning-management-system-software>, 2016). Table 4 contains data about decision making problem: criteria (Number of customers, Number of users, Facebook likes and inFollowers), alternatives (Moodle and Edmodo) and values. The results must show which one is a better choice based on defined criteria and judgements of decision makers.

The criteria weights and priorities of alternatives are shown in Table 5. Weights of criteria in ANP upgrade method are calculated normalizing centrality values. The results show different priorities of alternatives (Moodle and Edmodo) if we are using different methods for

decision making. Figures 2-5 represents nodes and ties for this example. As it is shown in Table 5, the final results are very similar for three methods. However, upgraded ANP method used less resources for obtaining the result than original ANP without losing network structure of the decision making problem modelling.

Table 4: Comparing popularity of Edmodo and Moodle

	1 Costumers	2 Users	3 Facebook likes	4 inFollowers	5 Twitter followers
A Moodle	70569	89237532	20747	8808	24400
B Edmodo	350000	58000000	69485	4753	111000

Table 5: Comparing different decision making methods results

	1 Costumers	2 Users	3 Facebook	4 LinkedIn	5 Twitter	A Moodle	B Edmodo
AHP	0.365	0.365	0.09	0.09	0.09	0.44	0.56
Original ANP	0.378	0.385	0.094	0.083	0.06	0.46	0.54
ANP upgraded	0.346	0.367	0.0911	0.0971	0.0988	0.47	0.53

Conclusion

In this paper, we presented basics of the upgraded ANP method that eliminates some of disadvantages of the original ANP, such as complexity of the method and a large number of pair-wise comparisons that decision maker must do. We have combined the methodology of decision making modelling applied in the ANP with centrality measures used in the SNA in order to develop an upgraded ANP that has direct impact on decreasing disadvantages 3-6 from the list of disadvantages mentioned in section 4. With a new method, the number of criteria comparisons on cluster level is decreased and all comparisons that are result of criteria or cluster influences in original ANP are now excluded because influences are incorporated in model through centrality measures. That can be done by using only data provided in step 1 of the ANP. This also eliminates disadvantages 4 and 5 because decision makers do not have to do comparisons that usually are not understandable to them. Complexity of algorithm for finding solution of a decision making problem is also lowered. It is still higher than the complexity of the AHP but the upgraded ANP, similarly as original ANP, is modelling influences between criteria. In the next phases of our research we are planning to do a validation of the developed method by using a number of simulations on different decision making problem structures.

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ASSESSING DIVERSITY IN LEARNERS BACKGROUND AND PERFORMANCE

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Introduction

Assessing diversity in learners' background and performance assumes the observation of learning processes. Observation may be executed both in case of contact learning activities and especially in e-learning systems, where the storing of data logs is an essential part of system maintenance and system analysis.

The observation of human individuals through questionnaires and/or interviews (e.g. collection data about satisfaction levels concerning learning objects, phases, etc.) should always be interpreted on the basis of the parable of the "boiling frog".

Storing logs apparently requires the definition of phenomena (being worth logging) in advance. It is – however – not the only method. Moreover this method as such has inevitable risks. Lack of data in case of newer interpretation needs being generated in the hermeneutical process based on plan-oriented data. Instead of defining data needs in advance, it is possible to create logs which guarantee a high level of reproduction concerning each detail of the learning process (incl. even mouse movements in 1/100 sec rhythm). Reproduction-oriented logs always ensure the chance of being able to follow arbitrary analytical objectives any time. Therefore the quality and efficiency of assessing diversity in learners' background and performance highly depends on the quality of data, where efficiency is considered as a kind of ratio between derived information added value and the resources needed.

In this article, the authors focus on e-learning systems with high level reproduction capacity in the process of logging. Contact study activities are not examined at present, yet blended learning activities (like e-seminars) are also among the targeted features. The aim of this article is (based on real data assets over 10 millions of records but without case-study-like results) to outline an analytical system covering quasi 360° of analytical expectations for a (later automated) decision support service using both classical statistics and artificial intelligence methods for modelling (e.g. robot teachers).

The system

Figure 1 show System elements and their connections.

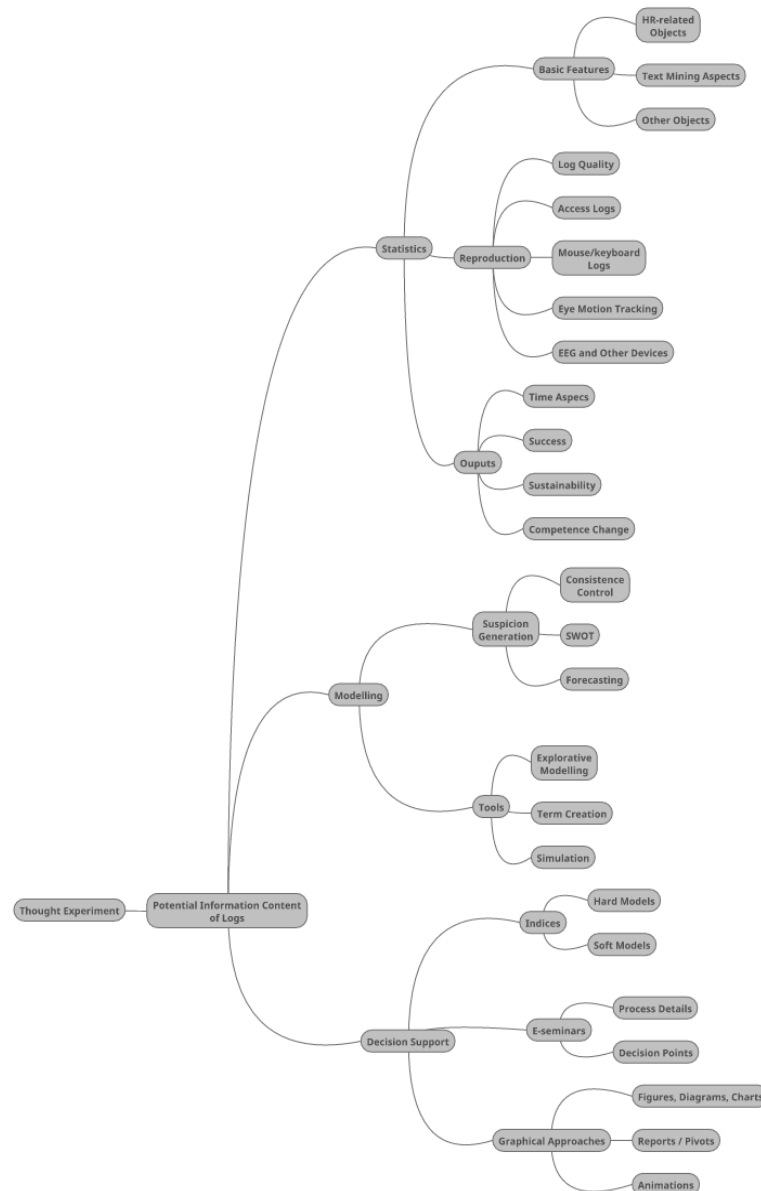


Figure 1. System elements and their connections (source: Edited by the Authors)

Legend

The figure above shows the structure of exploring diversity in learners' background and performance based on classic and innovative techniques (e.g. artificial intelligence). The brief description of the structure elements below outlines the most important characteristics:

Statistics: Parallel to modelling and decision support (see elements on the first level), classic statistics serve a kind of general interpretation and a sort of quality assurance in the data asset management through their results:

- *Basic features*: there are statistics, which are obligatory, such as plausibility or consistence checks (like exploring maximum, minimum, average, median values, or the same set for ratios between variables):
 - *HR- related objects*: in learning processes the HR-objects (like students, teachers, managers, etc.) play a central role;
 - *Text mining aspects*: although multimedia elements become more and more important in learning activities, pieces of texts are general parts of learning as such – pieces of texts, which may not be interpreted in an arbitrary depth, but they may be described based on a lot of specific indicator;
 - *Other objects* (courses, learning materials, etc.): parallel to HR objects, the object-attribute logic allows the definition of quasi unlimited further objects and their possibly measurable attributes;
- *Reproduction*: the logging of learning processes ensure the highest flexibility forever if the processes are stored in the most possible detailed way:
 - *Log quality*: the logs delivering high level reproducibility are in principle raw data from which further indicators/terms should be derived (like target-orientation of mouse movements);
 - *Access logs*: they are the most traditional data being available in e-learning systems, and they deliver basic information about system usage and access rights;
 - *Mouse/keyboard logs*: the most robust part of reproducibility is the set of control signals in the buffers assuming that there is not a voice control system active;
 - *Eye motion tracking*: eye motions do not produce control signals during the system usage, but they are signals for deriving learners' behaviour patterns;
 - *EEG and other devices*: like eye motion signals, EEG and/or other (non-invasive) physiological measurement devices are capable of collecting data about users' conditions;
- *Outputs*:
 - *Time aspects*: each logged data unit should always have a timestamp – this is the basic information unit of reproducibility in general;
 - *Success*: learning/teaching success indicators (mostly used as dependent variables of modelling/simulating) may be observed in a primary way (like credits, scores) and they may also be derived as secondary indicators (like ratio with eye contact during the whole education period in the class);
 - *Sustainability*: this is the multidimensional interpretation of unique success indicators, where a lot of parallel signals should always be aggregated to an ant discriminative index being capable of characterizing synchrony between separated evaluation criteria;
 - *Competence-change*: the most complex term concerning learning and teaching processes, because each kind of ability may be seen as an independent competence (like score in diverse tests: e.g. IQ) or a part of a set of raw indicators for a more

sophisticated phenomenon (like stress tolerance based on all thinkable inputs showing stress symptom);

Modelling: models are mostly decision-oriented objects with sophisticated hermeneutical support:

- *Suspicion generation:* suspicions are any type of irrationality in behaviour patterns of observed objects:
 - *Consistence control:* consistence is a global indicator in multidimensional system monitoring, where each attribute value in case of similar objects (like students) should be derivable based on the rest of variables;
 - *SWOT:* suspicion may have direction and dynamic – where the automated derivation of SWOT components deliver objective evaluations instead of subjective evaluation risks (as until now);
 - *Forecasting:* system behaviour may also be interpreted to predict the future (see plan-values) – each unexpected event is a kind of suspicion;
- *Tools:* to be capable of being objective, even automated, it is necessary to use innovative analytical techniques (like chains of similarity analyses):
 - *Explorative modelling:* exploration means being capable of deriving connection characteristics between phenomena without approximation in different ceteris paribus levels;
 - *Term creation:* human terms are products of human intuition processes, but computer systems need derivations of these terms from measured data in order to minimize the hermeneutical illusion of the human brain in the evaluation/observation/interpretation processes;
 - *Simulation:* to be able to influence complex systems, it is necessary to build simulators being capable of estimating system outputs, for circumstances which may happen, are bound to happen, but have not happened until now;

Decision support: assessing diversity in learners' background and performance is not an arbitrary activity – based on logs and their analyses, learning/teaching systems should be influenced in a rational way:

- *Indices:* in an object-attribute logic indices/variables make characterizing of objects possible (see before):
 - *Hard models:* analyses with a matured hermeneutical frame delivers decision possibilities (even for automated system maintenance if needed);
 - *Soft models:* analyses without clarified consequences catalyze human intuition processes leading to hard models sooner or later;
- *E-seminars:* this form of teaching and learning may be seen as a sort of complex experimental field:
 - *Process details:* to be able to derive complex hermeneutical processes, the observed system should always be described also with such parameters, which are basics of

- human ethological observations (like legal elements referring to learners and/or teachers);
- *Decision points*: in order to be efficient enough, it is necessary to think about the influence potential of system designers and users, where users are not always motivated to behave as expected (like pretended learning);
- *Graphical approaches*: a massive part of hermeneutical processes are visualization effects, where an optimized visual world supports both the analysis and teaching/learning:
 - *Figures, diagrams, charts*: only the most matured solution have the potential to substitute long descriptions;
 - *Reports/pivots*: it is necessary to build a standard for systems designers and also for users in case of common interpreting reports/pivots;
 - *Animations*: animations make it possible to show logical steps and/or dynamics of results.

Discussion

High-level reproduction of learning processes needs a kind of adaptation of data protection law. Users of e-learning systems must be informed with detailed rules in the terms of services before registration. In a similar case of a 360° health service (developed in a parallel way), data protection problems would be managed under the aegis of the Hippocratic Oath.

Classic statistical analyses may lead to a kind of hermeneutical illusion with higher frequency than sophisticated models based on artificial intelligence approaches. Beside physical, physiological, cognitive illusions, hermeneutical illusions derive the wrong association based on hard facts and cellular intuition capacities like prejudice towards individuals, or bad estimations in the stock markets, etc. Statistical logic uses ratios to derive evaluations, but this sort of thinking can be instable as the following fable highlighted the risk momentum: “It should be assumed, in a newspaper an article was published about for example that ‘Steppe-Land’ is at the last rank among the world’s countries regarding its environmental expenditures per capita, vis-a-vis for example ‘Robotia’ where a lot of money is expended for environmental protection. Poor people from Steppe-Land could walk from now with their head down in the world if they were not be spirited and if they could not be able so to say pass in the revolving door, too. As journalists and scientists of Steppe-Land published a news against the previous mentioned articles since the world's countries have been COMPARED using data series of UNO, and calculated that in certain life situation how much the correct amount is which should be spent to environmental protection considering the other country-indicators. And wonders of wonders in Steppe-Land, where the wind blows softly, the air has fresh flower fragrance and where industry, population is not much and where ancestors have already solved water regulation the statistically detected environmental expenditures per capita exceeds quasi with 10% that level, which could have been taken by others in their place. As in the case of Robotia (the muddy citadel of industry) turned out that if they spend quasi twice as

much as nowadays, maybe we can talk about such environmental condition, as in the case of Steppe-Land.” (Pitlik, 2014).

Infographics and their readers may both be diverse. The realization of a real graphical information added value is a kind of simulation problem. Based on the reader’s attributes, the ideal parameters of infographics should be optimized. For the time being this is a task for visual artists. However the concept of a robot designer may not be abandoned.

Potential meanings of competence should be defined in such a clear way, that the change of competence may be measured automatically. Competence could be interpreted in different ways: on one extreme opposite, the capability of mugging up learning material is also a sort of competence, but on the other extreme opposite – the right thinking about e.g. the Monty Hall paradox directly without ever during the teaching process is another competence. Term-creation capability of artificial intelligence methods – like similarity analyses (Pitlik, 2014) – ensures that words produced in the human brain can be transformed into source codes. The terms created should be compared to each other to see through the glass of term-creation possibilities, how consistent is the structure of facts (Pitlik & Horváth, 2016).

Conclusion

The reproduction level of learning processes (i.e. observing the user any time) is just a question of resources.

Artificial intelligence based analyses make managing diverse terms possible (originating in high flexible human association/intuition capabilities) in a numerical way. Model quality may be interpreted in new ways like consistency of models based on parallel function symmetry indices. Alternative solutions may be ranked following the logic of Occam’s razor, where the parallel goodness criteria of the ideal solution is interpreted in case of each unique solution. Finally a ranking model derives the best one, based on anti-discrimination principles.

The basic goal within the field of info-graphics is the adaptation of the well-known visualization highlight from Hans Rosling (2010). This solution can also be applied in the learning process as such, and in the interpretation processes of decision making/preparing.

Time-orientation makes it possible to calculate economic impacts during the learning processes. Moreover time is the navigation path (the “yellow brick road”) for the interpretation of competence changes. Measurable phenomena can be stored in timestamp-driven tables. Changes between status is also a time dependent term. Therefore time (the naïve time of the general human individuals) also delivers the basics for animations.

Summary

The main implications of the article are: log-quality should be optimized based on price/performance ratios for alternative reproduction levels including technical requirements and expected information added value.

The human brain should deliver more and more terms as a specific output of the hermeneutical processes about e-learning behaviours, which may always be modelled by using artificial intelligence approaches.

Decision support services may be generated in an adaptation procedure to exact decision needs (like aggregated evaluation indices for teachers, students, learning materials, courses, etc., or grouping students for predefined objectives of the classes based on each available attribute, etc.).

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AN ANALYSIS OF ICT POLICIES IN CANADA AND AUSTRALIA SECONDARY EDUCATION

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Abstract

This paper discusses various similarities and differences in ICT curricula and policies between Canadian and Australian secondary education. While people see these two countries as having very similar cultural, social and educational backgrounds, the analysis of ICT curriculum shows major differences. After analysing the content and policies, it is believed that the Canadian ICT curriculum shows more programmatic approach to move computer science towards the next level: (a) tertiary education instruction and (b) mastering programming. Differently, Australian curriculum perceive ICT mostly from a learner sing technology, as a way of acquiring knowledge through the use of technology and less as a way of promoting programming and designing software. However, new trends show the Australian curriculum as being updated and important voices calling for more hours of programming in schools.

Introduction

In the beginning of the 21st Century, the impact of introducing information and communication technology (ICT) in society has been perceived by national and provincial governments as important paths of accelerating knowledge and economic growth (Australian Council for Computers in Education [AACE], 2011; Technology Education Network, 2010; U.S. Department of Education, 2010). As such, ICT education became an important focus, as a way of speeding up the process of fostering ICT related knowledge and assure that future specialists are capable of continuing and improving the knowledge required in the advancement of technology (Anderson, 2008; Kozma, 2011). All world countries started important campaign of implementing ICT education in their national educational systems.

In particular, Canada and Australia have a great success in introducing ICT in all areas of society (UIS, 2009; Luu, & Freeman, 2011). Both countries are considered developed countries, have a common history as being part of Commonwealth, and have similar educational systems. These countries have large areas containing very diverse populations, from aboriginal or immigration roots. They have advanced technological level and a very sustainable internet infrastructure (Schrum et al., 2015). The education is decentralized in both countries, as in Canada the provinces have the main responsibility of organizing the educational settings at all levels, while in Australia the states have similar reaching rights of organizing education similar to Canadian provinces. As well, both countries have experience in using standardized testing. For more than a decade, in both countries the ICT and Internet

connectivity is almost universal. This paper will consider mostly ICT aspects from the New South Wales state from Australia and from Ontario province from Canada. This research has two main goals. First goal is to analyse the content of the ICT curricula in both countries and to show curricular similarities and differences between these two educational systems. Second goal, is to understand policies and the way ICT curricula is structured for the teachers and students.

Literature Review and Methods

ICT affects the way knowledge and power influence all aspects of society and, in their turns, each societal aspect are influences ICT education in multifaceted ways (Stoilescu, 2005, 2009; Technology Education Network, 2010). Being a global phenomenon yet developed by various countries with different cultural and social views, the ICT education has being implemented in diverse ways and perspectives (Kozma, 2011). More than a decade ago, in Canada and Australia, access to ICT devices and Internet connectivity became ubiquitous at schools (OECD, 2005). However, even the basic notions and key terms in ICT curricula are different in every country. This situation is true even though there are so many similarities between these two countries.

For instance, it was noticed that the terms used in computer related curricula are different in Canada and Australia. For instance, in Australia, ICT curriculum is introduced from year 7 to year 10 as Information and Software Technology (IST) and in the last two years introduces Software Design and Development (SDD) and Information Processing and Technology (IPT) for years 11 and 12. As well, a more hands-on unit is introduced for Graphics Technology. As well, there are some areas of computer instruction in Technological and Applied Studies (TAS) curricula.

In Canada, in the Ontario province, there are called four ICT related courses that emphasize programming: Introduction to Computer Studies in grade 10, Introduction to Computer Programming for Grade 11, and Computer Science or Computer Programming for the Grade 12. As well, there are several areas of ICT related curriculum in Educational Technology from Grade 9 to Grade 12 that emphasize different aspects of computer technology distinct from programming. Some course are: Communications Technology Broadcast and Print Production; Communications Technology, Communications Technology: Digital Imagery and Web Design; Computer Engineering Technology; Computer Technology; Computer Engineering Technology; Engineering Technology.

We attempt to present a framework capable to provide an efficient way to analyse ICT curricula in comparative education. For instance, comparative education was developed many decades ago as it “demands appreciation of the intangible, impalpable, spiritual and cultural forces which underline an educational system; the forces and factors outside the school matter even more than what goes on inside it” (Kandel, 1933, p. xix). As this research is an intersection of ICT education and comparative education, we use various reciprocal influences between social and curricular trends, in order to emphasize the way agency is

nurtured through the ICT curricula in both countries. Qualitative research is used to produce a detailed document analysis (Bowen, 2009) of ICT policies and curricula in Australia and Canada secondary education.

Findings

In the introductory part of the ICT units, it was noticed that in the ICT curricula from both countries concepts of teaching ICT for a diverse population are introduced. For instance, Canadian curriculum explicitly gives recommendations for the case of teaching to diverse population or for people from diverse ethical and linguistically background and, as such, provides some advice for students. The Australian curriculum introduces many theoretical aspects of ICT like copyright issues, ethical issues, social issues, and industrial issues.

As well, these curricula have different emphasis between general ICT literacy and the use of programming. First of all, the Year 7-10 Australian IST curriculum has seven core topics and 8 optional topics. It can be studies as a 100 – hour unit or as a 200 hour unit. These topics are: (a) design, produce and evaluate; (b) data handling; (c) hardware; (d) issues; (e) past, current and emerging technologies; (f) people; and (g) software. Looking at these topics, it was noticed that these core topics were very theoretical and the learner often had quite a passive role.

The optional part of the IST curriculum are: (a) artificial intelligence, simulation, and modelling; (b) authoring and multimedia; (c) database design; (d) internet and website development; (e) digital media; (f) networking system; (g) robotics and automated systems; (h) software developing and programming. Except maybe the first option, these parts are usually very hands-on. However, the programming might be missed for the first seven options. Only the last option contains, as the title suggests, the possibility do coding. Some content such as internet and website development, database design or digital media might be done either as offering programming activities either as a hands-on activity without any programming. For the rest of the unit options, all programming activities can be skipped or are not offered at all. The Australian curriculum spend considerable time on the process

While the computing curriculum inevitable start with some theoretical considerations, hands-on activities are strongly emphasized very soon. The hardware and the programming are both very conducive to hands-on experiences. There is a consistent part for software development and the language is this and it is soon conducive for practical activities.

The Canadian curriculum explicitly emphasize to programming activities. As such, they call the courses as “computer studies”, computer science and computer programming and computer programming. Different from the Canadian Curriculum, the Australian curriculum do not emphasize programming. As such, they leave to the teachers the opportunity of taking more or less programming. In this case, if the teachers are not programming savvy, they might chose not to do teach programming for students and as such, students can learn these classes without programming.

As well, the Canadian ICT curriculum explicitly emphasizes the use of debugging and testing for the purpose of improving and speeding up the process of designing software. The activities of debugging and test are integrated in programming and software design. Different from that, the ICT Australian curriculum does not emphasize about the use of testing and debussing and t integrate it with programming practices.

Discussions

As initially it was expected a greater degree of similarities between the two countries, in fact it was found that the countries structured the ICT curricula quite different as parted on divergent paths. The Canadian curriculum explicitly mentioned from the beginning whether the unit preparation is intended for further preparation for college or for university and as such, it offers a substantial time for programming. It is believed that Canadian Curriculum provides a stronger emphasis on programming and advancing computer science knowledge at the next level. As expected somehow in previous studies (Tran & Stoilescu, 2016), it is believed that due to lack of qualified ICT teachers, Australian ICT curriculum promotes less acquiring programming skills and more using technology for learning purposes.

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THE SOCIAL DIMENSION OF EUROPEAN MOOC RESPONSE: MAKING DIVERSITY A STRENGTH!

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Introduction

The MOOC hype in the media might be over, but investment and uptake of MOOCs are increasing significantly worldwide. By the end of 2015, approximately 4,200 courses were offered by 500+ universities to 35 million students. This has increased by 2016 to 6,850 courses by over 700 universities to 58 million students (Class Central, 2016). However, these figures exclude many European MOOC offerings as Class Central mainly lists MOOC offerings of the big (commercial) MOOC platforms. Many European universities have built an own platform or use a regional platform with a limited visibility. Most universities are not accepted by the big MOOC platforms in the US by lacking the reputation (in ranking) and finances to become a partner. As such, European efforts in MOOCs are less visible. Also the efforts of OpenEducationEuropa (European MOOCs Scoreboard, 2015) were incomplete and stopped in 2016.

Consequently, also research data about MOOC participants, needs in society, etc. are strongly biased towards US dominance and lack evidence what really is going on in Europe. As many European MOOC efforts are local, there is a lack of coherent research at a European level. Only recently some efforts at European scale were conducted. These results indicate a distinct European uptake of MOOCs related to different needs. This paper elaborates on the European context of the MOOC uptake based on various European MOOC research and discusses various strategies to increase awareness, visibility and collaboration.

Characteristic of European context

Are those MOOCs or ...?

In the European context MOOCs are defined as “online courses designed for large numbers of participants, that can be accessed by anyone anywhere as long as they have an internet connection, are open to everyone without entry qualifications, and offer a full/complete course experience online for free” (adapted from Mulder & Jansen, 2015). This definition was developed by many European MOOC initiatives and in addition different criteria (OpenupEd, 2015).

As such, a MOOC differs from a “regular” online course in at least four aspects (e.g., Patru & Balaji, 2016):

- It is designed for, in theory, an unlimited number of participants and as such is related to the scalability of the education service provider.
- It is accessible at no charge.
- It requires no entry qualifications.
- All elements of the course provision are provided fully online.

Hence essentially MOOCs offer a complete course experience to learners for free. By this definition, a MOOC offers a certificate for free as well, such as a badge or a certificate of completion. In addition, fee-based certification services are increasingly offered by either institutions or third parties. These services relate to more verified certificates (including authentication services and portfolio services for participants) and formal certificates (i.e., ones recognised as part of a regular bachelor's or master's programme). Over the last years, the big MOOC platform providers are tweaking their monetization model and shifting to pricing models where MOOC participants are offered less for free or are tempted to take additional services for a fee (e.g., Shah, 2017)

Consequently, some online courses offered are strictly no MOOC anymore. In this context it should be noted that over 70% of European Higher Education Institutions (HEIs) do not support the idea that MOOCs should be paid for except for getting a formal credit as part of an accredited curriculum. I.e., there is strong support for the complete course for free to the participants (Jansen & Schuwer, 2015; Jansen & Goes-Daniels, 2016).

European financial models MOOCs

According to Kalman (2014), it is hardly surprising that new business models based on “free” are powerful and often disruptive. The freemium approach can be an effective business model, whereby a product or service is free to a large extent, but some users pay for additional services. The freemium business model is based on offering a satisfactory but limited basic product (e.g., limited in storage capacity, number of users, features) and charging customers for versions in which some or all of the limitations are removed. While often a large percentage of the users are satisfied with the free product, the income from the limited number of paying users is sufficient to cover the fixed costs as well as the minimal variable costs created by all of the users.

SCORE2020 (2017a) provided an overview of added values of MOOCs and related possible revenues at a MOOC level, for a HEI and for providers offering MOOC services. Many MOOC providers are following the freemium approach such that revenues to balance their costs are mainly provided by MOOC participants in offering additional to be paid for services next to the free online course. However, most European providers advocate that the full course, including a credit should be for free and as such MOOC provision must be financed by public means or private parties. The SCORE2020 conducted a survey amongst participants of various events held throughout Europe. The vast majority of their survey participants believed that MOOC support should mainly be financed by public means (Figure 1), whereas 27% thought it should be financed by paid for services of the MOOC participants (SCORE2020, 2017b)

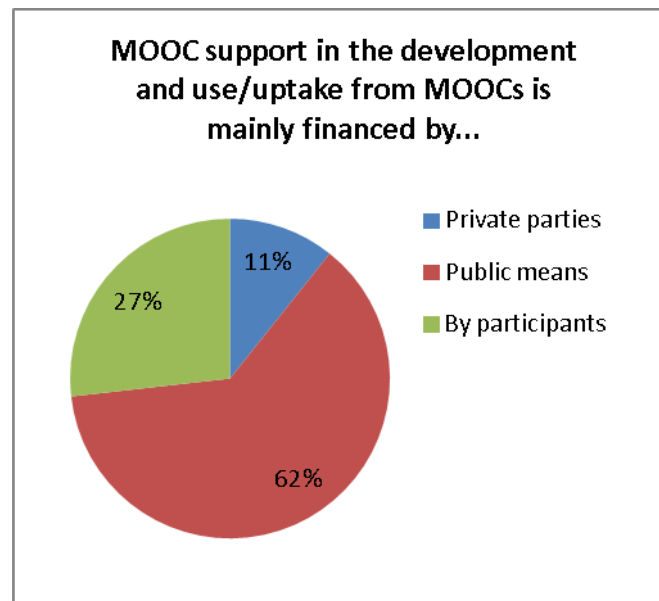


Figure 1. Response of question on "MOOC support in the development and use/uptake from MOOCs is mainly financed by..." as part of survey conducted by SCORE2020 (2017b)

This observation requires a more fundamental discussion between European stakeholders on how they should use and finance MOOCs.

MOOC development and delivery models in Europe

Currently, the following four modes for MOOC production and delivery are observed (e.g., Patru & Balaji, 2016):

1. National or centralised scenario (e.g., France Université Numérique, FUN);
2. Industrial scenario, facilitated by private companies (e.g., FutureLearn);
3. Collaborative–decentralised scenario, promoting diversity by embracing the strength of local–regional implementation (e.g., OpenupEd);
4. (Cross-)institutional MOOC development and delivery.

In the first two scenarios, a central MOOC platform is available for the development and delivery of MOOCs. Additional design and implementation services are offered to the academic staff of educational institutions next to marketing based on collective brand. In the collaborative–decentralised scenario, institutions of regional hub partners have their own MOOC platform, and those partners share different scalable services in the development of MOOCs and in their uptake by society.

In Europe the most common scenario is the last one where HEIs are developing their own MOOC platform mainly based on open source software like OpenedX and Moodle (e.g., UNED, Fachhochschule Lübeck), using a cloud solution like Canvas (e.g., University of Derby) or starting a regional collaboration (EduOpen in Italy, CADUV in Czech Republic). The main reason for this is that most European universities are not accepted by the big MOOC platforms in the US by lacking the reputation (in ranking) and finances to become a partner. Consequently, many HEIs in Europe that want to be involved in MOOCs cannot

connect to big MOOC players and are potentially left behind or need to invest in platform, tools and services themselves.

Mature uptake of MOOCs in Europe

MOOCs are becoming mainstream in Europe. Already four independent European studies show a strong MOOC involvement of HEIs (Jansen & Goes-Daniels, 2016). In Figure 2 the results of these European studies are compared to similar studies in the US by Allen and Seaman (2014; 2015; 2016).

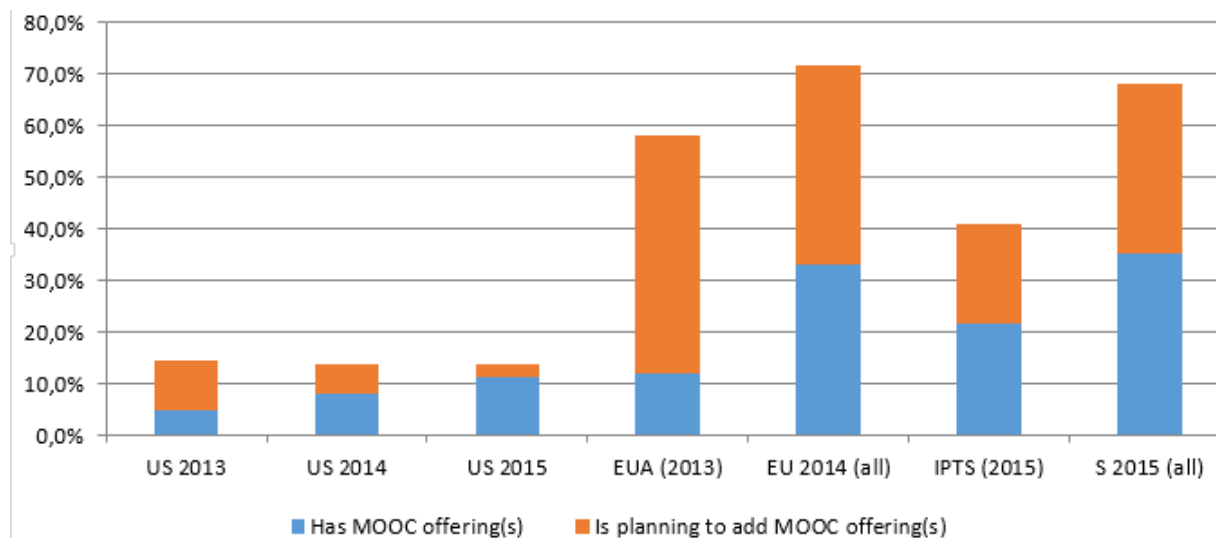


Figure 2. Institutional profile in their MOOC offering compared between that of US surveys (US 2013, US 2014 and US 2015) and the EU surveys (EUA 2013, EU 2014), Muñoz et al. (IPTS 2015) and HOME survey (S 2015).

The abbreviations US2013, US2014 and US2015 refer to the US studies published a year later (Allen & Seaman, 2014; 2015; 2016). EUA (2013) refers to the European survey in 2013 published by Gaebel, Kupriyanova, Morais, and Colucci (2014), EU 2014 (all) to results of Jansen and Schuwer (2015), IPTS (2015) to those published by Muñoz, Punie, Inamorato dos Santos, Mitic, and Morais (2016) and the results of S2015 survey are published in Jansen and Goes-Daniels (2016).

At least about 40% of HEIs in Europe are having MOOCs or planning to develop MOOCs soon against 12% in the US (Allen & Seaman, 2016).

Difference between European countries

Although some differences are observed between countries, it seems that a strong European involvement is widespread. Muñoz et al. (2016) limited their survey to five European countries. In their study the number of HEIs offering or planning to offer MOOCs ranges from 23% in Germany, 32% in Poland, 46% in the UK, 48% in Spain and over 62% in France. Hence, although more involved than US, HEIs in Germany and Poland are somewhat less involved.

The latest HOME survey end 2015 shows that HEIs in most countries have a MOOC or are planning to have a MOOC (Jansen & Goes-Daniels, 2016). Note that for a long period the main players in the European MOOC game derive from Western Europe (Dillenbourg, 2013),

with Eastern European HEIs only just joining in. These recent surveys show that the uptake in Eastern Europe is catching up. I.e., these surveys indicate an expected increased uptake of MOOCs in Poland, the Czech Republic and in Lithuania at levels equal to Western Europe.

However, the initiatives in central and eastern Europe are still in a vulnerable starting phase experiencing barriers like a) no regional platform available; b) lack of funding and b) not enough experience with Open Education in the region (hardly any regional support structure) (Rohlíková, Rohlík, Jansen, & Goes-Daniels, 2016). In general, strongest MOOC involvement of HEIs is seen in those regions with supportive policies and structures (e.g., Muñoz et al., 2016).

But low MOOC uptake by European companies

However, in Europe the low or about zero penetration of MOOCs in the corporate world is somewhat surprising. A recent study (BizMOOC, 2017) amongst 56 European companies concludes amongst others that there is a low level of familiarity with MOOCs and a very low percentage of the interviewed organisations are involved in MOOC related activity. In the BizMOOC study the organisations already applying eLearning state that MOOCs could become a core component of HRD, at least complement existing resources and materials, hence as part of a total solution. In that study interviewed companies perceive MOOCs as having the potential to transform current learning environments in companies and impact on various areas in a company or an organisation.

Making diverse European response a strength

Important role of policy-makers and governments

Observed regional differences in the uptake of MOOCs in Europe are correlated to the existing of supportive policies by regional or national authorities. A successful uptake of MOOCs requires that policy and decision makers need to be in a better position to understand the *MOOC phenomenon*, capitalise on the advantages of these large-scale courses and use them as a strategic opportunity to help meet local needs and develop related capacities. In this context, we need specially to address awareness raising amongst policy makers and governments about the potential of this new mode of achieving educational policy objectives in coherence with a broader continuous education/CPD policy. Different (regional) strategies must be highlighted to leverage the full potential of MOOCs and open education for Europe.

Need for a European voice in a global market

Although MOOCs are becoming mainstream, the European efforts are hardly visible and known, even to European organisations themselves and are not incorporated in worldwide MOOC portals as Class Central (Shah, 2016). This is partly due to very localised and sometimes short-term innovations (e.g. EU-funded projects). I.e., EU MOOC activities are mainly being predominantly driven by individual institutions or small groups based on a limited number of platforms.

We need a strong joint partnership to provide a European voice for European and national policy makers to ensure a European coverage for the development and use of MOOCs as a free part of the respective higher education systems, leading students to continuous education/CPD and open education provisions. Such a partnership must support the organisation of MOOCs and continuous education in European universities as complementary areas to degree education and the creation of interfaces for cooperation with companies and social partners.

HEIs, to increase their capacities in developing MOOCs

Several studies in general demonstrate that the uptake of MOOCs in Europe is maturing at a much higher level compared to the US. This is mainly an achievement of the current (cross-)institutional, partially language-bound platforms. However, many European HEIs that want to develop MOOCs report that (regional) support structures are missing and/or existing structures are unknown to them. The regional differences in languages, cultures and pedagogical approaches hinder the development and uptake of MOOCs in large parts of Europe. Hence, effective collaborations and scalable services for emerging MOOC provisions have to be made available at a European level. As such there is a strong need for support and scale in Europe by sharing platform for MOOC and building MOOC community, developing supporting tool for MOOC, workshops, seminars about MOOC and toolkit for developing MOOC.

Not one European MOOC platform

One centralised European or an integrated MOOC platform is hardly an option given the various languages, different cultures, regional needs and autonomy, etc. Instead we must cherish the diversity of the European MOOC initiatives and see the segmented MOOC approach as a strength in addressing the needs in each own market. Europe needs a joint partnership to *exchange, connect and align different European MOOC provisions* such that platforms, tools and support services are strengthened by collaboration and are better available for universities, businesses and learners in Europe. Innovative technologies, pedagogies and business models, will raise the quality of European MOOCs and promote their use in companies. For example, by developing approaches to the co-creation of MOOCs for continuous education/CPD with companies or knowledge transfer centres.

Collaboration on scalable services

The latest MOOC surveys (SCORE2020, 2017c) amongst >100-HEIs demonstrates that many European higher education institutions are willing to collaborate on scalable services in MOOC provision, and that a regional collaboration is much more likely than outsourcing services to commercial parties. It is of interest of Europe and individual countries that HEIs European-wide are stimulated in their motivation to be involved in MOOCs and are assisted in their needs to scalable services by emerging and maturing, possibly language-bound regional platforms.

It is generally observed that European HEIs are very much willing to collaborate on services like co-creating MOOCs with other institutions, re-using elements from MOOCs, development of MOOC (materials) and in the design of MOOCs next to a quality assurance framework the use of MOOC platforms, learning analytics and recognition of each other's MOOCs. The joint development of a European MOOC platform is not seen as very likely as well as services on selling data and translation services. These results strongly indicate a strong need in Europe to strategically invest in a European partnership and capacity development in order to strengthen the quality of MOOCs for education and upscaling their use in HEIs and companies.

The economics of open and online education requires developing and delivering open products and services in partnership with others, regionally and globally. The world of open and online education does change the way we innovate our education system, programmes and courses. Investment in networked models (involving regional, national and corporate entities) is needed to promote open, flexible and online education for all. A Pan-European response is crucial if we want MOOCs to advance the many possibilities for a more flexible and modern higher education system, and to fully open up education to the many that need the skills and knowledge for 21st century jobs (see also Porto Declaration on European MOOCs, 2014).

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THE GLOBAL MOOQ SURVEY: BUILDING A COMMON QUALITY REFERENCE FRAMEWORK FOR IMPROVING, ASSESSING AND COMPARING MOOC DESIGN

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Introduction

Societies and economies across the world are experiencing a time of transition and change. That includes the educational systems that are challenged by moving objectives and development targets (Nyberg, 1975; Stracke, 2017). Competing businesses and interests at national, regional and international scales are demanding for citizens to acquire and develop much different skills and competences, also new kinds of literacy. Numerous educational public authorities are understanding this shift and following this request (OECD, 2016). Personality and competence building in public education should prepare for new economies and jobs that are emerging but are not yet fully developed.

On the other hand, the personal living conditions are also changing considerably, in terms of working opportunities and pressure but also in terms of individual communication, collaboration and learning. The emergence of the world-wide internet and especially social media including online communities has accelerated the development of the network society, affecting the way each person lives and learns. Many new opportunities for online learning and collaboration were developed and are available for almost all interested people worldwide, albeit the limits by technology and Internet access lead to unbalanced and non-equal situations mainly in developing countries (Stracke, 2017).

As a consequence of the societal, educational and personal changes, Open (Online) Education has experienced a major development raising awareness amongst all actors (European Commission, 2011; UNESCO, 2012). This has led to global grass-root movements, events, communities and associations as well as international policies and implementations in national and regional educational systems. Next to the UNESCO declarations on Open Education and in particular on Open Educational Resources (OER) (World Bank, 2016), the European Commission through the communication on “Opening Up Education” (Brouns et al., 2014), has also taken the lead in demanding a change and improvement in European education and society.

During the last years Massive Open Online Courses (MOOCs) became a very popular expression of the development of open education. Since 2008, when the first MOOC was provided, the number of MOOCs, institutions involved and of registered users keeps constantly increasing (Gaskell & Mills, 2014; Stracke, 2017). More recently, this has been also followed by a discussion over their quality as an educational tool (Daniel, 2012). In particular, the high drop-out rates typical to traditional distance education courses, and not as common in formal education settings, are highlighted by critics, causing requests for re-booting MOOCs and the research on them and their quality (European Commission, 2013; Jansen et al., 2015). Although this discussion results mostly from an improper use of formal learning concepts in what is basically a non-formal learning experience (Onah et al., 2014; UNESCO, 2012), alternative measures have been proposed and discussed to focus better on the learners and on their individual goals (Stracke, 2017; UNESCO, 2012). Basically, as MOOCs become an important part of higher education institutions' provision and are increasingly used in formal learning contexts, the debate on how they meet quality standards gains relevance.

To address the quality issues involved, the Massive Online Open Education Quality (MOOQ) project was initiated as the European Alliance for the Quality of MOOCs. It is a 3-year project funded by the European Union under the ERASMUS+ call. The project started in September 2015 and is expected to complete in December 2018. The founding partners of MOOQ are the Open University of the Netherlands (OUNL, NL), which is the project coordinator, the Hellenic Open University (HOU, GR), the National Quality Infrastructure System (NQIS, GR), the Universidade Aberta (UAb, PT), and the École Normale Supérieure (ENS, FR).

MOOQ is directly relevant to several key aspects of the 2011 EU Modernization Agenda (European Commission, 2011)**Error! Reference source not found..** Firstly, Europe is taking steps in investing in flexible educational solutions trying to exploit the potential of OER much more than is currently the case (European Commission, 2011)**Error! Reference source not found..** MOOQ shares and contributes to this objective by providing guidelines for designing more successful MOOCs from an educational and business model point of view. In addition, one of the most significant challenges behind the 2011 EU Modernization Agenda is for education to respond to the characteristics of future students and to new needs in society. MOOQ contributes to the transferring of first class European expertise in Open Learning to the higher education system using formal channels (standardisation).

But, how can we anticipate increasing student numbers combined with the likelihood of lower funding? How should we combine online and traditional formats to enhance quality and at the same time devise university business-models sustainable? In fact, one target of the Europe 2020 agenda is that 40% of young people should complete higher education studies by 2020. MOOQ contributes to this objective albeit, the design of MOOCs to achieve this end without quality guidelines or standards will result in the phenomenon of increased dropout rates and/or failed attempts to deploy MOOCs by HE institutions. Thus, the goal to increase the number of graduates is served.

MOOCs and OER are a solution only if they retain a certain level of quality. MOOQ contributes to this end, beyond the experimentation phase being used by many HE institutions, by offering a systemic approach to massive student-centred online learning. By counter-parting the mere digitalisation of content or the use of simple process-oriented standards, the proposed project contributes towards the formation the appropriate pedagogical, organisational and business models for open and flexible education.

MOOQ will research and formalise the design of multi-stage, mixed model MOOCs that may be offered during anyone's lifetime, including non-formal and informal learning. These MOOC modes strive to serve new target groups such as combination of study and work, practitioners in professional networks in sectors of innovation and learning in the context of regional development (smart specialisation). This is a contribution to the implementation of the 2013 Communication by the EC on Opening up Education (European Commission, 2013).

Aims, Needs and Outputs of the MOOQ Alliance

The vision of MOOQ is to contribute to foster quality in MOOCs thus leading to a new era of learning experiences. As such, the project's mission is to develop a quality reference framework for the adoption, the design, the delivery and the evaluation of MOOCs in order to empower MOOC providers for the benefit of the learners. The main goal of MOOQ is therefore the development and the integration of quality approaches, new pedagogies and organisational mechanisms into MOOCs with a strong focus on the learning processes, methodologies and assessments.

The MOOQ project addresses the open issue of integration of quality approaches and mechanisms into the design of MOOCs by pursuing the following objectives:

- To analyse existing practices for integrating quality approaches on emerging open online courses, including active discourse on open issues and concerns arising from the massive, large-scale implementations, showcasing paradigms of key players in the field.
- To develop a Quality Reference Framework (QRF) for the design, evaluation and assurance of MOOCs.
- To design, deploy and assess (pilot testing) of 2 multilingual, collaborative MOOC pilots: "Introductions to Embedded Systems" and "Introduction to Software Technology", applying in practice and showcasing how to apply and manage the QRF.
- To standardise activities that shall allow the integration of the project's outcomes into specifications and standards both at European level (CEN-European Committee for Standardisation) and internationally (ISO).
- To disseminate and raise awareness on the basis of well-targeted communication aiming at the introduction and promotion of the QRF to all stakeholders including the establishment and pilot operation of an Observatory for the Quality of MOOCs, the European Quality Observatory for Massive Open Education (EQOM).

Target groups of MOOQ include MOOC designers, HE policy makers and strategists, students (graduate/post-graduate) and other learners in general, as well as teaching staff (teachers, facilitators. Furthermore, National Government and EU policy bodies, regional/national and international Associations in the Sectors of Education and Quality Assurance are targeted. MOOCs are increasingly seen as a specific form of transnational education. Collaboration leads to richer content and processes, based on the diversity and complementarity of research areas and methodologies in European universities. Many rising MOOC types and modes of provision are also based on new formats of partnerships and transnational education across European countries and beyond. A transnational effort is needed to formalise their design principles.

Identifying MOOC Design Patterns and Best Practices

The first output of the MOOQ project is a survey on existing practices and design patterns for integrating quality approaches on emerging open online courses, including active discourse on open issues and concerns arising from the massive, large-scale implementations, showcasing paradigms of key players in the field.

The goal is to reveal design patterns, both current and evolving beyond the classic theories of distance education. The needs analysis will quantify, explore, categorise and discuss educational, technological, organizational, legal, business and economic parameters involved in the design, adoption and enactment of MOOCs for Higher Education Institutions and to derive best practises that are both stand-alone tools for MOOC adoption as well as appropriate input for the design of a quality reference framework.

This also includes a collection of *best practises* (that can be used independently by stakeholders) which summarizes the amount of experience gathered, a categorized collection of well-established and documented techniques, methods and activities that are the most effective at delivering quality MOOCs. Best practises will be organized and ranked in terms of not only effectiveness (best results) but also as the most efficient (best ratio effort/results).

