Conference Proceedings

The Open and Flexible Higher Education Conference

Hosted by AGH University of Science and Technology in Krakow,
23-24 October 2014

"New Technologies and the future of Teaching and Learning"

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ISBN 978-90-79730-14-8

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Student Response Systems: Do nursing students prefer coloured paper or digital solutions?

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Background: Many components of our courses are replaced by more flexible formats accessible via a computer. The time where students and teacher meet each other face to face is used to methods with lots of student activity. The aim of the study was to investigate different formats for interaction via student response systems (SRS) in a large class environment where some students participate live, other via a live video connection. A simple SRS system using coloured pieces of paper was compared with a digital system where students used tablets, smartphones or computers.

Methods: 104 second year nursing students answered a simple survey about perceived learning outcome from the analog and digital solutions after introductory lectures in medicine and pharmacology in the autumn of 2013. The survey was administered on paper to each student immediately after the introductory lectures, and was also available digitally via Survey monkey (www.surveymonkey.com). The students were asked to rate the learning when using the different methods on scales from 0 (no learning) to 4 (huge learning impact), and were invited to give further comments on advantages or disadvantages with the two systems.

The digital SRS system used is made by one2act (www.one2act.no). The students in this course had tried the system once before, about three months before the lectures where the evaluation was made. The coloured paper and the SRS system were used on two consecutive days.

No IT equipment was made available to the students from the University College, as we knew that almost all students do own a portable unit with internet access. We asked the students beforehand to bring such a unit on these specific days. In the system made by

one2act, it is possible to answer questions via several different units: Smartphones, tablets or laptops. In the classroom, we saw that most students used their smartphones. The basic setup in this SRS system is that a question with some possible answers is presented to the students. A counter is started by the lecturer when the students appear ready. Next, buttons with the different alternatives (a, b, c, etc.) are presented on the student's smartphone. The students are then asked to choose among the possible answers before the timer reaches zero. Next, a graph showing the combined results from the whole class is presented on the main screen, visible for everyone.

The questions asked were classical multiple choice questions with one correct answer and three false answers. The timer was set on 20 seconds most of the time. After presentation of results, some time was used to discuss the answer with the students. When almost all students chose the right answer, this discussion was brief. On the other hand, the following discussion could be quite comprehensive and followed by a new vote before the right answer was finally revealed in cases where the answers suggested that many students were confused.

The subjects for the multiple choice questions were picked from themes discussed in the lecture during the preceding 15-20 minutes, preferentially formulated in a way where the students had to use what they had learnt in a new way. The intention was to use this as a kind of rapid repetitions to try to consolidate new learning.

The setup of the exercise with the coloured paper was basically done in the same way. A4 paper cards in yellow, red, green and blue were cut in four, brought by the lecturer to the classroom and distributed among the students. Questions asked were the same sort of multiple choice questions with one right answer. The countdown was done manually by the lecturer for 5-10 seconds, and it was stressed that everyone should raise the card at a coordinated time and try to hide their choice until this moment, to make it harder to figure out what paper to pick from the others' choice of colour.

Another topic discussed in this paper is whether presence in the classroom or participation via videolink affect the students' evaluation of these two different student response systems. A proportion of the class does not travel to the auditorium in Elverum, but follow the education at the local hospital in Kongsvinger 1.5 hours away via a videolink. These students can see and hear the teacher with quite high image and sound quality. The teacher can see the students participating via videolink on a small screen, and these students can turn on a microphone to ask questions or give feedback.

Results: 94 of the participants had experienced both systems. 10 preferred the analog version, 31 preferred the digital version, while 53 students gave both systems an equal rating.

Students' preference: Analog or digital voting system?

Prefer analog	Both systems equal rating	Prefer digital
10 (11%)	53 (56%)	31 (33%)

How would you evaluate your amount of learning from the analog and digital systems?

	No learning	Little	Medium	Big	Huge
Analog system	1 (1%)	4 (4%)	23 (24%)	44 (45%)	25 (26%)
Digital system	0 (0%)	2 (2%)	16 (18%)	52 (52%)	31 (30%)

The students felt that they learned from both systems. It appeared to be a tendency to prefer the digital system, but for most students, the difference was small.

The next thing we looked at in our data was whether there was any significant difference in rating between the students participating via videolink and the students who were physically in the auditorium.

How would you evaluate your amount of learning from the analog systems?