The phenomena of MOOCs is a rather complex one as it results from different kind of approaches. The literature establishes two basic, almost opposite pedagogical approaches, known as cMOOCs, for connectivist oriented, and xMOOCs, for the traditional learning approach (Roscorla, 2012; Siemens, 2012). Although the international impact of the MOOC phenomena came mostly from the initiatives led by the leading United States' universities, MOOCs started as a demonstration of the new connectivist educational theory principles. The connectivist-inspired approach highlighted the disruptive and networked nature of the learning experience (Bates, 2015). Differently, the x initiatives focused on the potential of open online courses for massive scale distribution of high quality scientific content. This fact had important consequences in the diversity of formats used and also its features as well as the true nature and purpose of the educational experience they provide.

Yet, even if the cMOOC and xMOOC opposition is still dominant, several other alternative formats have emerged. Recently in Europe many collaborative, social pedagogic models have been developed (Schuwer et al., 2015). The first one was the iMOOC model (Teixeira & Mota, 2013), which later inspired the sMOOC model developed in the framework of the EU-funded project ECO (Brouns et al., 2014). Researchers, designers, institutions and political decision-makers have focused on developing alternative, more collaborative approaches to MOOC design that embed important values as multilinguism and multiculturalism, richer pedagogical experiences and flexible transition of credits to formal learning settings. In fact, comparing the results of surveys conducted in the United States (US), with European surveys, Jansen et al. conclude that, in contrast to the US, a large majority of European high education institutions agree that “MOOCs are important to learn about online pedagogy” (Lane, 2012). They also conclude that in Europe using MOOCs for student recruitment is not considered as important as in US, but rather to reach new students and creating flexible learning opportunities (for those new students). In addition to variations in the pedagogical design, other include the adaptation of the MOOC concept to special contexts in which some of its typical elements do not verify, as for instance scalability and openness.

Being an innovative field of online education practice, MOOCs are still the subject of much experimentation and discussion. As a result, there’s still not a consensus amongst the designers and practitioners on the basic concepts involved, starting by the very definition of what constitutes this learning experience. As this affects any consideration on the quality criteria which can apply to the analysis of the MOOC provision, the MOOQ research framework has to start by addressing this issue.

According to Selwyn, Bulfin and Pangrazio, we can define MOOCs simply as “courses available to masses of online learners for little or no cost” (Selwyn, Bulfin, & Pangrazio, 2015). However, this definition is clearly limited. A more comprehensive definition can be found in the framework of the OpenupEd initiative. In fact, it describes a MOOC as “an online course designed for large number of participants that can be accessed by anyone anywhere, as long as they have an internet connection, is open to everyone without entry qualifications and offers a full/complete course experience online for free” (Brouns et al., 2014). This definition which was developed as a collaboration with different EU-funded MOOC projects, attempts to integrate a perspective more akin to the traditional conceptual elements used in open education, as ubiquity of access and social inclusion. In its more comprehensive description it defines a MOOC as a full/complete course which should not only include educational content but also facilitate interaction among peers (including some but limited interaction with academic staff), provide authentic activities and tests, including feedback (with well-designed rubrics for peer-assessment and AI engines for the integration of massive qualitative assessment), have some kind of (non-formal) recognition options and provide a study guide or syllabus (Brouns et al., 2014).

However, according to the different educational approaches used, also the pedagogical design selects different focuses (Daniel, 2012). While connectivist-inspired MOOCs use the openness

element in a broader way, similarly to how is commonly understood in the open education community, xMOOCs which apply a more traditional learning approach identify “open” mostly as “access free of charge”, independently of including costs for additional services. In short, the connectivist approach to MOOCs emphasizes creation, creativity, autonomy, and social networked learning. On the other hand, the xMOOC approach focus basically on a scalable content distribution system using mostly video presentations and reading materials with short quizzes and testing. While the first model focus on knowledge creation and generation, the second emphasizes knowledge duplications (Siemens, 2012).

But, as stated above, alongside the cMOOC and xMOOC approaches a new generation of alternative models have been emerging. As such, Conole highlighted a dozen dimensions on which a course could vary (Conole, 2013). These include the degree of openness, the scale of participation (massification), the amount of use of multimedia, the amount of communication, the extent to which collaboration is included, the type of learner pathway (from learner-centred to teacher-centred and highly structured), the level of quality assurance, the extent to which reflection is encouraged, the level of assessment, how informal or formal it is, autonomy, and diversity.

The diversity of current trends in the MOOC field resulting from much different approaches being followed in what concerns the concept, the pedagogical design, the learning environment design and the business model, has made this a much complex subject for research. In order to tackle with this challenge, the project team compared different typologies suggested by literature and conducted a preliminary exercise of categorizing using a sample of 30 different MOOCs. As a result, it developed an integrated model of analysis building on Lisa M. Lane’s proposal (Lane, 2012), which suggests a distinction between three different types, as follows: (a) network-based, (b) content-based and (c) task-based MOOC models. Although it is advantageous to use an integrated approach, our research also indicates that for each MOOC type there should be specific design patterns and best practices selected.

An important criterion for evaluating MOOC design patterns is therefore if they identify their pedagogical design approach and if they comply with the quality criteria specific to each type. In fact, all of the previously identified types include elements which are interesting and useful, but may not fit exactly either with the learning approach or with each institution/provider’s pedagogical culture.

There are also some general concerns which should be taken into consideration when identifying MOOC best practices. For instance, the focus on the learner and on the quality of his/her learning experience. This process must be understood as a whole and not just as awarding free access to scientific-validated content. However, according to different learning approaches, this can be understood differently as well. In fact, in xMOOCs the focus is usually on the learner’s individual acquisition of knowledge. In a cMOOC approach, on the other hand, the focus is on the learner’s engagement in the network of knowledge production. As for the emerging new combined or blended approaches, learners are expected to take an active

role in and be responsible for their own learning, but also to actively engage in helping build a supporting learning community.

Other important design elements, especially in the non xMOOCs, are the openness, flexibility and personalization which the MOOC provides, allowing for different learners to be able to build their own learning paths and to match them to their personal expectations and conditions. Participants in MOOCs are all there for different reasons and have different motivations. Also relevant is how inclusive a course is, allowing for the widening of participation in education. This means, for instance, to provide opportunities for the learners to prepare and train for the learning environment and the methodology used. The iMOOC model was the first to introduce a *bootcamp* module, usually lasting one week, designed precisely for allowing participants to get acquainted with the spaces, tools and services, as well as with the processes of work and communication that will be used in the course (Teixeira & Mota, 2013). Finally, a very important aspect is scalability. As such, a good MOOC design is the one which allows the replication of the services provided to an increasingly higher number of users for just a marginal cost.

The Global MOOQ Survey

The development of the survey started with the establishment of a quality reference matrix comprising the basic categories of a typical MOOC design process. The research used as reference the process model of EN ISO/IEC 19796-1 (ISO, 2005). This is based on the generic process model that is divided into seven process categories containing in total 38 processes. However, for the MOOQ objectives the first two categories were merged, giving way to only six process categories. The MOOQ quality reference process model consists therefore of three pillars which represent the main aspects involved in the production and delivery of MOOCs, each subdivided in 34 dimensions and respective descriptors. The model is described in Table 1, as follows.

Table 1: Quality Reference Matrix

Pillars	Dimensions
Pedagogical	Learning opportunities and course planning
	Pedagogical design
	Learning pace and progress
	Equity / Inclusion
	Openness of content data and software, flexibility and personalization
	Learning resources and support
	Learning assessment and certification
	Evaluation planning
	Evaluation realization
	Evaluation analysis
	Involvement of all stakeholders
	Learning design optimization
	Evaluation optimization
Technological	Learning environment approach
	Requirements
	Learning environment design
	Infrastructure and resources, data and metadata management
	Evaluation planning
	Evaluation realization
	Evaluation analysis
	Involvement of all stakeholders
	Learning environment optimization
	Evaluation optimization
Business Model	Social demand / Market analysis
	Return On Investment
	Scalability
	Budget
	Human and technological resources
	Evaluation planning
	Evaluation realization
	Evaluation analysis
	Involvement of all stakeholders
	Vision and mission optimization
	Analysis optimization

As a consequence, a number of critical elements were identified and incorporated in the design of the surveys in order to allow for appropriate categorization of the design patterns. Three different surveys were prepared, adjusting the fifteen constructs to each of the target groups previously selected (learners, designers and facilitators), as shown in Table 2.

Table 2: Overview of MOOQ Survey Constructs and Target Groups

Constructs	Target Groups
Demographic profile	Learners / Designers / Facilitators
Experiences with MOOCs	Learners / Designers / Facilitators
Pedagogical Decisions	Designers
Learning Objectives	Learners / Designers
Duration and Structure	Learners / Designers / Facilitators
Online Facilitation	Facilitators
Learning Resources	Learners / Designers / Facilitators
Learning Support	Learners / Designers / Facilitators
Flexibility and Inclusion	Learners / Designers
Learning Pace and Progress	Learners
Learning Environment Design	Designers / Facilitators
Learning Assessment	Learners / Designers / Facilitators
Learning Certification	Learners / Designers
Context of Design Process	Designers
Evaluation of MOOC experience	Learners / Designers / Facilitators

The surveys included a mix of various types of items (open-end questions, five-level Likert questions, multiple-choice questions and yes/no questions). The total number of items ranged from 64 items (facilitators survey) to 73 items (learners survey) and 95 items (designers survey). The surveys were launched online (www.survey.MOOC-quality.eu) in January, 2017 and are available in three different languages (English, French and Portuguese). The support of the leading international associations and institutions including four United Nations' organizations has allowed for a very high level of response. 625 questionnaires (443 partially and 182 fully completed) had been received by May, 3rd 2017. The very large amount of data retrieved is being analysed and interpreted. In addition, 36 semi-structured interviews with MOOC designers, facilitators and providers have been conducted by all project partners in order to complement the research. These interviews address two of the target groups already included in the online survey (designers and facilitators), allowing for triangulation of results, and include one new additional target group (providers). In order to facilitate the interviewing process and assure a common standard for data analysis and interpretation, a set of three questionnaires was developed as well as the respective coding schemes.

Conclusions and future work

MOOCs are now becoming a major part of higher education institution's provision across the world. This has led to an increasing debate over the quality of the learning experience they provide. The MOOQ project is the first research initiative which addresses specifically this debate by focusing on the development of a quality reference framework for the adoption, the design, the delivery and the evaluation of MOOCs.

As an initial part of this effort, a global survey on existing practices and design patterns was developed and launched targeting at learners, designers and facilitators. In order to categorize design practices, preliminary research demonstrated to be more appropriate to apply the

typology suggested by Lisa Lane (2012), which is based on a simple but effective distinction between three basic categories: network-based, content-based and task-based MOOC models. The resulting questionnaires followed a quality reference matrix specifically designed for open education courses, based on the process model of EN ISO/IEC 19796-1 (ISO, 2005). The innovative matrix is organised around 3 pillars (pedagogical, technological and business model) and 34 dimensions.

Currently the results of the first global survey on the quality of MOOCs, drawn from over 625 respondents are being analysed and a preliminary report is due in June, 2017. An additional 36 semi-structured interviews with MOOC designers, facilitators and providers has been also carried out, allowing for complementarity of target groups addressed by each tool. The results of the survey will inform the design of a common MOOQ quality reference framework for improving, assessing and comparing MOOC design which will lead to the development of a proposal for an international standard for MOOC design and delivery. At the EDEN conference, preliminary results of the surveys and semi-structured interviews conducted will be presented in detail.

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THE IMPLICATIONS OF A NATIONAL HIGH-STAKES MOOC ON THE BUSINESS MODELS OF ACADEMIC INSTITUTIONS, AND ON THEIR FACULTY AND STUDENTS

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Introduction

Technological innovation in higher education is actively discussed in the research literature and public discourse. Recently this discussion emphasizes the adoption of massive open online courses (MOOCs) and their potential impact on the business models of academic institutions, their faculty and students. Previous publications mostly explored low-stakes MOOCs that do not substitute traditional for-fee academic courses (Sandeem, 2013). This research of a high-stakes MOOC that substitutes an existing fee-based academic course, explores its impact on the institutional business model, faculty and students of academic institutions. The study is currently in its early stages. This paper briefly describes the context, the research questions, the methodology and the expected contributions to theory and practice. The lecture will present preliminary findings of the study.

MOOCs are a pedagogical innovation, but a significant part of the academic and public discourse surrounding them focuses on their impact beyond the classroom. This includes the impact of MOOCs on the “business model of academic institutions”, and their promise to address inequality in higher education and hence to empower disadvantaged populations (Dellarocas & van Alstyne, 2013; Kalman, 2014).

The adoption of innovations and their use influence business models, and in turn, business models influence the adoption and diffusion of innovations (Melville et al., 2004; Tallon, 2007). Most of the MOOCs aired so far are low-stakes and are mainly used for enrichment and for lifelong learning of high socioeconomic participants who already hold at least a bachelor’s degree (Hansen & Reich, 2015). Such low-stakes courses are not likely to replace for-fee academic courses and to alter business models in academia.

Recently, a new high-stakes national MOOC sponsored by The Council for Higher Education, Israel’s top academic authority, was launched. It focuses on reading comprehension of texts in academic English. Undergraduate students in Israel must demonstrate (through an exam) sufficient proficiency in academic English by the end of their first year at the latest. Passing these exams is a significant hurdle for many students, especially for disadvantaged ones. Special units in each university and college offer students preparation courses in academic

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English. The fees for these courses are significant, and are additional to the regular undergraduate tuition costs.

The MOOC “Academic English” offers participants access to extensive learning materials. These can be used as a self-paced MOOC meant to replace traditional Academic English courses (Sandeem, 2013), or as learning and practice materials to accompany and enrich traditional, campus-based Academic English courses through blended learning methods such as the *flipped classroom* (Milman, 2012).

The launching of the Academic English MOOC led to an immediate significant drop in the number of students enrolling to the costly preparation courses offered by academic institutions. This led to a widespread controversy: Is the MOOC a proper alternative to the traditional courses? What about the instructors and academic units who were financially hurt by the decline in enrolments to the institutional (for-fee) courses? The vast majority of MOOCs offered nowadays do not have a significant impact on the business model of higher education institutions since they can’t replace a “real” credit-bearing academic course (Kalman, 2014). In contrast, in the case of this national Academic English MOOC, it is in direct competition with campus-based courses which are an important source of income for the institutions. These courses are also a significant financial and academic burden for the students. This is especially true for students with low levels of Academic English who are required to take several Academic English courses and are anxious to pass the proficiency tests that impede their academic progress. Thus, this course is high-stakes for both the students and the institutions.

Research questions

The Academic English MOOC offers a unique opportunity to study the business model implications of a high-stakes MOOC that can substitute an existing fee-based academic course. Thus, the overarching research questions of this study are:

1. How does the Academic English MOOC influence the business models of the Academic English units in different Israeli higher education institutions, their faculty and students?
2. How do these business models in turn influence the adoption, use and diffusion of the MOOC among Academic English teachers and learners?

Method

Most current research on MOOCs is quantitative and based on participant logs and questionnaires (e.g. Hansen & Reich, 2015). These methods are less appropriate for deeply understanding the business model implications of the Academic English MOOC. Instead, we will embrace a qualitative research methodology.

The impact of the MOOC on the business model of the higher education institutions, and the impact of the business models on the adoption, use and diffusion of the MOOC will be

studied using Kalman's (2016) business model analysis. In this analysis, the impact of the novel educational technology on each of the components of the business model of the organization is evaluated, with the goal of assessing the extent to which the technology will improve the business model and increase the organization's ability to achieve its goals.

The business model of the unit in charge of teaching academic English in five to seven different higher education institutions will be explored. Semi-structured interviews will be conducted with 10 leaders and decision makers at these Academic English units, with the goal of describing each unit's customer value proposition, infrastructure (resources and processes), and financial model.

The business model and the role of the Academic English MOOC in teaching and learning will be further elaborated based on semi-structured interviews with 10 English instructors at each unit, as well as with 10 students in the traditional classes and 10 students in the Academic English MOOC. Such triangulation of data from different sources strengthens the validity of the findings (Jones et al., 2013) and enables comprehensive examination of the phenomenon. The inclusion in the study of students from both categories enables exploring the differences between students who are exposed to the MOOC in the form of technology-enhanced learning materials incorporated in traditional courses and students who have chosen a self-pathed learning of the Academic English MOOC.

The interviews will be audio-recorded, transcribed, and coded. Initial deductive codes derived from the interview protocols will be supplemented by inductive codes. These codes will be iteratively refined as more granular themes will be identified (Hollands & Tirthali, 2014). The transcriptions will be independently analysed by an additional rater in order to ensure inter-rater reliability of coding. Disagreements in coding will be discussed until a consensus is reached. The results will be analysed and discussed in accordance with the grounded theory approach (Charmaz, 2014; Corbin & Strauss, 2014).

Contributions to theory and practice

This study offers an opportunity to refine our theoretical understanding of the acceptance, use and diffusion of a novel educational technology through the lens of the business model of higher education institutions, teaching faculty and students. This lens facilitates a multi-level analysis of the adoption and diffusion of this novel digital technology, triangulating the strategic organizational perspective with the individual perspectives of different stakeholders: policy-makers, instructors, students in traditional courses and self-pathed students of the MOOC.

The practical question of how to benefit from innovations such as MOOCs, while avoiding the negative consequences, is a significant societal challenge. The findings of this study could assist policy makers in higher education in understanding the complex interdependencies between higher education institutions business models, the acceptance and diffusion of educational technology innovations and their impact of teaching and learning processes.

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EXPLORING THE USE AND CREATION OF A MOOC ENVIRONMENT: A CASE STUDY

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Abstract

Massive Open Online Courses (MOOC) have a large-scale effect and popularity on educational technology for recent years. The use and design of these courses bring new ideas and perspectives for the development of online learning environment and also for the definition of new online user profiles and their perceptions. The purposes of this study are to provide a detailed perspective for the motives for the use of MOOCs and to explore the design and management process of these environments. The results of this study indicated that MOOCs provide many benefits for learners and the challenges while designing MOOCs provided some information that the problems in online learning environments are still subtle and complicated.

Theoretical Framework

Reasons to use MOOCs

In the literature, there are many studies to collect data about the motives to use MOOCs. Based on Belanger and Thornton (2013) study, the purposes to use MOOCs are to have an interest for the subject, lifelong learning, entertainment, curiosity, social experience and intellectual stimulation (cited in Zutshi, O'Hare, & Rodafinos, 2013). Similarly, Hew and Cheung (2014) criticized the motivations to use MOOCs as being interested in a particular topic, increasing own knowledge, finding free resources, curiosity, personal challenge and getting certificate. In addition, Zutshi, O'Hare, and Rodafinos (2013) claims that the students in their study are feeling excited to see other people's ideas and works which help the participants to support their professional development. For some students, getting a certificate/degree has some incentives to use MOOCs (Hew & Cheung, 2014; Kizilcec, Piech & Schneider, 2013) but these certificates won't have the same quality with the degrees on traditional learning environments (Parr, 2013). Also, some studies showed that most users already had an official degree (Yuan & Powell, 2013) and they are adult/lifelong learners. In addition, as indicated above, most users have a tendency to follow the parts they are interested in so the degree/certificate or the completion are not the primary motivations, adult learners may already have the motivation to use MOOCs for their own interest and need.

Experiences/Opinions while taking MOOCs

Learners have many experiences while taking MOOCs that have both positive and negative sides. Zutshi, O'Hare, and Rodafinos (2013) claims that the students in their study are feeling excited to see other people's ideas and works but not all of them completing or participating the discussion board activities, however, they stated that some students found the postings and interactions as overwhelming. Other challenge from the learner perspective is related with feeling isolated or not being a part of community/feeling anonymous (Zutshi, O'Hare, & Rodafinos, 2013). Some students may feel not being a part of the group because the group is much crowded than the level of knowing each other. In Hew and Cheung (2014) study, they explained the challenges from the learners' perspectives as lack of incentive, lack of focus on discussions, having insufficient previous knowledge, ambiguous assessments and requirements and lack of time.

Challenges while creating and managing a MOOC

In the literature, there are several ideas about the benefits and the challenges of MOOC practices. Yuan and Powell (2013) summarized the challenges in terms of sustainability, quality, pedagogical problems, completion and motivation. Similarly, Milheim (2013) and Richter and Krishnamurthi (2014) criticized the challenges as the completion rates, financial problems of creating and providing the courses, certification problems and reliability and the validity of the students' performances. Richter and Krishnamurthi (2014) and Spector (2014) explained the assessment problems as the difficulty for evaluating many people and giving appropriate and detailed feedback. Moreover, Hew and Cheung (2014) mentioned the similar issues while designing a MOOC and explained the challenges as absence of student immediate feedback, heavy demands of time and money and lack of student participation.

Significance of the Study

Learners' experiences and behaviours in online learning environments have significant role to enrich the learner experiences and activities. In addition, designers constitute an important part for understanding the new practices and instructional aspects of MOOCs. Therefore, through this study, learners' and designers' experiences could provide important issues for the development of MOOCs and online learning environments.

Methodology

The purpose of this research is to gather a detailed understanding of designing and providing a MOOC environment and experiences of the learners and designers in these environments. Behind these purposes, the research study was designed as a case study. As Yin (2009) suggested, through this research, the phenomenon (MOOC environment) was investigated within its real life context (a MOOC course environment) through the specific participants (MOOC design and development group). In addition, this specific case (MOOC course that was provided by a professor in a university) will provide a detailed description of a MOOC practice. Therefore, this research was designed as a single case study through the specific data collection time and data collection methods. Research questions of this study is as follows:

1. What are the experiences and opinions of MOOC users from the designer and learner perspective?
2. What are the challenges that encountered while creating and managing a MOOC?

Research Design

First of all, the researchers observed the MOOC environment in order to investigate the activities, materials, students' behaviours and management issues with head assistant of the course. Secondly, interviews were conducted with the participants. The participants were doctoral/master students group (17 people) that design, manage and utilize the MOOC (Social Media for Active Learning MOOC) environment. Purposeful sampling method was used to select 10 participants based on their contribution and role of the course design to get the sufficient information about their experiences. The interview questions were prepared in order to see the participants' experiences related with the creation, management and utilization of the MOOC environment.

Course Environment

MOOC was created to provide an online learning environment for educators who will use social media to support the students' learning functions. This project was held on 4 weeks through Blackboard course site. Each week was designed to teach different components of social media (Week 1/Curation, Week 2/Social Media Lessons, Week 3/Personal Learning Networks, Week 4/Privacy & Ethics) (Figure 1). In total, 600 people were participated this course from different locations within the different time of 4-week period.

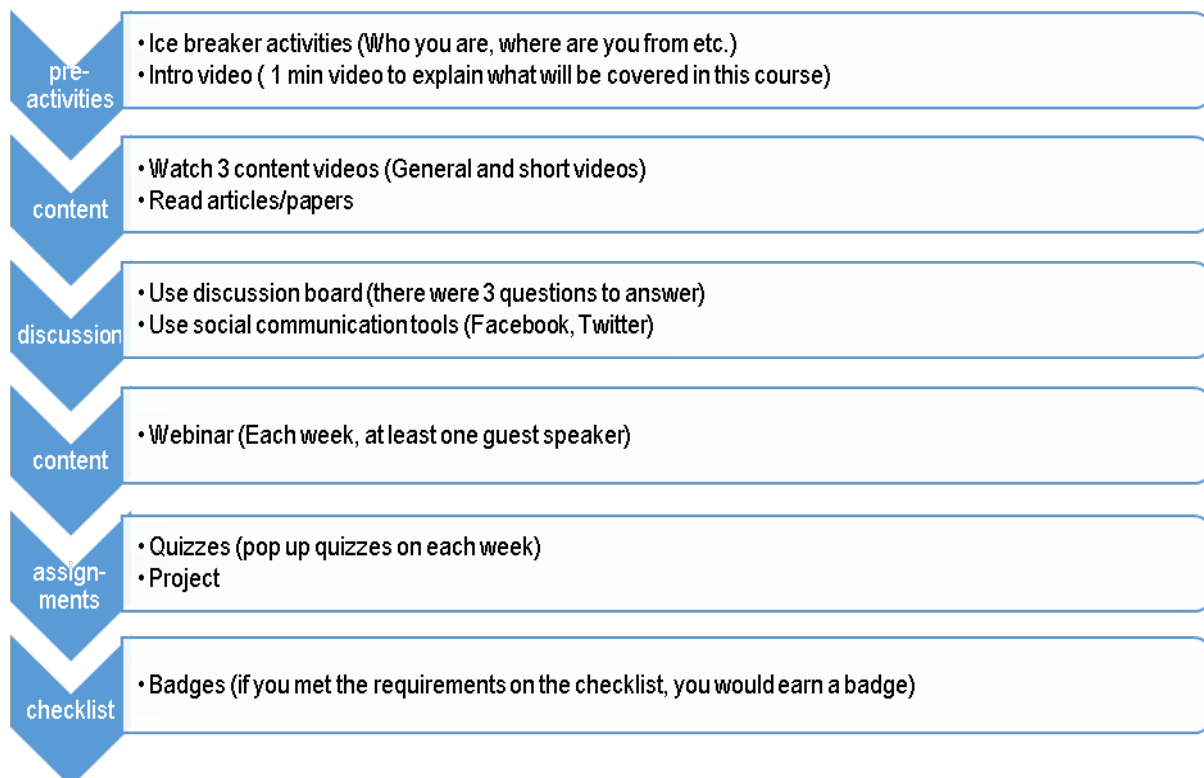


Figure 1. The activities on each week in MOOC environment

Results

Result of the interview created some themes and subthemes after the analysis (Table 1). In the interview, participants were asked to explain their experiences related with MOOCs (if there were) as a designer or learner before this MOOC project and their opinions about these experiences. 10 participants had an experience of MOOCs (two of them had designer experience and 8 of them had learner experience in advance). The platforms they mostly used were Coursera and edX. The reasons to use MOOCs were diverse in terms of curiosity, finding topics that are interested, finding supplementary material, using free courses/resources, improving professional development, and individual learning. Most of the participants indicated that they began to use MOOCs to see what is going on there and to explore the environment. In addition, they used these platforms, to find some supplementary materials for their own courses, to get some different teaching ideas for improving their own teaching profession, and to find information about the topics they are interested.

The participants mentioned the advantages in MOOCs that derived from their experiences; the most common themes were being free of charges and ability to find free resources within easy access. Three of our participants emphasized the importance of communication between different learners through MOOC platforms by enhancing their community of practice and personal learning networks. Some participants described the cons of MOOC environment as not providing an official degree/certificate. And two of them emphasized the problem related with limited interaction between peers and instructors and plagiarism.

The opinions of the participants about MOOC were positive that they were happy to participate this project because it helped them to facilitate their online learning experience and profession as a designer/developer. Also, they were eager to participate another online learning project if they have a chance. Most participants saw MOOC initiative as a facilitator that brings new ideas and arguments on online learning environment. In addition, they were happy to use MOOCs to develop their profession and to support their individual learning.

Table 1: Themes, Sub-themes, and Codes

Themes	Sub-themes	Codes
Usage	The reason to use MOOC	Curiosity Topic that are interested Supplementary material Free courses/resources Professional development Individual learning
Advantages of MOOC		Free/open course Diverse materials Easy access Personal learning network Community of practice Learn new ideas/teaching styles Free of charges (pressure, failure, consequences)
Disadvantages of MOOC		Flexibility Certificate /degree Limited interaction Time consuming Unknown people Plagiarism
Challenges	Design process	Time consuming Decide the topic Find free resources Providing clear guidance Getting permission
	Management process	Technical problems Too many people to control Absence of students Language Management Cost Dropout rates
	Assessment	Peer review Automated grading systems Qualitative evaluation Feedback Discussion board Quality of the assessment
	To take MOOC	Select a course Self-motivation Overwhelming Technology literacy Feeling isolated
Opinions	SMOOC experience	Instructional experience Interaction Career/professional development Group work
	MOOC	Social network Popular topic Applicability/feasibility Aware of open education
Concerns		Success of students Workforce/labour Transform educational system

All participants mentioned different challenges while they are designing the course as a developer and taking the course as a learner. Challenges while designing the course have three components in terms of design, management, and assessment. In the design process, participants defined the challenges as time consuming, hard to decide the topic that fits need from too broad contents through a limited time, finding free resources to share with students, providing clear guidance, and getting permission from the institution that you are part of. In the management process, participants indicated that it was hard to find quick solutions to the technical problems, there were too many people to control (over 600 students on MOOC), invisible background information of participants and language diversity made interaction difficult, it was hard to engage the students into course process/to sustain students' interest, finding budget and drop off rates. However, in MOOC, the dropout rate was high as expected (Less than ten percent of the participants only complete the courses (Alraimi, Zo, & Ciganek, 2015; Cordero et al., 2015) but the participants were not much stressful about that situation because they were familiar with the students' habits in online learning environments because of their learner experiences in MOOCs. In the assessment part, all participants had some time problems to evaluate qualitative essays/assignments and students' posts on discussion board. But they were not much overwhelmed because they had just 25-30 students to complete every assignment in each week. If they had more people than that they had a plan to use peer grading between students to lessen their works for assessment. In addition, they had some concerns about the quality and the effectiveness of the assessment in that course. Related with the challenges from the learner perspective, two of the participants stated that it is tricky to decide a MOOC before take the course whether it is worth for your time or not. In addition, one participant explained the challenge for keeping alive his/her self-motivation to complete the course. Two participants did not feel comfortable when they were taking a MOOC for their own interest that the community was too big to feel a part of it.

Discussion and Conclusion

According to the results, most of the participants prefer to use MOOCs to find out supplementary material, to develop their individual and professional skills and also to find free courses/resources. In addition, the free feature of MOOC environment brings some conformity to both designers and learners. The students feel much free to attend the courses without failure/success concerns. In our study, we found that the learners have positive opinions to have free and accessible materials and to expand their personal learning network and community of practice.

The findings also revealed that there are some concerns both from the learner and designer side for MOOC environments. While some students find the social media and other communication platforms (like discussion board) as a way of interaction and engagement for the course, some students indicated to feel distracted because of the number of participants, excessive number of discussions, and lot of assignments.

Based on the results, the most common challenge while creating the course is related with providing clear guidance and framework to the students. In MOOC environment, the enrolments and the requirements are not restricted as in traditional learning (DeBoer et al., 2014) so this brings the concerns about unclear learner characteristics and styles. The diversity on the students' characteristics, learning styles, background and language makes the instruction more problematic and uneasy but with the clear objectives and requirements, online courses could be more successful and satisfied (Toven-Lindsey, Rhoads, & Lozano, 2015). The second common challenge while designing a MOOC are the lack of student participation and time consuming activities. Design and the creation process of MOOCs requires extra effort, time and support. Another common challenge, dropout rates, less than ten percent of the participants complete the courses (Cordero et al., 2015; Parr, 2013). In some studies, students were defined as lurkers (Breslow et al., 2013) or "following the pulse of the event" (Kop, 2011). Therefore, some students might need a particular part of the course (Fini, 2009; Siemens, 2013) rather than following the whole course.

Another challenge from the designer perspective is related with assessment. In most MOOCs, automated graded quizzes are used. The major problem on assessment part is regarding the quality of the evaluation and time requirement for evaluating open-ended essays/assignments. Some automated grading systems for essays are valid but their performance and quality are still vague (Hew & Cheung, 2014). Spector (2014) examined summative and formative assessment on MOOCs and argued that in most MOOCs, assessments applied on very basic level rather than requiring an application of the knowledge. Similarly, the instructors evaluated the assignments based on the completion, not for the quality of the content. This problem comes from both the lack of time and excessive number of students.

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UNDIVIDING THE DIGITAL? THE POWER OF NARRATIVE RESEARCH TO UNCOVER THE HIDDEN COMPLEXITIES OF STUDENTS' DIGITAL PRACTICE

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Abstract

It looks like the emerging media and the new technological landscape brings some magical change with it. Furthermore, those changes are mostly seen as inevitable and always for the better enabling students to access *effortlessly* some kind of inevitable progress. Thus the usual questions asked in the field tend to be related with *what works?* *performativity* and *efficiency*, narrowing the understanding of these issues and avoiding as Selwyn (2017) reminds us the problematisation of the use of technology in education. This paper aims to challenge these assumptions by telling the story of thirty-two undergraduates at an English University that struggle to understand online tools and services, finding themselves more like visitors of the Web than residents.

Adopting a more conservative stance and scrutinising the *state-of-the-actual*, I decided to explore the current digital practice of students, placing the digital inside the texture of everyday life. I used mapping as a means to enquire whether, how and why students engage with digital tools and platforms in formal and informal settings. Constructivist grounded theory (Charmaz, 2006) has been used for sampling, collecting and analysing the data.

Despite the euphoria and enthusiastic rhetoric of many educational technologists (Oliver, 2011; Selwyn & Facer, 2013), the participants of this study have not yet changed their behaviours nor their attitudes towards learning. Instead what is observed is how participants cling to the structures and practices they are familiar with being reluctant to explore let alone adopt new tools for their academic practice. This reality reinforces an increasing 'digital inequality' (DiMaggio et al., 2004) stemming from individuals who have access to the Internet.

The results include valuable insights that allow for a deeper understanding of students' voice, their experience, struggles, and needs regarding their digital practices in academic settings. Some of these elements can be hindering students to experience a more critical and productive engagement with digital literacies for learning and researching. Inspired and driven by the results of this study I argue for the need to deliver a more realistic and inclusive student experience that includes scaffold and support regarding the critical engagement with digital literacies and practices; an experience that takes into account the voices of the most unconnected and vulnerable students as well as the specialists users of technology.

Introduction

“[...] It is difficult to determine whether digital media are levelling the playing field for youth or whether they are raising new barriers for some while advantaging the societal position of others” (Hargittai, 2007). This quote encapsulates my thoughts about the depth and breath of the work Higher Education Institutions (HEI) are doing around educating students to be digitally fluent for their academic digital practice. I question if instead, universities are perpetuating and even increasing inequality and exclusion? Is the University aware of the need and struggles that students are having when engaging with their academic digital practice? It is curious as Selwyn (2010) states, how many of the features of teaching and learning remain untouched by the potential of educational technology despite the long history of ‘potential’ transformation of education through innovative technologies (Selwyn, 2010).

Practice in this paper is defined as the “nexus of doings and sayings [that are] socially dispersed and temporally unfolding” (Schatzki, 2010; p.22). That is a spatio-temporal manifold of actions that have two basic components: action and structure. The structural component entails the know-how (performance of the actions and activities), the rules (maxims that guide the practice), teleo-affective structuring (the purpose, goals and emotions that underpin and direct performance) and the general understandings (relevant information for a particular task).

There is a need to approach research in education and technology with a critical stance (Selwyn & Facer, 2013); or in words of Winner (1980), with political teeth (Winner, 1980). In so doing we minimize – at least we attempt to – the risk of deterministic ideas obscuring the state of the actual use of digital technology in education. Research in Technology Enhanced Learning is usually approached from an enthusiastic view with an emphasis on *what works*, *performativity* and *efficiency*. Little analytical attention has been given to the lived digital culture and experiences of young people, thus leaving this area of research relatively unexplored (Selwyn & Facer, op. cit.). Greater attention needs to be paid to how technologies are actually being used or not used in real world educational settings. For that, Selwyn (2010) suggests we develop a context-rich account of the social realities of technology use on the ground in educational settings. This study aims at such a critical endeavour; to shed light on a complex and messy area of education and technology, namely the daily entanglements of young people with digital tools. This with the intention to operate in and consider the broader sociological and political account of education where ideas such as young people being *Digital Natives* (Prensky, 2001) are uncovered (Oliver, 2011; Selwyn, 2014) allowing us to see beyond what seems apparent. In so doing I aim to reveal some tensions and uncover naturalistic discourses that render the presence of educational technologies as an inevitable progress “very easy to accomplish with young people ‘always ready and prone’” to dive in and explore new digital landscapes. On the other hand, it is important to stress the inherent risk that is implicit when the philosophy of the university is based in such deterministic ideas, i.e., the net generation or the digital natives as it entitles them to think that there is no need to educate their students digitally (Lanclos, 2016). It also hides, in nuanced ways, the internal politics of

the University regarding the ways in which they use and promote technology. It reminds us that “decisions about technology are political” (Pelletier, 2004).

Diving deeper into the politics of technology one is able to see how it can veil the real needs of students. The work of Pelletier (2004) is relevant and illuminating. She hypothesizes that the way technology is realised within the university is as an ideology; ideology in terms of Barnett (2003), that is, beliefs systems that are guided by interests. It involves collective identities to achieve particular ends (Barnett 2003). Pelletier asserts that there has been little theorization of the role that technology plays in university cultural agenda notwithstanding the wide acknowledgement of its importance (Pelletier, 2004). This under-theorization reinforces the idea of new media and digital technologies in general as having inherent positive consequences for university's practices. The danger of ideological projects is that what remains untouched and unseen is the social context within which teachers and learners work, has historically undermined efforts to transform education through technology (Pelletier, 2004; Selwyn, 2012; Selwyn & Facer, 2013). In this regard, Cuban's (1986, cited in Pelletier op. cit.) ideas although thirty years old are relevant to the argument I am making, as he points to the fact that educational technologies are not only the outcome of technological development but also a consequence of social and institutional demands which technology helps to fulfil. If we aim to understand and address the implications of digital technology in education for issues of social justice, we ought to take a step back from our privileged position towards digital technology to gain insights into the social, political and cultural nature of educational technology (Selwyn & Facer, 2013). We are encouraged by Selwyn & Facer to “develop a more politically aware and sociologically grounded narrative of change” (p.4).

With every narrative to influence change towards a more equal society one needs be clear about the questions one makes regarding inequality (van Dijk, 2012). In the first instance, we need to ask what inequality we are talking about, equality of what? Second: What is new in this particular inequality? Third, what new types of inequality are rising in the researched context? I will refer to the first question in more detail, showing through the data of my study what is unequal in my researched context. First I will describe some of the current ideas around digital inequality and how this concept has evolved from an earlier idea, namely the digital divide.

Technology and inequality, how does it work?

My analysis shows the unequal distribution of digital cultural capital among young students in an English university. I refer to cultural capital as in the view of Bordieu, the ingrained habits, skills and dispositions individual possess due to their life experiences.

Technology is changing fast. Every day there are new applications that improve the older ones. Society, is transforming into an information and Network Society (Castells, 2000; van Dijk & Hacker, 2000) where the majority of the processes occurring in different spaces of society are mediated through digital tools and online applications. In such society information is a primary good, everyone, or at least those who are active citizens, need information to

function in society. Together with information, people need the skills and knowledge to use it appropriately, what is also called, cultural capital in terms of Bourdieu. This cultural capital is unequally distributed in society (van Deursen & van Dijk 2010; van Dijk & Hacker 2000). On the other hand, but within this line of thought, Pearce & Reis (2013) suggest that even though eventually everyone would benefit from a resource such as the Internet the pace of appropriation is different among different groups of people. What tends to happen, the authors have found, is that the ones with the most resources (status, cognition, education) adopt it first gaining more skills, using it more and in a more creative manner (Pearce & Rice, 2013).

The exponential growth of information available on the Internet demands that people choose and use different tools to sieve through the information and keep updated with relevant material. Hargittai (2007) has found that search engines and portal sites require a certain level of understanding and the know-how to use them properly. The fact that the Internet offers information about almost everything does not mean that finding it is a straightforward task. Hargittai (op. cit.) comments on how easy it is to get lost in the vastness of resources and many times, she affirms, it is not easy to find the level of specificity that one is looking for. If people who need the information are not able to find it, the availability of the material does not imply any benefit for them. Feed or RSS how they are popularly called, is another example of this situation. Feeds are a useful tool to curate resources and sift the noise of the Internet allowing to harness the materials that are relevant to the user, but understanding the mechanisms of the tool and being able to make it work is a key skill in order to take advantage of the affordances of the tool. Individuals with the skills and know-how will take advantage earlier in their own practices.

In a network society the major form of organisation is the network, thus the position an individual occupies (in or outside the network) becomes vital, it defines the opportunities and power in society (Castells, 2000; van Dijk, 1999). The position in the network acquired at the university, at work, and in the local community determines the opportunities to get basic digital experience, to develop that experience, and to put it to use in particular contexts (van Dijk & Hacker, 2000) being able to take advantage of the opportunities available through the medium and the network.

As getting connections to the Internet is becoming less difficult nowadays, the important question to ask is not so much if people have or do not have access to the Internet but about the quality of the experience people have while they are online. This is a significant aspect to predict the level of skills and usage of the Internet. DiMaggio et al. (2004) have found that when the experience being online is positive, people tend to come back exposing themselves more to the internet and in so doing they increase the opportunities to learn the skills and knowledge they need to navigate successfully and do what they need to do. The rewarding experience is a driver to further engage in the Internet and pursue more difficult and challenging tasks. Instead, if the experience online is a negative one, where what is needed is not found, or information is lost, or tools just cannot be understood, the level of frustration

increases and people tend not to come back again, hence they will have less exposure to the Internet and to the skills and know-how gained when using it (DiMaggio et al. 2004) being in a less advantaged position.

As the evidence shows it is not so much about people having access to the Internet but how they experience the Internet what is more important when it comes to more nuanced ways of access. There is much more to this fascinating topic of the different and contested visions on technology and inequality, but it is out of the scope of this paper. For the interested reader I suggest to read DiMaggio & Hargittai (2001) to have a more expanded view on these issues.

From Digital Divide to Digital Inequality. Does it matter?

The metaphor of divide has been used in initial research when the concerns had to do more with having or not having access to the Internet (DiMaggio et al., 2004; Hargittai, 2007; van Deursen & van Dijk, 2010). Though it is still used in some spaces of educational research, the problem with term *divide* is that it suggests binary thinking and it seems that the problem lies in having or not having access to the Internet ignoring the more complex fabric where access to the Internet and its tools and platforms is embedded.

Although findings from earlier investigations were showing that despite the increasing level of penetration of the Internet, the spread of the medium happened at different rates in different social strata (DiMaggio & Hargittai, 2001; Hargittai, 2002), more recent work has focused on more refined and nuanced measures of access and use. Thus the type of use and user abilities need to be considered (van Dijk, 2005; Hargittai, 2007) as new elements in the research agenda (van Deursen & van Dijk, 2010; van Dijk, 2012). In fact, if we aim for a more equal society in terms of the digital experience and its implications for people's daily life, we need to move to a more complex landscape. This will provide a better understanding of where inequalities may reside (DiMaggio et al., 2004; Hargittai & Hinnant, 2008; van Dijk, 2008).

Digital inequality is a field that has gained interest and is expanding (Robinson et al., 2015). There are different figures in the field, of particular interest for this study are Hargittai, DiMaggio (with a US oriented perspective) for their similarities with Schatzki's ideas of social practice, being digital practice the focus of this study, and Jan van Dijk, Warschauer, van Deursen (with a more Europe centred perspective) to put the issue within a European context. While all of them suggest different models to study the issue, they agree on the need to explore further in a more refined manner to find ways to bridge the gap where it is possible. DiMaggio & Hargittai's theoretical framework to analyse inequality through five dimensions has proven useful, and inline with Schatzki's definition of practice, to understand better what are the constraints and enablers of students' digital practice, shedding light on a rather unclear space for students themselves.

The authors call attention to five forms of inequality (DiMaggio & Hargittai, 2001), which I will describe briefly:

Undividing the Digital? The Power of Narrative Research to Uncover the Hidden Complexities of Students' Digital Practice

Caroline Kühn

1. Variation in the technical means, the technical apparatus (Hardware, software and connections) with which people access the Internet. This will have consequences in the experience people have online and the range of sites they are able to access.
2. The degree to which people exercise the autonomy in using the web. This refers to the fact that some people access the Internet from home where they have freedom to do what they want/need whereas other people can only access the Web from work or a library where they sometimes are monitored and need to compete for time to connect having a negative consequence in their experience.
3. The skills that people bring to use the medium. The authors suggest there are at least four areas of relevant knowledge.
 - a. Recipe knowledge: How to log on, to conduct searches, and download information.
 - b. Non-domain specific background knowledge: Designing effective search algorithms is one example.
 - c. Integrative knowledge in regards to different ways the Web operates that makes the navigation experience optimal (use of plugins, feeds, web browser extensions, etc.).
 - d. Technical knowledge about software, hardware and networks that can be of use in case of troubleshooting (how to operate a tool, how to solve different problems).

These four kinds of knowledge are what the authors have called 'digital competence', they are necessary for individuals to act and respond to challenges and opportunities in a way that they take advantage of the Internet's potential and in so doing they could avoid frustration and the negative consequences already described above.

1. The social support on which Internet users can draw.
2. The purpose for which people use the Internet.

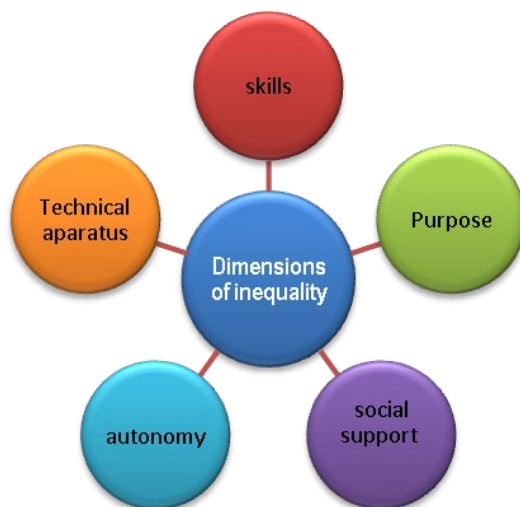


Figure 1. Model for digital inequality (DiMaggio & Hargittai, 2001)

As an initial step to contribute to the call in the research agenda of digital inequality, my study approaches students' (daily) digital practice to find out how do they engage or do not engage with the Internet its tools and platforms and why, and which are some of the barriers they are confronted with. This together with an exploration of their experience and expectations of the digital practice at the University will give the reader an idea of where are students standing regarding their digital practice identifying where inequalities may reside. The next section will describe the methodology and the preliminary findings of my study.

Methodology

In order to avoid simplistic and narrow views about the digital practice of young people, this study aims at co-constructing data with the participants. Therefore, the study has opted for a qualitative empirical method that uses a constructivist grounded theory (CGT) approach (Charmaz, 2006) to explore weather, how and why students engage with digital tools and platforms in formal and informal settings and how they make sense of those engagements and the environment in which they are learning and making meaning. In so doing it assumes as Charmaz (2006) states, the existence of multiple realities "recognizing the mutual creation of knowledge by the viewer and the viewed, and aims toward an interpretative understanding of subjects' meanings" (Charmaz, 2006; p.250), that is, how participants construct their realities, namely their digital practice. In so doing it aims to generate as its outcome and together with the participants, a shared reality instead of a concept as in classic grounded theory (Charmaz, 2006). The study is framed in a socio-cultural perspective.

The empirical data was collected at an English University. The project was publicised through different means to all students across the three years of education studies degree. Thirty-two undergraduates volunteered to participate in the study. Two of them were mature students, over 35, and the rest between 20 and 26 years old and only four of the participants were male. They were invited to a focus group (4 to 5 participants per focus group) that was organised around the visitor and resident approach (White & Le Cornu, 2011) as the starting point of a longer discussion. The cited authors generated this method as an alternative proposal to the limited view of the *digital native/digital immigrants'* typology presented by Marc Prensky around 2001. Prensky's proposal has been criticised elsewhere by McKenzie (2007) and Kennedy et al. (2010) both cited in White and Le Cornu, (2011), due to lack of substantial evidence and the limitations that such a deterministic approach entails. The conceptual idea of mapping is inspired by Deleuze and Guattari's construe about rhizomes and mapping (Deleuze & Guattari, 1987). It is based on the ontology of becoming instead of being, portraying reality as a dynamic process of change. The experience of mapping discloses potential instead of reinforcing fixed and deterministic identities; a powerful tool to uncover the myth of the digital natives.