	No learning	Little	Medium	Big	Huge
Videolink student	1 (5%)	0 (0%)	7 (33%)	9 (43%)	4 (19%)
Physically in classroom	0 (0%)	4 (5%)	16 (21%)	35 (46%)	21 (28%)

How would you evaluate your amount of learning from the digital SRS system?

	No learning	Little	Medium	Big	Huge
Videolink student	0 (0%)	1 (5%)	8 (36%)	5 (23%)	8 (36%)
Physically in classroom	0 (0%)	1 (1%)	8 (10%)	47 (60%)	23 (29%)

To summarize, the students participating via a video link rated the methods at about the same levels as the students participating live in the auditorium.

The further comments from the students stressed two main points: The advantage of the digital version most frequently mentioned was the ability to give answers anonymously, the main advantage of the analog model was unbeatable ease of use. Several students stated that these methods really helped them to retain knowledge.

We did not do any quantitative registration of the number of students answering each question in this study, but the impression by the lecturer was that a clear majority of the class, always over 70%, usually over 90%, answered each single question.

Discussion: Our nursing students perceived that they learned from both systems. It appeared to be a tendency that they preferred the digital system, but the difference was small. Both systems used multiple choice questions. It is plausible that it was the use of questions that facilitated learning and not necessarily the use of SRS. The assertion is supported by the pedagogical phenomenon called self-explanation. The use of multiple choice questions and responding in-class could have enhanced the nursing students' ability to explain to themselves, which were the right and the wrong answers to teachers' questions. Students learn more when they have to explain to for themselves what they are studying (Strømsø 2014). Kay and LeSage (2009) underline that use of SRS in the classroom does not guarantee improved student learning. It is the implementation of pedagogical methods in combination with SRS that influences the students' perception of learning. Evidence also implies that students' perception of learning is affected by the teachers' enthusiasm and level commitment when using SRS (Nielsen, Hansen, Stav 2013). On the other hand, the students' perception of learning with SRS may also be explained as a novelty effect. Several studies showed that nursing students reported that it was fun to use SRS (Meedazan & Fisher 2009; Smith & Rosenkoetter 2009). Furthermore, nursing students report that they learn more when SRS is used. However, findings from several studies (Patterson el al. 2010; Stein et al. 2006) do not support the nursing students claim.

Our results indicated that the main advantage with digital SRS compared to the analog SRS was that nursing students could respond anonymously to the questions raised by the teacher. Previous studies (Fifer 2012; Patterson et al. 2009; Porter & Tousman 2010) that investigated nursing students experiences with the use of digital SRS, found that being able to respond anonymously was perceived as an important benefit with this system. Being able to respond to questions anonymously appears to facilitate participations from students that do not normally respond in-class (Lantz 2010). For nursing students it is important that other students and the teacher do not know that they answered incorrectly (Patterson et al. 2009). Due to anonymity students could become more willing to choose an incorrect answer when they are unsure about the correct one (Draper & Brown 2004; Jensen et al. 2009). In contrast, when nursing student used coloured paper solution to respond, they could have looked at other students before they chose their own answer and responded. Furthermore, evidence suggests that students think that responding by holding up a response card is too public and could decrease the number of students that are willing to respond (Lantz 2010).

In our study, nursing students reported that the main advantage with the analog SRS solution was that it was easy to use. Evaluation of students' experiences with the use of the SRS made by one2actshowed that technical difficulties, such as students' tablets, smartphones or computers that were not able to connect to the server, were aspects that could negatively affect students' experiences of the system. Technical problems could probably prevent students from using the digital SRS (Nilesen, Hansen, Stav 2013). Teachers that want to use the digital SRS need specific training before they can use the system. On the other hand, use of coloured paper solution is not affected by technical difficulties or requires any specific training in beforehand. In addition, there are virtually no costs related to the use of the coloured paper solution for either the students or the university college.

Keywords: Curriculum Innovation, course design, QA in e-learning.

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Team-Based Design: Self-Regulation for Global English Language Learners

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Abstract

Increasingly, nations are recognizing the need to democratize higher education (Grundy, 2007; Kamenetz, 2010; Trow, 2005). Distance education can provide access to those previously excluded due to elitist admission criteria, delivery mode, scheduling limitations, and prohibitive costs. However, extending higher education opportunity to new target populations in global contexts requires innovative course development processes and design models, and in many cases, the prerequisite of academic English language proficiency. This preparatory coursework is a significant component of learner success. A team-based approach to distance course development is useful in achieving consistency across course sections and levels of instruction as opposed to adhering to the more traditional practice of instructor development and ownership of a course. This paper describes a team-based approach to course development that resulted in a course design model aimed at helping global English language learners achieve greater levels of self-regulation, or responsibility for managing the factors that affect learning, and acquire the language skills needed for further academic study. In the context described, the team identified learners' technological and pedagogical needs and created a course design model founded on three key theories: transactional distance (Moore, 2013), language acquisition (Nation, 2001), and self-regulated learning (Zimmerman & Risemberg, 1997). These theories guided the development of a model aimed to increase learner self-regulation while simultaneously providing a rich, interactive environment for language acquisition. Students self-evaluate, identify goals, engage in dialogue with peers and instructor, utilize the social environment for knowledge exploration, and reflect on their performance.

Keywords: English language learning, distance education, self-regulation, course design.

Introduction

Worldwide, the number of individuals seeking tertiary education continues to rise. The percentage of students enrolled in higher education increased from 19% to 26% from 2000 to 2007 for a total of 150.6 million students (Altbach, Reisberg, & Rumbley, 2009). This growth, however, is uneven with much of it occurring in developed countries. For instance, participation in higher education has increased from about 40 to 60% in Central and Eastern Europe but from only 5 to 7% in Sub-Saharan Africa (Altbach et al., 2009).

Some students choose to access higher education beyond their borders. The globally mobile student population has increased by 50% since 2006 and consists of approximately 3.5 million (Choudaha, Chang, & Kono, 2013). Institutions in English-speaking countries are competing to attract this population (Altbach et al., 2009). Australia leads the way with 24% of its total undergraduate enrollments consisting of international students (Choudaha et al., 2013). Institutions have also chosen to expand their operations by establishing outreach campuses in international locations (Altbach et al., 2009).

The need to widen participation in post-secondary education is critical in today's knowledge society. Individuals, families, communities, and nations benefit from a well-educated citizenry, which supports self-sufficiency, stronger economies, and the resolution of global challenges (American Human Development Project, 2009; Baum & Ma, 2007). This demand has outpaced traditional institutional capacity. As such, nations are identifying innovative strategies, including technology-based instruction, to support demand and subsequent growth. One of these strategies is distance education. Indeed, "distance education represents an area of enormous potential for higher education systems around the world struggling to meet the needs of growing and changing student populations" (Altbach et al., 2009, p. xvi). It increases access to allow more individuals to reach their potential and contribute to society, and enables student mobility in terms of location and scheduling flexibility.

These factors characterize an era of global or cross-border higher education. "Cross-border higher education is fueled in part by the growing worldwide demand for higher education and is characterized by increased mobility of students, courses and programs and increased mobility of institutions across national borders" (International Council for Open and Distance Education, 2009, p. 11). It "encompasses a wide range of modalities from face-to-face (taking various forms such as students travelling abroad and campuses abroad) to distance learning (using a range of technologies and including e-learning) (United Nations Educational, Scientific and Cultural Organization, 2005).

The global expansion of higher education not only requires flexible delivery options, but new models and approaches for learning, and particularly distance learning, including course design and content that reflect the needs of target learners. In many cases, success in global

online programs depends on fluency in academic English. Innovative approaches are needed to help learners acquire English language skills in online environments and build a foundation to further mobility through educational opportunity.

This paper describes a team-based approach to distance course development that resulted in a course design model aimed at helping global English language learners acquire academic English skills through socialization, interactive language practice, and community building while developing greater levels of self-regulation, or responsibility for managing the factors that affect learning. The goal of the model is to help students acquire the language and learning skills needed for further academic study. The theoretical background for this approach is next examined followed by a description of the team-based approach, the design model, and examples of course activities.

Theoretical background

Compared to other areas of study, language learning has been a feasible option for distance education only recently. Some language teachers still question the viability of this model in terms of supporting interaction and communicative practice. Although the interactive components and language rich environment needed for language acquisition have contributed to the slower growth of language learning instruction through distance education, languages can and are learned successfully through this mode of delivery. Learners include those in the first language environment and those in a foreign language environment who seldom encounter the language of study in daily life. Three concepts relevant to online language learning include language acquisition, or creating a well-balanced language course, transactional distance, and self-regulated learning.