The visitor and resident approach takes a different view on the ways people engage with the Web; it is framed as a continuous mode of engagement. It fluctuates from feeling like a visitor who thinks about the Internet as a series of tools to resolve particular tasks with no intention

Undividing the Digital? The Power of Narrative Research to Uncover the Hidden Complexities of Students' Digital Practice

Caroline Kühn

of leaving a social trace on the web, to a different view of the Web as a series of places where people are active participants who are looking to establish social bonds on the Web. They are interested in leaving a social trace and developing a social identity while engaging with people in open and visible ways. Individuals are split all across that continuum no matter if they are from a particular niche or if they are part of a broader audience, let us say a whole university. The continuum is depicted in the X axis of the map whereas the context is depicted on the Y axis. For this study I was interested in formal (Institutional) and informal (personal) settings. In this way the map is formed of four quadrants: institutional-visitor, institutional-resident, personal-visitor and personal-resident. Students allocated the tools and platforms where they felt more identified with, either as residents or as visitors throughout the continuum. They could perceive themselves residents (more or less) in some spaces of the Internet whereas in others they felt like mere like visitors. To understand this metaphor, it is useful to imagine what we do and how we feel when we are residents in a neighbourhood compared to how we feel if we visit an area for the first time.

In the focus group students had time to map their engagements in the web and after that each of them described their map in detail and we discussed the relevant aspects that the map described for them. The sessions were videotaped and then transcribed.

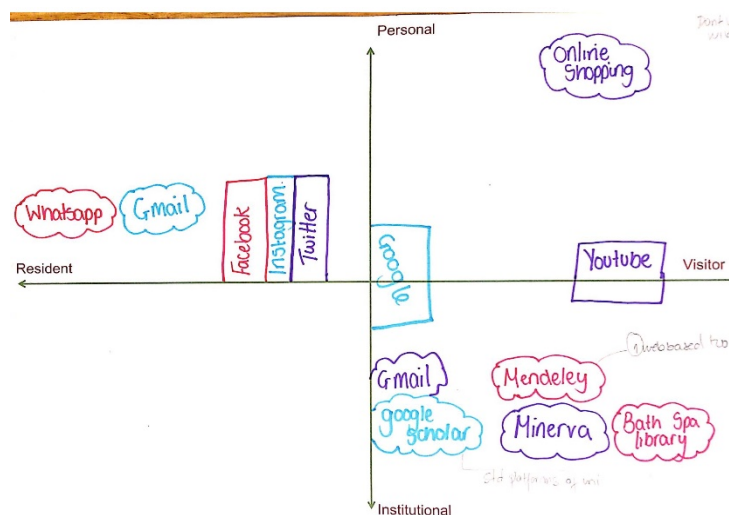


Figure 2. One of the participants' map: topography of their digital practice

This method was an excellent opportunity rarely given to students, so they said, to reflect upon their digital practice. Much of what students do online is not visible for themselves let alone for the university. One of the aims of this approach is to bring students to reflect on their own digital practice, making visible the invisible and in so doing understanding what the main constraints and possible enablers are in their practice. It brings students to think about and discuss how they can bring their practice further, how can they shift it in any way that it turns out more useful for their learning experience. It is a way to DO something instead of talking about it.

Preliminary Findings

The preliminary findings indicate more struggle and conflict in students' digital practice than any other thing, in particular in their academic digital practice. Although all of the participants have access to a formal education and come from a middle class background, they have difficulties using the Internet in more sophisticated ways. They are able to access basic services like their email account(s), the virtual learning environment, the library page, Google Scholar, but they stay at a very basic level, so they said. Their barriers and difficulties are mainly related with the skill and knowledge dimension of DiMaggio and Hargittai's model and the structural element of practice defined earlier in the paper (Schatzki, 2012). In the data a curious pattern appeared, namely the majority of students had rather ambitious aspirations when it came to their digital literacies and the way they wanted their digital practice to be, this became evident throughout the discussion that arose while they describe their maps. But there was a big disparity in what they aspired to and what they were able to accomplish in reality. This deserves to be investigated further and in more depth, as I believe it can provide fruitful insights about new areas to explore and identify where potential barriers to a more sophisticated digital practice reside and how students can be encouraged to bring their practice more aligned with their aspirations and in so doing building a stronger social identity.

As Figure 1 depicts, and this was the case for 28 maps out of 32, the institutional-resident quadrant is empty and the institutional-visitor one is populated only with the institutional tools, tools that are closed and provided by the institution, hence not chosen by students. One of the things many of them said is that they felt safe within those closed spaces, as they could not break them. But what most of them also said is how little they liked the Virtual Learning Environment, some went as far as "I hate it but I am forced to use it". This shows that they felt unable and unsafe to explore new tools for their academic practice as they said they felt anxious about the lack of skills and know-how to find new tools and bring them to work for their purpose. They were afraid of doing something wrong and as a consequence affect their grades. For some students messing up with their grades was not an option and that kept them away from trying out new things. This was the case when I asked why they do not use a referencing manager tool or a social bookmarking tool that allows them to annotate the Web and curate, organize, store and share resources to be used in their dissertation, why they preferred to do things the old way, namely copying and pasting the references from the source to the word document. One student said, "I am scared, I don't understand where my stuff is, in the cloud? How does it work? What do I do if I cannot find it anymore?" "The risk of something going wrong with my grades puts me off to try new tools in my modules"; "I stick with what I know"; "It is the new stuff that worries me." To explore this further I asked: "what do you do if you are interested in anything you find on the Web, do you save it, bookmark it?" A student answered: "Usually what I do is copy and paste it into a Word document and then I referenced it from there." I wanted to go even further so I asked why again? She said: "It is safe, and it is quicker to reference because I already have it there." Instead of knowledge of the tool's affordances what motivates her performance, it is the fear of loosing information; hence

affecting her grades. This clearly limits her to explore and find out new tools forcing her to stick with her known practice for the sake of “efficient and practical reasons” as she said.

From the four students who had a referencing manager tool (3 had Mendeley and 1 had RefMe) in their institutional quadrant, all of them referred to the importance of the lecturer's support regarding the use of the tool. One of them said, “I use it (Mendeley) because my lecturer encouraged me to do so. If I would have not had the support from him I would have dropped it.” This reveals what DiMaggio and Hargittai (2001) said about how the social support that students get is a determinant factor in the use of the Internet. All of the participants said that support and guidance is needed to explore and improve their digital literacies in the university.

Another element that hinders the exploration of new digital tools is the anxiety students have towards the openness and immaterial nature of the Internet. Some of the students said, “the Web is too big and too open”; another described this in a different way, “there are too many tools that do the same thing, how can I choose? It is all like different entities, without a unifying factor, I don't think it is worth it”. This reveals the anxiety and preoccupation with a discrete vision of technology that some students have, which is already researched in other studies (Davies et al., 2008). Some of the students feel they are the generation that has been forgotten! “No one explained us at school because no one knew about this stuff and now at the university we are expected to know all of it, so no one bothers to explain it to us. How am I supposed to know this?”

For the majority of students, it is difficult to build their network of people and resources. Many reasons for that, the most common was the feeling of not having a strong voice in their field of interest. They felt they had not much to say in the public arena so they prefer not to expose themselves to any relevant network of people, be it experts or not. The fact they feel vulnerable and exposed is another barrier to build a network and be an active part of it, despite the importance of it already stated by van Dijk (1999) increasing the existing inequality. There is much more that can be teased out from the data, but for what I aim to show in this paper this is enough.

I will now proceed to discuss the findings looking at the broader issues happening around digital inequality.

Discussion and future actions

The aim of this study is not to produce generalisable results, rather the intention has been to have an in-depth approach that allows students' voice to be raised and create a space for reflection and awareness regarding their actual digital practice exploring barriers and enhancers in order to find ways to overcome them. It was important to hear their worries, struggles, and experiences, in short, document the state-of-the-actual in words of Selwyn, in order to identify where do issues of digital inequality arise and how can something be done.

A limitation of the study is the self-selected sample, which opens the door for different hypotheses about why people decided to participate in the study, is the sample biased? Nevertheless, bigger studies (Beetham & White 2013; Davies et al., 2008; Hargittai, 2002; Prendes et al., 2014; Sefton-Green et al., 2009) point towards similar findings, which indicates that the results of this study are aligned with broader studies that aim at generalizing further. Furthermore, it contributes to the field of research with a more detailed account of students' views and perspectives about potential barriers and enablers of their academic digital practice. In this way it provides fine grain detail about the messy present of students' use of digital technology on the ground. I believe that there are issues to resolve around unequal access and performance of academic digital practices in young students and devote attention to students' voice when it comes to tackling problems that are related to them.

What can be concluded in this study, I repeat, with no intention to generalize any further, but dramatic enough to pay attention to, is the limitations that the lack of skills and knowledge described in DiMaggio and Hargittai's model, and evidenced in the data, brings to students' academic digital practice, hindering students to benefit from advance digital technologies and more complex applications and services that lead to a more sophisticated digital practice. As Hargittai (2007) described in a more recent paper, certain attributes of users' Internet-related experiences (i.e. the sense of getting lost and not finding what they are looking for) influence individuals lack of motivation to engage further with the consequence of being less exposed to the skills and know-how they need to improve. All of the above only increases, as DiMaggio and Hargittai (2001) predicted, new kinds of inequality among Internet users affecting the extent to which they reap benefits from going online.

People could argue that students learn despite the lack of digital literacies and that they do not need a huge range of digital tools to study. That can be true to a certain extent and not without its consequences for student's current and near futures. In fact, the differential usage of the Internet is a neglected phenomenon (van Dijk & Hacker, 2000). Most of the time it passes under the radar of social and educational policy-makers, arguing it is a matter of free choice of individuals in a differentiating post-modern society, leaving the more disadvantaged ones with neither protection nor support and exposed to a minuscule fraction of the benefits and advantages that can be found mainly online (Pearce & Rice, 2013). This scenario, in my view, will be less and less possible in a society that is transitioning from being a combination of online and offline modes to one that will be mediated exclusively online, where the boundaries between the two modes are increasingly blurred. My stance on this issue is that digital literacies are still a choice but not for much longer. Students can definitely come away without them but not without exacerbating already existing social inequalities that are fostered by differential access to benefits (Helsper & Eynon, 2010; Pearce & Rice, 2013) and an uneven spread of cultural capital among students. We would not question nowadays the importance of being literate, on the contrary, it is highly encouraged from very early on. Literacy and numeracy are present along the entire education system. Almost six hundred years has passed since the book has made its debut, there is copious evidence of the

advantages this medium, and its concomitant skills, brought to human development. To read and write in sophisticated ways rather than just at a basic level is not questionable anymore. Hopefully we will need less than 600 years to acknowledge the relevance of engaging in a sophisticated manner with refined digital practices increasing the level of digital literacies in order to take advantage of the benefits of the medium in students' daily life – formal and informal. Warshauer (2002) reminds us that literacy is a social practice, involving access to the physical artefacts, content, skills, and social support. Skills and social support, I argue, are mainly missing in many educational landscapes. Authors that have opposed themselves to simplistic and asocial approaches to literacy have been leading movements that extend literacy. That is the case of Paulo Freire who put forward a social-rooted critical concept of literacy being in his main interest to devise campaigns of mass literacy around the world revolutionizing what education is for the more disadvantaged part of society.

The committee of the EDEN conference posed some interesting questions about digital inequalities, i.e. how do educators, stakeholders, and policy makers meet digital inequalities? As part of the dissemination stage of the research I opened up my findings to a broader audience at the university. I observed that different members of staff are struggling with digital literacies and their digital practice as students are. Many of them tend to walk away not aware of students' struggle and limitations. In general, HEI tend to hide in deterministic and false metaphors like the one of the *digital natives*, which makes them think that there are not much problems around students' digital literacies thus there is little to do around digital education. It becomes evident in this study that this is not the case, on the contrary, students are very illiterate therefore they ask for guidance and support to improve and refine their digital practice and experience. Technology and 'open' education will not open any doors to learners if the basic and more complex needs of students regarding the skills, know-how and social support are addressed. It is the University as an Institution for intellectual experimentation and emancipation who needs to allocate resources for both, students and members of staff.

As seen in the study, it is not so much about the technical apparatus students have access to or the autonomy they have when connecting to the Internet, it is more about the lack of social support students are able to ask for and get and the lack of different forms of knowledge described in DiMaggio and Hargittai's model of digital inequality. Some of the items that conform the structural dimension (know-how and teleo-affective structuring) of practice defined by Schatzki (2012) are what in my view needs to be attended and be included in teaching and learning initiatives and supported by inclusive policies at Higher Education Institutions.

This can be offered to students through the creation of a safe space to explore and *play* with new tools and ways of engage with the Internet. A *sandpit* that is not related with students' grades, a lab where what counts is what students do and so much if it is wrong or right. The first year at English universities is ideal, as the grades do not count for their final mark. Students can be encouraged to experiment with participatory tools that boosts an open digital

practice instead of closed ones – VLE, where students are conceived as the passive consumers of content leaving their agency dormant and their creativity locked away. I have proposed elsewhere (Kühn, 2017), that a Personal Learning Environment approach (Buchem, 2014; Castañeda & Adel, 2013; Prendes & Castañeda, 2013) to learning and teaching could be one way of addressing digital literacies. Students could experiment with creating their own learning space, a personal domain as a means to build their social and digital identity that will be part of their e-portfolio to take with them to the work place. And all of it can be embedded in the curriculum so to make it meaningful for students and relevant for teachers. As Gert Biesta affirms, we need self-determined empowered subjects and this, in my view, should be our goal.

In the field of education, in particular, in Higher Education, *Open* is among the most debated topics in the current research agenda, but *open* is not open by default, there are a set of skills and knowledge that need to be in place so students can open the *open* spaces of learning and access the plethora of opportunities available online but necessarily mediated by digital tools and platforms.

It is a deliberate act that requires intention, know-how, time, and resources. I believe that for that to happen, political awareness ought to be raised so that we can find alternative routes than those offered by an instrumental approach to digital technologies that is guided by what works, efficiency and retention. Not only digital literacies need to be supported and improved to close the gap between students' aspiration and the actual precarious reality of their digital practice, but a deeper approach needs to be taken to awaken students' minds, in words of Pelletier (2004), towards the political elements present in the university's approach to the use of technology in educational settings. We would be favoured if we create opportunities for non-instrumental exchange, dialogue, and critique at our universities if we aim to foster an education that enables students to voice out and demand the education they are aspiring to have but first of all, foster awareness of what that means and entails.

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FACTORS THAT PREDICT DIFFERENTIAL ONLINE VERSUS FACE-TO-FACE COURSE OUTCOMES: EVIDENCE FROM GERMANY AND THE UNITED STATES

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Introduction

By 2013, over 40 million college students took online classes worldwide; by 2017, that number should triple (Atkins, 2013). If online courses have lower completion rates, they may hinder degree completion. It is therefore essential to identify which students are at highest risk of failing or dropping out of those courses if they enrol in them online, so that interventions can be targeted to those students at highest risk.

Research questions

This study explores the interaction between the online medium and student characteristics in predicting subsequent course outcomes. Specifically we ask:

1. Which student characteristics exacerbate or mitigate differences in rates of online versus face-to-face course retention and successful course completion?
2. Which characteristics make students more likely to drop out of college after taking an online course? And to what extent do online course outcomes explain subsequent college dropout?

Online Learning and Higher Education in the U.S. and Germany

This study aims to look for generalizable patterns beyond a single culture, and the goal is to compare models across national boundaries. Germany's educational system has sufficient similarities with the U.S. to make comparison feasible, while simultaneously diverging from the U.S. in a number of ways, and thus providing for generalizability beyond U.S. culture. The U.S. and German education systems both have a recent history of rapid enrolment expansion and struggle with upward educational mobility in comparison to international averages (McAdams, 2002). Additionally, both the U.S. and Germany have an education structure that is organized primarily at the state level (Eurydice, 2007). However, the German system's early tracking results in proportionately fewer students obtaining a tertiary educational credential (29% versus 44% in Germany versus the U.S. (OECD, 2014). While U.S. institutions usually charge tuition, public colleges in Germany are tuition-free. And in contrast to the liberal arts

education model that prevails in the U.S., where students typically choose a major after two years of college, in Germany students must apply to a department at college entrance and take all of their courses within that department. German colleges also rarely have dormitories or the supplemental student services typically found in the U.S. (McAdams, 2002).

Online Outcomes

Many meta-analyses suggest no positive or negative effect of learning outcomes online versus face-to-face as measured by exams or course grades (e.g. Bernard et al., 2004). However, there have been studies that have reported higher online dropout rates (e.g. Jaggars, 2011; Johnson & Mejia, 2014). Despite this, there is little research on the effects of online course-taking on college persistence and completion, and available results are mixed (e.g. Jaggars, 2011; Shea & Bidjareno, 2014; Wladis, Conway, & Hachey, 2016).

One major difficulty with determining whether or not online courses put students at higher risk of course or college dropout is that students are not randomly assigned to take courses online. Online learners are more likely to be female, older, married, active military and to have other “non-traditional” characteristics (e.g. delayed college enrolment; part-time enrolment; financially independent) (Shea & Bidjareno, 2014; Wladis, Hachey, & Conway, 2015). Online students also tend to be first generation students, to have higher academic preparation, to be white, native English speakers, and to have applied for or received financial aid (Xu & Jaggars, 2011; Athabasca University, 2006). However, research on demographic variables is conflicting (Jones, 2010); it is still unclear how differing characteristics interact to affect student retention in online courses.

Investigations of student characteristics as predictors of outcomes online-versus-face-to-face have been mixed and inconclusive, and almost none of them have directly tested the interaction between various factors and the course medium. To accurately assess whether a factor puts a student at greater risk in the online environment specifically, one must analyze the *interaction* between that factor and course medium, while simultaneously controlling for self-selection into online courses. Only a few studies have considered these interactions (Xu & Jaggars, 2013; Wladis, Hachey, & Conway, 2015), and both of these studies excluded important life factors (e.g. whether the student had children) that correlate simultaneously both online enrolment and college outcomes.

Methodology

Data source and sample

This study uses two samples: (a) 9,663 students with 37,442 course records, from the 18 two- and four-year colleges in the City University of New York (CUNY) system in the U.S.; and (b) 337 students with 1,607 courses records, from 30 colleges and universities in Bavaria, Germany. Students in both samples were selected if they were enrolled in a course in the sample frame, which consisted of online and comparable face-to-face courses offered during the 2014-2015 fall/winter semester at one of the CUNY colleges or through the *Virtuelle*

Hochschule Bayern in Germany (an online platform for multiple universities). At the end of the semester, both samples were invited to participate in an online survey.

Measures

This research utilizes three measures of student outcomes: *successful course completion*, or whether the student successfully completed a course with a C- or higher (the typical standard to receive major or transfer credit), *course failure*, or whether the received a grade below a C- in a course (rather than earning a higher grade or dropping the course) and *college persistence*, or whether the student re-enrolled in college in the subsequent full semester. In the German dataset, a 1.0–3.5 grade was equated to C- or higher in the U.S., since this is the criteria used by most Bavarian Universities when they evaluate U.S. transcripts). However, we note that criteria for credit in the major and for transfer credit seem to be much more variable in Germany than in the U.S. The main independent variable (IV) of interest, course medium, was dichotomized to face-to-face or fully online, based on Sloan Consortium definitions (Allen & Seaman, 2010). Covariates included: whether the student had a child (and age of youngest child); gender; race/ethnicity; age; work hours; income; parental education; developmental course placement; marital/cohabitation status; immigration generational status; native speaker status; college level (two-year, four-year, or graduate); G.P.A; and number of credits/classes taken that semester. For the German dataset, ethnicity, developmental course placement, and college level were not collected as they are not relevant to the German higher education structure. Various non-linear versions of variables were explored, and as a result age is squared in the subsequent analyses because this better reflected the relationship observed between age and the various outcomes explored in this study.

The survey used included scales measuring: motivation to complete the course; course enjoyment/engagement; academic integration (i.e. interaction with faculty/students outside class); self-directed learning skills; time management skills; preference for autonomy; and grit (i.e. perseverance and passion for long-term goals). Confirmatory factor analysis using structural equation modelling (SEM) was used on each country's datasets separately to model items for each scale as predictors of a single latent construct. Error covariance terms were added between some individual items based on theory, prior to estimation. Some items from the motivation and grit scales were eliminated because of poor performance during SEM. For the final scales, average variance extracted (AVE) was 0.50 or greater, indicating convergent validity, and composite reliability (CR) ranged from 0.77 to 0.89, indicating good reliability (Hair, Anderson, Tatham, & Black, 1998); SRMR ranged from 0.000 to 0.059, supporting the operationalization of each scale as a single factor structure (Hu & Bentler, 1999).

Analytical Approaches

Courses for which valid grades did not exist were dropped. Multivariate multiple imputation by chained equations was used to impute values for survey questions with missing responses, using all IVs chosen for subsequent analyses. Depending on variable type, binomial, ordered,

or multinomial logit models, or predictive mean matching on three nearest neighbours was used for imputation. A median of 2.6% and 3.3% of data were missing in each imputed variable in the U.S. and German samples respectively. After preliminary tests for stability of model estimates, final imputed datasets contained 35 and 10 imputations, for the U.S. and German data respectively.

Propensity scores, indicating the probability of online enrolment, were generated for each student using logistic regression and included all of the IVs used in the subsequent analyses; scores were averaged across imputed datasets. Initially data were weighted prior to propensity score matching to account for survey non-response, but since preliminary models with and without weights were substantially similar, subsequent analysis was performed without sample weights. Matched datasets were generated for U.S. and German data using single nearest-neighbour matching with replacement because this approach yielded the best balance on the covariates, based on the standardized bias for each imputed variable averaged across imputations. In addition, the distribution of each variable was compared across both matched datasets, to ensure that the distributions for each covariate were similar in both groups of the matched sample. The median standardized bias across variables was 2.6% for the U.S. and 4.0% for the German dataset. Based on Rubin's (2001) rule of thumb that standardized bias should be approximately below 25% after matching, the matched dataset achieved good balance on all covariates. Distribution of propensity scores was evaluated before and after matching, and both datasets showed significant overlap in the region of common support.

Each dataset was formatted into two distinct datasets: the first dataset was used to run multilevel mixed-effects logistic regression models with student as the first-level and course as the second-level factors, in order to control for unobserved heterogeneity between courses; the second dataset was used to run multilevel models with course as the first-level and student as the second-level factors, in order to control for unobserved heterogeneity between students. The KHB decomposition method (Kohler, Karlson, & Holm, 2011) was used to calculate direct and indirect effects, in order to explore the relationship between online course outcomes, student characteristics, and subsequent college persistence. Standard errors during KHB decomposition were computed using clustering by course, to account for the multi-level data structure.

Results

This section describes factors that had a significant interaction with the online environment in predicting course and college outcomes. This means that the *difference* in outcomes online versus face-to-face is significantly different for distinct factor values. However, the direction or significance of the interaction alone does not provide any information about the relative outcomes of these groups overall, just about how outcomes *change* for these groups across different course mediums.

Course retention and successful course completion

Results of multi-level logistic regression models for course-level retention in the U.S. and German revealed the following constructs were significant predictors of lower relative risk online: higher enjoyment/engagement in the specific course taken; higher levels of academic integration; higher levels of grit; higher work hours; Black ethnicity; male gender; being a community college student; and being foreign-born. For the German dataset, only being native-born, and taking fewer courses were associated with lower risk online.

Results of the multi-level logistic regression models for successful course completion in the U.S. and German dataset revealed the following constructs were all associated with lower relative risk online in at least one of the models: lower levels of academic integration or autonomy; not having a child under the age of six; being in the lowest income category (as compared to the highest); having parents who have completed a graduate degree (as compared to not completing high school); being foreign-born; having a spouse or live-in partner; being a four-year college student (compared to two-year); and having a G.P.A above 3.0 (compared to below 2.0). For the German dataset, lower levels of self-directed learning skills, higher levels of grit, having a child, having higher work hours, and having a higher GPA were all associated with having lower relative risk of course dropout online.

For the U.S. dataset, the most consistent predictor of both course retention and successful course completion was being foreign-born. Across all versions of the U.S. dataset, native-born students were at greater risk online compared to foreign-born students, and this was particularly true for native-born students for whom both parents were also native-born. Native-born students with one or no native-born parents were also at increased relative risk online, but the difference was less pronounced. Higher levels of academic integration were associated with less risk online, but only when comparing outcomes in the same course taken online by one set of students and face-to-face by another set of comparable students, and not when comparing different courses taken online versus face-to-face by the same student.

In terms of successful course completion, in the U.S. dataset having a child under six years old was associated with higher risk online, although this interaction was only significant when comparing outcomes in the same course for different students who took the course online versus face-to-face. Lower rates of autonomy were also consistently associated with lower risk online in all versions of the U.S. dataset, although this interaction was only significant when comparing outcomes across different online and face-to-face courses taken by the same student. Being married or having a live-in partner was also associated with lower risk online in all versions of the U.S. dataset, although this interaction was only significant for one of the matched datasets. And finally, GPA's above 3.0 (in comparison to below 2.0) were also consistently associated with less risk online in both the U.S. and Germany, although this relationship was not significant in all versions of the data.

College persistence

College persistence in the subsequent semester was analyzed for the U.S. student-level datasets (since persistence is an outcome at the student level, it was not assessed for the course-level datasets). Instead of assessing the interaction of each IV with the medium of the course in the sample frame, the interaction between each factor and whether or not the student had ever taken an online course was assessed. The following factors had a significant interaction with the fully online medium in predicting college persistence in at least one dataset, putting online students at higher risk of college dropout: lower levels of academic integration; higher levels of motivation; lower levels of grit; fewer work hours; being older; Hispanic ethnicity; being a native English speaker; and taking fewer credits. Being a native English speaker was significant across both the matched and unmatched datasets. Aside from being a native speaker, other factors that were consistent across both matched and unmatched dataset (but only significant in one of the two) were: grit; work hours; age; Hispanic ethnicity; and number of credits taken.

This study also explored the extent to which the subsequent college persistence of online students could be directly related to the outcomes of their online courses, and to what extent it is likely related to other characteristics which also increase the likelihood of taking an online course. The KHB decomposition method was used to calculate the direct, indirect, and total effect of taking a fully online course on subsequent college persistence as mediated by successful course completion, while controlling for the variables included as covariates. No significant indirect effect were observed, suggesting that online students are not more likely to drop out of college immediately after, or due to, the outcomes of the online course; rather, it seems that other student characteristics may be significant in determining college persistence.

Discussion

Limitations

This study analyzes data from a large U.S. university system and from a large German province in order to increase generalizability and validity, but still has some limitations. While the CUNY system is highly diverse and likely generalizable to a wider U.S. student population, it is not necessarily nationally representative. CUNY does not have rural campuses, so caution should be exercised before extending any results taken from the CUNY dataset to students who attend rural colleges. The German dataset contained data from students at rural, suburban, and urban colleges, but not all patterns observed for German data may be relevant to the U.S. Further, while this study has attempted to control for a wide array of factors, it is unlikely that any study could include them all. Online students are more likely to have more “complicated” lives that include experiences that are difficult to measure or quantify, but that influence both decisions to enrol online and subsequent course and college outcomes. Further exploring and refining of factors that may impact online course enrolment should be a focus of future educational research to conduct well-controlled observational studies about cross-cultural online outcomes.

Overall trends, national comparisons, and implications

Consistent with the literature (e.g. Goodfellow & Lamy, 2009; Shattuck, 2005), we report mixed findings. The most consistent pattern observed across U.S. datasets was that native-born students were at greater risk online than foreign-born students. In Germany, being native-born was also significant, but the relationship was reversed, with native-born students at higher risk online. Perhaps this is due to differences between the U.S. and German datasets: at CUNY, roughly 40% of students are foreign-born, while in Germany foreign students are disproportionately underrepresented in tertiary education, and those who do enter University are often marginalized (Thomasen, 2012). This cultural marginalization may be exacerbated in some way by the online environment.

The number of credits/courses taken was also a significant predictor of differential online versus face-to-face course retention, with students who took more credits/courses at higher risk of online dropout, in both the U.S. and German course-level matched and unmatched datasets (the results were only significant for the German dataset). Since this result was obtained in the course-level datasets where online versus face-to-face courses taken by the same student were compared, this suggests that students with insufficient time for their academics may be more likely to drop an online courses than a face-to-face class, all else being equal.

For successful course completion, G.P.A. was a significant predictor, with the weakest grades in each country associated with higher risk online. However, we note that students with average grades (e.g. 2.0-3.0) did not have significantly different risk online than students with higher or lower grades. It is possible that this pattern of interaction between the online medium and G.P.A. only holds for students at the very top and bottom of the grading scale. This correlates with some previous research that suggests that G.P.A may be a factor in online completion (Xu & Jaggars, 2013), but that for students with average grades it may not be a helpful predictor (Hachey, Wladis & Conway, 2013). Lower levels of grit were also correlated with higher risk online in both the U.S. and German course-level matched and unmatched datasets, although these results were only significant for the German dataset. This may confirm research that suggests that grit may be essential to achievement (Duckworth et al., 2007).

Having a child (or a child under 6 in the U.S. dataset) interacted with the online medium to predict successful course completion in both the U.S. and German datasets (significantly so for the German matched dataset and for both the matched and unmatched U.S. student-level datasets), but parents were at higher risk online in the U.S. dataset and at lower risk online in the German dataset. Repeating the U.S. analysis with a binary variable indicating whether the student had a child instead of whether they had a child under six produced similar results. It may be that student parents are more likely to enrol in online courses if they have greater time constraints, and that these same students are less likely to successfully complete a course. The fact that this pattern was significant in the U.S. only for the student-level dataset (where

unobserved heterogeneity was accounted for by course and not by student), but not in the course-level dataset (where unobserved heterogeneity by student was accounted for), supports this interpretation. Differences in U.S. versus German patterns may be due to differences in how parents are supported. In Germany, all families (including students) receive paid parental leave (*Elterngeld*) equivalent to up to 67% of their yearly full-time pay that can be taken over 12-24 months after the birth of a child. All parents also receive funds (*Kindergeld*) equivalent to about 200 EUR/month per child, and all children over 12 months are guaranteed publicly subsidized childcare. In contrast, the U.S. has no paid federal parental leave, and the cost of childcare is significantly higher than in Germany, particularly for low-income and single parent households (OECD, 2014). These results suggest that without adequate support for student parents (e.g. childcare, financial aid to reduce work hours), the flexibility that online courses offer may not be enough to compensate for the time demands of parenthood.

Conclusion

Colleges wanting to target interventions to students at highest risk in the online environment may want to focus on students with lower G.P.A's (e.g. under 2.0), student parents, native-born students, students with lower levels of self-reported "grit" and students who are enrolled in higher numbers of courses/credits. But while these are the groups found by this study to be most vulnerable in the online environment, these groups are not necessarily the ones with the poorest absolute online outcomes. For example, for the datasets used in this study, household income was strongly correlated with course and college outcomes even though it was not relevant to the online environment specifically. Lower-income students likely still need significant support in online courses, just as they do in face-to-face classes. In addition to targeting student groups that are vulnerable in the online environment specifically, colleges hoping to improve online retention should continue to support student groups that have historically been identified as at-risk generally.

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TEACHERS' AND STUDENTS' UNDERSTANDING AND USE OF ICT FOR TEACHING AND LEARNING – COMBINING DIFFERENT PERSPECTIVES AND METHODOLOGIES IN RESEARCH ON TECHNOLOGY-ENHANCED LEARNING

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More than half of the 14,000 students currently studying at the University of Gävle (HiG) are enrolled in courses that are totally or partly online based. In 2015, a university-wide project on technology enhanced learning (TEL) (Steffens et al., 2015) was initiated. The project focuses on course and programme development and is divided into four sub-projects, all of which contribute to the overall goals of project.

AIMS of the project

The aims of the project are to: (a) restructure teaching facilities and integrate digital technologies, (b) develop technology supported teaching methods, (c) integrate campus and distance education, (d) enhance teachers' and students' digital skills and (e) increase collaboration with relevant external actors.

These aims are achieved through the work of four project groups.

The *digital environment group's* (1) main focus is on digital tools for learning and the physical arrangement of learning spaces. The *collaboration group's* (2) main focus is on the maintenance and development of collaborative relationships and connections with communities in higher education for e-learning. The *education and professional development group* (3) focuses on issues such as professional development, learning design and the implementation of ICT in different courses and subjects. The *research group* (4) focuses on different issues connected to TEL.

One of the main principles of the project is that the above areas are interlinked and interdependent and that the different experiences and skills of each group and its members contribute to a broader perspective of TEL.

This poster focuses on the research conducted by the project's research group. Taking a multidisciplinary approach, the research focuses on issues and aspects of teaching and learning in higher education that contribute to multifaceted knowledge. The overall aim of the research is to generate knowledge about how conditions for teaching and learning change

when the use of technology increases. The four research studies that are initiated are described below.

Study 1: Lecturers' and students' agency in encounters with digital media in higher education

This research study focus on issues related to lecturers' digital teaching practices and students' digital technological use in their everyday lives and for learning purposes.

Digital practices are defined as the different contexts in which lecturers teach and students participate in digital media (such as learning management systems, forums, communities etc.). Previous research shows that students' own digital practices are not always made use of in higher education (Buzzard et al., 2011; Kelm, 2011).

A controversial issue in the Swedish higher education context is the discourse on students as customers. The perception of students as customers and “buyers” of ready-packaged content from lecturers is problematic. This view of what higher education stands for clashes with traditional academic views emphasizing critical thinking, reflection, self-directed learning, collaborative and individual learning etc.

In this study, the concept of agency is important in that it reflects “the capacity of actors to critically shape their own responsiveness to problematic situations” (Emirbayer & Mische, 1998; p.971). In the different perceptions of students' and lecturers' tasks and roles in teaching and learning, especially in TEL, all the actors have to display agency in order to manoeuvre in the educational and digital contexts. Notably, agency is not something that people have, but is something that people achieve (Biesta & Tedder, 2006).

Aim

The aim of the research project is to study: (a) students' use of digital technology in their everyday practices and in relation to teaching situations and (b) how lecturers' agency is played out in teaching and learning when trying to facilitate TEL.

Methodology

In spring 2017 an online survey involving up to 200 students will be conducted in order to generate knowledge about (a) students' everyday experiences of digital practices and how these are utilized in higher education and (b) how higher education challenges and develops students' digital skills and knowledge. In the same period, interviews with lecturers at the university will be conducted in order to generate knowledge about lecturers' (c) everyday teaching practices with digital technologies and (d) the perceived challenges and development of teaching in relation to their use.

Study 2: Teachers' understanding and enactment of practice in online and blended educational contexts

The knowledge that teachers need to develop is referred to as a “didaktik” knowledge in the German/European tradition (cf. Kansanen 2009) and as pedagogical content knowledge (PCK) in the Anglo-Saxon literature (Shulman, 1986; 1987). However, in what Castells (2011) describes as a network society, teachers are faced with new challenges and opportunities. Koehler et al. (2014) argue that teachers' development and integration of a new knowledge domain is not simply a matter of adding this “technology knowledge” to existing knowledge, but involves a reframing and reconceptualization of their existing professional practices and knowledge. They refer to this amalgam knowledge as technological pedagogical content knowledge (TPACK). The TPACK framework has been widely accepted as a useful theoretical construct. However, there is a need for research on the development and manifestation of TPACK in different disciplinary contexts (Koehler et al., 2014).

Aim

The aim of this sub-project is to study: (a) how teachers reframe and reconceptualize their practices and the kind of knowledge that is needed in online contexts (b) how teachers practices are manifested when ICT is used to create (intended) added pedagogical values in educational designs (c) the characteristics of educational designs regarded as adding pedagogical value

Methodology

Three higher education teachers of different courses and subjects in three different departments participate in the study. A design-based research approach is applied, where one of the participating researchers engages in so-called design conversations with the teachers. As is characteristic of DBR, this researcher does not only observe and interview, but also acts as a “co-designer” on the understanding that the teachers are the context experts and the final decision makers (McKenney & Reeves, 2012; Plomp & Nieveen, 2013).

The data consists of recorded design conversations, educational designs and the artefacts used in the educational designs, the researcher's/co-designer's field notes and recorded “field-note conversations” between the researcher/co-designer and the other researcher.

Expected outcomes

The study is expected to contribute knowledge about how teachers' knowledge and practices are understood and manifested in online and mixed higher educational contexts.

Study 3: Researching and developing student nurses' drug calculation skills in an explorative design comprising digital technologies

This study is partly experimental in nature. It focuses on the challenges involved in student nurses' development of accurate drug calculation skills. Challenges like this are not specific to

nurse education at the University of Gävle, but appear to be universal (cf. Wright, 2009). However, it has also been claimed that written drug calculation tests do not accurately evaluate the skills involved in drug calculation, in that they are decontextualized from healthcare settings (Wright, 2005; 2012). It has also been claimed that this problem is more imaginary than factual, given that in practice nurses have been shown to handle drug calculation well (Wright, 2009).

Aim

The aims of this sub-project are to: (a) deepen the understanding of the challenges and mistakes that student nurses make in drug calculation exams, why they occur and how they might be prevented, (b) explore how the teaching and examination of drug calculation can be made more effective and contextualized and whether digital technologies can help in this.

Methodology

A multiple design method is employed using empirical data from written examinations, analyses of the set tasks and interviews with student nurses.

Expected outcomes

It is expected that the study will contribute knowledge about why (some) student nurses find it difficult to pass exams and that sufficient knowledge will be developed to facilitate the exploration of an experimental design for teaching and learning that includes digital technologies.

Study 4: Situating ICT in teacher education programmes at the University of Gävle

Integrating ICT as an integral part of teacher education programmes has been addressed as the most significant factor in determining the future level of ICT use in teaching and learning practices (Davis, 2010). According to the Swedish Higher Education Act, ICT should be embedded across entire educational practices in teacher education programmes (Government Bill, 2009/10:89). Numerous teacher education programmes have made extensive efforts to prepare and empower teacher education students' ICT competences so that ICT-based technologies are seamlessly woven into the teaching and learning process. Most schools try to enhance teachers' digital competences by in-service education and expect newly qualified teachers to be adequately trained to use digital technologies in their educational practices. However, in reality it would seem that many newly qualified teachers do not have the necessary skills for this (see Chigona, 2015; Koehler, Mishra, Akcaoglu, & Rosenberg, 2013).

Aims

This study focuses on understanding why a large number of the newly qualified teachers in teacher education institution remain underprepared to use digital technologies in their

educational practices, despite an increased investment in the provision of digital technologies in these institutions.

Methodology

In order to explore how digital technologies are integrated into teacher education in higher education institutions, a sequential explanatory multiple sources design consisting of two distinct phases will be implemented (Creswell, 2012). In this design, a number of course syllabi in a programme will be analyzed. Interviews with key actors, including students, teacher educators and gatekeepers, will be conducted in order to contextualize and deepen the analysis of the syllabi.

Expected outcomes

The study is expected to deepen the understanding of how student teachers are pedagogically trained in ICT in teacher education institutions.

Concluding remarks

The four research studies in the project investigate how students and teachers understand and use educational ICT. This is done by using different methodologies and from different perspectives. It is expected that the research studies will contribute to the broader and more inclusive project perspective by their specific aims and generate knowledge that will contribute to the multifaceted field of TEL.

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APPLICATION OF SOCIAL NETWORKING AS A REFLECTIVE LEARNING AND CRITICAL THINKING TOOL

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Abstract

Educators seek ways to improve the learning process such as stimulating students' interest in subject matter, helping students visualize concepts, and heightening student-student and student-instructor engagement and collaboration. One valuable approach is through the application of technology.

The objective of this research is to evaluate the use of Twitter, a social networking technology, in a graduate level online class to support reflective learning and critical thinking. It describes a study in which students participated in a weekly learning activity in which they would share their reflections from the course through the use of Twitter messages and demonstrate critical thinking. A survey was conducted to capture student reactions to the use of this social networking media for these purposes.

Introduction

Context and relevancy of this study

Educators constantly seek ways to improve the learning process such as the practice of reflective learning and the promotion of critical thinking. There are various ways to achieve this and one novel approach is through the application of technology. This research explored the use of an online social networking service to facilitate reflective and critical thinking in order to provide a more engaging online experience for both students and instructors.

The objective of this research is to evaluate the use of one social networking service, Twitter, by students in a graduate class towards enhancing the online learning experience.

Another objective is to compare the use of Twitter with the use of other social media platforms, specifically, blogs, wikis and podcasts – and evaluate the effectiveness of each.

Background

Twitter is a popular microblogging service in which users send and read 140-character messages called *tweets*. Users access Twitter via websites, mobile device apps or SMS. Users can create their own tweets and if they wish they can subscribe or *follow* other users' tweets. Messages can be grouped together using hashtags which are word or phrases with a # prefix.

Application

The study period was during 2015-2016 semesters starting from the spring 2015 through the fall 2016 semesters. Approximately 100 students were exposed to the study.

Students were assigned a voluntary weekly activity in which they would capture their reflections as they progressed through the course. As an incentive, they would receive bonus points at the end of the semester if they participated in the activity regularly.

The instructional steps which the students were asked to follow as listed below:

1. Signup for an account and watch videos explaining Twitter and hashtags.
2. After end of each week, tweet the following (be sure to include the hashtag: #610reflect):
 - What did you learn in the preceding week? (Not a list of facts, but rather, what can you take from the lesson, what had an impact on you, and what has value to you?)
 - How do you connect what you learned this week with your personal experience or what you already knew?
 - How could/would you apply your new knowledge?
 - What new knowledge and skills do I need and want?
3. At the end of the semester, provide culminating tweet(s).

Throughout the semester, students were encouraged to visit Twitter and use the hashtag #610reflect to review their fellow students' tweets and participate in the exchange.

A survey was conducted at the termination of each semester. This is the link to the survey form:

<https://docs.google.com/forms/d/18485ZRw29XyarfyH9RhAWxGNVCqrW2XglkPkhnPQV0/viewform?c=0&w=1>

Findings

Preliminary results from surveys are summarized below:

- For most students, this was their first experience with Twitter. For those it was their first time using Twitter, a vast majority of the students plan to use it again.
- Most students found Twitter a “good” way to collect weekly reflections. No student felt that it was a “poor” way.
- All students felt that the reflective writing they did helped in some degree in their learning experience.
- To improve their experience, they suggested more instruction on the use of Twitter include the “language” of Twitter.
- Most students felt that Twitter reflections should not be graded and be kept as an extra credit assignment.

Lessons learned from this study include the following:

- Use a short hashtag. There is a 140-character limitation to the length of a tweet.
- Outsiders should be allowed to participate and/or follow the students in Twitter.
- Provide this media as an opportunity for participants to ask questions and provide comments and feedback to the instructor and classmates.
- Utilize photos in tweets for richer exchanges.
- Encourage use of mobile devices to access the class tweets.
- This experience was an effective introduction to Twitter and social media.

It was concluded that Twitter can be used for reflective learning. When comparing with blogs, wikis, podcasts, Twitter offered these advantages:

- high availability (such as through mobile apps);
- concise messages (140 characters);
- accessibility to the instructor and classmates;
- immediate collaboration and exchange with other students.

However, there were disadvantages compared to these other platforms. For example:

- Blogs, wikis and podcasts offered a larger and richer environment for reflection.
- Weekly blogs tend to be much more structured and orderly.
- Wikis afford more interaction when engaging with a body of work.
- Podcasts take advantage of the audio capabilities.

All in all, Twitter showed to be a useful tool to promote engagement and reflective learning in an online graduate class. However, the 140-character limitation restricted in-depth critical thinking by the students.

Conclusions

There are new, innovative and useful ways to utilize technology to improve the quality of learning for students and heighten the effectiveness of instructors. When applied properly, technology such as social networking sites will mean higher levels of interaction and productivity, increased accessibility, and improved efficiencies for everyone involved. The future looks very promising as the educational technologies such as microblogs grow and evolve to better meet the needs of students, educators and administrators.

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EFFECTIVE LEARNING THE PROPEL-LEARN WAY: AN EVIDENCE BASED, MOBILE DELIVERED PROGRAM ENGENDERING SELF-DIRECTED LIFELONG LEARNING HABITS AND STRATEGIES FOR DISTANCE EDUCATION STUDENTS AND STAFF

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The Reality – too much to know

To be human is to learn. We learn from the day we are born until the day we die. Education aims at making learning more effective and more focussed. The question is, however, when has education reached its goal?

For a very long time education focussed on the content of the discipline or subject that is being taught, and assessment centred around testing whether the content has been mastered. That did bring about some success, as can be seen from the progress made in many fields by humankind. However, this is not adequate anymore.

So much has happened in the history of the sciences, that we are faced with an information overload as never before. The knowledge explosion is a reality. According to Eric Schmidt, the CEO of Alphabet-Google,

“Every two days now we create about five exabytes of data. That is as much information as humans did from the dawn of civilisation up until 2003.”
(<http://techcrunch.com/2010/08/04/schmidt-data/>)

There is just too much to know, too much to keep up with, too much to master – even in well demarcated fields of skills and knowledge. Knowing how to master knowledge and skills is crucial for navigating life, and the rapid obsolescence of knowledge calls for self-directed life-long learning, to continue after formal studies.

The Need – knowledgeable people

For this reason, the focus is shifting towards also developing learning skills in humans. According to the 2030 Development goals (Goal 4), humankind strives to “Ensure inclusive and equitable education and promote life-long learning opportunities for all”.

Learning as a prerequisite for sustainable development of humanity is underscored in goal 4 of the 2030 Development goals: “Ensure inclusive and quality education for all and promote lifelong learning.”

According to sub-goal 4.4 “By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.”

The reason being an explicit goal, is because it is not happening and 103 million youth worldwide lack basic literacy skills, and more than 60 per cent of them are women is seen as of particular interest to students at Distance Education institutions, and especially to people in the workplace after completion of their formal studies which continues to the end of their careers and even thereafter.

The Challenge – ill prepared learners

The importance of this is because of the reality of a world-wide skills shortage, made more pertinent because of the fact that learners are actually unprepared for studying and learning the knowledge and skills they really need. Often learners are being coached to pass school, instead of being taught how to learn and master the necessary skills and knowledge in the field they are working in. To address this in the long term, education and training needs to be carried out more efficiently. In the short term, current learners and also employees need to be continuously up-skilled and re-skilled, coupled with developing the ability of life-long learning.

When Frederick Taylor published his pioneering principles (Taylor, 1911) of scientific management in 1912, the repetitive and mundane nature of most jobs required employees to think as little as possible. Breaking down each task into basic components and standardizing workers’ behaviours to eliminate choice and flexibility could help managers turn employees into productive machines, albeit with alienated spirits.

Fast forward to the present and we see that most jobs today demand the exact opposite from employees: the capacity to keep learning and developing new skills and expertise, even if they are not obviously linked to one’s current job. As academic reviews (Hogan, Chamorro-Premuzic, & Kaiser, 2013) have pointed out, people’s employability – their ability to gain and maintain a desired job – no longer depends on what they already know, but on what they are likely to learn.