A well-balanced language course, regardless of delivery mode, consists of four strands: meaning focused input, meaning focused output, language focused instruction, and fluency development (Nation, 2001). In other words, to acquire a language, learners must have input in the form of reading and speaking and opportunities for output in the form of speaking and writing. Both input and output must focus on comprehension of meaning. Learners also need to study the rules, systems, and structure of the language. Finally, they need to practice all language skills—listening, reading, writing, and speaking—using the language they have already acquired in order to develop fluency. These four components should be present in a course in approximately equal amounts. Language acquisition can be difficult to support in an online or distance learning environment; however, the elements mentioned can be

incorporated and supported by various forms of technology including live interactive tutoring or conferencing sessions, discussion forums among students, collaborative group projects, and posting videos.

The theory of transactional distance encompasses three components: structure, dialogue, and autonomy (Moore, 1983, 2007, 2013), and describes the interaction among the teacher, learners, and course materials. Transactional distance is the psychological space between the learner and the instructor in a distance education context (Moore, 1983, 2007, 2013). It can be mitigated by the elements of structure and dialogue in order to increase learner autonomy. Autonomy, encompasses both choice and self-direction, plays a critical role in successful distance learning. Structure consists of established content and organizational elements including instructional units, presentations, exercises, activities, and deadlines. When these course features offer limited learner choice or decision-making, autonomy is low. Dialogue involves learner and instructor interaction and can take a variety of forms such as discussion forums, announcements, email exchanges, technology-mediated live interactive tutoring sessions or office hours, and assignment feedback. When dialogue is extensive, learner autonomy is low, as learners depend on teacher direction.

Autonomy increases as learners are allowed and encouraged to control what, when, where, and how they learn. It may be characterized by instrumental or emotional independence. “Instrumental independence involves the ability to undertake an activity, including learning, without seeking help; emotional independence is the capacity to pursue the activity without seeking reassurance, affection or approval in order to complete it. The drive to achievement is derived from a need for self-approval” (Moore, 1983, p. 162). However, autonomy does not generally imply complete independence or a lack of support but rather a state of interdependence among teachers and learners (Little, 1995), or what some have referred to as collaborative control (White, 2003). In most cases, learners must develop the capacity for autonomy through instructor facilitation. Structure may be more pronounced in the beginning stages of a course as the instructor orients students to the content and activities (Sabha, in press). Adaptive learning experiences can be utilized based on the learner’s capacity for autonomy and level of dependence on structure (Sabha, in press). “As individual learners become more knowledgeable and skilled, structure … tends to decrease, thus decreasing transactional distance” (Sabha, in press).

A related concept to autonomy is the theory of self-regulated learning. The latter is defined as learners taking responsibility for the factors and conditions that affect learning (Dembo, Junge, & Lynch, 2006). This theory provides a useful framework for distance learning as it

indicates *how* learners can develop the skills that allow them to be autonomous in the sense of possessing the ability to take control of their learning. The theory consists of six dimensions: motive, methods of learning, time, physical environment, social environment, and performance (Dembo et al., 2006; Zimmerman, 1994). Learners identify their purposes for learning and set goals (motive); they increase knowledge of and the ability to use a variety of learning strategies (methods); they evaluate their use of time and set priorities (time); they monitor their physical environment and eliminate distractors or change their study locations (physical environment); they learn to recognize that seeking help is a positive behavior and can identify when and where to find appropriate help (social environment); finally, they regularly self-evaluate their performance and revise their goals as needed (performance). Course activities that help learners self-analyze, implement self-regulated learning strategies, and reflect on their progress can be part of the course design and supported by teacher response.

Team-based design

While it is increasingly common for individual faculty members in higher education institutions to modify their courses for partial or full online delivery, these courses are often designed for on-campus students; thus, in some respects, are not true distance courses although the psychological distance referred to by Moore (1983, 1997, 2013) is relevant. The development of English language courses or a series of courses has distinct development considerations. Academic English language programs, designed to prepare learners for university coursework, typically operate as well-coordinated units in which instructors teach from a common curriculum with established course objectives, textbooks, assessments, and advancement standards. In these programs, courses are not owned by a single instructor who teaches a particular course every semester and has autonomy over its content and delivery. In such programs, curriculum changes are collaborative and course assignments may vary each semester depending on learners' needs. Similarly, instruction within and between language proficiency levels (i.e., beginning, intermediate, and advanced) must be carefully designed so that learners can progress seamlessly through a program and complete it with the requisite proficiency to succeed in university courses. All of this takes coordination and oversight. As such, English language courses designed for distance delivery are typically not instructor-specific but adhere to an established curriculum and are characterized by a style suitable to a range of instructors.