In other words, higher career security is a function of employability, and that in turn depends on learnability. Thus Eric Schmidt notes that a major pillar in Google’s recruitment strategy is to hire “learning animals,” (Stone, 2014) while EY recruiters (Tkaczyk, Chew, & Groden, 2016) observe that “to be a standout, candidates need to demonstrate technical knowledge in their discipline, but also a passion for asking the kind of insightful questions that have the power to unlock deeper insights and innovation for our clients.”

Sadly, most organizations have yet to wake up to this reality, so they continue to pay too much attention to academic qualifications and hard skills, as if what entry-level employees had learned during university actually equipped them for today’s job market. Although

learnability does boost academic performance (von Stumm, Hell, & Chamorro-Premuzic, 2011), just because someone is job-ready when they obtain their educational credentials does not mean that they are also learning-ready (Chamorro-Premuzic & Swan, 2016).

The Red Herrings – neuromyths and other unworkable solutions

There is a myriad of study method programs available, varying substantially in terms of effectiveness, validity and groundedness in reputable research. Many are based on what can be called neuromyths, which are ideas claiming to have a solid foundation in neuro- and cognitive science research, but which are devoid of any scientific basis. Examples are programs utilizing the left brain – right brain distinction, learning styles such as Visual, Auditory and Kinesthetic, and the use of baroque music while studying.

Often people rely on “Study Method Courses”, hoping that mastering a few “tricks and trades” of studying will be sufficient.

A growing body of evidence from the classroom, coupled with emerging research in cognitive psychology and neuroscience, is lending insight into how people learn, but teaching on most college campuses has not changed much, several speakers said here at Harvard University at a daylong conference dedicated to teaching and learning.

Too often, faculty members teach according to habits and hunches, said Carl E. Wieman, a Nobel Prize-winning physicist and associate director of the White House Office of Science and Technology Policy, who has extensively studied how to improve science education. In large part, the problem is that graduate students pursuing their doctorates get little or no training in how students learn. When these graduate students become faculty members, he said, they might think about the content they want students to learn, but not the cognitive capabilities they want them to develop.

The Proposal – a workable program

Responding to the need for a workable program on effective learning strategies for distance education students, the Propel-Learn Program was developed and tested with learners and students at South African schools, tertiary institutions and company employees. It is based on recent reputable research in the Mind, Brain, and Education sciences. The program is web-based, and therefore available on mobile devices for the sake of convenience and accessibility, but also on laptops and computers. The program is intended to focus on usability, and is therefore well-researched, but ultimately practical.

What is rather needed, is a comprehensive human development program, that aims to instil positive traits and habits in a person, linked to meaningful life goals. A truly effective approach should therefore address realities such as Identity, Mastery and Legacy:

- Addressing the *Identity* of the learner, attention is given to self-knowledge, determination as well as the ability to focus.

Effective Learning the Propel-Learn Way: An Evidence Based, Mobile Delivered Program Engendering Self-Directed Lifelong Learning Habits and Strategies for Distance Education Students and Staff

Ignatius G. P. Gous

- Attending to *Mastery*, the skills of Listening, Reading (on paper and on screen), Studying and Memory are shared.
- Striving for leaving a worthwhile *Legacy*, the ability to Perform and show what you know, as well as to apply and create is taught and coached.

Learners need to have the ability to master masses of information in short times – *binge learning*, as it were.

It also means that learners need to be able to discern, evaluate and weigh information as to its quality and reliability. Lots of available information also brings along lots of useless and plain erroneous information.

In all of this learners need to master the huge volumes of reliable information available, while at the same time mastering the ability to change information into useable knowledge to grapple with relevant issues.

The realities are, however, that teaching often still is archaic in the sense that it mainly focuses on the mere mastery of facts, which is necessary, but not sufficient to address the realities of our times.

Where there are attempts to transform teaching, it is sometimes based on pop psychology and neuro-myths, and might do more harm than good.

It is also true that there is solid research about minds, brain and education available, but often these research results are hidden from practical application in the real life situations where it is needed.

It is more than a “study method course”, in the sense that it aims to assist student in launching habits for a life-long journey of self-directed learning.

The program is made available as web based lessons, which can be accessed from any mobile or computer device with access to the internet. It is aimed at being light on data, making useable for even for students in developing countries with older feature phones. The program is available in English, Afrikaans, Russian, and Chinese, with translations in more languages to be added soon.

More information about the program is available at www.cerebration.info, or on cerebration.teachable.com.

Effective Learning the Propel-Learn Way: An Evidence Based, Mobile Delivered Program Engendering Self-Directed Lifelong Learning Habits and Strategies for Distance Education Students and Staff

Ignatius G. P. Gous

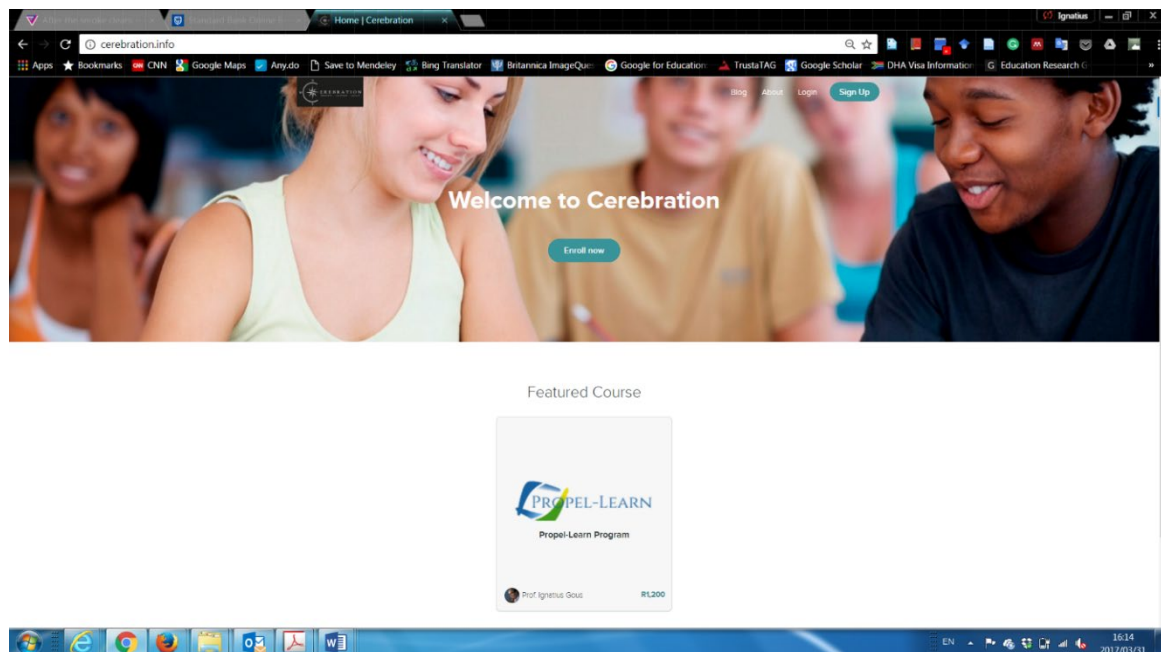


Figure 1.

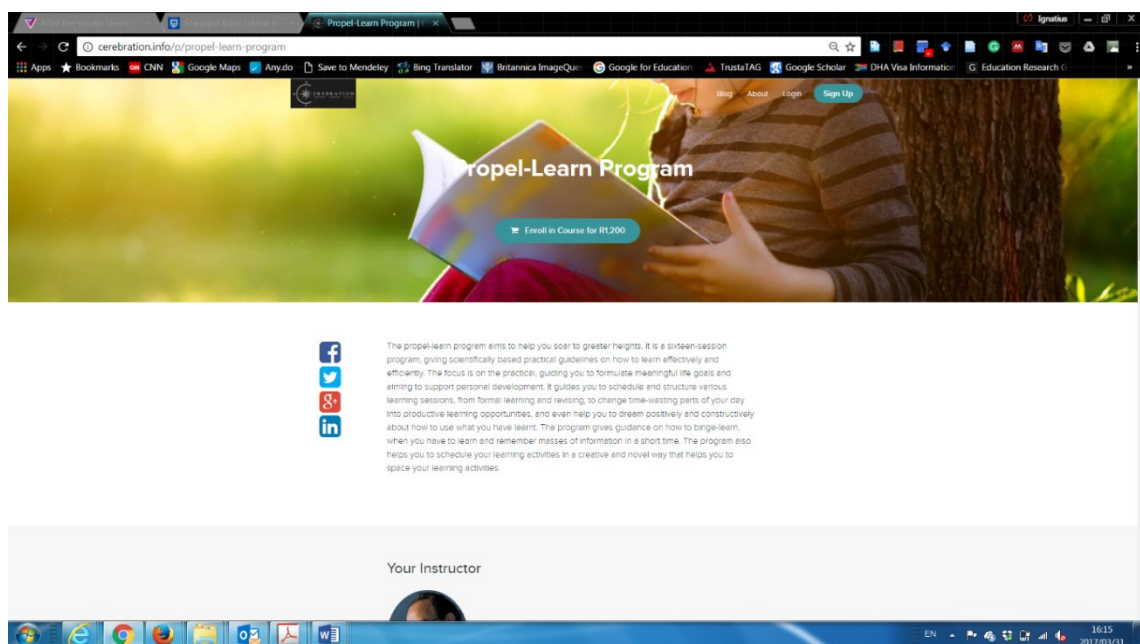


Figure 2.

Effective Learning the Propel-Learn Way: An Evidence Based, Mobile Delivered Program Engendering Self-Directed Lifelong Learning Habits and Strategies for Distance Education Students and Staff

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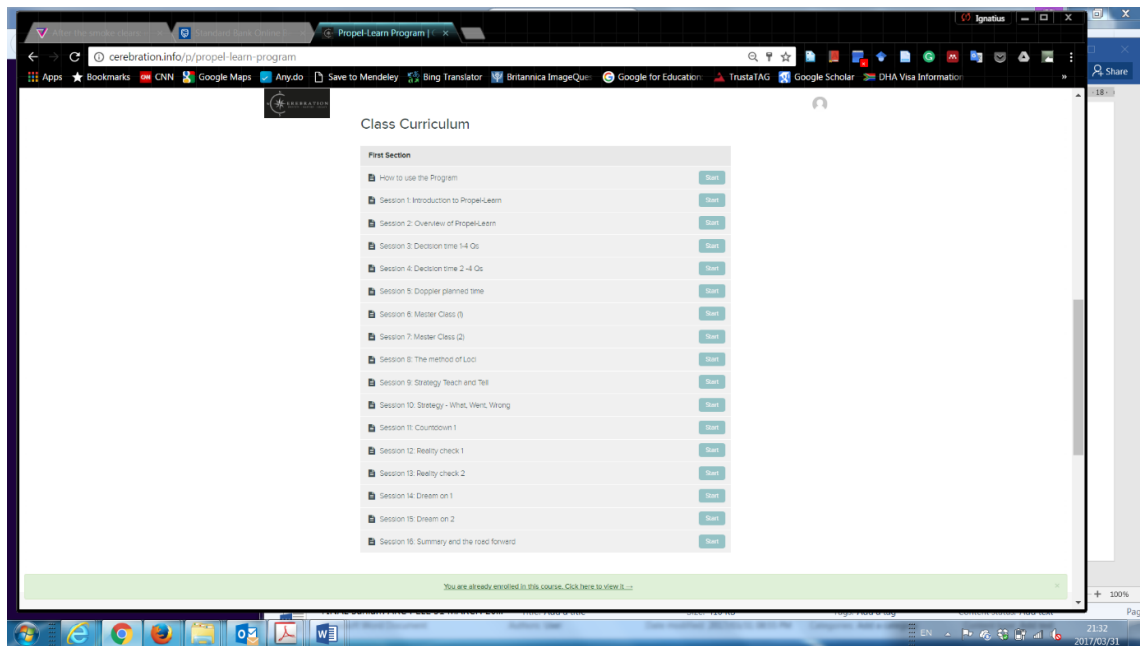


Figure 3.

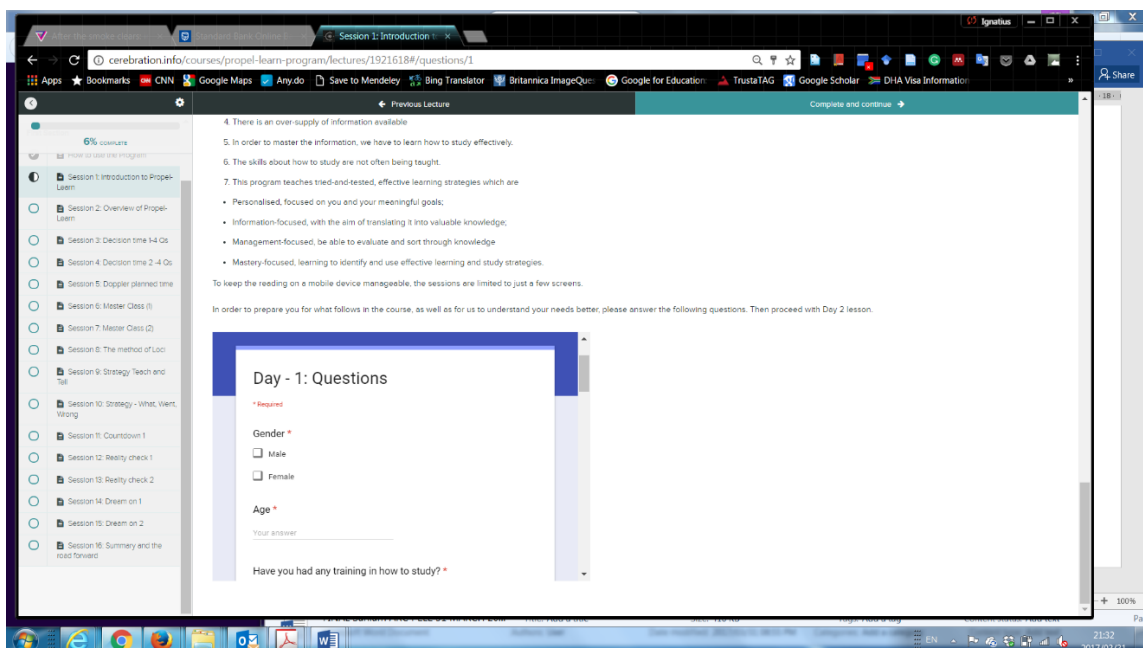


Figure 4.

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DIVERSITY AND DIGITALIZATION AS VITAL KEY SUCCESS FACTORS FOR INDIVIDUALISATION OF LEARNING

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Digital transformation as driver of the epochal change

Transformation means conversion, re-modelling, re-designs as well as changes and revisions. The four main fundamentals of transformation are transforming competitive strategy into strategic renewal, transforming organisational development into cultural dynamics, transforming R&D into social innovation, and transforming the functions of management. These characteristics prove that transformations have always been part of social development, but their dynamics are growing steadily (Schieffer & Lessem, 2009; pp.23-35).

The peculiarity of the present epoch is that omnipresent transformations are superimposed by omnipresent digitization. If both are connected to one another, then the key driver is called digital transformation. It is the change of organisations by using and embedding the possibilities of digital support and services for the processes and functions of the organisation. Transformation and digitization are in a dialectical context. Transformations lead to a drive to rationalize with the help of digital technologies and media, which in turn lead to further transformations. The dynamics and complexity of change is currently so high that all stakeholders of the social developments have problems to cope with changes in the digital world.

Enormous challenges are generated by the fast growth of the networks, the dynamic development of the social media and social relations, the huge increase of knowledge and work requirements, the dynamics of science and technology, the increased security in general and data protection in particular, etc. If all these things are to be reconciled, the result is an enormous diversity. But the control and mastering of the (digital) transformations require a rich understanding and appreciation of cultural, sectoral, societal, organisational, and individual differences and diversifications (Schieffer & Lessem, 2009). Transformations are always embedded into the social and cultural background of the actors.

Holistic development of organisations

The holistic business process management is an important component of sustainable success recipes for organizations. It consists of the phases design, engineering, monitoring, and re-engineering (Schönthaler et al., 2011; pp.17-20).

The business process design is required when new business fields have to be integrated into existing process landscapes or new technical possibilities are introduced. Diversification leads to new business areas, digitization extends the technical possibilities. For this reason, organisations under the pressure of digital transformations have to go through this design process in several iterations.

The business process engineering includes the continuous further development and optimization of all processes. Proven processes will survive and will be combined with improved or partial new designed processes. In addition to a basic set of tried and tested offers, diversification opens up new target groups, which are integrated into the organization by extending the process landscape of the organisation. The increasing digitalisation of the organisation's processes necessitates a gradual change in all IT-supported and direct IT processes, which inevitably results in a continuous development of all processes up to an ever-increasing degree of digitisation in the organization.

The monitoring within the framework of the joint business process management is intended for the ongoing control and supervision of existing business processes in order to identify and eliminate bottlenecks in the processes or the provision of resources. It should reflect which diversification efforts are to be made and how their success rate is to be assessed. With regard to digitization, monitoring indicates how digitalization is to be integrated and what effects are expected from its further development.

The Business Process Re-Engineering ensures the partial or complete redesign or optimization of already introduced processes due to changed conditions. It is the central function of the business process management of organisations of all kinds. All processes of diversification are subject to this permanent reengineering. This means that all digitized processes or all processes that are digitally influenced are constantly renewed, expanded and adapted in the context of a holistic process optimisation.

Relevance of diversity as organisational principle

Diversity characterized the variety, manifoldness and multiplicity of objects and relations, processes and functions as well as actors and roles in an organisation. Therefore, diversity is an organisational principle. It is part of any organisational development, especially of its strategic orientation. Four strategies are essential for the organisation's overarching vision, mission, and strategy, which determine the diversity management aspirations: managing workforce representations, managing workforce demographic relationship, managing diverse talent, and managing all strategic diversity mixtures (Roosevelt, 2010; pp.13-14).

Diversity influences all basic strategies such as long-term strategic orientation, the main strategies as general organisational development, the derived strategies of the divisions up to the portfolio design for the organisation and its parts. In particular, the opportunities of positioning of the organisation in the markets in relation to the costumers and the providers are pushed by a successful control of diversity and related diversification strategy. Diversification strategies are applied to use the diversity of the organisation for purposeful

and targeted improvement of the organisational behaviour and performance by exploiting the existing variety of factors of the organisation.

Diversification strategy is a sophisticated approach for vertical extension of organisational activities such as new products in the same application field or new technologies for the available products or vertical expansion of organisational activities such as new offers of upstream or downstream services in relation to the organisational core processes. The lateral diversification offers the chance of extension of the diversity of the organisation by new products and services. The conclusion of this context of diversity and diversification is that diversity can be used for diversification, and diversification can be applied for improving the diversity. This means, a direct control of diversity will be achievable.

Relevance of digitalization as organisational principle

Originally, digitisation was simply the transfer of analogue data into a digital form. Nowadays, the term has a much more complex, additional meaning. Many processes of any nature in the society are automated or part automated with the support of information technologies. Thereby, they are automatically transferred into a digitized world. The human being acting as a carrier of the organizations is, in turn, compelled to process former analogous processes in interaction with digital objects, methods and devices. Digitalisation becomes an organisational principle, because it becomes indispensable in the organisation.

In general, the digital transformation influences the development of organisation by four levers: digital data, automation, interconnection and human-machine-transactions. The main levers are supported by technology-driven enablers such as big data, internet of things, cloud computing, additive technologies, social media, robotic, mobile communication and apps. Levers and enablers provide as services the application of digitalization in many fields of research, development, and use such as smart systems, trace and tracking, autonomous driving, infotainment, e-business, etc. (Roland Berger Strategy Consultant / BDI, 2017), but in particular in the educational systems based on learning and training increasingly in a digital way.

The digitalisation is precondition and part of the digital transformation. The cross-linking of digitalization and transformation is realised by IT-subjects such as big data, IoT, smart systems, IT security, cloud computing, cyber-physical systems, augmented reality, etc. They will be able to be the key driver for the digital transformation of organisations, if they are really focussed on transforming the systems, processes or objects. New digital business models are important to secure the sustainability of the transformations in the digital age. One of the most relevant approaches in this sense are digital Ecosystems including economy, ecology, social aspects, and digitalisation as a complex set of subjects for the further development of organisations.

Inter-organisational relation of diversity and digitalisation

The inter-organisational context of diversity and digital systems was already given by the traditional information and technology management. The business continuity management based on the contingency planning including emergency plan, vital record plan, and backup plan supported by means of some combination of redundancy, diversity, mobility (McLeod & Schell, 2007; pp.225-226). A typical example of the use of proven principles of classical information processing and its application in the development and design of digital transformations and digital systems to new application areas at a much higher application level.

The system of forces and forms in organisations (Mintzberg, 1991) based on entrepreneurial, machine, professional, diversified and adhocracy forms will be superimposed by the digitalisation and the related and driven transformation forces. All forces and forms interact with one another in such complex situations as the transformation and possibly turnaround of the educational systems focused on training and learning. Therefore, direction, efficiency, proficiency, concentration, and innovation are redefined and pushed. The whole organisational system will not only be changed in the structural context, but rather it is also strategically reoriented (Senior & Swailes, 2016; pp.100-105).

The direction determines the strategy. The efficiency is influenced by the ratio of costs and benefits. The proficiency is characterised by the quality of the application of knowledge and skills. The innovation encourages adaptation and learning. The concentration provides an expression, how an organization is positioning itself with regard to different products, services and markets. Therefore, diversity is one of the key aspects for the development of organisational and of inter-organisational strategy and structure. The digitalisation has in relation to the diversity direct impact on the structure of the organisations and the corresponding strategy.

Impact of diversity and digitalisation on individualisation of learning

Diversification and globalization are inextricably linked. The trend is being reinforced by digitalization. Learners become more mobile through digital techniques and digital products. They are better and better able to choose from the wide range of offers, those which best appropriate to their interest. The development creates new demands on education products and services on the education markets. Educational organisations must adapt their strategies to the changes in time (Senior & Swailes, 2016). The interaction of users in social networks accelerates this process enormously.

The stronger individualisation is based on a comprehensive diversification in connection with the digitisation. Because more and more people are increasingly using diverse ways of accessing new products, services and offers through digitalisation, traditions are increasingly being questioned and more and more choices are made available to the individuals. However, this also results in a higher individual decision-making pressure, which in turn causes a change in value systems. Learners are more individualized and have less stable relations with

the educational organisations, but they are constantly in exchange with other stakeholders in order to find the best offer for themselves.

The digital natives, generation Y, prioritize their criteria in the educational choice. The individual self-realization and thus the less affinity to the educational organisation are based on a much higher self-attention. Learners are increasingly demanding the adherence of a work-life balance by their education providers. The entry of Generation Z into the systems of higher education will further intensify the demand for individualisation of learning, because this group of people has fully integrated the digitalisation into their daily lives and have learned to deal with complex situations and the related diversity.

Individualisation of learning in practice

The prerequisite for the individualisation of learning is the design of modular learning systems. Once developed learning components have to be used as often as possible because otherwise the efficiency of the learning offers is usually not guaranteed. The development of individual learning modules from a basic and well-structured knowledge is technically, organisationally, contently, socially and economically feasible. These smallest knowledge modules can be mapped in semantic networks in order to make them available for individual learning paths (Figure 1).

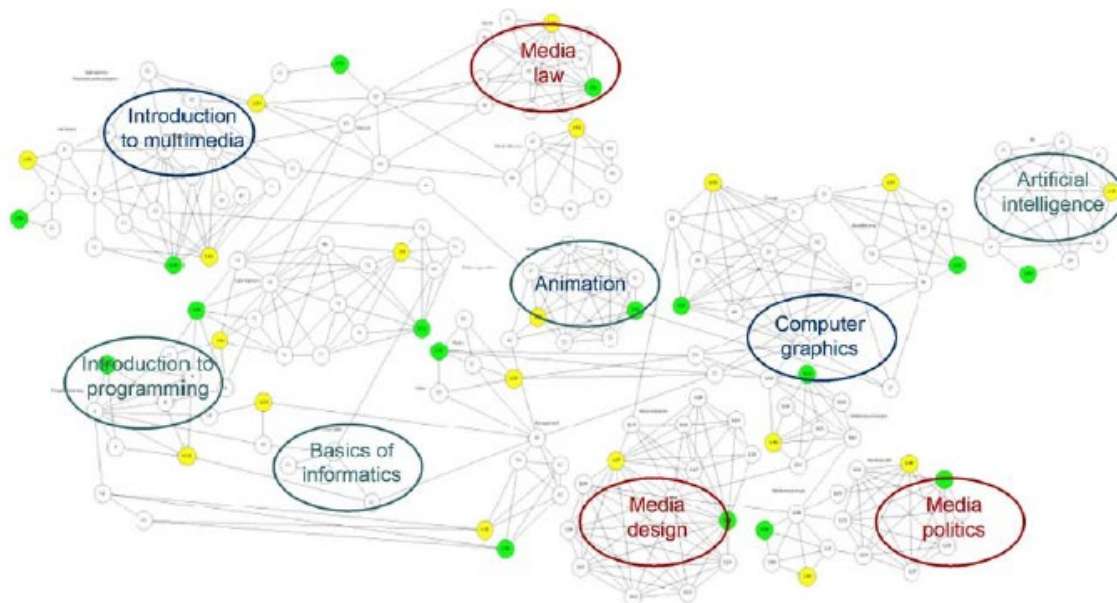


Figure 1. Granulated and structured learning objects as basis for individual learning paths

Individualisation as part of mass consumption in learning and training

Individualisation becomes part of the mass consumption in learning and training. It is the complementary development to the mass component production for user-individualised products in industry. After structuring the contents, the semantic network has been developed for creating an individual, on-demand generation of courses (Figure 2).

The provision of the study documents and learning contents will be realized course-wise supported by a multidimensional system of knowledge distribution, in which may be varied as dimensions: the knowledge of the learner, the optimal methodology used and the type of delivery channel and devices. Thus, the methodological and technical conditions are created to provide diversified educational modules for the use in the design of multivalent need-based forms of learning through channels varying due to the situation.

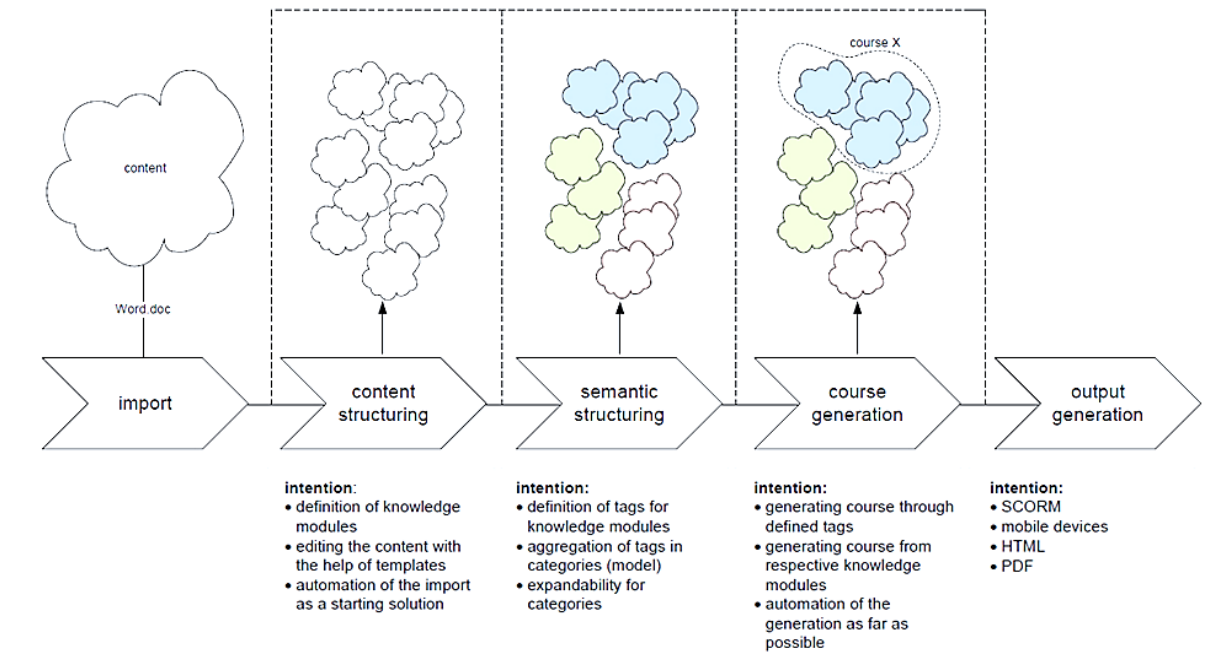


Figure 2. Structuring and schematic modelling of content for course generation

Conclusions

The mainstreams in the society are recently characterized by digital transformations. The result is an epochal and global change. The further successful development of organizations depends on the holistic understanding, design and control of the systems in general and of the educational systems in particular. Diversity is not only a characteristic of a system or its processes and functions as well as products and services, but it becomes more and more an organisational principle. The same development is typical for the digitalisation. A common indication of the maturity level of the development of systems is converted into an organisational principle. Both principles are key driver for the further development of organisations as well as the inter-organisational relations. The single organisation is pushed to more cooperation and competition in alliances or other related forms in order to be competitive and efficient in the future. Digitalisation enables the organisations to cooperate, to diversify their services and to individualise the learning, but it is also needed to realise the processes efficient and proficient. The individualisation of learning in practice is economically and technologically achievable by using the opportunity of diversification especially in the inter-organisational context and applying the means of the digitalisation. But, it will lead to more changes in the end, the so-called digital transformations of the educational systems.

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WRITING TO LEARN WITH AUTOMATED FEEDBACK THROUGH (LSA) LATENT SEMANTIC ANALYSIS: EXPERIENCES DEALING WITH DIVERSITY IN LARGE ONLINE COURSES

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Abstract

The increasing demand for higher education and life-long training has induced a raising supply of online courses provided both by distance education institutions and conventional face to face universities. Simultaneously, public universities' budgets have been experiencing serious cuts, at least in Europe. Due to this shortage of human and material resources, large online courses usually face great challenges to provide an extremely diverse student community with quality formative assessment, specially the kind that offers rich and personalized feedback. Peer to peer assessment could partially address the problem, but involves its own shortcomings.

The act of writing has been identified as a high-impact learning tool across disciplines, and competence in writing has been shown to aid in access to higher education and retention. Writing to learn (WTL) is also a way to foster critical thinking and a suitable method to train soft skills such as analysis and synthesis abilities. These skills are the base for other complex learning methodologies such as PBL, case method, etc. WTL approach requires a regular feedback given by dedicated lecturers.

Consistent assessing of free-text answers is more difficult than we usually assume, specially, when addressing large or massive courses. Using multiple choice *objective* assessment appears an obvious alternative. However, the authors feel that this alternative shows serious shortcomings when aiming to produce outcomes based on written expression and complex analysis.

To face this dilemma, the authors decided to test an LSA-based automatic assessment tool developed by researchers of Developmental and Educational Psychology Department at UNED (Spanish National Distance Education University) named GRubric. The experience was launched in 2014-2015. By using GRubric, we provided automated formative and iterative feedback to our students for their open-ended questions (70-200 words). This allowed our students to improve their answers and practice writing skills, thus contributing both to better

organize concepts and to build knowledge. In this paper, we present the encouraging results of our first two experiences with UNED Business Degree students in 2014/15 and 2015/16.

Writing to learn (WTL)

The act of writing has been identified as a high-impact learning tool across disciplines, and efficacy in writing has been shown to aid in access and retention in higher education. Writing has also been shown to be effective in the promotion of learning and student success in relatively large enrolment face-to-face courses. Research suggests that writing instruction in online settings can provide enhanced learning experiences and opportunities for pedagogical reflection (Comer, Clark, & Canelas, 2014). The use of WTL can improve student understanding of contents and concepts; in addition, it can be an effective tool in student learning and engagement. Finally, WTL helps students to retain what they have to learn.

Furthermore, this approach promotes a deep learning also it is a suitable method to train soft skills such as critical thinking and the ability to analyze and synthesize (Forsman, 1985). These skills are at the base of other complex learning methodologies such PBL, case method, etc.

In spite of, evidence that writing can be an effective tool to promote student learning and engagement, writing-to-learn (WTL) practices are still not widely implemented, particularly at large online courses. One possible explanation is that WTL requires a regular feedback given by dedicated lecturers. Without such feedback, much of the learning potential of WTL is missed.

Giving feedback is one of the requirements to ensure the effectiveness of WTL. This feedback should be provided by teachers, lectures or experts in the subject. However, the increasing number of students and the subsequent workload make very difficult for university teachers to stick to this kind of exercise. Moreover, feedback makes possible the personalization of learning, fostering performance improvement and increasing motivation, as well. But what kind of feedback is demanded nowadays? Our students, as users of technologies, demand a quick and iterative feedback; for instance, they are accustomed to the trial and error method to learn how to handle technological devices and applications. Therefore, the challenge is how to give them quick, iterative and sustainable feedback when quality feedback is required, such as in WTL, and human instructors are not available, or not available enough.

An automated-assessment system for free-text short-answer questions (G-Rubric)

Automated Essays Assessment (AEA) has a long history. The development of technologies such as word processing and the Internet, encouraged the improvement of AEA systems. In addition, the advances experienced since the 1990's in computational technologies of natural language processing facilitated the analysis of morphology (word structure), syntax (sentence structure) and semantics (meaning). The analysis of content was carried out through lists of

keywords, synonyms and the analysis of the frequency with which certain terms appeared (Shermis & Burstein, 2003).

Recently, several new approaches have been explored, being Latent Semantic Analysis (LSA) one of the most promising developments. Research has burst in the last decade, with special focus on its application to education, although basically on small scale environments. Paradoxically, there is not so much research in Distance Education institutions, in spite of that massive numbers of students should have encouraged this field (Jorge-Botana et al., 2015). Concerns about plagiarism and identity-control issues have presumably hindered progress in this specific context, along with logistical issues related to access to computers at the examination place. At present, MOOCs represent, indeed, an obvious field for the implementation of this kind of application.

In general, according with previous research, AEA scoring tends to be accurate. Human and computer-assigned scores correlate around 0.80 to 0.85, with 40-60% perfect agreement and 90-100% adjacent agreement (human and computers scores within 1 point). Some AEA systems have become embedded within automated writing evaluation systems than assign scores along with feedback on errors and may include instructional scaffolds and learning management tools (Roscoe & McNamara, 2013).

LSA – What is it?

Latent semantic analysis (LSA) is based on the concept of vector space models. This means using linear algebra for allocating lexical units in an n-dimensional vector space. LSA is a set of different procedures by which a textual corpus, usually lemmatized and curated, is transformed into a semantic space. In a first step, this corpus is expressed into an occurrence matrix, which usually includes its terms as rows and paragraphs as columns. A second step is applied to this matrix which smoothes the asymmetries in word frequencies. The third step has made LSA famous which is applying to this matrix a dimension reduction technique by means of singular value decomposition (SVD) which provides a suitable space in which words and texts are represented in a few but relevant latent (with no meaning) dimensions. This space is very useful to represent expert and student answers and calculate similarities between them. The more similarity among student-expert answers, the higher score. But recently, some authors have developed a very promising procedure called inbuilt-rubric (Olmos, Jorge-Botana, León, & Escudero, 2014) which transforms the k first latent dimensions of the original space into non-latent dimensions. The k first dimensions no longer reflect latent knowledge, but reflect conceptual axes spread from relevant words of the academic topics. This is very useful to offer a conceptual feedback. The scores of the student answers in such k first dimensions indicates if the relevant concepts of the rubric are present in his answer. This technique has reached satisfactory results in real contexts (Olmos, Jorge-Botana, Luzón, Martín-Cordero, & León, 2016). This is just the procedure GRubric, the AEA of this study, uses.

For the Economic History teachers involved in this study, the most important characteristics of GRubric refer to its ability to provide the student with, at least, three different kinds of feedback for his/her answer to the short question posed: a numeric grade for content, an additional numerical grade for writing quality and a third, detailed graphic feedback which plots the score in each conceptual axe of the rubric. These scores, actually, are the scores in the first k-dimensions of the vector that represent the student answer. This is due to that inbuilt-rubric method imposes the meaning of every conceptual axis of the rubric to that k-dimensions of the space.

To do this, teachers had to provide/create two different types of inputs (which are the inputs to make GallitoAPI work):

1. *General texts for the corpus*: this is the raw material of the course (handbooks, reference texts, etc.), to be inserted on the corpus.
2. To generate the space from the corpus, all processes mentioned above are carried out through a specific program called Gallito Studio (Jorge-Botana, Olmos, & Barroso, 2013). Then, the resultant space, including inbuilt-rubric space, are upload to a specific API (Application Programming Interface) called GallitoAPI (www.gallitoapi.net) developed by researchers at UNED's Department of Developmental and Educational Psychology. The web interface for assessment of free-text was baptized as G-Rubric and we will usually refer to the whole system with this name, although it is important to retain than managing of the multi-vector semantic space, which is the heart of the system, is conducted via GallitoAPI. For our experience, we built a corpus on Economic History using six different World Economic History textbooks, all of them written in Spanish, and published in the last twenty years.

To accompany each question, we prepared a canon answer (or *golden text*) with which students' answers would be compared. A series of *conceptual axes* (three-five per question) were prepared for each question, made of a series of keywords that depict different regions of the semantic field the answer should cover. This golden text and *axes* were tested with actual students' answers taken from past exams in order to test the accuracy of the numerical grade and the graphic feedback drawn from conceptual axes. Several iterations were needed to reach acceptable objects for a trial with students. This material allows the system to process and assess free-text answers and provide students both with numerical grades for content and composition and a graphical feedback regarding conceptual axes. A web interface, named as G-Rubric, allows users to easily select questions and submit answers, and receive feedback almost immediately.

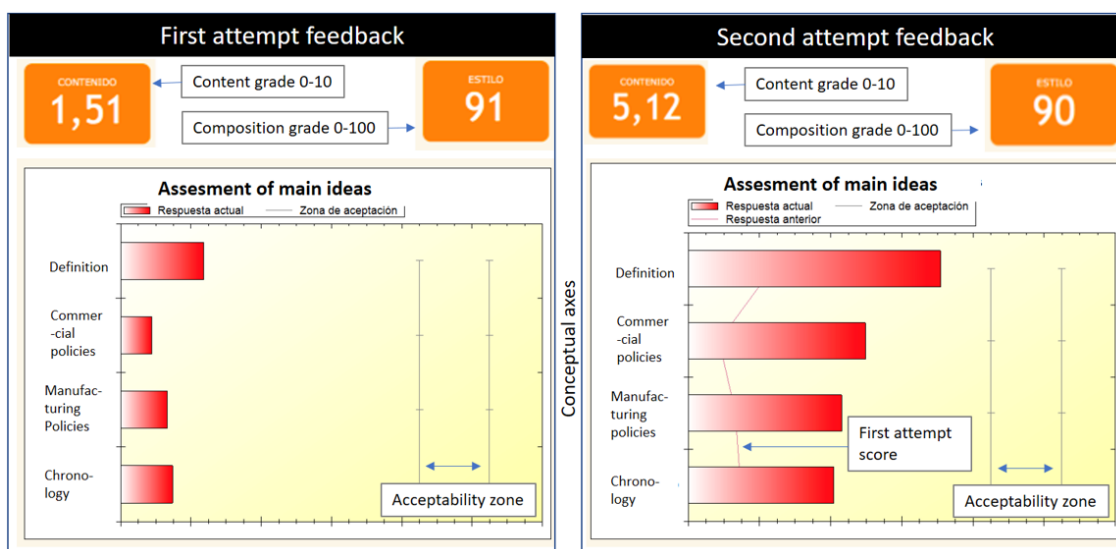
In order to help to understand how GRubrics works, we offer a sample of those activities proposed to our students.

Once the student registers in GRubric website and chooses the activity, he/she can write down/paste an answer. We have chosen an activity on the concept of Mercantilism.

First attempt, student's response:

“Mercantilism is a set of ideas and policies deployed in early modern Europe (16th, 17th and 18th centuries) aimed at strengthening the State through economic power, and specially focused on trade-balance surpluses and accumulation of precious metals (bullionism).”

After submitting an answer, he/she receives the feedback that can be seen on the left side of the figure below. After examining this feedback, the student can review the earlier answer and make a new attempt adding, for instance, some new ideas about mercantilist policies (bold text in the second attempt).



Second attempt:

“Mercantilism is a set of ideas and policies deployed in early modern Europe (16th, 17th and 18th centuries) aimed at strengthening the State through economic power, and specially focused on trade-balance surpluses and accumulation of precious metals (bullionism). Amongst mercantilist polices, some outstand, i.e. those focused on attaining surpluses in trade balance through tariff protection, prohibition of exports of gold, silver and raw materials, creation of chartered trade companies, navigation acts and commercial monopolies.”

A new feedback is produced, as seen on the right side of the Figure 1. Then, the student can try again using the new feedback to improve his/her answer.

Experiences carried out in 2015-2016: description and main results

It is important to point out that the trials carried out along the last two years were focused on providing formative assessment. Our goal was to promote deep learning through iterative

feedback, not just grading student's assignments. GRubric offers two main advantages regarding formative assessment: it allows as many attempts as lecturers set and gives the students immediate rich feedback. All trials have been conducted with first year Business Administration Degree students.

First experience with GRubric (May 2015)

Whit this first experience we had two goals: first to determine the efficacy of GRubric to promote learning and second to establish its reliability to mark student's assignments. To develop this first trial, we asked for volunteers between our students and offer them a little reward (adding 0.25 point to their final mark). We got 132 volunteers and we split them randomly into 3 groups establishing different conditions for each group. Group 1 received rich feedback, both numerical and graphical, and had 6 attempts to answer. Group 2 received poor feedback (only numerical) and had also six attempts. Finally, Group 3 was the control group and received poor feedback and only one attempt per object was allowed.

The students taking part in the trial would answer five short open questions (between 70 and 200 words), very similar to those they would find in their final exam. For each question, the student got a set of instructions referring to the number of words expected to write, how to use the tool to answer, and guidance for using the received feedback. Groups 1 and 2 could use six attempts to improve their answers according to the received feedback. Each student could decide how many attempts he would make. The difference between the worst and the best mark achieved in each of the activities was used to measure the learning improvement of each student. In addition, a questionnaire was used to measure student's agreement with the grades assigned by GRubric to their answers.

As can be seen in Table 1, in general, there was a learning improvement for Group 1 as well as for Group 2. Also, the difference between highest and lowest grades was higher for the Group 1, which received rich feedback.

Table 1: Trial 2015. Improved learning indicators

Item	Average Grade GRubric (/10)			Difference between max-min grade		
	G1	G2	G3	G1	G2	G3 ⁽¹⁾
1 Demographics regimes	6.9	6.5	6.4	0.52	0.69	0
2 Consequences of the Neolithic Revolution	6.5	5.9	5.6	1.06	0.95	0
3 European agrarian economies during Middle Ages	6.2	7.4	5.5	1.10	0.78	0
4 Mercantilism	7.7	7.5	6.6	1.95	1.15	0
5 (Final) Colonial Commerce ⁽²⁾	6.2	6.3	6.1	0	0	0

⁽¹⁾ G3 was the control group and had only one attempt per item, then there was no option to improve

⁽²⁾ For Item 5 only one attempt was allowed.

As for student's agreement with the grades received, as we can see at Figure 1, it marked quite well.

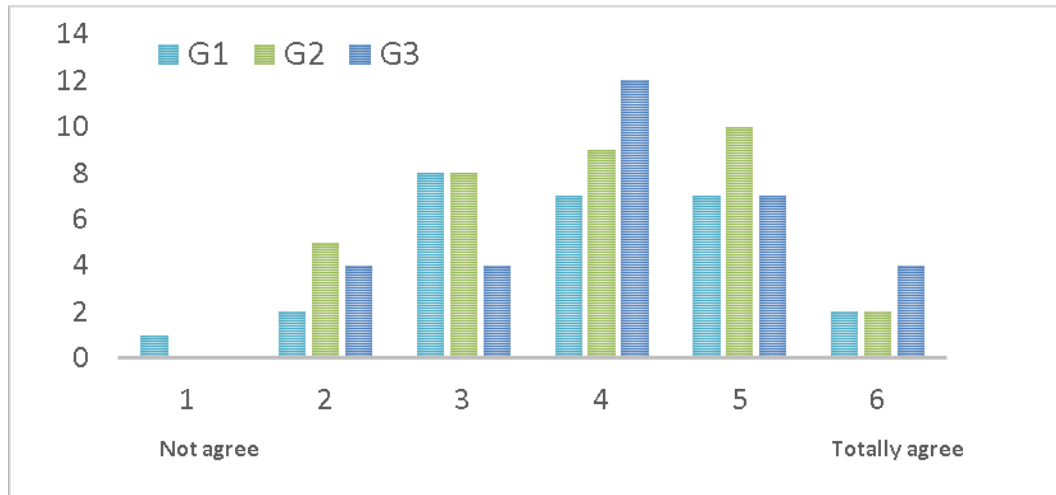


Figure 2. Student's agreement with the grades received

Second experience with GRubric (April-May 2016)

The goal for this second trial was to improve the design of GRubric objects to fostering learning and increasing student satisfaction. In order to carry out this second trial, we devoted time to set up new questions, increasing from five to seven the number of objects offered to the students. To increase the number of volunteers the reward was upgraded from 0.25 to 1 point. This reward was associated with the number of attempts performed, rather than with the grades produced by GRubric, because after the first experience we discovered that learning improved after several attempts at answering.

According to data in Table 2, the average grades obtained were satisfactory. It should be taken into account that we had recommended to the students that they should review the textbook before producing an answer. As we can see, after students accessed to feedback they were able, on average, to improve their marks in the following attempts.

It is also worth to note that the best students were able to obtain high scores, very close to those of the *golden essay* produced by the lecturer and used by the system as a reference to mark students' submissions.

Table 2: Trial 2016. Student's scores by item

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Average
Lowest grade	6.19	4.51	5.10	4.95	5.39	5.02	5.66	5.19
Highest grade	7.41	5.53	6.12	5.81	6.74	6.29	6.78	6.31
Difference in points	1.22	1.02	1.02	0.86	1.34	1.27	1.12	1.12
Difference %	19.67	22.62	19.95	17.45	24.93	25.36	19.80	21.66

To analyze learning improvement (i.e. *learning*) we used the difference between the lowest and highest grade obtained by students. Table 2 shows the difference by item, both in absolute term and as a percentage. A 21.6% improvement average could be considered as remarkable, given that only three attempts were allowed. The different degree of improvement by item

could be a consequence of different factors such as the quality of the item design, difficulty of the item, etc.

To conclude the analysis of this second trial, we would like to point out some results of the satisfaction questionnaire that students completed after the experience (Figures 3 and 4).

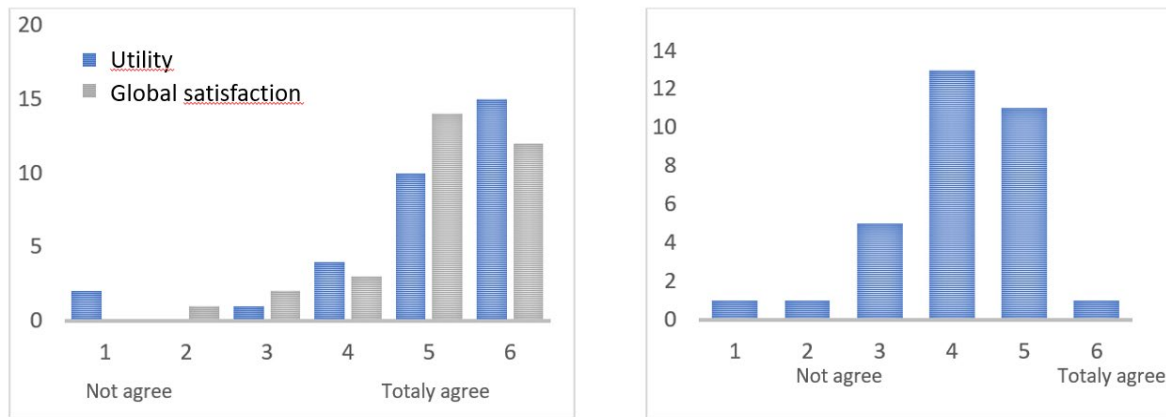


Figure 3. Trial 2016: Utility ad satisfaction with GRubric app

Figure 4. Student's agreement with grade obtained

According to Figure 2, students considered the experience very useful and believed that they were better prepared for the final exam. Global satisfaction was also high.

Regarding the student's agreement with the grades received, as we can observe in Figure 3, it could be said that it was quite satisfactory.

Conclusions

Some conclusions can be drawn from our experience:

1. Automated-assessment software such as Gallito-GRubric is currently mature enough to be used with students obtaining quite satisfactory results in terms of acceptable accuracy. Results in terms of students' satisfaction are also encouraging. Developments in this area, especially with LSA-based systems, will probably be added to our teaching toolbox in the near future.
2. This kind of systems is particularly apt and useful for on-line teaching, especially in massive courses such as MOOC, in which the great number of students often poses serious challenges to the scarce teacher's hours. Nevertheless, they show also great potential for face-to-face or mixed teaching at any level.
3. The experience of adapting such a system to assess open-ended questions to Economic History proved reasonably affordable in terms of time and effort invested. Learning to work with GRubric was also easy for students, although there are some indications that mastering the system – and especially fully understand graphic feedback – could take them a little more than expected.

4. The trial's results seem to point out that interacting with GRubric can improve learning by giving detailed feedback: (a) encourages devoting more time to the task; (b) increases *earnings* in the quality of answers; (c) increases motivation to work on activities (d) helps students to achieve better final answers. In this sense, it may soon become a viable tool for formative assessment.
5. Although it requires further research, the accuracy of GRubric, both as perceived by teachers and students, offers a great potential for its use in summative assessment, as well.

In the near future, automated assessment systems will be part of the teacher's toolbox, as Virtual Learning Environments are today. LSA-based systems such as GRubric are a solid candidate to a leading role in that process.

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BLENDED LEARNING TO SUPPORT A DIVERSE GRADUATE COHORT DURING CAMPUS DISRUPTIONS: BARRIER OR BLESSING?

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Introduction

Higher education the world over requires support in order to ensure that it survives current turbulent times (Schreiber, Moja, & Luescher, 2016). Student protests and violence have caused closure of campus for students at the University of Pretoria for extended periods during 2016 in order to protect people and property. These circumstances necessitated instruction to a change from only on-campus to larger components of online instruction in order to safeguard completion of studies. While this study explores the experience of a cohort of graduate students, it was envisaged that the learning challenges could increase, as graduate students were often diverse in background, previous learning and experience in diverse employment sectors. They faced unique, yet significant challenges that needed to be addressed with appropriate support. A new approach to graduate studies was necessary with blended learning as a potential vehicle to achieve continuity. What was not known is how ready the graduate students in an entrepreneurship course were for their Masters' studies, or how they experienced the involuntary blended learning approach that was implemented in 2016.

Even under stable circumstances students who return to University for advanced degrees, particularly if they are working full-time, face many challenges, such as managing time constraints and balancing work/family and study roles (Pluut, 2016). An online environment also challenges students with new advances in ICT on top of mastering the writing skills and research component of graduate studies (Pintz & Posey, 2013). A blended environment may paradoxically increase their discomfort and uncertainty, while the intention was to assist them in managing their studies and time better. The uncertain situation in Higher education in SA added to the challenges graduates faced on many levels. The turmoil made it necessary to revisit delivery modes of traditional on-campus graduate programmes. The teaching approach therefore had to accommodate the diversity of student background knowledge, the unique challenges graduate students face upon returning to University, all in a setting of limited contact time with peers and lecturers. Adopting a blended format was one option to reach the desired outcome of successfully completing their studies in turbulent times. The study focuses on the experiences of one cohort of graduate students at a traditional contact university who were introduced to a blended delivery format. This was necessary to avoid disruption of the academic programme and ensure throughput. The blended format introduced online activities to replace two of the contact sessions and supplement the remaining three contact

sessions. This allowed students to work at their own pace and time as most of the theory-based course-work was presented online or outside of the lecture hall. The theories underpinning the educational approach is blended learning (Picciano, 2009), flipped learning (Herreid & Schiller, 2013) as well as the first principles of instruction according to Merrill (2002).

Therefore, the focus of this study is to observe graduate students, their perceived preparedness for their studies, experience of the blended teaching method particularly the more challenging technology component in the course. Our main question translates into the local vernacular the question posed by Milman, Posey, Pintz, Wright, and Zhou (2015), namely: “which supports and resources should be offered by institutions of higher education to promote success in online learning for online masters graduate students?” The research sub-questions are:

- What barriers do entrepreneurship students experience when starting their Masters’ studies?
- How does a blended environment influence their ability to overcome such barriers?

Literature

Blended Learning

Garrison and Kanuka (2004) approach blended learning as the thoughtful integration of classroom face-to-face experiences with online experiences where the emphasis is on integrating the strengths of activities from the two main delivery modes. Picciano (2009) furthermore posits that blended learning can accommodate students with diverse needs, intelligences, personality types and learning styles. However, he also calls for a purposeful blend of classroom and online activities informed by pedagogy that is driven by the course goals and objectives.

Flipped Learning

Flipped classroom can be described as “a new pedagogical method, which employs asynchronous video lectures and practice problems as homework, and active, group-based problem solving activities in the classroom” (Bishop & Verleger, 2013). The characteristics of a flipped classroom are not restricted to the above format. Jon Bergmann (2016), one of the first exponents of this teaching method emphasizes the exchange activities of individual and collaborative nature in the two teaching modes. This viewpoint allows adaptation of a flipped classroom to fully online environments, without losing the strengths of the “classroom”. Such an approach supports the study of content outside of the classroom (individual space) and application in a collaborative space, which we contend can vary from being inside a real classroom to an online classroom. Such concessions may be beneficial in supporting graduate students with time constraints due to work schedules.

First Principles of Instruction

The educational practices are further based on Merrill's first principles of instruction. "Many current instructional models suggest that the most effective learning products or environments are those that are problem-centered and involve the student in four distinct phases of learning: (1) activation of prior experience, (2) demonstration of skills, (3) application of skills, and (4) integration of these skills into real-world activities" (Merrill, 2002; p.44). In cohorts with diverse background and pre-knowledge, these principles are indispensable. The flipped learning process can achieve those principles in a logical way. These first principles also suggest two layers of relationships. On the surface they identify learning activities that should be included in effective instruction while a second deeper, subtler level consists of structure-guidance-coaching. Moore and Fetzner (2009) argue that effective practices for engaging students and motivating them to persist can best be addressed through collaboration within and across learning organisations. The collaborative activities, peer critique and discussion, as well as the coaching conversation can operationalise the deeper layers of instruction that are also recommended by Merrill (2005).

The Coaching Conversation

Coaching conversation in general refers to a goal-directed, multi-faceted process for enhancing people, work and life. Coaching is further defined as a solution-focused, systematic process that supports reflective learning (Mühlberger & Traut-Mattausch, 2015). Coaching is also understood as an action oriented conversation that focuses on collaborative goal setting to construct solutions and employ goal attainment processes. The aim is to foster the on-going performance, self-directed learning and personal growth of the client (Mühlberger & Traut-Mattausch, 2015). More-over coaching aims to improve the attainment of self-congruent goals or conscious self-change and self-development. Coaching relationships inherently provide the opportunity to interact with a client on more than one level of engagement namely on a cognitive, behavioural and emotional level. This "helping process" provides a context where learning can take place.

"Building trust, understanding and managing coachees' emotional difficulties, having a two way communication process, facilitating coachees' learning and development and having a clear contract and transparent process were identified as the top five critical factors for enhancing the coaching process" (Lai & McDowall, 2014; p.15).

"Coaching furthermore is seen as a social support system. Social support presents a critical interpersonal resource that signals that one's well-being is valued by those providing support. Social support is a key interpersonal resource intended to enhance the well-being of the recipient" (Pluut, 2016).

Context

“The higher education sector in South Africa is in turmoil with ongoing student protests causing widespread disruptions and destruction” (Council of the University of the Witwatersrand, 2016). Protest actions resulting from campaigns for “Fees must fall”, Africanisation of curriculums and language policies were dominating the higher education landscape in South Africa. The University management therefore encouraged teachers to use more online activities in order for programmes to continue online when classes are disrupted in future. The study was done in a 14 week-long graduate Entrepreneurship course in the faculty of Economic and Management Sciences that was presented in English. The 10 students enrolled for the course were selected purely on their previous accredited academic degrees. They had diverse cultures and mother tongues; none were first-language English speakers, while the mother tongues of eight were indigenous African languages. They included two full-time students, while five worked for government agencies, the rest in the private sector of which two had their own businesses. Four were alumni of this University, including three with degrees in entrepreneurship, while one was a foreigner. The course was facilitated and managed by a senior lecturer in Entrepreneurship who is also a qualified business and personal coach. The course /module consisted of a theoretical as well as a practical application part. After completion of their course work article they had to submit a mini dissertation or an article as the final contribution for being awarded the MPhil degree. The overall outcome of the module was twofold; firstly, to enhance knowledge of the subject area namely entrepreneurial growth but also to assist them in their ability to do academic writing. The theoretical part introduced the student to the small business environment in South Africa dealing with the small business act, industries within the small business arena as well as growth possibilities for entrepreneurial businesses. The practical application part was aimed at developing a research ability in the growth field.

Teaching Design

In a blended learning approach, no traditional face-to-face lectures were given. The course was structured around five milestones each with its own outcomes to support students in successful completion of their studies. Course activities followed the instruction cycle (Merrill, 2002) to demonstrate, activate, apply and integrate knowledge into the students’ world. The blended learning approach depended on the use of technology in the University’s Blackboard Learn CMS (course management system). This was communicated to them in an online study guide and discussed in the first contact session. Online activities included analysis of journal articles, self-study and viewing online videos in preparation for a collaborative assignment. Class time was used for discussions and presentations. To achieve the outcomes, students had to reach five milestones. The first milestone was a face-to-face contact session in classic flipped tradition as an introduction and meeting of students, discuss the content of the course and what was expected from them. Discussion of the Small Business Survey demonstrated the small business environment. Merrill’s (2002) principles were evident in the activities as indicated in brackets. Due to the diverse background of the group it was necessary to help

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students to relate and apply the new knowledge to their existing or prior knowledge (activation of existing knowledge). In the class discussion students debated the report (application), tell the rest of the group how it applied to their business or industry (integration). The lecturer facilitated understanding of new and unclear concepts. The second milestone required online activities aimed at improving academic writing, by first guiding them in how to read an article and to reflect critically on what they learned by giving peer feedback. Students had to read three articles one week apart and analyse the articles based on criteria provided online. They received two submissions to peer review and provide feedback online. The third milestone addressing theoretical knowledge was also achieved online. They were required to watch content knowledge videos online in the individual space (activation of pre-knowledge) in their own time while applying that to a specific given case study. The outcome was evaluated in a test that also comprised the application of theoretical knowledge to a case study in the fourth session. Students also prepared a group assignment using own initiative to communicate and collaborate. The assignment had to be in article format, thus strengthening their academic writing skills. The fourth milestone represented the collaborative space activities of a flipped classroom consisting of a case study application and group assignment presentation. After writing the test, the groups presented their assignment. The last part of the session provided for an opportunity for peer feedback and discussions on the findings in the group assignments. After these four milestones it was required from students to schedule a meeting with the lecturer to reflect on their experience and progress and to discuss possible dilemmas that may hamper their studies. This was done to check in with students, connect with student on a deeper guidance-coach level to assure that each student progressed in such a manner that they can successfully complete their studies as suggested by Merrill (2005) to guide, coach and reflect on their progress. The interviews aimed to engage, motivate and detect early signs of dilemmas hampering students' success on personal and academic level. The fifth and last milestone consisted of the presentation of the individual assignments and wrapping up the course. The individual assignment was also completed in article format. The students did a literature review on the development in entrepreneurial growth research from 2011-2016. They reported on the status quo as well as made recommendations for further research. The outcome aimed at improving their academic writing and to provide possible research topics for their mini dissertation later in the course.

Methodology

Considering the diversity of the small group of students, a was followed in the research, with the lecturer being a participant, observer and researcher. The researcher wanted to make sense of the student experiences within the blended learning format, the dilemmas experienced and suggest ways to successfully complete their studies. This involves description (of issues) and understanding (relational), but mainly sense-making and interpreting the multiple narratives describing the experiences. Data were collected on student experiences at key points during the course. Firstly, students were asked to complete a short survey after the first contact session to rate their preparedness for their studies on a 5 point Likert scale. The questions were informed by the challenges of graduate students who have studied some time ago (Pintz

& Posey, 2013). The possible challenges included: computer and internet access, general computer skills, using Library online resources, academic writing skills, conducting research, motivation and managing time. They could also list other anticipated barriers at this stage. Secondly students had coaching interviews with their lecturer after completion of the fourth milestone to reflect on their study experience, discuss their progress and to determine what they needed to successfully complete the coursework. The interviews were transcribed and analysed using qualitative analysis methods by allocating codes and grouping them into code families, according to emerging themes. After completion of the course, students provided written feedback on the technology aspects of the course that was also analysed thematically. Triangulation among findings provided a richly nuanced picture of students' experiences.

Findings

The questionnaire indicated that all but two students in the beginning had home computers, of which one used a computer at work and the other on campus in the laboratory; only one student had insufficient internet access, while three others had limited internet access. None was intimidated by new computer technology, while only one was unsure of how to use the Blackboard CMS. Half the class were unsure of using the online library resources, four were unsure of research terminology, while the largest group (seven) felt under-equipped for academic writing. Supporting the requirement for becoming self-regulated independent learners, they all had excellent motivation, but six did not think their time management skills and ability to balance work and studies were sufficient.

In the discussion on the first milestone, three students mentioned late registration as the reason they missed it. Registration procedures were disrupted at that stage, and students were not allowed access to campus to clear out problems with lecturers. They also felt uncertain of what was expected of them in the course, which caused unnecessary stress and wasted time. The other seven said that the first session was insightful, gave them an overview of the field, helped them to link it to their industry and alerted them to the course outcomes and deadlines. Discussing the report that they had to prepare for the first session was also helpful and the discussion and integration in their specific industries was insightful setting a base from which they could work in future.

The experience of milestone two focused on three issues: firstly, the online activities, value of analysing articles as well as giving and receiving peer feedback. The students said that the online activities benefited their overall studies, was however time consuming because they were unfamiliar with doing it online. Some had to reread it several times to make sense. Their experience of giving peer feedback varied from *felt inadequate to give sensible feedback, found it difficult, did not like it, was scared and did not trust [their] judgement*. However, seven enjoyed the feedback received. One student mentioned that he had spent a lot of time to give good constructive feedback but was unhappy about the effort of his peer reviewer. A lack of coaching on how to approach peer review, and the delays in completion of registration

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resulted in late engagement with the online systems, which added to students' poor confidence in their own judgment and abilities, as also reported by Pintz and Posey (2013):

"Giving peer feedback was difficult but receiving it was valuable"

"I did not feel confident enough to give peer feedback"

The discussion of on milestone three focused on the value and benefits of the videos. Students preferred videos above lectures, giving them flexibility in when and where to watch and watch again, all helping them to manage time better. They also commented on the practical examples discussed in the videos that allowed them to integrate it in their world of work and the value of application to the case study.

"I prefer watching the videos to a lecture"

"...the online videos allowed me better time management."

"I had internet problems that frustrated me a lot"

In the fourth milestone discussion the case study assessment and group assignment were dealt with. The students mentioned group work and collaboration, meeting online which saved time and the value of the intervention for their thesis. Under group work they mentioned sharing ideas, feeling supported, understanding and insight as well as communication online. Only one student reported that he did not enjoy group work. Another student reported that he battled to join a group due to late registration. Meeting online for group sessions (Skype™) was a benefit and time saver. Students referred to the online article analysis and reported that was a big help and time saver in finding suitable articles for their assignments. Two students also referred to how it benefitted their academic writing abilities. According to Merrill (2005) learning from application is enhanced when students collaborate with each other through active learning. It is more effective when they come up with a solution themselves, describe, discuss and defend their solution in an attempt to come to some agreed solution. The students experienced emotional and practical aspects of group activity:

"I like group work and enjoyed the interaction and collaboration. I felt supported and it help me to clarify uncertainty"

"Collaborating online saved so much time"

"I found it difficult to join a group due to late registration"

The students reflected on their experience of the interview session itself. The interviews were experienced as valuable on both a personal as well as an academic level. On the academic level students mentioned that it forced them to reflect on what they have accomplished up to that point, their marks, what they struggled with and what hampered them to complete their studies. It forced them to look at available resources and what was needed to complete their

studies. On a personal level they reported that they felt emotionally and physically supported, as somebody was listening and not judging. One student said that he realised he is his own worst enemy regarding procrastination and time management. Others afterwards said that they felt less stressed, had a clear way of where to go, felt supported and in control of their destiny after the coaching. Although such a conversation was new to them, it was very helpful and insightful. They said:

“I think the timing of the interview was good. I reflected on my progress and the way forward. I needed the support

“I felt supported on a personal and academic level. It forced me to look at my progress. I appreciated the guidance”

When concluding the course, the students were asked to reflect on the blended format and the use of technology in the course. The overall sentiment was that the bigger online component helped them to manage their studies and time better, allowed them a better balance between work/family and studies for it gave them flexibility to work when and how they wanted. It allowed for flexibility. However, three of the students complained about internet services that were unreliable, expensive and resulted in limited access.

The biggest hurdles to successfully achieve their overall study outcomes were observed as administrative matters resulting in limited access to campus due to protests, as only two were registered in time, their limited academic writing skills, time management, work/family/study balance, and procrastination. One student reported:

“Managing my office workload with my studies was very difficult. However, when my manager gave me the support to continue with my studies it became easier”

Initially the biggest hurdle was academic writing closely followed by understanding research and accessing electronic library resources. The structured approach to academic resources and practice in writing greatly enhanced their skill and confidence to write. Initially time management was the other great barrier, and it remained an issue. In the beginning, nearly half the group experienced internet barriers, even before they fully experienced high intensity online activities as part of blended learning. It is gratifying that only two at the end felt that the internet was a barrier. On the contrary, seven students were positive about the way the online environment helped them save time, manage time, work in their own time, and positively helped them to negotiate the biggest hurdle, namely balancing workloads, even if the internet was a challenge.

Conclusions and Recommendations

Students were initially particularly worried about their academic writing skills and their ability to juggle their time between studies, work and other responsibilities. Disruptions in the registration process resulted in many students missing the first orientation and not starting to

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interact with the CMS in time. This resulted in gaps in the foundation for academic writing skill outcomes, and eroded their self-confidence, a known barrier in graduate studies (Pintz & Posey, 2013). While disruptions increased the necessity of connectivity that was another barrier most students negotiated internet problems creatively. This resilience was possibly due to confidence in their general computer skills, that differs from barriers reported from other institutions (Pintz & Posey, 2013). The online environment was clear and structured. As reported elsewhere, these students also preferred videos to class lectures (Bergmann, 2016). Campus lockdown also resulted in collaborative assignments shifting from classroom to online environment, stretching the flipped approach. Surprisingly, students experienced online collaborative activities very positively due to convenient online meeting times, which helped them manage their time, one of their biggest concerns. The value of the coaching conversations turned most of their personal and learning barriers around, helped them with strategies to manage their time and priorities, and contribute towards successful course completion. Both the insights from the coaching conversation and the online learning skills contributed to the development of self-regulated, independent learners (Pintz & Posey, 2013). To answer the main research question, Universities should not shy away from replacing lecturing contact time in coursework Masters' degrees with online resources and self-paced and collaborative activities. Support should communicate the need for internet enable using the CMS and online Library resources. A structured, scaffolded introduction to research methodology and academic writing from the very beginning will allay many fears. In addition to online resources, recognition should be given to students' personal and emotional stresses and needs for which capable facilitation or coaching is indispensable.

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ICT PROFESSIONAL DEVELOPMENT BY ENCOURAGING COMMUNITIES AND NETWORKS ACROSS FIVE CLOSELY LOCATED K12 SCHOOLS

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Introduction

Many studies have found that participation in teacher communities is an essential part of professional development (Timperley et al., 2008). Such professional development could be described as a relational-responsive approach to change because thoughts and activities emerge inside relationships rather than outside or planned beforehand (Gustavsen et al., 2001). Most research has focused on teacher communities within schools. However, there also lies potential in collaboration across schools. For example, action researchers held dialogue conferences during a two and a half year period with more than 100 principals from a range of schools. The aim was to develop new knowledge on how to implement reforms in their schools but also to inspire the principals to use dialogue conferences as a way to structure conversations in the schools (Wilkinson et al., 2010).

Brown and Duguid (2001) argue that one of the weaknesses of the community perspective is that each community creates epistemic barriers. For example, a mathematics teacher community and physical education teacher community might describe and understand their use of ICT in different ways, although they share a common interest, i.e. to improve student learning. Thus, a key challenge is to coordinate the knowledge produced in different communities (Brown & Duguid, 2001). Individuals and communities can be connected through networks. The relationships among members of a network are looser than within a community. Although many people within a network might not know one another, they share an interest in practice and are able to share knowledge (Brown & Duguid, 2001). An example is Björn et al. (2002) who encouraged networks across 25 Swedish schools in order to support project work.

The teacher professional development literature typically focuses on teacher communities rather than teacher networks. However, there are some notable exceptions. Lieberman (2000) argues that networks might be one approach to address that school and school systems are organized bureaucratically and have difficulty changing. She suggests that networks are well suited for taking advantage of new technology and to initiate new institutional arrangements. Networks are flexible and borderless and “develop agendas that grow and change with their participants” (Lieberman, 2000; p.221). Teachers that participate in, learn from and use knowledge created in networks could contribute towards strengthening teacher professional

knowledge for teachers in general and for themselves in particular. Studies on teacher networks in online settings have described the advantage of being available anytime and anywhere, and that such networks have the capacity to meet diverse interests and needs (Trust, Krutka, & Carpenter, 2016). Hofman and Dijkstra (2010) found that factors underlying successful teacher networks are that these encourage reflection, include subgroups and network meetings with a clear focus, build a community of teachers and make it possible for teachers to apply new material and methods in the classroom.

This paper is based on a project, carried out during 2013-2015, with the purpose to encourage ICT professional development across five Swedish schools. These schools are located in a quite small geographical area, within walking distance from each other, and all activities and meetings for the teachers were conducted at these schools. The authors of this paper participated as action researchers, and encouraged the formation of a school leader community and lead teacher community. Furthermore, the authors encouraged a relational-responsive approach to change in order to create an infrastructure for development and learning, although it was up to the communities and teachers to decide more specifically what they, for example, wanted to present and discuss. The Swedish Ministry of Education and Research (2012) states that a lead teacher should spend the main part of their time teaching. They can also, for example, "... coach other teachers, initiate educational conversations, initiate and manage projects in order to improve teaching ..." (p.27, our translation).

The aim of this paper is to explore how the encouragement of communities and networks across schools could contribute to ICT professional development. We will pay special attention to the perspective of the members of a lead teacher community, who coordinated and organized the professional development efforts.

Method

The school leader community included two or three school leaders from each school and the lead teacher community included one or two lead teachers from each school. The lead teachers mainly worked as teachers but were also expected to support and encourage ICT professional development. They organized conferences and workshops, inspired by the TeachMeet model complemented with opportunities for reflection, for the teachers in the five schools. There were about 230 teachers working in the five schools, representing all grades and subject disciplines. Figure 1 illustrates the different stakeholders in the project.

ICT Professional Development by Encouraging Communities and Networks Across Five Closely Located K12 Schools

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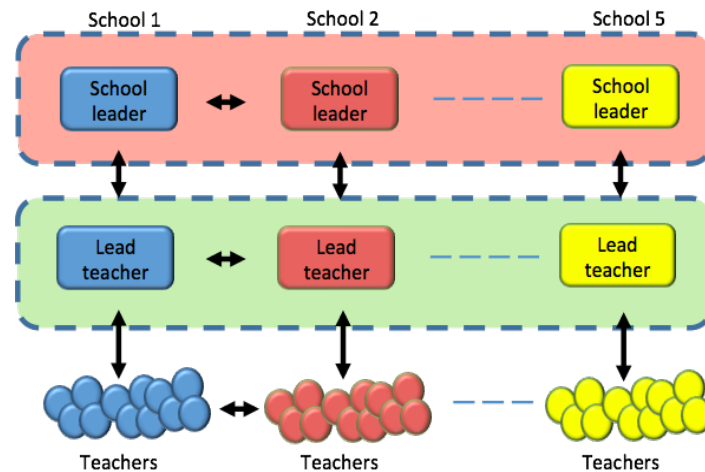


Figure 1. School leader community, lead teacher community and teachers in five collaborating schools

The authors took an active role in the project by contributing in the discussions in meetings with the school leader and lead teacher communities, while primarily being observers during the conferences and workshops. The authors took notes during all meetings and also regularly met to discuss the progress of the project. Our experience from having conducted participant observation guided this study in two ways. First, it gave us a detailed understanding of the research settings, which was necessary in order to design the interview study described below. Second, it helped us in interpreting the interview data, since we could relate to what we were told by the respondents.

All seven participants of the lead teacher community were interviewed. Five of them were female. Some of the lead teacher positions had a general focus on IT and learning, while other positions had a focus on IT in combination with a pedagogical focus, such as language development or genre pedagogy. All lead teachers mainly worked as school teachers. Some of the teachers had 20% of full-time set aside for their work as lead teachers, while others did not have time set aside. Each semi-structured interview was about one hour and was subsequently recorded and transcribed. The interview guide included a number of questions, based on the research questions of the study, but the interviewer also posed follow-up questions and allowed the interviewees to elaborate on issues of potential interest. For example, one of the questions was the following: Can you describe the relationship between the school leader community and the lead teacher community? Then, follow-up questions were necessary in order to encourage the respondents to describe this relationship in detail.

The constant comparative method was used to identify themes across the interviews (Glaser & Strauss, 1967). The data was organized according to the concepts community and network, and depending on whether ICT professional development occurred within or across schools. The empirical data was also read and re-read iteratively in order to confirm and identify other themes (Strauss & Corbin, 1997). The complementing identified themes were agreeing on a common purpose and sustaining ICT professional development across schools.

Results

In this section, the results are presented according to the identified themes of data, i.e. the process of agreeing on a common purpose, professional development across schools, professional development within schools and how to conduct sustainable professional development across schools.

Agreeing on a common purpose

All respondents described that it took a long time to make sense of the quite general starting point of the project, i.e. to explore how ICT professional development could be encouraged across five schools. They argued that projects at their school typically have a more specific predetermined purpose. For example, one previous national ICT program for schools had focused on how to become proficient in using specific software, such as PowerPoint. The respondents found it challenging to be part of a process where the participants were supposed to agree on what was to be achieved. They were also trying to make sense of what was expected from them in their role as lead teachers. Most respondents described the initial period as stressful as they knew that they were expected to contribute to the project, but they did not understand more specifically what was expected from them.

“I was forced to be at these meetings, even though I did not want to. Then I was told, over and over again, that this was a project that would be bottom-up.” (Margareta)

It took about six months to agree on a common purpose, which was to organize conferences and workshops that was mandatory for all 230 teachers in the five schools. These events were inspired by the TeachMeet model. The premise was that teachers from the schools would share experiences on using ICT for teaching and learning. There were also opportunities for reflection during the final part of the conferences in small groups based on educational level, subject discipline or school. The school leader community was approached to make practical decisions, such as when and where the conferences would take place.

“The first half year, it felt like it went nowhere. It did not lead to anything. We sat on many meetings and talked in different directions, but it led nowhere, nothing came out of it. So it felt little frustrating and a bit of a waste of time. Then when we got going with [the joint conferences], I just feel that it has been positive.” (Lena)

Professional development across schools

The lead teachers described the organization of joint conferences and workshops as the main benefit of collaboration across schools. Their impression was that most teachers found these activities to be valuable. Many lead teachers also mentioned that new contacts were initiated. For example, teachers representing small subject disciplines, such as home economics and physical education, which felt isolated at their respective school, enjoyed meeting colleagues

from the other schools. The main concern was that the conferences and workshops mainly focused on basic skills, such as how to use certain software or apps.

“Many have experienced these meetings as positive, the opportunity to sit together with others and talk about what one have done, how it worked, provide suggestions and take part of others’ suggestions.” (Lena)

“I know that home economics, I heard, has met spontaneously or talked to each other. Even the physical education, I heard now. ... So I think this is positive, if [the project] has opened up new ways and new opportunities, new groups get together.” (Malin)

“There were different opinions the last time. I think it’s because there are so many who have come so far here. When they go to something they want to go and really get inspiration and new things. They are demanding it, they do not want to sit at a conference or a workshop or something that doesn’t give anything immediate.” (Margareta)

The lead teachers described that the main purpose of their community was to organize these activities, i.e. conferences and workshops for the teachers in the participating school. However, they disagreed or could not provide examples of learning from each other as a result of being a participant of the lead teacher community. Thus, they mainly focused on how to organize ICT professional development for large groups of teachers, rather than improving their personal ICT pedagogical competence. Instead, the lead teachers argued that professional development mainly occurred outside the formal school context. Most of them argued that they developed by taking part of, and in one case by contributing to, teacher social networks, such as Facebook groups, blogs and Twitter.

“I’m following many Facebook groups and get inspiration and new ideas. When I have found a new tool, I usually test it and often I conduct tests with my students, just to see: How does this tool work? How can we use it best in class? What are the difficulties? I explore and test, that is how I learn.” (Lena)

Professional development within schools

Prior to conducting professional development across schools, typical ways of gaining support for ICT pedagogical support was to discuss with colleagues, ask teachers that were assigned the role ICT pedagogue and participate in workshops. According to the lead teachers, ICT professional development across schools provided new ways of learning.

“Earlier at our school I have been the only one that has showed what I have done and how you can do. Now there is a bigger bank of knowledge to draw from.” (Lena)

When analysing the interview data, different consequences of conducting professional development across schools could be discerned within the participating schools. Several of the respondents provided examples of how the teachers at their school decided to continue working with, for example, apps that had been brought up during the conferences and workshops. Typically, this was done together with the closest colleagues. Another example was that teachers representing small subject disciplines continued to meet colleagues from the other schools.

“These meetings have been important and interesting. But then there is a feeling that one has not been able to train. ... [The primary school] had their own workshop. ... Everyone were able to work and helped each other. ... And they felt ‘Aha, I really know this now. It was not that difficult’”. (Johanna)

It also seems that the schools were provided with a basis for making strategic decisions, when learning more about the conditions at other schools. For example, one of the schools that had limited infrastructure, decided to provide all K12 students with a tablet and also decided that one of the lead teacher that was part of the project would work full-time supporting teacher colleagues with ICT professional development.

“Yes, I think the greatest benefit has been that we have been able to exchange experiences both within the school and between the schools, and I think that the frustration this creates, it also creates movement. Really, that you feel, ‘we do not have tablets. No, but maybe we should get tablets then?’” (Johan)

Sustainable professional development across schools

The respondents were positive towards sustaining the lead teacher community over time. They also felt that they have developed a competence model that would be worthwhile to sustain and that could also be used for the support of collegial learning in other areas.

“What came out of this, what to preserve, is that there is a clear, simple model on how one easy as pie can organize these kinds of afternoons where we work together, with collegial learning. Just take our grid and put in content and then meet.” (Tina)

All respondents argued that the school leaders are essential in making the collaboration between the schools sustainable. Most of the respondents described that they had a good relationship with the school leaders at their school. However, the respondents did not perceive that they had a relationship with the corresponding school leader community. Each lead teacher mainly communicated with their school leader, which in turn were members of the school leader community. This led to some misunderstandings during the project and it sometimes took a long time to make practical decisions, such as when and where to schedule a conference.

“[The management] need to decide that ‘this is what we are going to do and we are going to do it because collegial learning is both important and good’. And maybe we have not found the optimal form yet, but we will continue to look, and you need to put aside time to have it, to plan it... The research project might end, what do I know, but the project ‘how to develop the school?’, it never ends.” (Johan)

Concluding Discussion

The aim of this paper was to explore how the encouragement of communities and networks across schools could contribute to ICT professional development. The lead teacher community played a central role, but ICT professional development was dependent on the interplay of different types of communities and networks. The identified communities and networks are discussed below.

School leader community

The school leaders could be described as a community with the shared common purpose to make joint decisions that were necessary in order to enable ICT professional development across the five schools. Decisions made by the school leader community included whether participation would be mandatory, and when and where the conferences and workshops would take place to make sure that all teachers from the five schools could participate. As a strategic group representing several schools, they were also able to insist that, for example, ICT implementation in the municipality was tailored according to their local needs. Thus, they created organizational structures, which have been found to be one of the enablers of teacher communities and networks (Supovitz, 2002). The school leaders gave the lead teachers mandate to manage ICT professional development across their five schools.

Online teacher network

The lead teachers mentioned few examples of where they learnt from the other lead teachers, but primarily gained inspiration by following other teachers by using social media, such as Facebook groups, blogs and Twitter. One of the lead teachers maintained a blog, while most lead teachers seemed to follow rather than contribute to online teacher networks.

Lead teacher community

The lead teachers could be described as a community with the shared common purpose of organizing large-scale professional development in conferences and workshops inspired by the TeachMeet model. In order for the lead teachers to organize joint conferences and workshops, they were dependent on support from the school leader community. The school leader community and lead teacher community worked independently, with little interaction between the two communities. However, in several schools, there was an ongoing one-to-one relationships between the school leaders and lead teachers, where the school leader typically encouraged and supported the work of the lead teacher, and where the lead teacher would inform the school leader about the activities of the lead teacher community. The role of lead

teachers was primarily to organize activities, rather than to share their expertise with each other or other teachers. That said, it was evident that the lead teachers continuously improved their competence on how to organize large-scale teacher professional development across schools.

Teacher network

All teachers participated in joint conferences and workshops. The teacher could be described as a network as they were loosely connected with the common purpose of sharing experience of using ICT in pedagogical practice. The network made inequalities visible, such as that one of the schools had limited technical infrastructure, which was quickly addressed by the school leader of that particular school.

Intra-school teacher community

Some teachers worked in intra-school teacher communities with the common purpose of improving their use of ICT in pedagogical practice, based on what was learnt during the conferences and workshops. In other cases, formal teacher teams, typically organized according to level or subject discipline, picked up on certain topics. For example, a teacher community could decide to adopt one of the apps that were introduced during a workshop. The community would discuss how they wanted to use the app in their teaching, test in each of their classes and then evaluate and report back to the community.

Inter-school teacher network

Teachers belonging to smaller subject disciplines, such as home economics and physical education, jointly formed inter-school networks with the common purpose of sharing experience of using ICT in subject-specific pedagogical practice. These networks provided an opportunity for teachers to share experiences in their specific subject discipline, which previously had not been possible, since they felt isolated at their respective school. They spontaneously organized meetings and invited each other to their school.

This study illustrates that ICT professional development across the five schools were dependent on different types of communities and networks. For example, the intra-school teacher communities used the conferences and workshops as inspiration and influx of ideas. It was evident that the organization of joint activities also contributed to learning in unexpected ways, such as spontaneously initiated inter-school networks. Research often identifies weak positive effects on student outcomes, because teacher communities often entrench, rather than challenge, existing practices and assumptions (Timperley et al., 2008). Examples of challenging and developing the use of ICT in pedagogical practice were mainly identified in the intra-school teacher communities. These were spontaneously formed in order to implement what was learnt in the large-scale conferences and workshops in practice.

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FRAMEWORK FOR DIGITALLY MATURE SCHOOLS

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Abstract

Rapid diffusion of Information and Communication Technologies (ICT) in all professional and personal areas require digital maturity from schools. In order to assess this aspect of school, a concept of digitally mature school has been developed and translated into different frameworks. In this paper, we describe development methodology of Framework for Digitally Mature Schools (FDMS) in Croatia. The FDMS, together with the accompanying instrument and software, represents a unique and comprehensive tool set for the assessment of digital maturity of a school. The FDMS recognized five areas divided into 38 elements that are described on five digital maturity levels in the form of a rubric.

Introduction

A concept of digitally mature schools is increasingly becoming significant within the modern educational system due to the growing importance of Information and Communication Technologies (ICT) in education. The European Commission has recognized the significance of this concept and, through its policies, encourages the development of digitally mature schools. We described digitally mature schools as schools with a high level of integration of ICT and systematized approach to ICT use in school management and in their educational processes. The use of ICT in schools is no longer a matter of individual enthusiasm, but a systemic approach planned and implemented at the level of school in accordance with local and state policies (e-Schools). The Framework for Digitally Mature Schools is therefore needed to enable the identification of areas and elements that contribute to the digital maturity as well as for planning of possible progress in the integration and use of digital technologies.

There are several frameworks designed regarding the digital maturity of educational institutions (Table 1). However, based on the performed qualitative analysis of these frameworks we conclude that neither of them provides a comprehensive concept which could be used as the basis for the establishment of a digitally mature schooling system. There is no concept that would encompass framework, the instrument for evaluation nor a software supporting implementation.

Based on the analysis of the existing frameworks and in line with the goals of e-Schools project in Croatia ("e-Schools: Establishing a System for Developing Digitally Mature Schools (pilot project)" funded by the ESF and ERDF), we developed a comprehensive Framework for

Digitally Mature Schools (FDMS), instrument for self-evaluation and external evaluation of schools, as well as the software supporting FDMS implementation. The FDMS consists of five evaluation areas and five levels of digital maturity and it is in line with the generic European Framework for Digitally Competent Educational Organizations (DigCompOrg). In accordance with the FDMS, the instrument for evaluation of the digital maturity of schools was prepared. The self-evaluation and external evaluation of 151 schools in Croatia was performed according to the mentioned instrument and online software. The purpose of evaluation was to determine the initial level of the digital maturity of each school included in pilot project. This was necessary in order to enable the monitoring of their progress and the planning of the most suitable means of support for schools.

Finally, in this paper, we present the methodology used in developing the Framework for Digitally Mature Schools (FDMS), as well as the FDMS itself. The methodology will not be presented in detail due to the page limit.

Objectives of the research

The overall objectives of the research within e-Schools project related to the FDMS are:

- to review the existing findings on maturity of schools, to propose main areas and elements, to describe digital maturity of schools and to build a comprehensive framework for assessment of digital maturity of schools;
- to develop a framework for evaluation of digital maturity of schools for Croatian educational context;
- to develop the Instrument (in form of a rubric and accompanying questionnaire) for self-evaluation and external evaluation of schools in order to be able to determine the digital maturity level for each school;
- to assess the level of digital maturity of schools in Croatia with self-evaluation and external evaluation using the developed instrument;
- to perform in-depth analysis of maturity levels of all schools included in the research, as well as to monitor their progress and plan the means of support within e-Schools project.

The specific objectives of this paper are:

- to briefly present methodology used in developing the Framework for Digitally Mature Schools (FDMS);
- to present developed FDMS based on theoretical findings and survey results.

Analysis of Digital Maturity Frameworks

In the scope of our research the qualitative analysis of 15 digital maturity frameworks was performed. The following Frameworks were analyzed:

1. Assessing the e-Maturity of your School (Ae-MoYS);
2. DigCompOrg (DigCompOrg);

3. eLearning Roadmap (eLearning Roadmap);
4. eLemer (eLemer);
5. The ePortfolios & Open Badges Maturity Matrix (ePOBMM);
6. Future Classroom Maturity Model (FCMM);
7. HEInnovative (HEInnovative);
8. Jisc Strategic ICT Toolkit (JISC);
9. Ledning, Infrastruktur, Kompetens, Användning (LIKA);
10. Microsoft Innovation Framework & self-reflection tool (MICROSOFT IF & SRT);
11. NACCE SRF (NACCE SRF);
12. OPEKA (OPEKA);
13. Up-scaling Creative Classrooms in Europe (SCALE CCR);
14. SCHOOL MENTOR (SCHOOL MENTOR);
15. VENSTRESS (VENSTRESS).

Within the analysis, a special attention was paid to the following elements: implemented development approach, application area, sensibility to beginning and/or advanced levels, the existence of accompanying framework, instruments for evaluating the maturity level and for the supporting software and best practice examples. An overview of the frameworks analyzed in this research is shown in Table 1. The analysis revealed two frameworks/toolkits (DigCompOrg and eLearning Roadmap) that, due to their characteristics, best describe the comprehensive field of digital maturity of schools. However, further modifications and adjustments are needed for both frameworks on grounds of two major reasons: (a) to adjust the framework to the local (Croatian) context (also required and suggested by the DigCompOrg framework), (b) to update outdated elements (due to fact that the second identified framework/tool – eLearning Roadmap is outdated).

Table 1: Overview of frameworks analysis

Name	Framework /Instrument	Level	Approach	Application area	Best practice
Ae-MoYS	Framework and online self-evaluation questionnaire	Elementary	Qualitative Quantitative	Elementary and high-school	EU
DigCompOrg	Framework	Advanced	Qualitative	Elementary and high-school, HEI	World
eLearning Roadmap	Framework and matrix	Advanced	Qualitative	Elementary and high-school	Ireland
eLEMER	Framework and online self-evaluation questionnaire	Advanced	Qualitative Quantitative	Elementary and high-school	Hungary
ePOBMM	Framework and matrix	Advanced	Qualitative	Mostly HEI	EU
FCMM	Framework and online self-evaluation questionnaire	Advanced	Qualitative	Elementary and high-school	EU
HEInnovative	Framework and online self-evaluation questionnaire	Elementary	Qualitative	HEI	World
JISC	Framework and online self-evaluation questionnaire	Advanced	Qualitative Quantitative	HEI	EU
LIKA	Framework and online self-evaluation questionnaire	Elementary	Qualitative	Elementary and high-school	Sweden
Microsoft Framework	Framework and online self-evaluation questionnaire	Advanced	Qualitative Quantitative	Elementary and high-school	World
NACCE SRF	Framework and online self-evaluation questionnaire	Elementary	Qualitative Quantitative	Kindergartens, elementary and high-school	United Kingdom
OPEKA	Framework and online self-evaluation questionnaire	Advanced	Qualitative Quantitative	Elementary and high-school	Finland
SCALE CCR	Framework	Beginning	Qualitative	Elementary and high-school	Europe
SCHOOL MENTOR	Framework and online self-evaluation questionnaire	Advanced	Qualitative Quantitative	Elementary and high-school	Norway
VENSTRESS	Online self-evaluation questionnaire	Beginning	Qualitative	Elementary and high-school	Netherlands

Research methodology

The Framework for Digital Maturity of Schools (FDMS) was being developed in the period from October 2015 to June 2016 within the framework of e-Schools project by FOI (Faculty of Organization and Informatics, University of Zagreb) and CARNet (Croatian Academic and Research Network) experts. The methodological approach we used for the development of the FDMS was for the most part qualitative. It was based on the comprehensive review of academic and grey literature, a pool of the existing frameworks, meta-analysis of selected frameworks and a number of stakeholders' consultations.

First phase

In the first phase, we have done a comprehensive qualitative analysis of 15 frameworks for the digital maturity with focus on digital technologies or some forms of digital maturity in different sectors (Section 3). Based on the results of the analysis two frameworks have been selected to form the basis for the creation of the FDMS: (a) DigCompOrg, the framework developed by the European Commission for the digitally competent educational institutions, and (b) the eLearning Roadmap tool which is very successfully used for the purpose of certification of digitally mature schools in Ireland. However, these frameworks did not cover the entire concept needed to support building of the FDMS. Roadmap is not a framework but a tool which mostly covers e-Learning. Therefore, it enables schools only to test the current level of their e-Learning maturity. Namely, the digital maturity is a broader concept than e-Learning maturity. Further, it is adjusted solely to the Irish educational system which influences its applicability in Croatia or any other country. DigCompOrg is a framework for digitally competent educational institutions and includes all the main areas of digitally competent educational institutions. Additionally, it represents a very complex and comprehensive framework that can be the basis for the assessment of all educational systems. In the development of our Framework, DigCompOrg served as a generic framework. However, its elements within the main areas were reduced and modified in order to correspond to the context of elementary and high-schools in Croatia. The described analysis was based on expert knowledge and experience. Table 2 shows the mapping of the basic dimensions of two above-mentioned frameworks on the newly created FDMS. The result of the first phase was the first version of the Framework, developed by using qualitative analysis of 15 Frameworks with focus on two indicated European models. It was followed by several demanding cycles of confirmation and revision using expert knowledge.

Table 2: Mapping of the FDMS to existing frameworks

Croatian framework	DigCompOrg Thematic Elements	eLearning Roadmap Constructs
Planning, management and leadership	Leadership and governance practices	Leadership and planning
ICT in learning and teaching	Teaching and learning practices Assessment practices Content and curricula	ICT and curriculum
Development of digital competences	Professional development	Professional development
ICT culture	Cooperation and networking	E-learning culture
ICT infrastructure	Infrastructure	ICT infrastructure

Second phase

In the second phase of the framework development, we applied sorting cards (Q-sorting) method and two focus groups analysis as tools for defining new framework areas and their elements as well as descriptors related to the levels. Ten experts that participated in the card sorting method covered the areas of digital technologies, their application in the educational system, strategic planning and similar. The suggested pool of elements in the Q-sorting method was created on the results of the DigCompOrganalysis and on the conclusions of two focus groups performed with more than 60 principals and teachers. The new elements included in the Framework are: Assessment, Learning Analytics (LA), Content repository and licensing, Learning spaces and E-inclusion. At that stage, it was decided to base the framework on five maturity levels and to present it in a form of a rubric. Namely, the rubric enables mapping of the achievement against explicit assessment criteria. However, it is important to describe the criteria as clearly as possible.

Third phase

In the third development phase, the experts who developed the framework now determined the descriptors for all levels in rubrics form. A research was conducted, using a questionnaire, on about 70 examinees who had to prioritize the areas and elements and list new ones if they considered necessary. There were also semi-structured interviews with the representatives of school founders, ministry, school principals and digital technology experts. The participants were asked to assess the implementation of digital technology in school in order to confirm and improve the proposed areas, elements and descriptors in the FDMS. It is important to mention that, in this phase, the specificities of the Croatian system were built into the developed FDMS and Instrument. With this, the procedure of defining areas, framework elements and descriptors for all the elements on all levels was completed.

Fourth phase

Based on the FDMS, the fourth development phase resulted with the rubric (maturity matrix) for each domain with 5 maturity levels, 5 areas and 38 elements. We used mathematical (propositional) logic with logical operations and quantifiers to clearly connect statements and accurately describe maturity levels. However, since the pilot group of respondents found challenging to work with the rubrics directly, it was decided to convert the rubrics into questionnaire items. In order to map the questionnaire items into the rubrics, the use of mathematical logic proved to be valuable. In order to determine the overall maturity level of a school, Taxicab metric was used.