Figure 1 illustrates the two scenarios with the individualized model being more traditional and the collaborative model being most appropriate for sequenced online English language

courses as described. The latter model lends itself to greater scalability due to the fact that multiple instructors (full and part-time) are able to teach the courses and the content, design, and style accommodate this. The collaborative model allows for flexibility of content and design changes as needed due to being centrally owned and managed. Instructors responsible for individually designed courses have autonomy over changes in their own courses. Both models are appropriate for on- and off-campus learners.

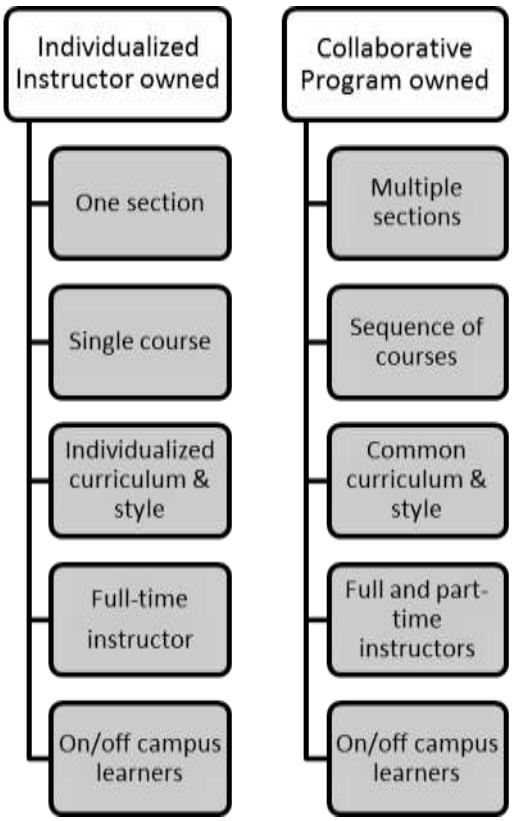

Figure 1. *Individualized and collaborative design approaches.*

The collaborative model lends itself well to team-based design with multiple contributors. This model has a number of variations. One of these includes a variety of individuals who can contribute their expertise not only to designing the course, but also to teaching it (UNLV Faculty Institute on Research-Based Learning for High Impact Classes, 2010). This includes instructors, librarians, assessment experts, learning assistance staff, instructional designers, and technology specialists (Andrade, in press-b). Of these examples, those most likely to provide direct teaching assistance in coordination with the instructor are librarians and learning assistance staff. An advantage of this model is that support is embedded within the course rather than extraneous to it, and students become acquainted with those who will assist them in their learning endeavors.

A variation of this model, and perhaps one that is more common, is for members of an academic department to develop a course together and coordinate with those outside the department to access expertise they lack (e.g., instructional design, library or peer tutoring services, technology and media assistance) (Andrade, in press-b). Roles for various contributing instructors include writer, editor, content specialist, assessment specialist, and potential instructors (particularly those who will pilot the course). Generally, this group needs a coordinator with expertise in distance learning who manages the project; identifies, assigns, and directs tasks; ensures that collaboration occurs; invites discussion but makes final decisions; and communicates and coordinates with supervisors and stakeholders. Figure 3 provides guidance for development team leaders related to these responsibilities.