Fifth phase

In the fifth development phase, there were several consecutive iterations of improving the Framework and descriptor elements, the rubrics, as well as the questionnaire items (in the Instrument) with help of experts from CARNet, principals of several Croatian schools and the representatives of school founders. This resulted with the final version of the FDMS and with the Instrument that was further implemented in form of an online software. The Instrument

was further validated on a sample of 151 schools in Croatia where evaluation of digital maturity was conducted.

Framework for Digitally Mature Schools

The Framework for Digitally Mature Schools (FDMS) defines the areas and levels of the digital maturity of schools. The methodology used in developing the FDMS was presented in Section 4. The schools can use the FDMS as a guide when planning and integrating the ICT in learning and teaching, as well as in their management processes. The policy creators and the decision-makers in the educational system can exploit the FDMS for the development of policies and initiatives aiming at successful integration of the ICT into the educational system. The FDMS consists of five areas and five levels of digital maturity of schools. Table 3 presents the areas and elements of the digital maturity of schools within the FDMS (e-Schools, Begicevic Redjep, 2016). Each area consists of a larger number of elements which have been described for each maturity level. In Table 4 Rubric for the element “Vision, strategic guidelines and objectives of ICT integration” is shown to illustrate the approach.

Table 3: Areas and elements of the FDMS

Area	Elements	Area	Elements
Planning, management and leadership	Vision, strategic guidelines and objectives of ICT integration	ICT culture	Access to ICT resources by educational staff (teachers)
	Plan and programme of school development from ICT perspective		Access to ICT resources by students
	Managing the integration of ICT in learning and teaching		Network presence
	Managing the integration of ICT the school's business activities		Communication, information and reporting
	Learning analytics (LA)		Netiquette
	Regulated access to ICT resources		Copyright and intellectual property
	Use of ICT in teaching students with special educational needs		Projects
ICT in learning and teaching	Awareness	ICT infrastructure	Planning and procurement
	Planning		Network infrastructure
	Use		ICT equipment in the school
	Digital content		ICT equipment for educational staff (teachers)
	Evaluation of students		Programme tools in schools
	Students' experience		Technical support
	Special educational needs		Equipment maintenance
			Central repository of digital documents and educational content
			Information security system
			Licensing control
Development of digital competences	Awareness and participation		
	Planning		
	Purpose of professional training		
	Self-confidence in the use of ICT		
	Digital competences of students		
	Special educational needs		
	Informal learning		

Table 4: Rubric for the element “Vision, strategic guidelines and objectives of ICT integration”

	Basic	Initial	e-Enabled	e-Confident	e-Mature
Vision, strategic guidelines and objectives of ICT integration	In the school documents, general vision and strategic guidelines for school development are not defined. The ICT integration in learning and teaching processes as well as in school management processes is not included in the general vision and/or strategic guidelines for the school development. Long-term objectives of the ICT implementation are not defined.	In the school documents, general vision and strategic guidelines for school development are defined. However, the ICT integration in learning and teaching processes as well as in school management processes is not included in the general vision and/or in the strategic guidelines for the school development. Long-term objectives of the ICT implementation are not defined.	In the school documents, general vision and strategic guidelines for school development are defined. This includes the ICT integration in learning and teaching processes as well as in school management processes. Long-term objectives of the ICT implementation are partially defined in the school documents.	In the school documents, general vision and strategic guidelines for school development are defined. ICT integration into learning and teaching processes and school management processes is defined as a separate vision in strategic guidelines. Long-term objectives of the ICT implementation are defined. However, there is no periodic evaluation of effects of the defined long-term ICT implementation objectives.	In the school documents, a general vision and strategic guidelines for school development are defined. ICT integration into learning and teaching processes and school management processes is defined as a separate vision in strategic guidelines. Long-term objectives of the ICT implementation are defined. The school board periodically evaluates the effects of the defined long-term ICT implementation objectives.

Below, there are brief descriptions of each maturity level. The descriptors indicate the characteristics of a typical school on a particular level of digital maturity. A specific school may differ in some aspects from a typical representative for a particular level. In the process of self-evaluation and external evaluation, each school receives the feedback based on their characteristics and regarding the assessed maturity level.

Level 1: Basic

The school is not aware of the possibility of using ICT in learning and teaching nor in management processes. Therefore, the school does not take the ICT into consideration in planning its growth and development. The ICT is not used in learning and teaching. The educational staff (teachers) do not develop their digital competences. The online communication with school is generally not possible. The ICT infrastructure has not been provided yet and the computers are used only in few classrooms in the school.

Level 2: Initial

There is awareness of the possibility to use ICT in learning and teaching and in management processes, but it has not yet been implemented. A small number of teachers use ICT in learning and teaching. There is awareness of the need to enhance the digital competences of teachers and students. However, the system for the professional development of digital competences still does not exist. The school is still inactive in the online environment and access to their own ICT resources is limited. The ICT infrastructure is generally undeveloped and computers with Internet access are available only in few classrooms in the school.

Level 3: e-Enabled

The school is aware of the possibility to use ICT in all its activities, guides the development of its strategic documents and integration of ICT into these documents. The ICT is used for working with students with special educational needs. The teachers advance their digital competences, develop digital content and start introducing innovative teaching methods. The school participates in small ICT focused projects. The access to different ICT resources is provided in most classrooms. A special attention is given to equipment maintenance and to controlling software licensing. The school is active online, in terms of content presentation and communication.

Level 4: e-Confident

The school recognizes the advantages of ICT usage in its activities very clearly and integrates the ICT implementation into strategic documents, as well as in everyday activities. The teachers use ICT for advanced teaching and assessment methods, as well as develop their own content and protect it by copyright. There is also a shared repository of content which can be used by teachers and students. The continuous professional training of teachers for the purpose of acquiring digital competences is planned and performed. Students are encouraged to develop those competences. Access to different ICT resources is provided in most classrooms, whereas the procurement and maintenance of the ICT resources is planned. The school is active with respect to ICT projects. The school is also very active online in terms of content presentation and communication. Software licensing is controlled and the security aspects of ICT use are taken into consideration.

Level 5: e-Mature

In its strategic documents and development plans, the school very clearly recognizes and requires the use of ICT in all activities. The management practice relies on the integration and obtaining the data from all school information systems. The approach to enhance digital competences of teachers and students is systematic, professional training for the teachers and additional course activities for the students are available. The teachers use ICT within advanced teaching methods, for the development of new course content and for the assessment of student accomplishments. Teachers and students regularly protect digital content by copyright. There is also a shared repository of content available for use by teachers and students. Access to ICT resources from own devices is provided in all classrooms and

other rooms in the school. The school independently plans and acquires ICT resources which are available in nearly all classrooms and other rooms in the school. The entire school has a developed network infrastructure. An information security system was developed and software licensing is systematically controlled and planned. The school is characterized by varied ICT project activities, cooperation between teachers and students, as well as between other schools and stakeholders. This is done through the use of online communication tools and e-services.

Conclusion

The Framework for Digitally Mature Schools (FDMS), the accompanying Instrument for evaluation of the digitally mature schools and the supporting software developed in the scope of the e-Schools project represent a unique and comprehensive tool set created according to sound research methodology. The FDMS identifies five areas organized as a rubric with 38 elements, each described on five levels of maturity. Due to their generic characteristics, the FDMS and the Instrument can be applied in other educational systems and countries with minor adjustments. The Instrument can be used as a tool to evaluate the school's digital maturity level but also for the identification of the areas for improvement that could enable the growth on the scale of digital maturity and improve the overall reputation and school results. The FDMS, the Instrument and the accompanying software have been already successfully applied in the process of self-evaluation and external evaluation of 151 schools in Croatia. The significant feedback for improvement of the FDMS and of the Instrument was collected in this validation process. The evaluation of further 1400 elementary and high-schools in Croatia is planned for 2017.

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DBS (DATA BACKGROUND SEARCH) MODEL TO SUPPORT CHILD PROTECTION PRACTICES IN INDIA

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Rationale and background

Attending schools is the most usual experience that most children around the globe have in common. This is the regular way in which societies prepare them to be fully equipped for the future.

Nevertheless, schooling is not always a very happy experience for every child. In many cases, the physical conditions of the educational setting are not optimal; some children attend school feeling unwell, hungry or thirsty, or may be victims of domestic violence or of violence within their communities. In some cases, they may bear many types of abuse at school by teachers or peers.

These conditions not only jeopardize the learning development of the child, but also can produce long lasting symptoms of post-traumatic stress disorder (PTSD). According to a report by UNICEF, “The brain development of children who are victims of violence can be affected – with some [of them] showing similar brain activity to [those of] soldiers exposed to combat” (UNICEF, 2016).

Despite India’s recognition of the United Nation Convention of Child Rights in order to ensure that all children’s needs are met and that human rights are protected, there is still an existing gap for the implementation of the law in vulnerable areas of the country, which prevents many children from being able to enjoy their well-being.

The Juvenile Justice (care & protection of children) act – 2000 as well as 2015 classify the juvenile offenders in two categories. Firstly, the juvenile delinquent and the juvenile in conflict with law. Most of the children who are found in conflict with law are the children of rich families who break the law just for the reason of being misguided. The juvenile delinquents are the poor children who commit offence for the fulfilment of their basic needs like food, medicine, clothes etc. for themselves or their family members. None of these two offenders can be set on a right track just, by prescribing certain punishments and reformation. It requires a basic transformation.

The next challenging issue is the violence upon the children; which have been made punishable under the Indian Penal Code, Protection of Children from Sexual offences Act,

The child and adolescent labour (Prohibition and Regulation) Act, The Juvenile Justice (Care & Protection of Children) Act 2015 etc.

The statistics reveal that most of the cases are of the category, in which the child is known to the offender. The offender is relatives or family member of the offender or the offender is the master / custodian of the victim child. Owing to this factual situation most of the cases are not reported. Whatever, case is reported gets fail due to the lack of evidence which is attributed to the commanding position of the offenders.

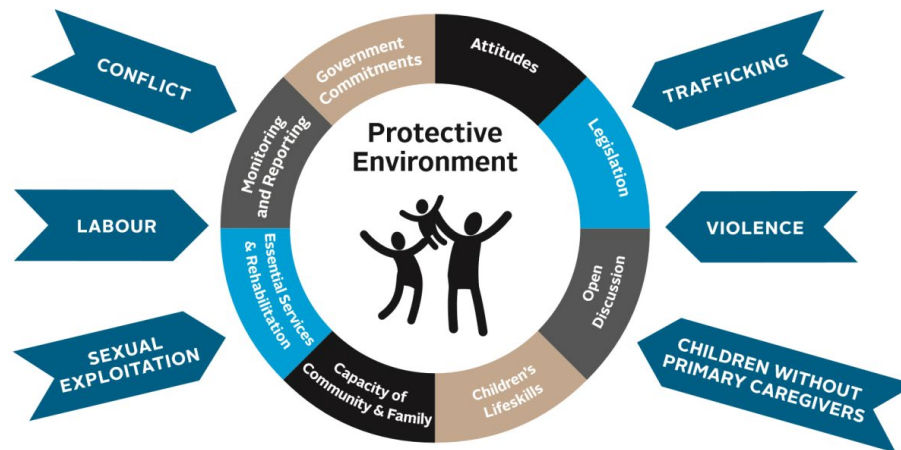
In Delhi, the situation is best in India as “Delhi Commission of Protection of Child Rights” is active since many years but then to the rate of conviction is 25% in the child abuse cases; in Delhi. There is no specific data over the factum that on what percent of cases go unreported. The latest speculation is that almost 40% of the cases are not reported. It is expected that four years back only 40% of the cases were being reported.

In spite of the handicaps the protection of children from sexual offences Act & rules – 2012, the juvenile justice (Care & Protection of Children) Act – 2015 and the Juvenile Justice (Care & Protection of Children) Model Rules – 2016 are good legislation and a good result is expected from it in coming days.

Children growing in a country such as India, in which the gap between poor-rich is so big, determines the level of education, health, nutrition, protection and opportunities, which prevents the development of the most disadvantaged groups of the society in which children’s needs are many times forgotten or not even taken into consideration.

According to UNICEF’s Protective Environment Framework (Figure 1) for protecting children from maltreatment, there should be a synergy of different actors and sectors conformed by eight keys elements. In the case of the absence of one of them, children are more exposed to the vulnerability of their rights (FHI 360, 2012; p.8).

Figure 1.
Protective environment framework



Source: Enhanced Protection of Children Affected by AIDS. A Companion Paper to The Framework for the Protection, Care and Support of Orphans and Vulnerable Children Living in a World with HIV and AIDS. New York: The United Nations Children's Fund (UNICEF), March 2007.

Figure 1. Protective environment framework

Therefore, based on this Protective Environment Framework, the DBS will help to enhance the surveillance processes of reporting of child protection issues and build the capacity of professionals in contact with the children to identify and respond to all kind of abuses faced by children.

This loophole of the applicability of the law was confirmed by an assessment carried out for this proposal, based on the UNICEF's framework called Child Friendly School (CFS) in a village of India. A CFS assures children safe, protective and gender-sensitive spaces, free them from violence and abuse, and secures their health and well-being, raise teacher self-confidence as the main partner of the child, status and mobilise community support for education (UNICEF, 2014; p.32).

During the data collection, children spoke about physical and verbal punishment at the school, imparted in the form of slaps, hit with a cane, pulling the child by the clothes and/or shouting. Additionally, the participant mentioned that sanitary facilities were not fit to the needs of girls during the period time, forcing many of them staying at home and not attending class during those days.

On the other hand, an assessment about the legal framework for child protection in India was conducted in order to detect the problems stemming from the lack of applicability of the law preventing children to be fully protected in every region of India. We got to know that there is no central database which keeps record of Convicts of crime against Children (Violence, Child Punishments such as beating in School and Sexual Abuse). Here, the local police station keeps the record of accused and convicted persons in the abovementioned category.

Aim

Renovating the conventional education system by:

- Developing a verification system to check for serial offenders of crimes against children with special emphasis on education sector, for selecting professionals who are free from any stain stemming from either conviction or accusation.
- Training professionals dealing with children in child protection practices and inclusion of diversity in broader sense of term (from gender, social-cultural background, differently able pupils and religion).

Problem statement

Despite India's recognition of the United Nation Convention of Child Rights in order to ensure that all children's needs are met and that human rights are protected, there is still an existing gap for the implementation of the law at different levels, which prevent many children from being able to enjoy their well-being in remote areas of India.

Despite of the presence of prevention of Atrocities act, 1989 for schedule Caste and Schedule Tribe, as act of Indian parliament to prevent atrocities to Schedule Caste and Tribe, the situation on the ground is very diversify with pots of excellence in areas of utter lack of application.

In India still offenders can re-locate to different places and join an educational institute without any hindrance. This creates the malice of repeated incidents of crimes against children (sexual abuse, child punishment...) by the same person without the system knowing that they are offenders and prosecution.

The problem in terms of diversity lies in:

- Basic difference between upbringing of a boy and girl; gender inequality that still exist after years of work towards promoting the "girl child".
- Caste system – low caste people are kept away from mixing with general public; causes hindrance in learning.
- Colossal difference between rich and poor both in monetary and resources terms.

Methodology

We used an ethnography approach to assess the current status of education and wellbeing and Child Friendly School experiences of children in rural India.

As subject for this study, 20 children (13 girls, 7 boys) between 10-16 years old, were invited to talk about their school experiences and participate voluntarily in the discussion and by using participatory methods such as a playful tasks and semi structured interviews to hear children's point of view and ascertain the main vulnerabilities of the children at schools (perceived and actual).

The adopted approach will have required a systemic sampling to be used for treating a sample population fully representative of the present India society. However, KIIT is presently caring (Education, accommodation and nourishment) for over 25,000 children which provide a significant cross-societal sample of the India population.

A legal expert in the area was interviewed to ascertain the present provision for child protection and its implementation. To this extent the lack of a centralized search facility comparable to the UK DBS system is perceived as a major impediment for India to develop a proper scrutiny approach in the recruitment of teaching staff.

Work carried out

A random sample of children was selected by inviting them to participate freely in the drawing and playing activities. The facilitator introduced the aim of the session and told the children that we wanted to hear and learn about their school's experiences.

There was a pilot carried out in order to identify which participatory tools worked better with the participants. Children were requested to draw a map of the school in order to identify the physical settings of the institution, safe/unsafe places, which activities they like the most doing at school and the people they trust the most and don't trust at all (CFS elements).

During the process the children took the task as an assignment and were not able to draw freely as it was expected. Nevertheless, despite this situation, they shared stories of physical punishment and were able to identify the elements of CFS that were requested.

During a second session the mapping tool was changed for a Lego playing session, which consisted in building freely with blocks whatever they wanted and the facilitator carried out the interview about CFS elements. Also they were requested to answer a semi-structured questionnaire after playing. This activity turned out to be the best option because children appeared more relaxed and engaged.

During the activities with the children, active observation was adopted in order to detect perceived and actual vulnerabilities, as well as child's involvement in the activities.

- The following guidelines were adopted during the observation:- Child's involvement in doing or saying something, such as answering a question, making a drawing to explain herself or himself, interacting and communicating with others in the development of the activities.
- Child's mastering of a skill, such as dancing, singing, drawing, expressing feelings, giving evidence of confidence and ownership of the space.
- Child demonstrating evidence of dispositions or attitudes of mind that promote ongoing learning and participation. For instance, child's capacity to persist in doing a drawing or telling a story that is difficult or child's disappointment when unable to fulfil a task.

- A child telling or showing you by their words and/or behaviour that they are deeply engaged and that this is important learning for them.
- A child demonstrating higher order thinking. For instance, reflecting on past experiences and integrating it in the dialogue.
- A child demonstrating learning which shows that body, mind and wellbeing are all actively engaged.
- A child trying to communicate difficult experiences or looks for the attention of the facilitators in order to express something that cannot be articulated.

Also, one girl and a boy were trusted with a camera each in order to photograph whatever they wanted from the school and their homes. The next day the children were requested to explain the pictures to the facilitator and this exchange helped to re-confirm the data that was previously collected.

The collected data was contrasted with current legal framework by interviewing an expert lawyer.

According to the inputs provided by Mr. Sanjay Kumar Pandey, Advocate on Record, Patna High Court, India; there is no direct provision in the Constitution of India regarding Prevention of abuse of Children. But there are some articles which indirectly imply to the safety and protection of children, they are

- Article 24 (Prohibits employment of children in factories etc.), Article 23 (Prohibition of human trafficking and forced labour) & Article 39 (e) and Article 39 (f) (Protection against exploitation) of the Indian Constitution;
- Indian Penal Code : Sections 82 (it says “nothing is an offence, if committed by child of an age below 7 years”) and 83;
- Protection of Children from Sexual Abuses Act 2012: Under this act the cases are tried in special courts and classifies the accused in two categories namely *general* & *custodian type* (like teacher, priest, janitor, police officer, mentor etc.);
- Juvenile Justice Act 2015 : Sections 75 (Punishment for cruelty to a child), 76 (for Child beggars), 77 (giving liquor to child), 78 (using child for smuggling), 79 (exploitation of child employee), 80 (Adoption without formalities), 81 (sales and procurement of a child), 82 (Corporal punishment), 83 (use of child by militant group) and 84 (kidnapping);
- Child and Adolescence labour Act 1986;
- Right of Children to Free and Compulsory Education Act 2009;
- Factories Act (1948): defines hazardous/non-hazardous factories and regulates working hours;
- The Mines Act (1950).

It was observed by our legal expert that the success of conviction in child abuse cases depends upon the efficient investigation of the offence and quick collection of the incriminating evidences. It is not in dispute that there is a provision for the special courts in both the circumstances but the courts has its own limitations. Unless and until some Jermaine and

concrete evidence is brought on the record the courts cannot convict an offender. The investigation and collection of evidence part is also essential for the prevention of the misuse of the law. It has been found that very often false cases are being filed in the special provisions to take revenge from the persons. The good investigation would efficiently eliminate the misuse of these laws.

Comparing the data with the existing framework, it is evidently proved that protection of a child cannot be secured solely by a legal frame work; particularly in a country like India where the poverty rules. Many a relaxations has been provided in law itself for financial reasons.

In his opinion, the first and foremost stand of the Govt. should be the providing social security to the poor families, poor children and moral development to the people at large. He also inferred that the realistic situation is that an ideal situation is never achieved in the society. The grim reality is that most of the child abuse cases are not reported and a number of false cases are being filed in the special provision to take revenge from the private persons. An ideal situation cannot be attained only by implementing the child abuse law or gearing up the facilities for the rehabilitation of the abused or delinquent children. A social transformation is required to achieve the ideal situation.

Findings

61% of the participants reported being victims of physical or verbal punishment. 73% of the students mentioned that physical punishment was imparted due to their lack of attention at classrooms, wrong answers or misbehaviour. 89% said that they only spoke about the physical punishments only with their friends. 82% of the girls found the toilets being dirty and unsafe and 26% mentioned skipping school during their periods. 12% of the girls said that they wait until the recess in order to visit the toilet at their home. The total number of the boys said that the toilets are dirty, but didn't mention facing any major problem related to the sanitary facilities. Only 3% of them said that waiting for permission to visit the toilets was physically uncomfortable. 27% of the children gave evidences of lack of safety in the infrastructure of the school. 93% mentioned that the person(s) they trust the most at the school were their friends or a friend and 7% trust a particular teacher. 91% of the participants said that the playing ground or playing with their peers was the aspect they liked the most from their school. 9% enjoy spending time in the computer room.

Conclusion

After analysing the collected data and introspection of the Legal framework and its loopholes, it is hence concluded that there is a compelling need of a central database of Convicts of Child Abuse (Physical and Sexual). It could help the government keep a tab on regular offender to try to slip into jobs of teaching/day care to commit these harmonious crimes. This database (DBS) would ensure that a convict/accused of a serious crime against children is monitored irrespective of the state or city he lives in or in many cases, tries to relocate. It would be also helpful in catching and inspecting serial offenders who under the present rules, easily relocated and hide from the authorities. This would be a boon for the combined recruitment

drive of teachers in public schools as DBS can be used as a verification system to scrutinize the candidates.

Moreover, a module could be designed for the teachers which could help in dealing with children in child protection practices and inclusion of diversity in broader sense of term (from gender, social-cultural background, differently able pupils and religion). In this way the teachers would be more equipped in handling diversity related issues in Education precinct.

Future work

There is a vast scope for work for child protection in India especially in the field of monitoring Convicts of Child Abuses and building a training module for teacher dealing with children in child protection practices and inclusion of diversity in broader sense of term (from gender, social-cultural background, differently able pupils and religion). A team of Project FINDIgATE is currently working on building a prototype of the Data Background Search (DBS). The prototype would demonstrate how the central administration/ government of a country can keep track of all the Convicts of Child Abuse and use it for verification/detection of Serial offenders.

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EFFECTS OF MULTIMEDIA FEEDBACK ON PRE-SERVICE TEACHERS' PERCEPTIONS, SELF-ASSESSMENT, AND ACADEMIC ACHIEVEMENT

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Introduction and Review of Literature

The importance of feedback for learning is recognized by a number of theoretical perspectives rooted in behaviourism and pursued by many others such as goal setting theory (Locke & Latham, 1990), social cognition theory (Bandura, 1991) and conditions of learning (Gagne, Briggs, & Wager, 1992). Feedback serves as an essential component of teaching and learning process in these theories because it provides important information to learners about their performance on a specific task or goal (Hollenbeck, Karam, DeRue, & Lam, 2011).

This crucial component of the learning is mostly classified in terms of its source (Brett & Atwater, 2001; Greller & Herold, 1975; Vancouver & Morrison, 1995, as cited in Lam et al., 2011), timing (Druskat & Wolff, 1999, as cited in Lam et al., 2011; Kulik & Kulik, 1988), type (Earley, Northcraft, Lee, & Lituchy, 1990; Hammond, Summers, & Deane, 1973; Jacoby, Mazursky, Troutman, & Kuss, 1984, as cited in Lam et al., 2011) frequency (Anderson, Kulhavy, & Andre, 1971; Hundal, 1969, as cited in Lam et al., 2011) and its methods for response (Dopke, 2010). These methods are known as text-based (Tang, 2000; Quible, 1997 as cited in Dopke, 2010), audio (Sipple, 2007) and multimedia (Ice et al., 2007).

Text based feedback is the most common one for the majority of instructors because it seems the most pragmatic method for providing feedback (Dopke, 2010). Butler and Nisan (1986) reported that the group which received task related written comments showed significantly more interest on the task than the other group which received only the grades (as cited in Styrk, 2007). Kumar and Stracke (2007) stated that expressed opinions of instructor in written feedback were perceived very helpful for doctoral students to build their confidence (as cited in Can, 2009). Providing written feedback seems to be same with the feedback that is provided electronically. However, it offers lots of benefits. Gould (2012) argues that two most common benefits of electronic text based feedback are its legibility and efficiency. In a study, Denton (2001) found that emailing feedback to learners contributed to the improvements in students' report writing skills over a 2-week period (as cited in Gould, 2012).

Audio feedback is mainly known as recorded comments that are prepared by the instructor on a task. This method has some advantages compared to the written-based. According to Dopke (2010), instructor can provide a great deal of information than can be provided in writing with the help of audio based feedback. Some researchers (Ice et al., 2010; Norcliffe &

Middleton, 2007; Oomen-Early et al., 2008, Rotheram, 2008) reported favourable results on instructor workload and learner perceptions, performance, and satisfaction when providing assessment feedback in recorded audio format (as cited in Gould, 2012). Providing audio feedback has also proven to be more time efficient than text, under certain circumstances (Davies, 2010; Nortcliffe & Middleton, 2007; Rotheram, 2008, as cited in Gould, 2012).

Combining text, audio and video into one format can increase the effectiveness of the feedback, because lots of benefits of these methods can be combined in multimedia feedback experience. Several studies indicated that students preferred a combination of these methods in the process of receiving feedback (Ice et al., 2010; Oomen-Early et al., 2008; Simonsson et al., 2009, as cited in Gould, 2012). Tsutsui and Kato (2001) designed a multimedia feedback tool that was developed by the University of Washington's Technical Japanese Program in their study. Results showed that this tool was approved as effective for oral skills training. Additionally, in Gould's (2012) study on multimedia feedback, the findings revealed that students reported positive effects on their cognitive, affective, and psychomotor learning through the learning process along with the multimedia feedback.

Majority of existing research about effectiveness of feedback in terms of response method is based on text-based feedback (Butler & Nisan, 1986, as cited in Styrk, 2007; Denton, 2001 as cited in Gould, 2012; Quible, 1997; Kumar & Stracke, 2007;) and audio feedback (Ice et al., 2010; Oomen-Early et al., 2008; Davies, 2010; Nortcliffe & Middleton, 2007; Rotheram, 2008, as cited in Gould, 2012; Sipple, 2007). However, based on technological developments, using multimedia technologies in educational environment is increasingly becoming popular among researchers. Some of these researchers argue that students prefer multimedia method, a combination of audio and text-based methods, in the process of receiving feedback (Ice et al., 2010; Oomen-Early, Bold, Wiginton, Gallien, & Anderson, 2008; Simonsson, Kupezynski, Ice, & Pankale, 2009, as cited in Gould, 2012). In the light of those statements, the investigation of pre-service teachers' experiences on this new response method of feedback might be beneficial in order to determine its effect in educational environments.

The purpose of this study is twofold: One of them is to investigate the effect of providing feedback in digital multimedia format on pre-service teachers' perceptions toward multimedia feedback and self-assessment about their skills on a performance-based task. The second purpose is to investigate whether or not providing feedback in digital multimedia format affects pre-service teachers' academic achievement on a performance-based task.

In compliance with these purposes, the following research questions are addressed:

- Does providing feedback in digital multimedia format affect pre-service teachers' perceptions toward multimedia feedback?
- Does providing feedback in digital multimedia format affect pre-service teachers' self-assessment on their skills for a performance-based task?

- Does providing feedback in digital multimedia format increase pre-service teachers' achievement on a performance-based task?

Methodology

Two different research designs were used in the light of research questions of current study.

Study 1

A matching only pre-test-post-test control group design among quasi-experimental designs was applied in this study. This type of design is more suitable when the random assignment for study groups is not applicable since some of the other variables may not be equal in a study (Frankel, Wallen & Hyun, 2012).

The sample of the study composed of 19 sophomore students from Computer Education and Instructional Technology department at Middle East Technical University and they voluntarily participated in this study. The data were collected from laboratory sessions of *Design and Use of Instructional Material Course* being taught in this field. The participants were assigned into two groups named as experimental and control groups. This selection process was administrated by applying to the pre-test scores, prior feedback experience, GPA and gender of the participants.

Gould's (2012) pre- and post-course survey was used in this study to obtain the information of participants. This instrument was a modification of an instrument that was used and validated by Ice et al. (2007). It is composed of four main parts such as demographics, experience, course expectations, and multimedia feedback. The multimedia feedback section of the survey consists of nine questions aiming to obtain information about participants' perceptions on multimedia feedback. The second instrument in this study is a self-assessment form about the competency levels on use of software program which is Microsoft Expression Web. The researchers developed the instrument and content validity was provided by an expert from the field. The data analysis of Study 1 was conducted by using SPSS 23 software. As a non-parametric test, Mann-Whitney U test was utilized along with descriptive statistics.

Study 2

One of the sequential types of mix methods design, explanatory sequential design was utilized in this study. The quantitative data collection and analysis process is followed by qualitative data collection and analysis phase in this design. Two types of data are analysed separately. The results of qualitative analysis are used to extend the results of quantitative analysis (Fraenkel, Wallen & Hyun, 2012). In this direction, the qualitative analysis results were used to support the quantitative analysis results.

Only the experimental group students ($n = 9$) from the previous study participated in this study. For the quantitative phase, convenient sampling method was used for the selection of the participants. A purposive sampling technique was applied for the qualitative phase of this

study. Four participants from the experimental group were invited for interviews after taking the post-test.

In quantitative phase, achievement scores of the students were obtained via the rubric developed by the researchers to evaluate the web sites designed by students. This rubric consists of twenty criteria that have different percentages out of 100-point. For the validation of the instrument, expert view was taken into consideration. On the other side, semi-structured interviews were administered with four students for qualitative phase of the study. The content validity of interview questions was provided by expert views. A schedule was also followed during the interviews. The quantitative data of Study 2 was analysed by applying Wilcoxon test in SPSS 23 software. For qualitative data, codes were defined and reported with related quotations.

Procedure

After pre-defined lab sessions of Design and Use of Instructional Material Course, there were assignments for students. Students uploaded the related file prepared via Microsoft Expression Web design editor to online course page. The researchers examined these assignments and feedback files which were created. Students could download their feedback file from the same course page. Feedback files were different for experimental group and control group. For the experimental group, this file was created with Adobe Captivate software that enabled to record onscreen activities easily. In these activities, text and audio based feedback was provided via videos as a part of multimedia feedback. On the other side, feedback files created with Microsoft Office Word software in text were delivered to students in control group.

Results

Descriptive Statistics and Past-Feedback Experience of Participants

Of 19 participants, the number of females was 12 and the rest ($n = 7$) were males. Their ages ranged from 20 to 23. The experimental group was formed by 10 students. While 5 of them reported that they had already taken feedback in text format in three or more courses, the number of students whom had taken such feedback in two courses was 2. The rest ($n = 3$) stated that they had taken this type of feedback for only one course. Besides, 6 students had never taken feedback in audio format, whereas 3 of them had taken this feedback type in one course and 1 student had already taken this type feedback in two courses. Finally, for multimedia feedback, when 7 students out of 10 had never taken this type of feedback, the remaining 3 students had taken such feedback in one course.

On the other side, 9 students were assigned to control group. While 3 of them had previously taken feedback in text format in 3 or more courses, 4 students had taken this type of feedback in two courses and 2 of them had taken in two courses. For audio type of feedback, 4 students reported that they had never received such feedback before. When 2 of them had taken this feedback type in one course, the rest 3 students had taken in three or more courses. Lastly, the

majority of the control group reported that they had never taken this multimedia feedback before ($n = 6$). One of them had received in one course and the remaining ($n = 2$) had received multimedia feedback in two courses previously.

Results for Study 1

The aim of Study 1 was to investigate the difference between pre and post test results of experimental and control group in terms of skills and perception towards multimedia feedback. As the number of participants was below 30 ($n < 30$) (see Table 1), among non-parametric tests, Mann-Whitney Test was utilized. The results showed that there was no statistically significant difference between pre-and post-test results of experimental and control group except the perception post-test results as indicated in Table 2. The significant difference was found between post-test scores of experimental and control group and experimental group ($M = 13.25$) had larger mean score compared to control group ($M = 6.39$). That is, experimental group had an increase in their level of perception towards multimedia feedback, $z = -2.71$, $p < .05$.

Table 1: Means of Pre-Post Test Results for Groups

	Study Group	N	M
Perception Pre-Test	Experimental	10	11.00
	Control	9	8.89
Perception Post-Test	Experimental	10	13.25
	Control	9	6.39
Skill Pre-Test	Experimental	10	10.40
	Control	9	9.56
Skill Post-Test	Experimental	10	10.15
	Control	9	9.83

Table 2: Results of Mann-Whitney U Test

	Perception Pre-Test	Perception Post-Test	Skill Pre-Test	Skill Post-Test
Mann-Whitney U	35.00	12.50	41.00	43.50
Wilcoxon W	80.00	57.50	86.00	88.50
Z	-.82	-2.71	-.33	-.12
Asymp. Sig. (2-tailed)	.41	.007	.74	.90
Exact Sig. [2*(1-tailed Sig.)]	.447 ^b	.006 ^b	.780 ^b	.905 ^b

a. Grouping Variable: group

b. Not corrected for ties

Results for Study 2

The aim of Study 2 was to find whether there was a significant difference between pre and post test result of experimental group in terms of academic achievement. According to descriptive statistics, the mean of scores before multimedia feedback was 71.50 and the mean scores after multimedia feedback was 90.30 (see Table 3 below). The results of non-parametric test indicated that there was a significant difference between pre and post test scores of

students who participated to experimental group, $z = -2.66$, $p < .05$ as stated in Table 4. Providing multimedia feedback increased students' academic achievement.

Table 3: Descriptive Statistics for Multimedia Feedback Scores

	N	M	SD
Score before multimedia feedback	10	71.50	17.76
Score after multimedia feedback	10	90.30	8.19

Table 4: Results of Wilcoxon Test

Test Statistics	First Score-Second Score
Z	-2.668 ^b
Asymp. Sig. (2-tailed)	.008

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks

In order to support these findings, four students from experimental group were interviewed based on their academic achievement. The important aspects mentioned by students included understanding and correcting mistakes easily, remembering the concepts or steps to be followed, opening space for new learning, discovering even small mistakes, increasing step by step learning, giving the opportunity to work on mistakes and flexible learning as a result of getting multimedia feedback. As there was the opportunity to watch the feedback again, one participant resembled this type of feedback to face-to-face feedback. The students also underlined some motivational factors leading to higher academic achievement: The more interaction between instructor and student encouraged students to work on the necessary changes about feedback; reduction of procrastination; new ways of providing feedback was supportive for students in terms of motivation because they know how to find answers to their questions whenever they need. Interestingly, one participant stated an increase in her level of self-confidence as a result of much care from instructor. Getting multimedia feedback was not only useful for checking mistakes about the task, but also useful for willingness to discover mistakes. Some of the direct quotations were provided below:

"I looked at the feedback there, and did the task again according to feedback. I watched from the beginning by checking my mistakes and when I thought that it was completed, I uploaded it."

"When I got written or oral feedback, I can forget if I do not take notes. When you provided multimedia feedback, I could look at it whenever I want."

"This shows that the instructor spends time for student. In a way, instructor cares for student, and this supports studying much. Somehow, it gives student self-confidence."

"I did what you said and showed one by one there and so, my score increased."

Conclusions and Discussion

The aim of this study was to examine the effect of providing feedback in digital multimedia format on pre-service teachers' perceptions toward multimedia feedback, their self-assessment about their skills, and academic achievement on a performance-based subject. Pre, post-test experiments and semi-structured interviews were applied in order to response the research questions under two different research designs.

According to pre, post-test results for perception and skill scores in Study 1, significant difference was found only post-perception scores of study groups. Experimental group had larger mean scores than control group in terms of their perceptions toward multimedia feedback. One can interpret that students in experimental group perceived that taking multimedia feedback for a performance-based task is useful for their performance. They prefer to take multimedia feedback. In the light of this result, Tsutsui and Kato (2001) found multimedia feedback more efficient and rewarding for students while comparing to other feedback types. Furthermore, Ice at al. (2010) reported that students preferred taking a combination of different feedback types which refers to multimedia feedback. On the other side, no significant difference between study groups was found in terms of their self-assessment scores for their skills while performing during the study. That is, providing multimedia feedback did not significantly affect students' self-assessment scores while using a web based material for a performance-based task.

Finally, academic achievement of experimental group was examined in Study 2. The pre, post-test results concluded that statistically significant difference was found. Students' achievement scores during that performance based task significantly increased with the help of multimedia feedback they took from the instructor. The interview results also supported the experiments' results. Four students stated that taking multimedia feedback helped them to increase their course scores, complete related task, have chance to follow task steps when needed, increase the interaction between instructor and student, and increase their self-confidence. They all had positive attitudes toward taking multimedia feedback during a performance-based task. The results of Gould's (2012) study were also parallel to current study. He reported that providing multimedia feedback increased the satisfaction, motivation, interaction level and learning of students.

Since the number of participants in this study was not efficient enough for making reasonable generalizations, more research studies formed from larger samples are suggested to be conducted. Furthermore, different performance-based tasks can also be applied in order to explore the effect of multimedia feedback for various parameters in educational environments.

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PLEKHANOV RUSSIAN UNIVERSITY OF ECONOMICS: THE EXPERIENCE OF LIFELONG EDUCATION IMPLEMENTING

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Lifelong education indeed has its place deserved among key components of sustainable and effective development of human capital, as well as increase of competitive capabilities of University graduates at the labour market.

In the Plekhanov RUE almost all levels of education currently available in the Russian Federation are implemented – secondary general education, secondary vocational education, higher education, including postgraduate and doctoral studies, additional education. The University provides all necessary conditions for acquiring the necessary basic and additional qualifications not only during the period of study at the University but also throughout the whole employment period and lifetime in general. The development of the Plekhanov RUE lifelong learning system has become possible thanks to modern remote technologies, individual approach to each student and listener, flexible teaching schedule, a wide range of ongoing programs of basic and additional education, excellent instructors.

The key role in this system is played by the Faculty of Distance Learning (FDL), which covers almost all aspects of lifelong education provided for different group of learners – from freshmen-students to graduates of the Plekhanov, and from 1st year schoolchildren to senior citizens. To implement educational and awareness programs, as well as the communication of students and teachers, the FDL administrates LMS (Learning Management System) on the Moodle platform.

For children – the “University Saturdays” project

The “University Saturdays” is an educational career guidance project for school and college students implemented since 2014 and held under the support of the Moscow Department of Education. Within the bounds of this project a range of activities were organized by the FDL of the Plekhanov RUE in cooperation with other faculties and departments aimed at attracting students to the University. Visiting Plekhanov University at least once, students are not thinking about where they will study further. For years of 2014-2016, 3595 schoolchildren and college students from 180 schools and 10 colleges of Moscow had participated in the project. Among all project educational activities, the most interesting and memorable were the following:

Master classes/workshops:

- “The art of public speaking”. The master class was devoted to the formation and development of skills of eloquent, brilliant and charismatic speaking performances.
- “The state is I: each of us has the right of...”. Being the part of the workshops thematic cycle “State and I”, the master class provided for the listeners an opportunity to learn what the Constitution is and why it is needed, why should one know and be able to defend his or her citizen rights and freedoms and, finally, why it is important to be an active citizen of the country and how to become one.
- “Chinese traditions and customs”. The participants of the master class learned about the history of Chinese New year, lantern Festival, traditional Chinese weddings, traditions associated with different seasonal holidays, participated in the tea ceremony.
- “Fundamentals of Chinese painting and calligraphy” (a part of series of events “Moscow & Beijing – partners or friends”). Listeners were acquainted with the art of calligraphy and Chinese ink wash painting. Of particular interest to schoolchildren was the opportunity to “try their hands” at these arts.
- “Monumental painting”. Participants had the opportunity to watch an interactive movie about the Russian monumental painting, see some examples of exhibitions organized by the State Russian Museum, come in touch with vivid examples of the use of monumental painting in the interior design.

Trainings:

- “The tax calculation is easy! *The Glavbuh* accounting reference system will help us!”. In this training boys and girls have mastered the basic abilities of *The Glavbuh* electronic accounting reference system. In particular, they learned to calculate the taxes on their incomes, property and motor vehicle, use an electronic service *Error-free payroll paycheck*, which makes it easy to understand all the features of payroll calculation, calculate interest payments under the loan agreement.
- “Secrets of modern advertising”. This topic was especially interesting for high school students who plan to pursue a career in marketing and advertising. The participants got familiar with the most effective forms and methods for viral advertising and promotion through traditional (mass media, Internet technologies, social networks) and innovative forms of communication (WOW-Call etc.).
- “Personal Finance: what is it, why to think about it and how to manage it”. The participants learned that the owner of the money manages the finances for two possible purposes: for consumption (family or personal) and for accumulation (family or personal). They mastered the usage of an electronic system of family expenses accounting, learned how to form a family budget, plan family incomes and spendings, and manage savings of the family.
- “Sly prices – the trade motor”. This training gave a chance to students to get acquainted with hidden and explicit ways of influencing on consumer behaviour, encouraging them to make a purchase.

Quests:

- Series of quests "Defenders of Moscow" devoted to the events of the 1941 Battle of Moscow during the Great Patriotic war. These patriotic games included the study of history, urban orienteering, costumed entertainment etc. and were very popular among schoolchildren of 12-15, their parents and teachers.

Lectures and excursions:

- "Library is the herbarium of feelings and passions...", which attracted the attention of lovers of old and unique books published in Europe and Russia in the XVII- XX centuries. The schoolchildren studied the stories of the rare books stored in the Fundamental library of the Plekhanov RUE, learned its relation to social and cultural events in Russian and world history.
- "110 years of the University – a lot or not". The excursion was designed as the fascinating journey through the historical Plekhanov RUE buildings that are officially recognized as heritage objects. Participants got acquainted with the rich historical, cultural and scientific heritage of the University, with the history of its formation and work, as well as general history of the Russian science and education development

Together with schoolchildren and college students attend events with their parents and teachers have participated in the majority of the events outlined above, remarking the high level of them.

For students and adults – FDL opens its doors!

Nowadays basic educational programs are implemented at the Plekhanov RUE Faculty of Distance learning for more than 4000 listeners. The programs are conducted in part-time (evening) and distance learning forms. The total number of bachelor, master and specialist programs is 41. They are designed for graduates of schools and colleges, as well as persons who already have higher education, including University graduates.

Along with the main educational programs, the Faculty is implementing additional professional programs with the annual number of graduates about 1000. Students of the Plekhanov University (as well as other Universities) are also offered with a wide portfolio of additional educational programs developed in conjunction with employers.

Among the most interesting and popular projects of the FDL was the one carried out in close cooperation with the OBI retail company. It was held with the participation of the Plekhanov RUE Marketing and Trade policy Departments from December 2015 to July 2016. The practical result of this research project was the development and approbation of professional training program "Universal head of store department" for the last-year PRUE students. The program is completely free for students, being funding by the sponsor (OBI, which was also the customer of the research project). Program duration was 8 months, 60% of the classes were conducted by PRUE teachers, 40% – by employees of OBI, at both PRUE campus and the company head office. The program was characterised with a rather rigorous process of students selection, which took place in several stages in October and November 2015. In the

end, 20 students from different faculties of the University were enrolled to study. After completion of the program students received a diploma on professional retraining, and the best students were employed in the company at an initial salary of 50.000 roubles. Thus, at the end of the study at the University, the students received a diploma of higher education, the diploma of professional retraining and (the most successful ones) signed job contract.

The Faculty of Distance Learning is currently implementing a range of professional retraining programs for University students in conjunction with relevant departments, including:

- “Effective personnel management”;
- “Law for beginners”;
- “Banking for beginners”;
- “Accounting for beginners”;
- “Finance for beginners”.

Thus, upon graduation students receive not only the higher education diploma, but also acquire additional competences and the right to conduct a new type of professional activity. According to the graduates, a record in the summary about an additional education gives them preferences in employment.

Graduates wishing to continue their education in the University and not to lose touch with their Alma Mater are offered with programs of master level and additional education. The master programs of the FDL have international and professional accreditation. Some of them are unique, such as the “Examination of the evaluation reports” master program. This is the first in Russia practice-oriented master program designed for professional appraisers and based on project teaching method. Master thesis of the program is defended in a special format. It is accompanied by the Internet stream in real time, which connects more than 20 regions of the Russian Federation and foreign countries: Belgium, Luxembourg, Germany and the United States. Moreover, representatives of the government and professional communities are invited to the defence, including ones from the Ministry of defence of the Russian Federation, the Moscow region Ministry of construction, the Central Bank of the Russian Federation, the Trading-industrial chamber of the Russian Federation, Russian Guild of realtors, Association of Russian banks, JSC "United aircraft consortium", JSC "LUKOIL", Grant Thornton etc.

For seniors – “Silver Generation University” project and more

The older generation is not to remain without attention of the Plekhanov University. In 2014, the FDL co-organized the IV All-Russian Championship on computer decathlon among pensioners conducted by the Russian Union of Pensioners. More than 130 pensioners – winners of regional competitions in 59 regions of Russia, participated in the two-day marathon of computer decathlon, which took place within the walls of the Plekhanov University. There were also participants from international teams (of Belgium, Slovakia and Belarus). This Championship has led to the idea of the annual Championship on computer decathlon among students and teachers of Moscow universities, and, what was the most

important, the launch of the FDL social project “Silver Generation University”. These activities and projects are implemented now with the active participation of PRUE students and teachers.

At the moment, the following activities are conducted within the bounds of the “Silver Generation University” project:

- Creative week “I don’t get tired to explore the world”. This event aims to support the personal and social status of older people, maximum extension of their active lifestyles, organisation of leisure activities tailored to their interests and needs. In the framework of the creative week several activities were held:
 - Excursions dedicated to the study of the historical and cultural heritage: “To grasp the immensity: The old and the new in the Plekhanov University”, “Stories about Art: An excursion to the virtual branch of the Russian Museum”
 - Master classes aimed to increase consumer, computer and legal literacy of the older people: “My pension: how to manage pension savings?”, “How to protect yourself from poor-quality counterfeit goods” and “Open the window to a New World: How to use computer to improve the quality of life”.
- Creative week “Health. Longevity. Demand”. The event was dedicated to exploring of some innovative methods of healing the body, the use of minerals, new approaches to the improvement of life in modern conditions, improvement of mental and physical activity of an older person.

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E-LEARNING AND MULTICULTURALITY IN MEXICO

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Abstract

Since its origin as a nation, Mexico has been a meeting place for people with diverse cultural roots. This situation has two important aspects to be considered: the preservation and dissemination of the cultural richness that each group contribute, and, overcome the enormous challenge of achieving a respectful and harmonious coexistence between members of all groups. Making an effort for university students to develop knowledge, skills and aptitudes for the preservation of cultural wealth and for harmonious multicultural coexistence, the National Autonomous University of Mexico (UNAM) has developed a distance course, which is the object of this paper.

Cultural Diversity

As part of its commitments, the United Nations Educational, Scientific and Cultural Organization (UNESCO) should “ensure the preservation and promotion of the fruitful diversity of cultures” (UNESCO, 2002).