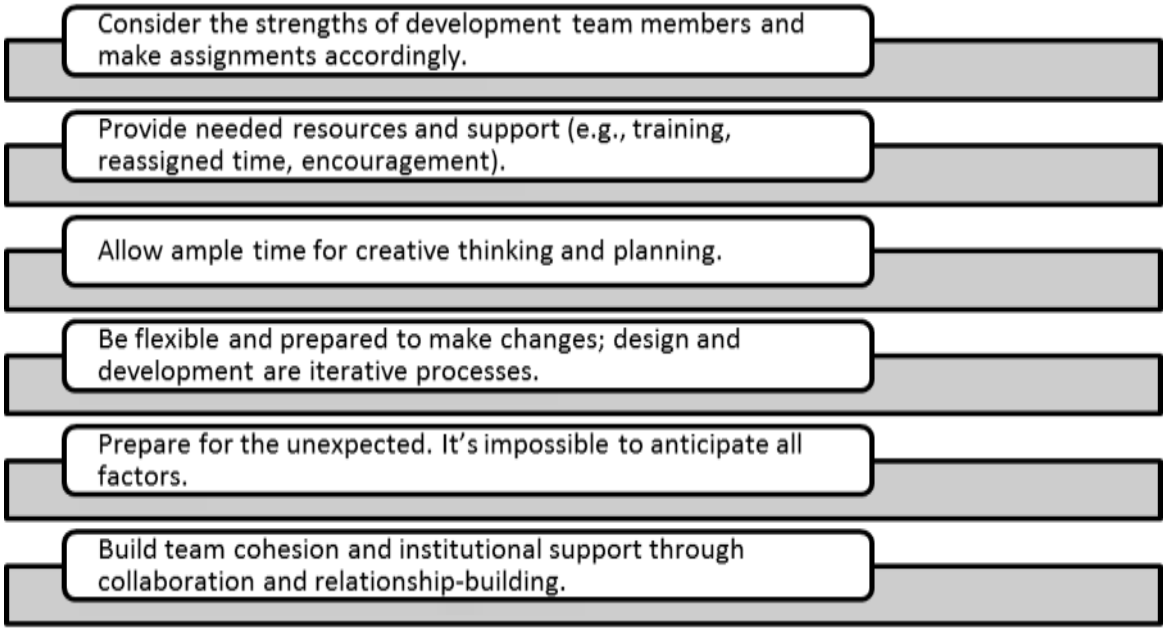

Figure 2. *Development team guidelines*.

The development team lead also has primary oversight for determining if the delivery will be synchronous or asynchronous, developing a scope and sequence plan to guide design, creating assignment templates and styles, setting project development phases and deadlines, identifying appropriate activities and related technologies, and ensuring that the needed institutional infrastructure exists (e.g., registration, technology help, student advisement, etc.). Much of this can be delegated and decisions made collaboratively, but the project leader oversees all of these elements. On an institutional level, certain elements must also be in place. These include a clear guiding direction; the alignment of distance learning initiatives and strategic plans; quality standards; instructor support; ownership, copyright, and compensation policies; learning management systems, and financial resources (Franker &

James, in press).

Course design and activities

The primary goal of the development team is to identify the objectives for the course, needs of potential learners, and the most effective pedagogical approaches and content. To do this, the team should consider the following elements to create a development plan and determine an appropriate design. In this section, each of these elements is illustrated with examples from the development of English language courses for global learners.

- Learning philosophy or model
- Scope and sequence
- Course components and requirements
    - Interaction
    - Pedagogy
    - Technology
    - Orientation, training, support
- Structure & templates
- Timeline

Learning philosophy

Although not all distance courses have a theoretical background that guides design, in the case of English language courses for global learners, the development team recognized that to be successful, those enrolled would need to take greater responsibility for their own learning. This determination was based on the team members' experiences with learners in face-to-face courses and the cultural adjustments these students needed to make, particularly in terms of becoming accustomed to a learning-centered rather than a teacher-centered educational environment. To accomplish this, the dimensions of self-regulated learning served as a framework (e.g., see Andrade, 2012, 2013; Andrade & Bunker, 2009, 2010, 2011).

In the courses, the self-regulated learning framework is integrated with the four strands requisite to language acquisition and the elements of structure, dialogue, and autonomy as accounted for in the theory of transactional distance. The integration of these theories is illustrated in Figure 3.