If culture includes arts and letters, as well as ways of life, value systems, traditions and beliefs, then cultural diversity is “the multiplicity of ways in which the cultures of societies are expressed; when it manifests it, enriches and transmits the cultural heritage of humanity through diverse modes of artistic creation, production, dissemination, distribution and enjoyment by the various generations that inhabit the planet” (SEP, 2011)

From the previous information, it can be understood that the greatest challenge to protect and promote cultural diversity is to “defend the creative capacity of culture through the multiplicity of its material and immaterial forms and to ensure a peaceful coexistence of the people who carry them” (SEP, 2011).

Cultural Diversity in Mexico

As a member of UNESCO, Mexico endorsed both the 2001 Universal Declaration on Cultural Diversity and the 2005 Convention on the Protection and Promotion of the Diversity of Cultural Expressions.

In that connection, the article 2 of the Political Constitution of Mexico was reformed in 2001, which currently states: “The Nation has a pluricultural composition originally based on its indigenous people. They descend from populations who inhabited the current territory of the

country since the beginning of colonization, maintaining their own social, economic, cultural and political institutions, or part of their culture (CPEUM, 2016).

From this recognition, regulations and institutions emerged to strengthen Mexico's position to support cultural diversity such as:

Table 1: Multicultural Regulation/Institution

Year	Regulation / Institution
2003	The General Law on Linguistic Rights of Indigenous People
2003	The Federal Law for the Prevention and Elimination Discrimination
2004	The National Council for the Prevention of Discrimination

To achieve a change in the perception of cultural diversity required a deep change, that is, from the educational field. So, in 2003 the General Education Law was reformed, specifically in its article 7, paragraph IV, to establish the following:

- “Article 7 – Education provided by the State, its decentralized agencies and individuals with authorization or with recognition of official validity of studies shall, in addition to the purposes established in the second paragraph of Article 3. Of the Political Constitution of the United Mexican States, the following:
 - IV. To promote through teaching the knowledge of the nation’s linguistic diversity and respect the linguistic rights of the indigenous people” (LFE, 2016).

Cultural Diversity in the UNAM

Taking into account this national context, in 2004 the National Autonomous University of Mexico (UNAM) created the University Program: Mexico, as a Multicultural Nation (PUMNM) whose main consideration was: “That the Constitutional redefinition of our country as a multicultural nation was the first great national agreement that explicitly established one of the fundamental axes that should guide the transformation and adaptation of national institutions towards the crystallization of the new Mexican National Project, in this regard, the UNAM assumes these definitions as an opportunity to give meanings and meanings to ongoing university reform processes. “(PUMNM, 2004)

This program was absorbed in 2014 by the University Program of Studies of Cultural Diversity and Interculturality (PUIC). The PUIC was created on March 3, 2014 and one of its recitals indicates: “That today our University and the country in general face enormous challenges to consolidate and increase studies related to multiculturalism and the recognition of the rights of the indigenous communities by promoting research in the fields of cultural diversity, interculturality, cultural plurality as well as the heritage of contemporary societies” (PUIC, 2014).

This program has generated various strategies to achieve its purpose, such as:

- Research lines delimiting projects categorized into: University, education and interculturality; Cultural diversity, globalization and development; Immigration,

migration and cultural diversity; Interculturality, health and traditional medicine; Family; Rights of the indigenous people; Ethnopolitical Movements in Mexico and America; Population, state and cultural diversity.

- Research programs that deal themes such as: Critical assessment of the relationship between UNAM and indigenous people; Pedregal's covenant; Digital Library of Traditional Mexican Medicine (BDMTM); The indigenous people and health indicators; Immigration and cultural diversity; The Mexicans who gave us the world; Afroamerica. The Third Root; The State of Economic and Social Development of the Indigenous People; State studies; Remittances, migration and development in the indigenous communities of the actual Mexico (1980-2010); Half a century of indigenous movements in Latin America; Silent colonization. Megaprojects for development in indigenous and Afro-descendant territories in Latin America; Diagnosis of indigenous companies and training model; Visibility and constitutional recognition of the black population in Mexico; Model of socio-environmental diagnosis of the Costa Chica of Oaxaca; Indicators of the indigenous population.
- Academic projects that serve the areas of: Health and traditional medicine; The indigenous People of Mexico; State of the economic and social development of the indigenous people; Indigenous People of America; Megaprojects of development in indigenous and black territories of Latin America; The Contemporary African American people; The immigrant communities in Mexico.
- Scholarship system for indigenous students whose objective is to support student members of the indigenous people in the achievement of their effective access to higher education within our university, and to contribute financial support for their maintenance, ensuring the permanence and completion of their studies.
- Diplomats to strengthen the leadership of indigenous women whose objective is to contribute to strengthen the leadership of the indigenous women for the participation and political at different levels of management.
- Elective course: Mexico, Multicultural Nation, whose objective is that students can problematize the current situation of the indigenous people in Mexico, to recognize that cultural diversity of the inhabitants of the country is extremely broad and complex, and that it is necessary to reflect on the efforts currently being made in Mexico to build a new nation from the richness of this historical, linguistic, cultural, social and political diversity of Mexicans.

Elective course: Mexico, Multicultural Nation

This course seeks the student to value the wealth of the nation's cultural heritage, by shedding some common prejudices in Mexico related to the language, culture and history of the indigenous people and their own; as well as to have theoretical, historical, political and social tools on the cultural diversity subject in Mexico and the phenomena of interculturality.

This subject is taught in 12 schools or faculties of UNAM, and it is an optional courses in three more faculties. In 2015, 1,709 students attended this course.

For students, this course has been attractive for students because of among other things for the transversality of the subject in the different schools, the interdisciplinarity, the advantage of being able to attend the classes in different schools. In this way, it's also possible to integrate students into wide student university networks.

It's also important to mention that the subject has been highly recommended among them.

In 2012, the Coordination of Open University and Distance Education (CUAED) was requested to generate the online course "Mexico, Multicultural Nation" in September 2014, this course.

The topics included in this subjects are: Mexico, Multicultural Nation; The indigenous People and Communities; Our Third Root; The Mexicans who gave us the world; The State of Development of the Indigenous People; The Environment and the Indigenous People; The Indigenous Rights; The Indigenous Women; Migration; The Indigenous Education; Health and Medicine among the Indigenous People; The Indigenous Literature; Interethnic Relations and Multiculturalism; Contemporary Conflicts and Negotiations in Latin America; Good living-sumak kawsay or development; Criticism of colonization and dispossession.

Each unit has the following structure:

- Introduction
- General objective
- Theme
- Way of working
 - Support materials
 - Media
- Way of working
- Calendar
- Accreditation criteria

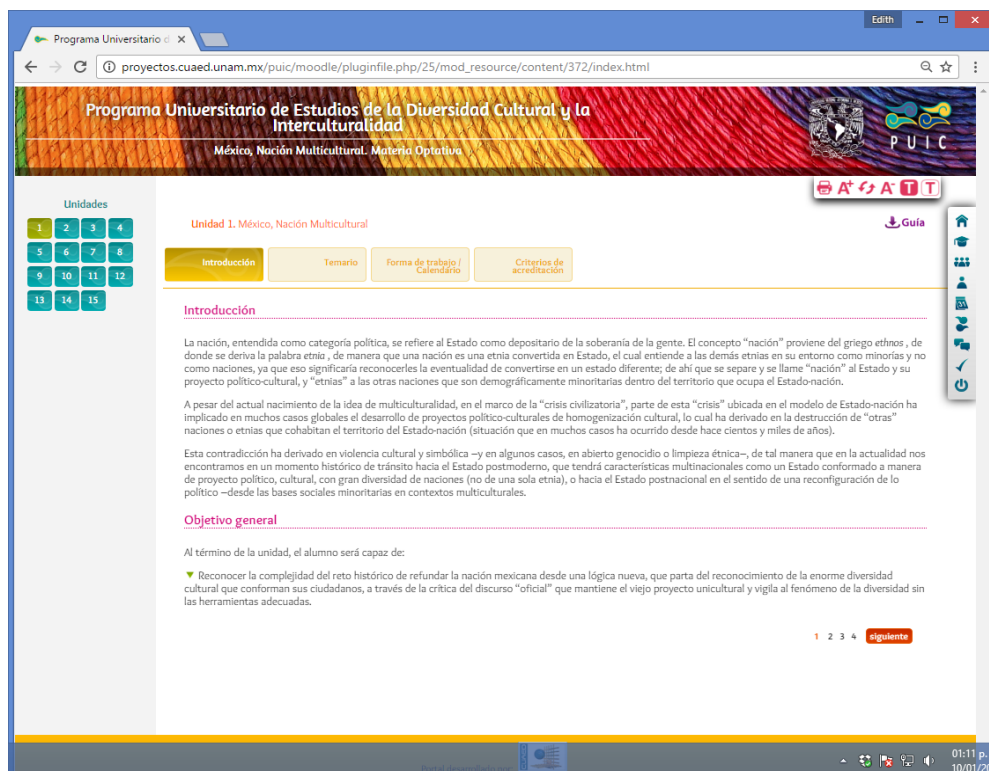


Figure 1. Unit View

For each theme the following structure is presented:

- Introduction
- Specific objective
- Content
- Glossary
- Learning Activity (optional)
- Self-assessment (optional)
- Opinion survey (optional)
- Reference sources

Additionally, the subject has two toolbars:

- Accessibility bar. It contains actions to: Print, Enlarge text size, Initial text size, Text size decrease, High contrast, and Normal contrast
- Toolbar. It contains options like: Home, Teacher, Group, My profile, Calendar, Forum, Chat, scores, and Logout

Currently the course has passed the pilot phase and it is about to begin its formal training in different schools and faculties.

Conclusions

The respect and promotion of cultural diversity is an action that UNESCO seeks to promote in all its member countries. In the case of Mexico, laws have been adopted and programs are implemented to achieve this. Specifically, in the UNAM it has been created the University

Program for the Study of Cultural Diversity and Interculturalism to form, investigate and disseminate issues related to Multiculturalism. As part of its training strategy, it was created the transversal subject “Mexico, Multicultural Nation” that can be integrated in the curricular map of its different degrees, seeking to expand the offer by putting it online with the support from CUAED. The path has been designed to fulfill the commitment of a nation that respects multiculturalism, preserves its wealth and promotes harmony among its members.

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ALTERNATIVE EDUCATION IS THE BEST POLICY FOR THE FUTURE

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This study investigates the need to develop alternative education programs in Saudi Arabia and indicate the most suitable ones for the Saudi context. The study has adopted a qualitative methodology and incorporates interviews with faculty members at the Faculty of Education in Taibah University (Madinah, Saudi Arabia). The results gleaned from the study reveal that all study participants agree on the real need for alternative education programs in Saudi Arabia. However, some participants expressed concerns about the suitability of the Saudi context for such programs. The interviewees have also indicated their eagerness to see such programs implemented in the country as they would provide an excellent environment that meets student needs. Accordingly, the current study puts forward a demand for educationalists and relevant decision makers in Saudi Arabia to allow for this critical improvement in the country's education system through the smooth integration of alternative education programs.

Introduction

The world Education system still suffers from high student drop-out rates. One example is the United States, as mentioned by Smith and Thomson (2014): every year approximately one in three students drops out of high school. This is an escalating problem, especially in light of growing concerns about economic and social challenges. High drop-out and low graduation rates, as well as an increase in discipline problems and other problems which prevent student education, show that the traditional school system is not very effective. Consequently, alternative programs have been developed to respond to this problem and support student needs. In a national survey, 64% districts were reported to offer at least one alternative school or program for at-risk students: the programs served 646,500 students in the United States (Porowski, O'Conner, & Luo, 2014), and reflects a sharp trend toward alternative education. Even though many students trend to public education, alternative education is often more helpful to students due to its flexibility, and the strong programs offered. Porowski and others define Alternative education programs as educational activities that fall outside the traditional K-12 curriculum, and serve students who are at risk of school failure. Because individual states or school districts define and determine the features of their alternative education programs, programs may differ in key characteristics, such as target population, setting, services, and structure.

Whereas public education is more suitable for students and is system-focused, alternative education is more effective at meeting student needs and is focused on the student. The curricula of these schools are different because they meet different learning needs. For

example, different alternative programs may be designed for students with disabilities, high-risk health behaviours, or those seeking vocational and technical education (Porowski, O'Conner, & Luo, 2014). Furthermore, alternative education begins with diagnostic steps that identify academic skills. Following this, the teaching begins, as does learning. Meeting the student wherever they are ensures that the programs are tailored to suit the needs of the individual student (Schargel Consulting Group, 2011). In this way, alternative education is more adaptive to students, in accordance with both their state and academic level.

While traditional education offers many programs, alternative education has the opportunity for students to get a better education and have a more positive experience. Alternative education offers a variety of environments, allowing students to succeed as Porowski and others have stated. In addition, there are many ways to become educated, as well as many types of environments and structures within which this may occur (2014; p.2). This type of education gives children a chance to better their knowledge and an opportunity to learn with students from different backgrounds (Thompson, 2012). Moreover, while public schools are larger, alternative schools stay relatively small and have smaller class sizes that allow students to receive more attention from teachers (Williams & Neal, 2015). Therefore, Alternative education is the best way to get a good education; in a good environment for those have had obstacles prevent them from attaining an education.

Also, alternative education helps students experiment educationally, under the right conditions. These alternatives make education more popular and trendy for many students all over the world because alternative education is specifically designed for individual students' needs.

Arguments for alternative education programs

There are multiple reasons to establish alternative education. Among them are:

Repetition rates at all educational levels

According to a study by Akhter (2011) on the Saudi environment, there is an increased repetition rate at different educational levels, especially in high schools, and it is higher in the girl's education system than the boy's. Also, the rate in elementary schools is 0.35% higher among girls than boys. This indicates that there are educational challenges in the traditional education system which requires solutions.

Table 1: Repetition rates in the traditional education system

Repetition rates at different education levels		
Educational levels	Female	Male
Elementary	2.20%	1.85%
Secondary	1.41%	1,75%
High School	4.48%	4.10%

Student dropout rate

The student dropout rate is one of the most important indicators reflecting the internal quantum efficiency of education systems. Akhter (2011) found the increase of the student dropout rate in Saudi to be higher among boys by 6.5%. The rate for girls is 7.81%, while 1.31% for boys. The rate was at its highest at a third grade level in secondary schools and it is 0.64% higher among boys than girls. Moreover, the rate sees a sharp increase among girls at a first-grade high school level, which may be due to marriages. All of this reflects the need for alternative education programs.

Table 2: Student dropout rates in the grades of education

Grades	Female	Male
S1	7.81%	1.31%
S2	3.7%	0.86%
S3	12.2%	11.56%
H1	10.18%	0%
H2	9.32%	0.96%
H3	0.04 %	4.09%

S = Secondary, H = High School

Illiteracy rate

Table 3: Illiteracy Rate (2005-2014)

Illiteracy Rate	Gender	
Youth Illiteracy rate ages 15-24	Female	1%
	Male	1%
Adult Illiteracy rate 15 and older	Female	9%
	Male	3%

Since literacy is an essential tool for individuals and states to be competitive in the new global knowledge economy, the higher the proportion of adults with low literacy proficiency, the slower the overall long-term GDP growth rate (Literacy Foundation, 2017), so a high illiteracy rate in adults as it appears in Table 3 gives a negative indicator for traditional education and points to a need for the application of alternative education programs.

Methodology

In line with the orientation of the current study, interviews have been used to advance a better understanding of the research context. Semi-structured interviews were utilized in this study to achieve its objectives, and in line with Merriam (2002) who stresses that this interview type is beneficial for research, as it saves researchers both time and effort. In addition, there may well be an opportunity for interviewers to encourage respondents to provide full answers and to probe into any emerging topics which allows for broadening the scope of understanding an investigated phenomenon (Kvale, 1996). According to Chenail (2011), semi-structured interviews commence with closed questions about a certain topic and end with open-ended questions such as, how, when, where and why; offering in-depth information which structured interviews cannot provide. Interviews were conducted in order to explore the

viability of the Saudi educational environment for the application of this type of education with 12 faculty members in the Department of Educational Administration, Department of Instruction Methods, and the Department of Education Technology at Taibah University in order to obtain varied views of the research subjects. The participating sample was selected following principles of “purposeful sampling” where more informative participants were given priority. The interview questions were as follows:

1. To what extent does the Saudi educational system need Alternative Education Programs?
2. What are the obstacles that the implementation of Alternative Education Programs in the Saudi context faces?
3. What are the implementation capabilities of Alternative Education Programs in the Saudi context?

Transcriptions of the interviews were done and the data was cross-checked with researchers’ notes and audio recordings before being analyzed preliminarily. Following this, the researcher undertook more interviews in the field. This took place in line with Merriam’s recommendation (2002) that transcription and preliminary analyses cannot be left until all interviews are complete. The majority of the respondents supported having alternative education programs in Saudi Arabia to make for a much-needed leap in quality of education, and they have also emphasized the vital need for such programs in creating a rich learning environment and solving problems faced by disadvantaged groups in the society through improved quality of education. The answers provided by the study interviewees revolved around the following four issues:

First issue

The Saudi education system’s need for alternative education programs was reiterated, as the majority of the study respondents asserted that the Saudi education system needs this kind of education, or as referred to by (Dr. F), “the presence of this type of education leads to educational justice.” Dr. SH, another interviewee, considered alternative education “an efficiency tool” and stated that this type of education contributes to raising the level of education and reducing drop-out rates. On the other hand, Dr. A, another interviewee, considered alternative education a vehicle of educational innovation, stressed that educational innovation will be required in the future and that school buildings may vanish while the system shifts to an alternative one. Dr. B, considered alternative education a mechanism of knowledgeable societies which do not exclude anyone from education, and a means of absorbing crime, extremism and ignorance through the creation of an educated Saudi populace. Dr. AM confirmed that the need for this type of education during the age of technical advancements and student reliance on mobile phone technology is increasing. According to her, alternative education could be utilized through the use of mobile phones, for instance, as she has attended a workshop whilst undertaking her household duties. Therefore, alternative education could indeed be enriching educational curricula. It may include extracurricular activities or classroom instruction, and thus becomes integrated with

the curriculum or provides extra support for it. This type of arrangement may be considered creditable for teachers in their job performance evaluations. Added to this, Dr. H claimed that the overcrowding of students in classrooms, an uncomfortable school environment, and inadequate infrastructure hinders students' reception of traditional education, which necessitates the need for renewal and a search for more modern educational methods. He also added that rates of student drop-out, failure, learning difficulties and underachievement in addition to the lack of students' willingness to stay in the classroom for extended periods of time are among the reasons for a call for alternative education programs (AEP). This type of education can also provide the type of future that saves time, effort and money.

On the other hand, opponents of these calls, such as Dr. B, consider the Saudi context unsuitable for accommodating alternative education and argue that there are many obstacles that face the implementation of such programs. Dr. H also stressed that Saudi Arabia is not ready for this type of education and there are a number of challenges that must be addressed for the application of AEP. However, Dr. AM confirmed that such programs already exist, even though they are not considered official or recognized as such. For example, there are free virtual public education classes created by teachers who "rent" a virtual classroom for a month. A number of teachers have set up virtual classes, but unfortunately these have not been recognized by school principals and supervisors –those responsible for teachers' evaluations. This has led to the painful reality that in cases where a diligent teacher offers this kind of education to his students, it will not be recognized or supported and the teacher will be told that this alternative form of education shall take place outside the school context.

Second issue

Stakeholders benefiting from alternative education programs were discussed with the study respondents. Dr. BR mentioned that the main reason for the existence of alternative education is to provide education in line with the individual characteristics of certain categories of students. For instance, all the respondents in the current study considered this kind of education fruitful in serving students with education difficulties or disabled (physically and mentally) students, and students with behavioural problems. Dr. R added that there are a number of students who may pose a danger to other students and thus they may further their education through this kind of education. According to Dr. SH, AEP is the best alternative for students with behavioural problems, or those with an imbalanced psychological status as Dr. R has argued. In addition, famous students, students with criminal records who may pose a real threat on their fellows, or those who have been deprived of education because of school punishment can benefit from this type of education. Moreover, Dr. M pointed out that alternative education has long been implemented in the USA and Canada. Dr. AM added that there is an increasing need for this type of education for advanced students as well. It is also needed by students with special needs, including the disabled and people students. AEP can be beneficial for all of these student categories. In a similar vein, Dr. SH states that this kind of approach can be very helpful for women who have been deprived of education for various reasons. Both Dr. AM and Dr. A agreed that AEP is consistent with the privacy of Saudi women in particular. This viewpoint was endorsed by Dr. A who stated that this type of

education is commensurate with the nature of Saudi women. Dr. O also went further to mention that AEP can benefit any student who has been deprived of education for one reason or another.

A number of respondents have also confirmed that the geographic factor is an obstacle to many students, so the alternative education can indeed contribute to solving this. Dr. O, for instance, stated that the distance of school from home is an obstacle to some students' education. This viewpoint is supported by Dr. H and Dr. SH who state that the remote location of some educational centres does hinder student enrolment. Dr. AM added that by giving even ordinary students (who account for the largest proportion), a new active online, program, an AEP can take the form of extra-curricular activities. They can also benefit from the school merging project published on the Ministry of Education's website, which is adopted in order to contribute to the enrichment of virtual learning in educational processes for the students of such schools.

Third issue

Barriers to the application of alternative education programs (AEP) in the Saudi context have also been addressed in more depth. The study interviewees listed a number of obstacles that hinder AEP implementation. These are as follows:

1. *Resistance to change*: A number of respondents said that resistance to change is a prominent feature in the Arab community, especially within the Saudi community and that it may be the first obstacle to the application of such educational innovations. To Dr. A, the Arab administrative mentality tends to resist change. Dr. HZ added that there ought to be some resistance and went on to argue that the level of resistance within Arab societies including the Saudi society is higher than other counterpart communities. In addition, this kind of education might be resisted by the leadership, since, according to Dr. AM, educational leadership is not sufficiently equipped to implement AEP.
2. *Societal culture* is one of the most influential factors in the educational process, both in positive and negative terms. The respondents of the current study agreed that Saudi society and culture are not so open and thus will not, according to Dr. HZ, accept this form of education, which as a result may adversely affect the application of AEP. This viewpoint was echoed by Dr. B who argued that parents are not prepared to accept this type of education as valid. Dr. O also added that Saudi society's rejection of this kind of education is a major obstacle. This viewpoint was supported by Dr. H who stated that the most important barriers to the application of AEP are the local society itself and the lack of student and teacher acceptance of the notion. To further explain this, Dr. AM added that it is a shame that we still look at alternative education as a privilege rather than an educational necessity. She also added that the lack of acceptance amongst parents with regards to this type of education – as some consider it 'playing' as opposed to education – does hinder its application. In addition, families may not accept AEP, as according to Dr. H, Saudi families are not ready for this kind of education and that the

educational level and the number of members of the family itself has an influence. This viewpoint has been supported by Dr. F who stated that the average number of children in a Saudi family is five, a reality that makes it difficult for families to apply this kind of education. He also added that social relations in Saudi society negatively affect this kind of education, whilst Dr. H on the other hand did not see this element as an obstacle.

3. *Learner autonomy* is one of the important elements of success of this pattern according to the majority of study participants who have also agreed that the Saudi student will have to bear the responsibility if he/she applied AEP. Dr. A added that the Saudi student is competent enough to handle alternative education if the opportunity arises. This viewpoint was further endorsed by Dr. R who argued that Saudi students need someone to understand their needs, and he stressed that there are many circumstances Saudi students. Dr. H also expressed similar ideas and stated that students will succeed in alternative education if the path to them trying it is cleared and their self-confidence is enhanced.
4. *Infrastructure deficiency*: All of the study participants agreed that infrastructure in the Saudi context is an obstacle to AEP implementation. Dr. R mentioned that the lack of proper infrastructure and technological facilities negatively influences the implementation process. She also added that there is an extreme shortage of technical support, which AEP requires. Dr. H also asserted that the lack of technical facilities including Internet access in rural schools hinders the application of AEP.
5. *Inadequate teacher qualifications*: The study respondents agreed that the inadequacy of teacher qualifications negatively affects teachers' ability to utilize AEP. Dr. AM, for instance, argues that teachers are not qualified enough to use this kind of education. In a similar vein, Dr. H asserted that teachers do not have sufficient experience to implement AEP and that teachers are unable to design virtual classes. Dr. O also confirmed this and went on to argue that more manpower in the teaching profession is needed to implement AEP. In addition, Dr. R stated that teachers are not qualified to implement this kind of education.
6. *Administrative and technical staff*: Some respondents have pointed out that a lack of sufficient administrative and technical staff in the Saudi educational context affects the implementation of AEP. Dr. AM mentioned that there is an extreme shortage of qualified administrative and technical staff. This issue was also further endorsed by Dr. R.

Fourth issue

Conditions for the implementation of AEP in the Saudi context were also touched upon in the study interviews. The study respondents mentioned that this kind of education requires the following:

1. *Infrastructure*: The study respondents asserted the necessity for developing the existing infrastructure in order to ensure accommodation of this kind of education. Dr. AM, for instance, argued that there must be a very powerful infrastructure that comprises high-

speed telecommunications and Internet at a reasonable cost. In addition, there is a desperate need for funding given that AEP requires expensive devices, as mentioned by Dr. HZ who also added that the provided materials must accommodate this kind of education. This viewpoint was echoed by Dr. F who mentioned that the provision of adequate infrastructure is necessary for the success of AEP given that the level of technology usage within Saudi society is relatively advanced.

2. *Increased awareness:* Dr. AM stated that awareness must be increased with regards to AEP culture until the whole society is convinced of its importance and only then can it be publicized with both visual and audiovisual aids. She also added that spreading this kind of awareness amongst society is important before implementation so as to ensure success. Dr. H also added that there is an extreme need for awareness raising within society. Dr. HZ also added that we must inform the local community about the levels of failure, drop-out, illiteracy and the numbers of deprived students amongst so as to reflect the importance of AEP implementation as a suitable environment that works on tackling these issues.
3. *Legislation:* Most study respondents considered the existence of a clear and decisive legislation one of the most important elements of a successful application of AEP. Dr. HZ, for instance, called for strong legislation to make this kind of education successful. For instance, distance learning has not succeeded in the Arab context due to a lack of legislation. Dr. A also strongly affirmed the need for a rigorous and critical system and the presence of stringent legislation. This viewpoint was also supported by Dr. HZ who stressed the need for mandatory legislation aimed at parents in the form of financial penalties, as well as more positive incentive policies for them, such as certificates that are not inferior to formal education certifications, together with the creation of a system of further incentives. This insightful opinion was supported by Dr. F. Dr. H also mentioned that AEP requires imposing new regulations and changes in current policies and regulations. Dr. F also confirms that there must be specific standards and regulated tests together with confidence on the part of senior leadership. In addition, Dr. AM mentioned that this type of education must be recognized and that laws shall be enacted and taken into account when evaluating teachers so as to ensure their usage of this type of education. Dr. R also sees that AEP must be imposed on administrative staff and that laws must be enacted to ensure full implementation.
4. *Teachers:* The study respondents agreed that the teacher holds a primary role in the implementation of AEP. Dr. O, for instance, stated that the success of this type of education depends on teachers and their efficiency. Dr. HZ also added that the provision of qualified teachers to deal with this kind of education is important to the success of its application. In addition, Dr. O stressed the need to focus on rehabilitation and training for teachers and professional development of teachers' educational capabilities and compatibilities. Dr. R also said that teachers should be trained to apply this kind of education and she sees the need to make use of teachers' free time during school hours in the development of his abilities and the implementation of such educational innovations. Training Dr. AM mentioned that available manpower should

be trained in the implementation of this type of education, including student training supervisors and educationalists. Dr. HZ confirmed this and pointed out the need for coaching a team of technicians and administrators with high efficiency to support teachers and the whole educational process. This viewpoint was endorsed by Dr. R who said that there is a great need for administrators, experts and technicians to implement AEP. Dr. R also added that the organization of training courses for parents as well as students, administrators and leaders would be needed. She summed this up by pointing to a need for comprehensive training centres.

Results of study

The most important results of the study:

- The results of the study reveal that all study participants agree on the real need for alternative education programs in Saudi Arabia.
- Alternative education could indeed be enriching and at the heart of educational curricula., the two elements that our society needs.
- All the respondents in the current study consider this kind of education fruitful in serving students with education difficulties or disabled (physically and mentally) students, and students with behavioural problems.
- The study interviewees listed a number of obstacles that hinder AEP implementation, including: resistance to change, society and culture, learner autonomy, infrastructure deficiency, inadequate teacher qualifications, and untrained administrative and technical staff.

The study respondents mentioned that this kind of education requires the following:

1. The development of existing infrastructure in order to ensure the accommodation of this kind of education.
2. Increased awareness with regards to AEP culture until all of society is convinced of its importance.
3. The existence of clear and decisive legislation is one of the most important elements of the successful application of AEP.
4. The provision of qualified teachers to deal with this kind of education is important to the success of its application.

Recommendations

- Apply alternative education programs in Saudi Arabia as this will provide an excellent environment that meets students' needs.
- Educators and relevant decision makers in Saudi Arabia work on improvement in the country's education system through the smooth integration of alternative education programs.

Conclusion

The advantages of alternative education programs are that students receive individualized attention from staff, which contributes to their academic achievement in Saudi Arabia especially for students who have been prevented from receiving an education as a result of different obstacles. The disadvantages of AEP are the obstacles that hinder its implementation. However, there are numerous requirements that must be fulfilled in order for these programs to succeed. I propose that additional AEP research needs to be done that looks at parent involvement, the implications that the program has on the home life of the students who participate, and how to expand on the support systems available to students.

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THE INTERNATIONAL COUNCIL FOR OPEN AND DISTANCE EDUCATION OPERATIONAL NETWORK BOLDIC (ICDE_ON_BOLDIC)

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Introduction

ICDE launched in 2015 a call for regional Operational Network in recognition of the importance of strengthening cooperation and reinforcing the impact of activities of the International Council for Open and Distance Education (ICDE) and its network of members globally. The project IIME is two years, and there are possibilities for prolongations. They will also announce a new call and to extend the regions. The purpose of the regional Operational Networks are according to ICDE to:

- Strengthen ICDE as membership driven organization and offer a regional localised support structure.
- Strengthen the visibility and representation of ICDE around the world.
- Increase ICDE's operational capacity, global insight and it will support global knowledge exchange.

After the call four regions were selected, and ICDE are now working in partnership with the following organisations and institutions i.e. ICDE Operational Network Africa, ICDE Operational Network Asia Pacific, ICDE Operational Network Asia Pacific, ICDE Operational Network BOLDIC, and ICDE Operational Network Mediterranean and Southern Europe (see Table 1).

Table 1: The four ICDE ON regions

ICDE Operational Network Africa	Regional Partner: African Virtual University, Kenya (AVU)
ICDE Operational Network Asia Pacific	Regional Partner: Universitas Terbuka (UT)
ICDE Operational Network BOLDIC	Swedish National Organization for Distance Education (SADE)
ICDE Operational Network Mediterranean and Southern Europe	The International University, (UNINETTUNO)

The ICDE Operational Network BOLDIC: ICDE_ON_BOLDIC

The Swedish Association for Distance Education (SADE) applied to the ICDE call, as SADE had run the BOLDIC project, financed by the Nordic Council of Ministers. The Nordic

Council of Ministers is the official co-operation body, where the Nordic Prime Ministers have the overall responsibilities. In the case for the BOLDIC project, it is not just the five Nordic countries, who are involved, Sweden, Norway, Denmark, Finland, and Iceland, but also the three Baltic countries, Estonia, Latvia, and Lithuania. Before presenting the ICDE_ON_BOLDIC, the BOLDIC project, which has been running for more than ten years will be presented and its purpose and activities will be described

The BOLDIC project (NPHZ-2013/10118)

The general purpose of “BOLDIC – open learning resources online” project is to deepen and bring further the co-operation between Nordic and Baltic organizations dealing with distance education, flexible learning and e-learning by opening the community for new partners from both the Baltic and the Nordic countries i.e. the partners wanted to continue and further develop the process from the earlier project “BOLDIC Perspectives Online.”



The partner in the BOLDIC project are:

- Swedish Association for Distance Education (SVERD – www.sverd.se), Sweden (project coordinator);
- Flexible Education Norway (FuN – fleksibelutdanning.no), Norway;
- Aarhus University (www.au.dk), Denmark;
- Vilniaus kolegija/University of Applied Sciences (www.ekf.viko.lt), Lithuania;
- BA School of Business and Finance (www.ba.lv), Latvia;
- University of Jyväskylä (www.jyu.fi), Finland;
- Tallinn University (www.tlu.ee), Estonia.

The current project summary can be expressed as to:

- continue, deepen and develop the process from the project BOLDIC Perspectives Online;
- develop and maintain the BOLDIC Award nomination and Award process;
- establish Annual conferences concerning dissemination and best practice in open learning resources online area;
- establish Webinars before and after the Annual conferences ,with focus on open learning resources online;

- maintain and develop the website.

One of the main activities for the BOLDIC project is the BOLDIC AWARD. What can then be awarded?

Any ODL-activity connected to adult learning meeting one or more of the following criteria:

- Teaching/learning arrangements.
- Support systems (for delivery of learning content or/and learning support).
- Development of activities, content or understanding within the ODL area.

The activities should:

- be transferable to the whole BOLDIC region;
- be learner focused;
- facilitate blended or flexible learning;
- be innovative;
- be scalable;
- have a sustainable strategy;
- have a sensible and appropriate approach to technology;
- involve continuing evaluation.

Both persons and organisations can be nominated. Nominees should be nominated by an organisation.



Since year 2005 and onwards (just 1 exceptions) interesting projects have been nominated, and in hard competition one prize winner has been elected. See the projects in the list as below:

- 2005 – Network Upper secondary school Jamtland, Sweden
Nomination: They have pioneered the innovator of adult education at a distance, through a flexible combination of distance learning and campus.
- 2006 – Nettskolen NKI, Norway
Nomination: Development for NKIs work to “Promote and develop the Nordic tradition of ODL (Open and Distance Learning)”. The learning concept adds an innovative new dimension to student aid in flexible distance learning.
- 2007 – Vitus Beaering, Denmark
Nomination: Energy-conscious truck drivers. The flexibility is great – drivers working on the course anywhere in the world. In the mandatory rest periods, they can retrieve

course modules with examples and explanations. They can then practice what they learned when they get behind the wheel again.

- 2008 – MKFC Stockholm Collage, Sweden
Nomination: A full commitment in e-learning and activities around internationalization. A popular education in a globalized world, supported by e-learning and modern learning management systems through the Web.
- 2009 – Bergen University Nettspansk, Norway
Nomination: Nettspansk is a 100% online study covering the first year of Spanish language and Latin-American Studies at bachelor's level. Its innovative use of platforms allows of synchronic communication (audio and chat) in combination with PowerPoint presentations. Students are able to follow the on-line classes from everywhere in the world.
- 2010 – Aarhus University ASBCAST video repository, Denmark
Nomination: The assessment committee stressed that ASB Media has demonstrated creativity and innovation by combining video presentations with research material.
- 2011 – The winner for BOLDIC Award NKI, Norway Berghs school of communication Sweden and Danish School of Media Multimediamjournalistikk
Nomination: This is a unique collaboration project where Swedish, Danish and Norwegian students participate in a blended learning online multimedia journalist courses.
- 2013 – RIGA Technical University, Latvia
Nomination: Innovative project work done during the eBig³ project (<http://www.ebig3.eu/v2/startp.php>). "For the innovative project work done with integration between broadcasting TV, internet based computers and mobile phones for training and courses during the eBig³ project".
- 2014 – Norwegian Digital Learning Arena NDLA, Norway
Nomination: The overall goal for the project is to deliver open and free digital learning recourses (OER) of high quality for all, and involve teachers and students in active and participatory learning processes.
- 2015 – Crossborder collaboration project,
Nomination: For educational cross-border teaching models. The project has been working with ICT, information and communication technologies in an innovative way. Partners are Danish, Norwegian and Swedish schools.
- 2016 – Seniors online, Soros international house (SIH – www.sih.lt), Vilnius, Lithuania in cooperation with Tallinn language centre (www.tallinnlc.ee) Estonia, Eurofortis (<http://eurofortis.lv>) in Riga, Latvia and Anmiro Oy (www.anmiro.net), Finland
Nomination: Innovative and scalable project that intend to strengthen seniors English language as well as ICT skills necessary for their everyday life activities.

ICDE_ON_Boldic

The ICDE_ON_BOLDIC aims to continue the fruitful over ten years collaboration with the BOLDIC project described above, but also to extend the collaboration with ICDE and the

other selected operational network. This means both to bring into the BOLDIC what is ongoing worldwide, but also to share with in the ICDE community what is happening in the Nordic and Baltic countries.



ICDE Operational Network Boldic

Conclusions

The over ten year fruitful collaboration within BOLDIC, through the Nordic Ministry of Councils, has in all means been very fruitful. There have been large possibilities within the partnership to collaborate and to share experiences. This has been done through the process of nominations of BOLDIC Awards, but also through the annual conferences given out the awards. During the years there has also been webinars by the BOLDIC Awards winners. The BOLDIC project has been disseminated at international events, and has raised highly appreciation of regional collaboration. The working language in the project is English, although the Scandinavian countries Denmark, Norway, and Sweden can understand each other.

With the ICDE_ON_BOLDIC the collaboration can partly continue. However a new application will be submitted to the Nordic Ministry of Councils in March 2017, focusing on open up education and the digital transformation in education and society

EVALUATING THE RESULTS OF USING OERS, PERS, BLENDING AND FLIPPING TO DELIVER A COMPUTER SYSTEMS MODULE TO YEAR 1 STUDENTS

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Abstract

The key aim of this project is to incentivise higher education students to engage with a Year 1 Computer Systems module through a blended and flipped classroom approach. Attendance at the traditional lecture is in decline for a variety of reasons. The concept for this module is to encourage self-directed learning (SDL) through reading online material and watching video in advance of class assessments. The actual class time is used for discussion of the content of lessons using PowerPoint summaries, watching related videos, online assessment and laboratory work. The project aims to measure and evaluate the effectiveness of this approach. The results of this project are examined and discussed, after a one year implementation, by means of a survey of these students.

Rationale for the project

The core material for this module comes from the Cisco IT Essentials PC Hardware and Software that is part of a suite of ICT modules that the Cisco Networking Academy (Cisco, 2016) offers. Thus, the material is proprietary in nature, hence the acronym PER (Proprietary Educational Resource). The courseware is delivered online in interactive lessons, via the Cisco VLE (Virtual Learning Environment). The student must enrol on the VLE to access the materials. This material is supported by OERs (Open Educational Resources) in the form of video tutorials that are freely available online. Examples of these OERs come from the Professor Messer and Eli The Computer Guy websites.

The concept is that the student reads the material outside of lecture (class) time. The class time is used for discussion of the lesson content, watching relevant videos and undertaking online assessments. The remainder of the class time is used for practical work associated with the module.

Key aims and objectives of the project:

- To determine if the approach generally works.
- To measure and evaluate student satisfaction with the concept.
- To attain greater student engagement by encouraging students to study and practise outside of class contact time.

- To illustrate that a blended and flipped approach is a viable alternative to the traditional lecture approach that can be quite boring for students.

Key features of the project:

- Online courseware provided by Cisco.
- Online assessment through the Cisco VLE.
- PowerPoint lesson summaries.
- Engagement analytics provided by the Cisco VLE.
- OERs provided by Professor Messer and Eli The Computer Guy websites.
- Moodle VLE used for additional support to bind student resources together.
- 50% of the class contact time is laboratory work.
- Small class sizes; 20 students maximum at year 1.
- 3 hours class contact time per week (2 x 1.5 hours)

Results

The students were surveyed using an online survey, created in SurveyMonkey, embedded in their Moodle website for their module, Computer Systems 1. This survey was undertaken towards the end of the delivery of the module. A total of 40 responses were received from the students. This represented a return rate of 80% approximately. They were asked two questions about time spent reading and watching video resources. Refer to Figure 1 and Figure 2.

**How much time do you spend per week
reading the Cisco online material outside of
class time?**

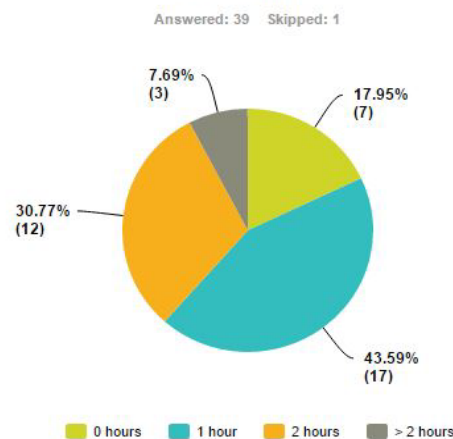


Figure 1. Time spent reading Cisco material in hours per week

Evaluating the Results of Using OERs, PERs, Blending and Flipping to Deliver a Computer Systems Module to Year 1 Students

Michael O'Rourke

How much time per week do you spend watching the recommended videos outside of class time?

Answered: 39 Skipped: 1

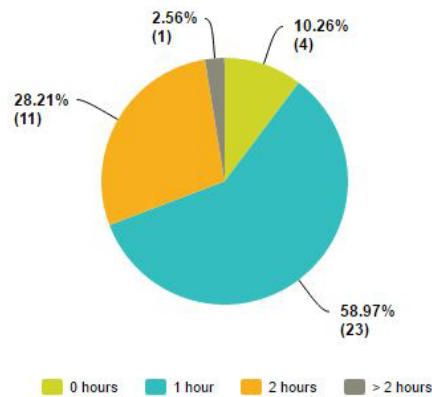


Figure 2. Time spent watching recommended video in hours per week

The students were asked to rate various statements about the module using a five-level Likert scale from *strongly disagree* to *strongly agree*. Refer to Figure 3 for the statements and student responses.

**Evaluating the Results of Using OERs, PERs, Blending and Flipping to Deliver a Computer Systems
Module to Year 1 Students**
Michael O'Rourke

	strongly disagree	disagree	neither agree or disagree	agree	strongly agree
I like watching the lessons on video.	0.00% 0	10.00% 4	2.50% 1	67.50% 27	20.00% 8
I like reading the Cisco online material.	0.00% 0	22.50% 9	15.00% 6	52.50% 21	10.00% 4
I like taking my assessments online using Moodle and Cisco Netacad.	0.00% 0	2.50% 1	5.00% 2	77.50% 31	15.00% 6
I feel that my understanding of the module material has improved as a result of using this method of delivery of the module.	0.00% 0	0.00% 0	10.00% 4	67.50% 27	22.50% 9
I prefer the traditional lecture approach where I listen and take notes.	17.50% 7	35.00% 14	22.50% 9	17.50% 7	7.50% 3
I would like this teaching and learning approach used on other modules on my course where possible.	0.00% 0	5.00% 2	35.00% 14	50.00% 20	10.00% 4
I prefer the traditional lecture approach where I listen and take notes.	17.50% 7	35.00% 14	22.50% 9	17.50% 7	7.50% 3
I would like this teaching and learning approach used on other modules on my course where possible.	0.00% 0	5.00% 2	35.00% 14	50.00% 20	10.00% 4
I am more motivated to learn using this teaching and learning approach.	0.00% 0	2.50% 1	12.50% 5	72.50% 29	12.50% 5
I find the instant feedback after taking an online assessment helpful.	0.00% 0	0.00% 0	2.50% 1	77.50% 31	20.00% 8
I find it easy to pace my study of this module	0.00% 0	2.56% 1	7.69% 3	79.49% 31	10.26% 4

Figure 3. Student responses (Likert scale) to statements about the module

Conclusions

The results were largely positive for this mode of delivery of the module. 74% of students spent 1 to 2 hours per week reading the Cisco courseware material. 87% of students spent 1 to 2 hours per week watching the recommended video material. Equally, the Likert scale responses were quite positive. 67.5% of students agreed with the statement that their “understanding of the module material has improved as a result of using this method of delivery of the module”. 72.5% of students agreed with the statement that they “are more motivated to learn using this teaching and learning approach”. 50% agreed with the statement that they “would like this teaching and learning approach used on other modules on my course where possible”. 52.5% of the students disagreed or strongly disagreed with the statement that they “prefer the traditional lecture approach where I listen and take notes”.

It can be concluded that, while the sample size is small (40 students), it demonstrates that using OERs, PERs, blending and flipping to deliver a module to higher education students can be successfully achieved. The key to success is having high quality interactive courseware and video content. This appears to motivate students, as interacting with web content and watching video is second nature to them.

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REOPEN – RECOGNITION OF VALID AND OPEN LEARNING

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Introduction

Opening Up education – apart from the need for structural changes – also created challenges and opportunities in curriculum opening up represented by

- Open Educational Resources and MOOCs;
- open collaboration and communication among teachers and learners;
- creating innovative education services for diverse learning groups and
- recognition and validation of non-formal open learning.

The ReOpen project follows recommendations stated in the EC JRC research study on “Validation of Non-formal MOOC-based learning” (2016) by establishing validated open learning practices: there is a need for

- validated Open Online Learning (OOL) curriculum examples;
- digitally smart learning environments leading to OOL recognition and
- case scenarios on recognition of validated non-formal open learning.

Scope

The project addresses the objectives of the “Opening Up” initiative and implements the recommendations of the EC JRC Case study by

- establishing validated open learning practices;
- offering learner credentials for online and open learning (OOL) by
 - verification of learner identity,
 - setting learning agreement and other instruments;
- establishing digital badges for recognition of learning achievements;
- establishing collaboration with institutions to provide transparent information on potential recognition of OOL;
- providing teacher training with the tools for OOL development and recognition.

Expected results

The project creates an online platform for non-formal open learning curriculum development with learning validation and recognition instruments in place (learner credentials, digital

badges, learning path recognition and assessment tools), and prepares training materials for teachers and trainers in (C-)VET, HE, companies and adult learning organisations on

- designing non-formal open learning curriculum;
- application of digital badges for credentialing the learning achievements;
- recognition of non-formal open learning in formal curricula.

Based on the above, a short term joint staff training event will be held using the above training materials and 5 CPD courses will be produced with the following features

- are non-formal open curricula;
- badgable for credentialing;
- recognisable in formal educational settings and by employers;

and a case scenario collection on recognition of validated non-formal open learning.

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REMOTE EDUCATION IN MOTHER TONGUE TEACHING AND STUDY GUIDANCE IN MOTHER TONGUE IN JÖNKÖPING COUNTY

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Background

E-learning or electronic learning is taking an increasingly important educational role in all sectors and European countries (Cullough & Aimard, 2006). E-learning is the process of providing education electronically in an online environment (Moore et al., 2011). According to European Commission E-learning Plan defines e-learning as “the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration” (Cullough & Aimard, 2006).

In Sweden, the most common e-learning types are distance learning and remote education. Distance learning is offered either as single courses or as programs in higher education studies. Studying at a distance is convenient and more flexible. Students have more freedom as they can study from anywhere at any time. Two main different types of distance learning are (a) courses without required meetings and (b) courses with compulsory meetings at university campus (Swedish Council for Higher Education, 2016). However, there is a difference between distance learning and remote education. Remote education is currently available in the subjects of mother tongue, modern languages, Sami and sign languages for students in elementary and upper secondary school (The Swedish National Agency for Education, 2016b; The Ministry of Education and Research, 2014). Remote education is defined as real time and interactive teaching by using information and communication technology (ICT). The students are in schools with a supervisor. The teacher or remote teacher is not in the same location as the students. Remote education is not the same as distance learning, where the students themselves decide when and where they do their schoolwork (The Swedish National Agency for Education, 2016c). What sets remote education apart from distance learning is that the teacher and students agree on a recurring schedule and have education under the agreed time. Students do not decide at which time they want to study.

Mother tongue teaching and study guidance in mother tongue

According to the Swedish National Agency for Education (2016a), there were 250,000 students in elementary school who were entitled to mother tongue teaching under school academic year 2015/16. This corresponds to about 25 percent of all elementary school students. However, there are shortages in both mother tongue teachers and study guidance

counsellor in several different languages (Swedish Parliament, 2015). Thus, not all students who applied for mother tongue teaching were provided with it. However, the situation is different in each municipality. The situation in study guidance in mother tongue was similar. Receiving study guidance in mother tongue can be seen as an instructional tool to students, and is recommended since it helps them to achieve educational success (Khan, 2014). The benefits of receiving mother tongue teaching and study guidance are of great importance for the child's identity and self-esteem. The mother tongue is the foundation for the child's ability to learn, and the child will learn its second language and other subjects more easily. Being proficient in multiple languages is beneficial to society (The Swedish National Agency for Education, 2015). Furthermore, the research shows that students who can speak more than one language tend to advance their thinking skills further than students who are monolingual (Bialystok, 2001).

There is Swedish legal support regarding providing mother tongue instruction to children who have a mother tongue other than Swedish (Ganuza & Hedman, 2014). According to the Swedish National Agency for Education (2010:800), students in elementary and secondary school have the right to receive mother tongue education in case the following conditions are met: (a) one of the student's guardians has a mother tongue other than Swedish, (b) the language is used in everyday communication at home and (c) the student has basic knowledge of that language. However, each municipality is required to organize mother tongue teaching in a language only if (a) there is an appropriate vacant mother tongue teacher and (b) at least five students with the same language have requested to study mother tongue in the same municipality (The Ministry of Education and Research, 2017). Students who are not able to keep up with education in Swedish language have the right to receive 'study guidance in mother tongue' in one or more subjects (The Ministry of Education and Research, 2017). However, the school principal decides if students need study guidance in mother tongue. Study guidance in mother tongue can aid the students to develop their knowledge in different subjects and bring them as close as possible to the subject goals (The Swedish National Agency for Education, 2015).

Starting from August 1, 2016, school principals are allowed to establish contracts among each other to provide and make use of tuition in mother tongue and study guidance in mother tongue as a service. As a consequence of changed legislation, all 13 municipalities in Jönköping County decided to cooperate in a unique effort to offer students better access to competent teachers in their mother tongue. A coordinator was employed to organize the operation. The coordinator has mapped the demand for languages in the county and trained mother tongue teachers in remote education. The approaches can be seen in Figure 1 and 2.

Purpose

The aim of the project is to coordinate all municipalities in Jönköping County in order to increase the opportunity for students to get their mother tongue teaching or/and study guidance in mother tongue.

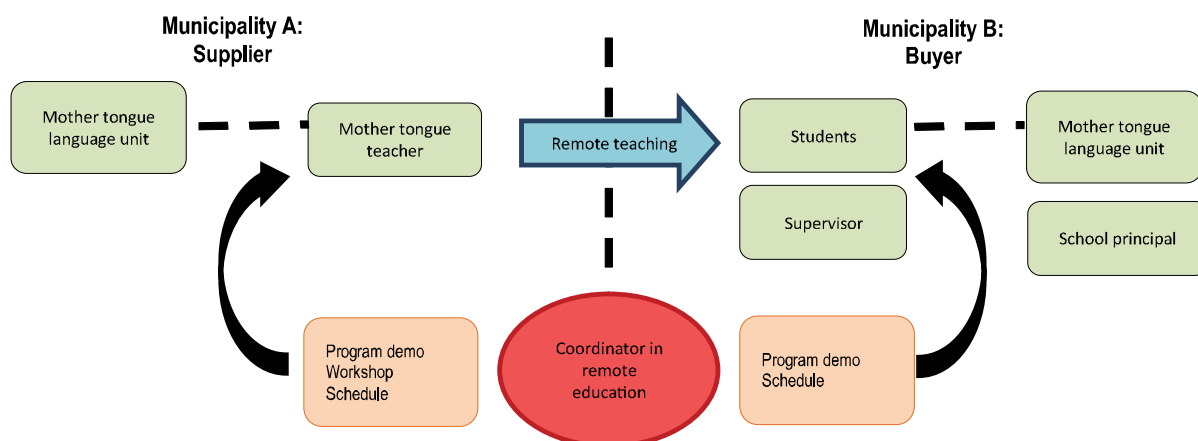


Figure 1. Remote education model between municipalities in Jönköping County

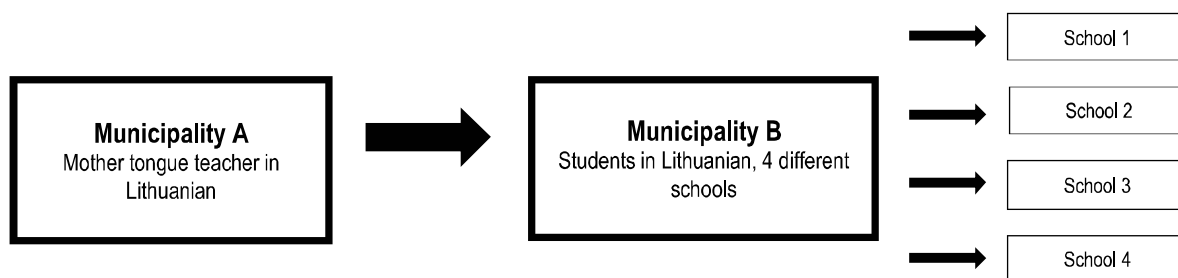


Figure 2. Example of Remote education between municipality A and B

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CIVIL SOCIETY POSITIONS ON DIGITAL LIFELONG LEARNING

András Szűcs, Lifelong Learning Platform and EDEN, United Kingdom

About the The Lifelong Learning Platform

The Lifelong Learning Platform (LLLP) is a European umbrella organisation with special status, gathering 40 associations with European outreach and membership, active in the field of education, training and youth. LLLP is covering all sectors of formal, non-formal and informal learning. The Platform aims to voice citizen's concerns about lifelong learning, promoting its holistic vision "from cradle to grave" and helping people in their life transitions. This vision is meant to ensure equity and social cohesion as well as active citizenship, advocating that education and training should be described beyond terms of employability and economic growth also as a framework for personal development and proposing solutions to make lifelong learning a reality for all.

The Platform promotes a dialogue between civil society organisations and public authorities in order to modernise our educational systems and to support public sector innovation.

The LLLP Manifesto – Building the Future of Learning in Europe (2015)

In their position papers, the LLLP represents a humanistic and holistic approach of learning. The Manifesto on Lifelong Learning issued in 2015, proposes the following main areas of reforms:

- Building inclusive and democratic educational systems
- Widening access to quality education for all citizens
- Increasing the relevance of education to modern societies

In this policy document, the Platform advocates for greater flexibility in learning (by using among others distance learning, digital technologies, blended learning and work-based learning) to meet the needs of a diverse range of learners, to widen opportunities for participation especially for socio-economically vulnerable people, but also fostering validation and recognition mechanisms for non-formal and informal learning and adapted assessment methods. Shift to creative solutions is also proposed such as experiential learning, learning by doing and better take into account students' diversity in order to raise engagement levels and improve educational achievement.

In the policy of the educational civil organizations, on macro-level more efficient coordination of social, employment and educational policies is stressed. Every European citizen should have access to digital technologies and learn basic digital and media

competences by mainstreaming them in formal education and to ensure that their interactions with new technologies are positive and enriching and a pedagogy that enhances well-being in a learner-centred approach is used.

This approach is pronouncing straightforward the need for secured and sustainable funding of education, highlighting the decreasing national budgets in the field since 2011 – whereas policy rhetorics say that investing in people is a way out of the crisis and a long-term investment for the future of Europe.

Sustained efforts to Implement such strategies requires a strong political will to coordinate political instruments as well as working in partnership between educational, social and employment sectors and between policy-makers and civil society organizations.

The Digital Education Policy Paper, 2017

The LLLP 2017 Policy paper titled “Reimagining Education in the Age of Digital Technology” intends to raise awareness on the impact of the digital technologies in education, to direct the attention of decision makers and citizens around the diverse implications of the digital age. It aims to reflect on the new challenges from an inclusiveness perspective, in order to promote the strategy concept to ensure universal access of all, thus adopting a lifelong learning approach.

The potential of technology use may enhance one’s life chances and contribute to upward mobility, an increased social capital, shaping citizens better informed of current events and political choices, and the civic engagement, on top of the increased labour market integration and income effects. There is a strong capacity to democratise knowledge and access to it.

One of the main messages of the paper is that genuine change and innovation in education should happen at the meso-level, therefore imposing fast-track changes in education.

Digitalisation, Lifelong Learning and System Thinking

The impact of digitalisation lies with potential of accessible, social and personalised technologies that can bring about more inclusive learning paths and a learning continuum between formal, non-formal and informal learning. Digital solutions can feed well into lifelong learning strategies and can be a powerful tool for narrowing the achievement and opportunity gaps. Also, lifelong learning holds the key to a successful societal response to the likely disruption caused by digitization in the workplace and in society more widely.

It is desirable that learners do not end up as technology consumers but become active, digital citizens, able to capitalise on their experiences in various forms of digital contents representative of their views and values.

Innovative education methodologies, enhanced through digital technologies can equip citizens with life skills such as creative thinking, curiosity and problem-solving.

System thinking as efficient horizontal attitude is respectively gaining importance in the strategic approaches and has the potential to deliver relevant solutions. This is the major aspect in order to turn educational institutions into dynamic learning spaces through inclusive and reflective digital innovation on the organisational level, including the knowledge triangle approach regaining and proving again its relevance. There is no other way for education to support tackling various complex issues linked to building more sustainable societies and economies.

Educational institutions need to work in partnership, together with different actors and partners. There is however a lack of support and preparation that teachers and educators receive on the efficient use of technology and learning from others. Although everyone seems to praise teachers for the work they do, there is an obstacle in adequately turning words into action: a multi-modal, multi-layered, initial and continuous professional development of teachers and other educators (including parents) is essential to support substantial innovation in education.

Technology: Empowerment Tool for the Already Empowered

The emergence of online encyclopaedias and MOOCs, as well as widespread digital devices, especially smartphones, have created many opportunities to bring education closer to marginalised groups. Mainstreaming digital access in education is not sufficient, because the equal access to technology does not automatically imply equal learning opportunities. There is a need for investment in the infrastructure, in up-to-date digital devices and educational software.

The learners who are the most in need of support are those with lower skills, likely to drop out or with least resources, also those who are least likely to benefit from the digital era. Technology may amplify the pedagogical capacity of educational systems; it can make good schools better, but it makes bad schools worse – it can become an empowerment tool for the privileged, instead of an opportunity for everyone. More privileged individuals have more access to the *enabling conditions* – competences, attitudes and motivation, which are a prerequisite for the meaningful digital participation and ensuring that the world of information translates into the world of knowledge.

Digital machines and robots can more and more perform the work done by humans cheaper and faster. There is however a need for new knowledge, with the related skills and competences that can complement technologies, based on higher order thinking and problem-solving capacities, supplemented by proficiency in formal and symbolic languages.

Digital Technologies and Career Paths

In times of global competition pressures, digital technologies are increasingly used as a device to bring education provision closer to the needs of the economy by pushing for economisation of costs, upskilling the workforce, turning learners into consumers and increasing competitiveness, instead of addressing the real concerns and needs of learners.

When economic priorities are overemphasised in education design, a holistic and humanistic vision of education that empowers citizens in multiple spheres of life, acts as social glue and gives voice to the voiceless, is jeopardised.

Recommendations of the Policy Paper

1. It is not digital technology that creates social change – people do
investment in people and widening access to their lifelong learning opportunities is as important as investment in the digital technology
2. Reinforce the effects of pedagogical and technological innovation
to support tackling various ever-complex issues linked to building more sustainable societies and economies.
3. Digital technology should be carefully integrated,
ensuring convergence, synergies and a cross-disciplinary expertise.
4. Investing into teachers as transformers and awakeners
improved support to teachers and educators in implementation of digital technology in learning environments, by investing in their initial and continuous professional development and their digital skills and competences.
5. Launching assessment methods
shifting the balance towards assessment methods that allow an increasing flexibility, creativity and innovation.
6. Technology as empowerment tool for the already empowered?
Technologies become increasingly affordable whilst the acquisition of basic digital skills remains a barrier.LLLP calls for investment in digital competence, motivation and attitude acquisition
7. Digital divide gap ...as long as there is the basic skills gap!
Complex, higher-order competences are necessary for the efficient use of the digital technology, rooted in basic skills. This puts further pressure on the lifelong learning dimension. LLLP calls for a holistic approach to digital strategies serving the development of basic skills as a cornerstone for social cohesion.
8. Neutralising digital space and commercialisation of education
Commercialisation of education is becoming a reality. The LLLP calls for ensuring pedagogical freedom of teachers as well as data security and addressing privacy concerns, to incentivise free digital resources and interoperability of hardware and software.
9. Digital technology for whom? Needs and concerns of people first!
Digital technologies are used often as a device to bring education provision closer to the needs of the economy, optimising costs, turning learners into consumers, increasing competitiveness, thus creating an environment where learning and skills development are not addressing genuine learner needs. LLLP emphasizes that a learner-centred approach is prerequisite for empowering the learning processes.

10. Holistic and humanistic vision of education vs. growing private interest interventions
The LLLP considers that EU Digital Skills and Jobs Coalition is based on wrong bases. Overrepresentation of private interests over public ones, hinders the long-term vision of the full potential that digital technologies can have in education.
11. Navigating safely through digital waters
Safety standards and accompanying measures for the groups in risks coming up with the digital technologies like parents, teachers and educators are crucial in this regard and should be encouraged at all levels.
12. Cross-disciplinary research and the unknown
Unbiased, cross-disciplinary longitudinal research is needed on different aspects of digital technologies in education, interlinking educational sciences, pedagogy, psychology, sociology, neuroscience, engineering and computer sciences, to explore how minds of learners may be developing in the digital world, to maximise benefits and minimise risks.

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GAMIFICATION AS PUBLIC POLICY OF TEACHER TRAINING BY INQUIRY METHODOLOGY

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Abstract

This article describes and discusses how gamification was inserted as part of a training policy for teachers who work with technologies in order to boost more investigative performances. It describes and analyzes one of the gamified training actions since the gamification elements present in its initial framework and its justifications, the playtest applied in technology managers, and the adjustments made based on the difficulties found in the playtest and also the action performed with eight hundred public school teachers. Bruno Latour's mapping controversies was used as a methodology for analyzing the process, highlighting the elements of tension and deepening into the process, identifying the points that need both greater care and attention, and also how the teacher learning can derive from these points of tension.

Introduction

This article describes a qualitative research that analyzes a teacher training practice for the incorporation of technologies aiming at learning which incorporates gamification as pedagogical strategy in the training process. The relevant aspect of this process is that it is not an isolated training for a group of schools or with a school with one or two classrooms, but rather a large-scale proposal, considering that at least one teacher from all the 502 public elementary schools has been invited, totalizing more than 800 people among teachers and managers involved, which means there was an attempt to include this gamified logic as a public policy.

In this analysis we intend to evaluate and describe the framework of the gamified activity of the training and its justification regarding the educational relevance, the playtest with the technology managers who were called to validate and support the mediation of the process, the mapping of the controversies that appeared in the playtest, the changes made in the final script of the activity, the experiences, the teachers' opinions about the experiences, the online actions, and the sharing of activities inspired by the training which were done by the teachers.

The gamification activity herein described was part of the proposal of the continuing education since teachers are the ones responsible for educational computing in schools. There were four moments of collective experience in this training action, and also an online training interaction which lasted one year and aimed at instigating these educators to think over their

performance and the role of Educational Computing as an integrating area of projects in the school, thus proposing the reflection about the change of conception about this class in the school curriculum, and the search for methodologies more investigative enabling the student to become a leading actor.

Gamification and Investigative Learning

Gamification

One of the biggest challenges of this audience made up of teachers is to keep a dialogue with the gamer generation, and also deal with several behaviours and demands related to elements of the gaming language that students bring to the school routine. Therefore, one of the pedagogical strategies that can facilitate the dialog between different generations and languages is the Gamification.

If it is a pedagogical strategy, it must have an intentional design, a script that needs to be planned and described so that one becomes aware of what the student is supposed to learn and how it is going to happen. From this point of view, designing games might give us some clues on how to make a good gamification design.

According to Salen and Zimmerman (2005; p.55), the biggest challenge of a game design model is a concept without a time criterion, and the creation of specific rubrics to solve concrete problems. We always live in this polarization concept / abstraction and practice / experimentation, and we can only connect them through advances and retreats in iterativity. The same applies to gamification, which is guided by models and frameworks, but also by experimentation and complexity.

Another important contribution of the gaming design and the experience design in education is considering the didactic action not as an instructional process, but as a proposal of experience with context and meaning. Therefore, it is necessary to define what elements of the games are really experiential and transformative, not only new aspects of reactivity. Murray (2003) says that the aesthetic of an electronic means such as a game is based on three axes: agency, immersion and transtraining. Carolei and Tori (2015) extended this concept of Murray when they emphasized that a process is really gamified if it is based on three elements that mix and complement each other: agency, immersion and fun. The agency is the way how the player acts and their various levels of protagonism; immersion is the way how he enters and stays within the magic circle of the game; and fun is what transports him to other worlds and possibilities, and how the subject transforms and is transformed by what is different.

Salen and Zimmerman (2003; p.80) believe that a game has primary ideas: it is a system. There are players who participate actively; challenges are artificial even having boundaries and real-life references. There are always conflicts to be solved that can happen individually and competitively, or in a collaborative group. Every game has rules and can have its result quantified.

A key element of gaming language is the active role of the player. We can say that the agency is very connected with the idea of gameplay in which the game design has to define challenges, tracks, forms of competition and/or collaboration. Another point that involves gameplay is that of the missions or challenges created which are called conflicts by Salen and Zimmerman (2003).

Every educational process has some intentionality and usually has competencies that are expected to be developed and expanded in a student. The idea of competence for learning rights has been broadened in the public policy of public schools. It means an advance in the conception.

A major leap forward for gamified proposals is to suggest coherent challenges in which the agency proposed by the activity is compatible with both competence and learning rights which the learner should have the opportunity to develop.

The second fundamental element of a game, which is closely linked to the agency, is the immersion that corresponds to the well-known *magic circle*, which usually makes a player play a game for hours. It is much more than varied and excessive sensory stimuli. Immersion is a complex concept that involves not only sensation or logic, that is, sensory structures and forms of representation, but also feeling and intuition, as well as an enlargement of the process of representation. It can also be triggered by the feeling of presence and archetypal structures, such as the ones that are aroused by the imaginary, especially represented in the narratives.

Investigative learning

According to Carolei and Schlummer (2016), there are several important competencies to be developed when a more investigative stance from the learning subjects is expected. It is in this context that we believe that games and gamification might help to develop observation, questioning, engaging, exploration, explanation, evaluation.

Chow (2015) studied several game mechanics and structures for ten years, and proposed a framework that goes beyond creating scores to support gamification processes. It aims to achieve the various forms of motivation and engagement. In this framework he considers eight faces as an octagon: meaning, achievement, ownership, scarcity, empowerment, social influence, unpredictability, repudiation. Meaning and repudiation are the top and base of this octagon. We can say that we are motivated by a purpose that gives us meaning, and by what we deny and avoid, which is considered as our shadow, that is, something that is part of us. We need to get along with that, and also work on this relation of conflict that motivates us.

The left side of Chow's octagon stands out for the intrinsic motivations (personal fulfilment, ownership and scarcity) and focus on the individual and its evolution with the rationalization of the process, such as the idea of completing stages, overcoming challenges and obstacles, making progress. In addition to evolutionary logic, the gain relation is a motivation such as the movement of possessing or collecting objects (even if they are symbolic), and thus

obtaining what is rarer in order to be different and usually better than the others just because something that is scarce was achieved.

The right side of Chow's octagon points to extrinsic motivation issues (empowerment, influence or social pressure, and unpredictability), that is, issues focused on our impact and social relation, such as empowerment, capacity for creation, how much your action affects the action of others or the other way round, and also the degree of surprise, risk and curiosity that the action causes. We are going to describe the proposal and the actions carried out in the playtest, and also analyze these aspects.

Action and Discussion

In order to build the gamified action, we started from some gamification elements we believed that would empower more investigative experiences: construction of characters; training of groups and creation of a group identity; narrative based on a plot of conspiracy theory in which teachers would have to discover clues and uncover pernicious actions; a destabilizing character who created conflicts and raised questions; exploration of spaces and images; search for coordinates.

From these elements we created a framework both to give visibility to the process of gamification for the group (highlighting the reason for choosing each strategy) and to help in the management and in the organization since the event involved more than eight hundred people, making it necessary to select, organize and prepare materials on a large scale.

In this framework the process was described in accomplished actions / developed skills; gamified principles of these actions; necessary material and people responsible for preparing the technologies involved and the steps of the narrative plot.

Playtest with managers

There was a partnership between the city hall and a fake technology company in the first version of the activity as a guiding plot. The activity was a poll of this company to create a gamified system of emotions of the students.

Managers should build characters and symbols to play with students, and then give their opinion. One of the steps of the analysis was to find strange elements in one of public policy documents. By the time they were filling in the analysis, the mediator would leave, and a provocative character would inform against the *scheme* of the company. From this moment, they were supposed to find clues about the company by exploiting images and documents using an invisible ink pen (an invisible ink pen had been used to completely scribble the official document, limiting some principles of autonomy and learning rights). There were several ways to find elements in the room: markers with QR codes and logical puzzles were used to unlock the padlock and open a box which belonged to the company representative and contained brochures with intraining about the gamified system already designed. So the conspiracy theory was confirmed by each clue as they discovered that they were being used to validate something that was already done, and that their opinion would not be respected in

the process since everything was ready and planned. In the end, all the groups should get together in order to find a coordinate in the auditorium where a final lecture would take place and all mysteries would be revealed.

The proposal was designed to last 4 hours; 2:30 to 3 hours for the experience, and 1 hour for the lecture and general discussion of the process.

Tensions and controversies

From the observation and records of the playtest discussion with the managers, we highlighted and analyzed the ones highlighted by them according to the perspectives of Latour's mapping controversies (2012).

As it always happens in every playtest, many things had to be resized. It was interesting to realize that managers often understand that something is "going to the dogs" as a lack of planning and anticipation, which may be true, but there is always a difference between the idealization of actions and their achievements. This process of advances and retreats, prototyping and refinement in the script is something very rich that can help to improve the logic of educational research projects. Machado et al. (2006) points out that the game is an interesting way to help understand what it is to work for a project, because in the game you take risks and are not afraid of trying, making mistakes, trying again. These are the biggest difficulties of working for projects that generate a tension due to the need of having a correct path, anticipating the results leaving little space for real exploration and investigation.

Thus, the first tension and controversy of the playtest was precisely to deal with all the mistakes that arose, and even to accept that it was necessary to redo elements and materials.

Besides the mistake, there is another usual difficulty for everyone: taking risks. Both immersion and agency are not so simple in the educational area, as it is necessary to give up control, to explore the unknown. It might be a scary experience even with all the interesting, symbolic, amusing elements allowing people to take control and play. Therefore warm-up activities are absolutely necessary in order to make people feel welcome as demonstrated in the experience. It is necessary to create a preparation that welcomes and invites people to participate, being aware not to explain, nor to spoil the mystery of the action.

Another tension that arose was the plot of "Conspiracy Theory", which despite being designed in a planned and complex way as in an alternate reality game (ARG), creating a fictitious reality – a company very similar to those in the market of educational solutions, but with exaggerated elements, even with secondary objectives of causing mistrust and a more critical view – the narrative did not please the trainers. Some thought that it would not be suitable to that training because it could cause a controversy that would go against to its objective; other people thought that it could change the focus of gamification.

This interesting controversy is worth highlighting in order to widen our gaze: Does the difficulty lie in the complexity of the narrative or in the controversy? The decision of

removing the narrative was unanimous as if it were something that would *distract* rather than contribute, as it was argued that teachers would be debating too much, stuck in the controversy instead of acting. This is a common controversy in ARGs as the narrative needs to be provocative and controversial. People often have a paralyzing involvement because instead of keeping on exploring, investigating and acting, they get stuck in the controversy, the confrontation and the denunciation. This is a fundamental question that can give some clues of which elements we need to expand and innovate in these gamified actions, as well as trying to find some measure or provocation that allows us to deal with controversies, progressing and deepening beyond irritation, denunciation and polarization with the intention of having more investigative attitudes that generate complexity. Maybe both games and gamified actions that propose exploration might help in this subject, but it is worth paying attention in this controversy.

Another interesting controversy was the question of punctuation and procedurality. Each action performed had a punctuation type with a corresponding meaning. It was a big challenge to make this meaning more visible and to create a way of comparing the groups that generated a movement and the notion of process, not only in a competitive logic, but rather to promote some complete engagement of the actions or phases.

The excess of activities for the duration of the group dynamics was also questioned. It is supposed to go wrong in the playtest, and it is not a problem at all as it generates series of suggestions. All we have to do is choosing the most viable and relevant ones.

Another issue that has always permeated the discussion and which can also be considered a controversy was: How to guarantee something that would be feasible with such a large number of people? This is another relevant issue because when we want to execute a large-scale process, we cannot think the same way as something that can be adjusted *on the spot*. Although there are some spaces for the projection and adaptation of the group, there are certain parameters and rules that need to be understood and followed by everybody. Besides, they must be clear and well described. This subject of what must and need to be standardized to ensure this scalability is something that raises many questions. It was no different when we needed to put it in practice. Several supporting documents were made, with rules and instructions on the dynamics and about how long they would last, the scores and feedbacks, the materials that would be used, the division of the groups etc.

Considering the action that is being discussed, we have an element that permeates the whole process which is the use of technologies that are available to teachers at school.

Due to the number of teachers, they could not use computer labs, nor the equipment to which they usually have access in the place where the dynamics took place. On the one hand, this situation creates the difficulty to think about the transposition of the logics and dynamics experienced in the training for its classroom. On the other hand, it makes pedagogical strategy explicit and shows there are several alternatives to apply them with materials and digital devices, or with physical materials.

Changes made

The following script was elaborated based on the results of the playtest and the suggestions given by the managers:

- Plot and narrative: The narrative has been simplified.
- Initial Challenges: Grouping, Character Construction, Group Identity.
- Gameplay issues, feedback and process visibility: Mapping of completed phases and actions.
- Challenges that considered investigative competences: Decision making, logical and spatial challenge, exploratory and observation challenge.

The three challenges resulted in numbers that had to be combined in order to open a lock of a box that was in the middle of the room. There was part of a code referred to the colour of each group inside the box, and managers needed to realize that they had to unite the codes to generate intraining. Either group waited, or helped the other because only when everyone had the code and could unite it, they would get the coordinate intraining with the hint of how to turn the classroom into a magical place. This tip was placed under a chair of the auditorium where the discussion of the process happened.

This tip was about gamification principles. Each group found a principle in the beginning of the lecture, and spoke about what had been found as a starting provocative point for the lecture.

The 10 listed principles were: (a) call for adventure; (b) groupings; (c) fictional narrative; (d) character construction; (e) exploration (of space, materials etc.); (f) challenge / counterpoint; (g) revealed secrets; (h) build models / choose models; (i) task compliance markers; (j) mapping usage.

Evaluation of the experience by teachers

After the face-to-face provocative experience, the teachers did an online activity in which they had to work with all the documents and descriptive scripts of the logics, and framework of the gamification and their highlighted justifications. The proposal was to bring them from a moment of immersion to a reflection about the intentionality there was behind everything. From the logic and theoretical background of the principles of gamification, teachers responded a questionnaire which had objective questions containing specific items to present a qualification of their impressions about the process. There were also open-ended questions so that they could bring suggestions and new questions. In addition, they shared some actions inspired by this training throughout the year.

There were 453 teachers who answered the process evaluation questionnaire. In the objective questions, they were supposed to respond about the relevance of the activity to their work, their qualification of the dynamics, the gamification elements that they identified as important for their practice with projects, the level of impact that the training has caused (any impact, awareness, glimpse of new ideas and concepts, related new ideas and concepts to the

possibility of real practice in its context or if the experiences and the course transformed its practice).

Based on data we can see how much relevance has been identified since 89% of the teachers identified items as relevant or very relevant. We also observed that 78% were able to identify the relations between gamification and learning by research projects.

Regarding the impact, there were only 4 teachers (0.9%) who said that the training had no impact, 49 people (10.7%) said they were more aware, that is, their interest in the theme was awakened, 150 individuals (32.8%) emphasized that they discovered new concepts and suggestions of practices, 153 teachers (33.5%) highlighted that they have already thought about HOW to apply gamification, and 101 teachers (22%) highlighted that the training has changed their way of thinking about projects.

As the graph of gamification elements shows, all of them were highly voted by more than 50% of the group. The most voted were Decision Making (80.7%), Logical Challenges (79%), Exploratory Attitudes (75.3%) and Learning with Errors (74.2%). These elements are deeply related to investigative attitudes. The least voted, which were below 50%, were the Creation of a Reward System or Score (47.9%), Mapping of Experiences (42.7%) and Creation of a Magical Circle (20.4%). Notice that the issue of awards was not considered as important as other elements, but it is possible to infer that there is still some difficulty in dealing with punctuation as a way of mapping the experience or as recognition and awareness of what has been learned through the experience of the game without being reductive to a number or a badge. This is a very relevant controversy.

Another point that is reflected in these data is the difficulty of working with the magic circle, the fantastic narrative, *taking risks* in the story that is often fictitious and losing control. This challenge in deeper immersion is still something that needs to be worked on better and experienced usually to realize its transforming role of this immersion, even if it is not fully controlled.

They were able to identify all the gameplay principles worked out as possible to be included in their project practice. Although their discourse is still a search for strategies and sharp resources, they still ask for and trainings for specific purposes, that give them more examples of formats to enable them to work. In this case, they also presented a speech that highlights they have noticed the procedural, and part of the individuals (22%) reports that the experience was totally transformative. The majority (75%) at least managed to find ways to incorporate these strategies as a way to spread their practice and make it more experiential.

Concerning the open-ended questions, most of the criticism was about logistics and time, but most teachers loved it, felt provoked and challenged, and 95% said they would like to participate in other similar trainings, and that also need more support and a continuing process.

Conclusion

In this article we emphasized the proposal of gamified training and its insertion as a public policy, its redesign based on a playtest with the managers, and the result of the application with the teachers based on their impressions.

Our qualitative, mapping methodology registered, described and highlighted the controversies that arose in the design of the gamified activity and its redesign based on the playtest with the managers who acted as mediators in the training. We also brought some more quantitative data from a questionnaire evaluating the experiences that the teachers filled.

We can highlight the following controversies: difficulty in dealing with mistakes; scalability; difficulty with controversial issues; difficulty with more complex and even fantastic narratives; transposition of actions in various technologies; motivation and engagement:

According to Chow's principles the top and the bottom of motivation is the purpose or meaning, and what we want to avoid: our fears, shadows, anguishes. Not much is done with conflict and things that bother, and this can be deeply mobilizing and transforming. As for intrinsic motivation, we may say that perhaps progress may be even interesting as a matter of organizational logic, but evolutionary logic can often undermine the realization that phenomena are not so linear and sequential. Ownership and scarcity may be complicated motivations to be used in educational action since they disseminate certain consumerist logic in which one values how much you have in order to be better than others. But these can (and must) be part of the plot in order to discuss about a world in which these values are considered important. Our action had neither collection activity, nor rarity, but it could happen as something about exploratory actions and its registration in a playful way in which symbols were collected in order to be associated with records.

Extrinsic motivations such as empowerment, pressure and social impact and also unpredictability are elements that favour a more investigative stance and were demanded to a certain extent in the actions in which they had to work together, compare characteristics, create group identity and propose elements.

We can say that the experience was deeply mobilizing for teachers who at least were able to take a glimpse at new practices and think over their logic towards more experiential and investigative actions.

This is the first step. We have already received several registrations of gamified actions inspired by this training that really involved the entire school, changed from the demonstrative and traditional logic to more experiential, exploratory actions, and the next step is to map this experience identifying if there really was this investigative transtraining at school.

As a mapping process, there is still much to map and our next steps must focus on listening to these teachers and their proposals based on these experiences, as well as a new hearing of mediators and managers after the teachers' production process in training.

But the first conclusions that we can take already give us clear clues that appear in the controversies and show us what points we need to create and innovate to make the gamification something that deepens and helps to realize the process better and its relation with the competences to be developed, and also awaken processes in which the students are more protagonists and take more and more responsibility to make their choices. We propose here a reflection from the training on gamification that goes beyond standardized and reactive logics (or the ones full of distractions) which can cause the student / player to be alienated in such fun, and forget the reason why learning is important.

In addition, our proposal is to promote a greater awareness about the processes and movements of learning, which may be immersive in the experiential impact, but also reflexive in understanding how and why we learn. We want a process in which the student is an agent / actor, but a reflected agency. We propose he makes decisions not by trial and error, but that he is able to explore and analyze the options and choose them consciously. We hope that mistakes and iterativity of the constructions, and also of the act of playing favour the idea of continuous design and improvement. We also hope fun becomes a way to learn from the diverse and that causes you to think differently and not something reductive and alienating that distances you from self-knowledge and the world.

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THE DUAL EDUCATION PROGRAMS ARE THE NEW POSSIBILITIES IN THE COOPERATION IN THE HIGHER EDUCATION AND BUSINESS

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The contribution of higher education to jobs and growth, and its international attractiveness, can be enhanced through close, effective links between education, research, business and industry. The “Modernization Agenda of European Universities” launched by the European Commission in 2006 and revised in 2011 sets various goals to the development path of the higher education institutions (HEIs). It aims at improving the quality and relevance of higher education by implementing knowledge based education necessary for the economic growth and social development of the region. As a policy recommendation HEIs are encouraged to involve employers, industry and labour market stakeholders in the design and delivery of programs, and in general to make curricula include more on the site practical components.

Hungary as a member the European Higher Educational Area (EHEA) is making efforts to comply with strategic goals of the community. Apart from traditional and fruitful relations of Hungarian HEIs with industry and business in the field of research, of counselling, of internship-projects and of joint scientific activities, time has arrived to bring theory and practice closer also in tertiary education. The Hungarian government following a 2 year long pilot period (2012-2014) has undertaken huge structural changes in its higher education system (Switching gear in higher education), which among others led to the adaptation of the German model of dual education with proper amendments to fit Hungarian needs.

The Hungarian educational administration assumes that engaging business, industry and local governments in education can create exceptional synergy in higher education as well, enabling higher education institutions to follow rapid technological changes and advance new learning technologies.

Budapest Business School (University of Applied Sciences) was among the first to adapt the dual education initiative and demonstrate that it can work successfully not only in the traditional fields as that of technology, engineering, nursing, etc. but also in diverse areas of business and management. Our presentation on this gives a detailed description of the process, of the state of the arts and of the perspectives.



MODERN PROJECT – USEFUL TOOLKIT DEMONSTRATION TO EVALUATE AND USE DIGITAL TOOLS IN EDUCATIONAL SCENARIOS

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Project Goals

MODERN is based on the awareness that digital and mobile resources have been proven to increase adult learner engagement and information retention. They are also well suited to *hard to reach* learners or those who direct their own learning activities *on the go*. However, only one in five students is taught by digitally confident and supportive teachers. MODERN aims to increase the ability and motivation of teachers, trainers and lecturers to use digital learning resources as a means to more effective, relevant teaching, thereby causing a positive impact in students, learners and trainees. The project will achieve the above goals by:

1. Providing educators with a convenient and highly usable set of innovative tools which they can use to engage their students on mobile devices.
2. Offering clear guidelines on which tool offers the best solutions to achieving pedagogical objectives.
3. Presenting project toolkit in a highly attractive manner and user friendly format – the project has identified, assessed and categorised the latest and best digital learning tools and represents a key resource in teachers and trainers' professional development.

By engaging with the project, teachers will:

1. learn intuitive powerful tools for engaging students;
2. understand the pedagogic potential of digital learning tools;
3. be motivated to incorporate some of these new tools into their teaching practice;
4. increase their own digital literacy.

MODERN is co-funded by the European Commission under the ERASMUS+ Programme, Strategic partnership for VET, Cooperation for innovation and the exchange of good practices action.

Project Partners

The MODERN partnership is formed by VET and HEI specialists, from across the profit, non-profit and public sectors and is led by Canice Consulting Ltd, an international consultancy in the field of business VET with a growing specialism in digital elearning and marketing platforms.

Project Outputs

The project has developed four resources to help teachers learn and introduce new digital tools and innovative practice into the teaching and training delivery. Each of the resources stands alone, but together they form a holistic package which leads teachers and trainers from the broad objective (*Audit of Learning Tools*) to a quite specific output (*Online Training Course*).

The first output is the *Audit of Learning Tools*. In this report the latest and best digital learning tools have been identified, assessed and categorised by real educators and teachers. Together with the assessment a ten category classification system has been created. Therefore, it is possible to use the audit in two ways: one can download and read the Audit Report, which will provide an excellent overview of learning tools in general and their applicability; or one can search by category to find specific tools for a particular function like testing students.

The second output is the *Pedagogic Assessment* of the selected top twenty-five tools, again sorted according to the ten categories classification system. This report presents a more detailed analysis of the pedagogic potential of the tools that were considered most useful. Each assessment is no more than three pages long and provides all the essential information needed to decide if the tool can be useful in a teaching or training activity.

The *Toolkit* is the third output. It is an online platform designed to teach and train the top twenty-five tools. It follows a four step process: read the pedagogic report, watch the introductory video, view some examples of the impact of the tool in real life learning environments and then learn the tool itself. It is aimed to encourage anyone interested to try any of the tools initially, to gauge the impact and then to learn some more tools.

The fourth output is an *Online Training* to help anyone learn some of these new and innovative teaching digital techniques. It has five modules:

1. Introduction to innovative teaching.
2. The Flipped Classroom teaching model.
3. Collaborative learning spaces and Peer connections.
4. Project based learning.
5. E-learning trends.

The relevant aspect of this online training course is that the five modules have been developed using eight of the considered top twenty-five learning tools. Therefore, while taking the modules anyone will gain new knowledge about these tools and also experiment the learning experience they provide.

Conclusions

MODERN seeks to generate greater acceptance of the mobile phone and other mobile devices as learning support by upskilling trainers, teachers and lecturers to give them more confidence

in their ability to select and use appropriate mobile and digital resources in their everyday teaching and training activities and, thus, engage and encourage young adults to learn and improve their learning experience.

This result is expected when improving pedagogical strategies and giving teachers and learners a greater ability to drive their own learning and training process and increase on-the-go access to learning and training when outside the classroom, while understanding how to create robust pedagogic strategies and boost acquired learning outcomes through the use of interactive digital technologies, especially those which are student-led and available on mobile devices.

The four outputs of the project (i.e. audit, assessment, toolkit and course) will enable teachers and trainers to boost career progression and make their institutions more competitive in terms of attracting students and producing excellence in results.

MUSACCES – A MULTIDISCIPLINARY PROJECT FOR THE DEVELOPMENT OF INCLUSIVE MUSEUMS THROUGH INNOVATIVE TECHNOLOGIES

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Introduction

Accessibility is an essential right and a fundamental tool to support social inclusion, non-discrimination and equality of opportunity and treatment, especially, after ensuring accessibility to physical environments, information and communications, processes, products and services. After all, universal accessibility, as a fundamental variable for achieving equality of opportunity, it is a basic criterion in the management of public action.

In Spain, the Law of Equality of Opportunity, Non-Discrimination and Universal Accessibility (LIONDAU), in force since 2003, is upheld by the principles of normalisation and an independent life. A study that applies these rights to the enjoyment of cultural heritage is entitled “Universal Accessibility to Cultural Heritage. Fundaments, Criteria and Guidelines” (2011) published by the Royal Board on Disability. This document aimed to help the institutions that look after our heritage to consider the question of accessibility as a very relevant aspect for the revitalization of the monuments that, being accessible to all people regardless of their disabilities, are long lasting and strengthen the nature of their heritage to all of society.

In the same vein, the document on “the Integrated Spanish Strategy for Culture for Everybody accessibility to Culture for Persons with Disability” (2011) promotes initiatives for “Accessibility and Culture for Everybody” in perfect consistency with policies channelled through the Spanish Ministry of Health, Social and Equality Policy and the Ministry of Culture. This ministerial document aims to promote and normalise the implementation of accessibility in all initiatives in the cultural universe, in such a way that they comply with the highest demands for quality, technology and adaptability.

Museology and Social Integration

One of the great challenges of 21st Century Museology is the attention to and integration of the least favoured and disconnected social sectors with our museums. The museum institutions are living spaces whose managers try to bring about a more dynamic and open participation. The interest in educating and socialising culture has endowed the museums with human resources, etc., and diverse strategies for attracting the public. However, in spite of all of these efforts, the changes introduced into society through phenomena such as multiculturalism, immigration, the economic crisis, the loss of motivation found in a significant part of young people, may give rise to social exclusion in segments of the population who would be left at the margins of the museum context and its advantages.

In Spain, in 2011, the *Museo del Prado* launched an activity called “El Prado for everybody”, which aimed to integrate and favour access to culture for those people who have some kind of physical, sensorial or intellectual disability and/or neurodegenerative illnesses. The activities were created from a didactic, artistic and creative perspective. This could be considering a pioneering experience among others that have taken place in Spain in the recent years such as *El Museo Espacio Común de Integración* (The Common Museum Space for Integration) *Museo Nacional de Arte de Cataluña* (The Catalonia Museum of Art); this latter aimed at people or a collectives who are suffering some kind of exclusion for social, physical or psychological reasons and who find it difficult to consider the museum as a personal reference. In Malaga, the program for the Transformation of the Joaquín Peinado Museum (Ronda, Malaga) has the development of skills, abilities and social capacities in people with intellectual disability as one of its main objectives by means of plastic expression.

The MUSACCES Consortium

Under this principles and objectives, the MUSACCES project (S2015/HUM-3494) began its development in 2016 with the consolidation of a Consortium whose work is developed in the *Comunidad de Madrid* (Autonomous Community of Madrid) and which proposes museology activity and social integration in an environment of interdisciplinary work, seeking to bring the *Museo del Prado* to collectives of special accessibility needs (blind, deaf and imprisoned people) supported by Information and Communications Technologies.

The Consortium is integrated by a multidisciplinary team of more than 80 researchers from 7 research groups (humanists, social scientists and technologists) from the main public Universities of Madrid (Universidad Complutense de Madrid, UCM, the Universidad Nacional de Educación a Distancia, UNED, and the Universidad Autónoma de Madrid, UAM), with the collaboration of the *Museo del Prado* and other businesses and institutions involved in promoting accessibility. Research groups are named as follow: CAPIRE+A (Cultural Heritage), coordinator of the Consortium, CAPIRE+B (Image, iconography and iconology) Museum I+D+C (Digital Culture and Hypermedia Museography Laboratory); EARTDI (Art Applications for Social Inclusion); ICONO-MUS (Musical Iconography); SICTO (Signum imaginem caeli terraeque observare), GREIGA (Image Studies from Ancient

Greece) and, finally, INADOC (Innovative User INteraction to Accessible Digital Objects and Collections).

In this triennial plan of activities (2016-2018) 8 specific objectives have been established, which are:

1. To create a state of the subject of the research into “accessible culture and tourism”, as well as the different initiatives of its application to the world of museums at both the national and international level.
2. To compile and analyze the interests and needs of each of the three collectives with special accessibility as regards the artistic heritage of the *Museo del Prado*.
3. To organise the thematic lines, the interactive routes and the technological applications with the artistic content of the Museum which will be studied to adapt them to the products of each of the three collectives according to their interests and needs.
4. To research the thematic content, adapt the didactical units and program the technological systems necessary for the three groups with special accessibility.
5. To produce, revise and try the prototypes of the final applications, systems and exhibitions, which embody the virtual routes adapted to the blind, deaf and dumb, and imprisoned users.
6. To disseminate the results among the main forums of the collectives which are the target groups of the proposals in particular and between social agents in general.
7. To carry out a follow up and draw up a qualitative and qualitative evaluation of the impact and degree of satisfaction that, in each group of the three collectives with special accessibility, have had the applications and virtual visits produced.
8. To transfer the results and innovations of the research to other national and international museography bodies and institutions from the organization of an International Congress on “Museography and Social Integration” and the publication of a monographic book on the subject.

The contribution of innovative technologies to make arts more accessible: The role of INADOC group in MUSACCES

INADOC (Innovative User INteraction to Accessible Digital Objects and Collections) group constitutes a recently created multidisciplinary group made up of teacher-researchers of UNED, experts in models for accessibility and usability, and technologies for the management of large repositories of information, the automatic processing of natural language and access to multimedia information, and experts in the design, implementation and follow up of the use of new technologies applied to enriched educational environments mediated by technologies and quality assessment. It works in close collaboration with the Chair of “Technology and Accessibility” UNED – Fundación Vodafone España (<http://www.catedrafundacionvodafone.uned.es>), to which several of its members belong. Within the Consortium, its labour is mainly focused on producing innovative technologies for

the development of accessible routes for those target groups in the project. Art routes will be based on the selection of specific artworks of the *Museo del Prado* collection and the didactic materials elaborated by the humanist groups, adapting its contents to each target profile.

Website and main social networks (<https://www.facebook.com/musacces/>; @musacces) are coordinated by INADOC, disseminating MUSACCES news and information of general interest about arts and accessibility in the world.



Figure 1. MUSACCES web portal

MUSACCES activities during its first year

In 2016, by the end of the first year of the project, the planned activities were centred on the development of the first two objectives and the carrying out of different training activities. Thus, for objective 1, a very extensive collection of bibliographical references has been compiled to shape the updated state of the art and carry out a survey in five languages (German, Spanish, French, English and Portuguese). For objective 2, a specific questionnaire was developed by experts in the group to analyse the interests of people with disability in relation, both, to mobile technologies use and art contents preferences of the *Museo del Prado* of the target groups.

This questionnaire includes a series of specific questions focused on the use of technology in this context in accordance with the TAM (Technology Acceptance Model) as the optimum use of Information and Communications Technologies (ICT) within a need, as well as the fact that they influence the production of quality goods and services. This model, originally developed by Davis (1989) and Davis et al. (1989), it is used to predict the use of ICT, based on two main characteristics:

- The Perceived Usefulness, PU, refers to the degree to which a person believes, that by using a technological system in particular, his/her performance will improve.
- The Perceived Ease of Use, PEOU, highlights up to which degree a person believes, that by using a technological system in particular, he/she will make less effort to carry out his/her tasks.

Educational activities in the Consortium are being addressed, both, as training programs for Consortium members in the different areas of interest of the project, and as dissemination activities related to art and accessibility issues and The *Museo del Prado* itself.

The following training programs have been carried out in 2016:

- Introduction to the *Museo del Prado* for communicators, educators and technologists (April 2016).
- Immortal death. Funeral images in the classical world (May 2016).
- Workshop “The *Museo del Prado* through the 5 senses” (Sept-Oct 2016).
- “The eloquence of the image in The *Museo del Prado* Conference” (November 2016).

All the educational activities have been recorded by the technical teams of the universities, with the aim of being offered in the YouTube channel of the Consortium and to be the basis of didactic materials in future training programs such as MOOCs on museology and art inclusion.

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