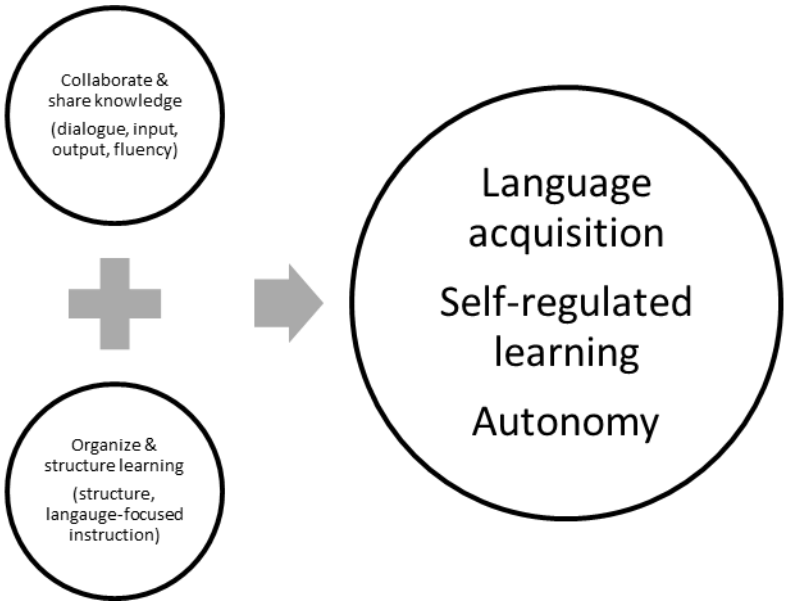

Figure 3. *Theoretical integration.*

Activities such as discussion board posts (written or oral) in which learners comment on prompts about readings, post essay ideas or first drafts, and then respond to their peers based on guiding questions create dialogue and apply the social environment dimension of self-regulated learning for collaboration and community-building. These activities also provide meaning-focused input and output and fluency-building opportunities to advance language proficiency. The discussion board post assignment, directions and guidelines, examples, and scoring rubric are part of the structure of the course, which also includes deliberate language instruction regarding organization patterns, grammar, and vocabulary. In this way, the various components of transactional distance, language acquisition, and self-regulated learning are integrated to result in increased English language proficiency and self-regulated learning behaviors.

Scope and sequence

Based on the theoretical framework, the team determined the content and how it would be organized within and across units. The content was set by those who were familiar with the academic skills and proficiencies needed by learners at various language levels to prepare for academic coursework. The content was then divided into 12-week modules to span the length of the course. For example, the content of each module for an intermediate level reading/writing course was specified as follows: 2-3 readings with exercises focused on various skills (e.g., finding the main idea, identifying details, understanding rhetorical patterns, making inferences), the introduction of a writing pattern and related instruction (e.g., narrative, descriptive, comparison/contrast, paragraph and essay organization, topic sentences, thesis statements, unity, coherence), the introduction and practice of a self-

regulated learning strategy, vocabulary study, timed readings, learner journals, peer tutoring, and a unit self-check.

Additionally, an introduction week was created to orient learners to the learning management system, the technology needed for the course (e.g., posting to the discussion board, capturing a video, submitting assignments, uploading files, checking grades, and communicating), and the content, requirements, and grading of the course. This week also provided an opportunity for teacher and student introductions. Performance checks and testing were built into the midterm and final weeks. Some assignments spanned more than one week such as the planning, drafting, and revising of paragraphs and essays. All instruction was sequenced to introduce, practice, review, reinforce, and build mastery of the identified skills over the duration of the course.

Course components and requirements

Regardless of the content or discipline, all distance courses benefit from certain features such as interaction (e.g., dialogue) among learners and instructors; learner-accessible technology that enables effective learning; orientation, training, and support mechanisms; and pedagogical approaches that support the achievement of learning outcomes. The following quote illustrates how interaction and technology can be integrated to help learners create new knowledge.

Today, software applications can receive data from learners, learn from them and provide them differential responses based on how each person acquires new knowledge. The ideal dynamic learning system would generate differential responses to a learner interactively, thus limiting or eliminating confounding states. In addition, it would prompt each learner to participate in a learning community where the learner can express novel ideas, display creative endeavors, and attain objectives that have not been set in the system a priori. Another outcome for learners would be validation of new learning by interaction between peers and instructor (Sabha, in press).

This description demonstrates how structure and dialogue can promote autonomy—the structure of the course allows for autonomous learning in the sense that the technology customizes the content to the learner's needs based on the learner's selections and performance. Dialogue occurs through interactions with others in the course. As learners share knowledge, new ideas are generated, considered, and validated. The instructor may participate in this learning community. The instructor also provides dialogue in the form of

response to learning activities (e.g., see Andrade, in press-a). As this cycle continues, learners gain confidence and become self-directed in their choices and application of strategies.

In the English language courses, technology is kept simple due to variations in technological skill among potential learners, their access to and the cost of technology (e.g., some learners rely on internet cafes), and inconsistency in internet availability due to power outages and other problems. Decisions regarding technology use must consider the target learner and context. For global learners, a wide range of situations can be expected. As such, technological support must be robust and include tutorials, and help desk support through telephone, email, and live chat.

While sophisticated technology is not used to individualize instruction in the online English language courses, a variety of activities provide interaction (dialogue) and the opportunity for participants to share knowledge with each other, receive feedback from peers and instructor in an individualized way, and make learning gains. Interaction is a critical pedagogical tool for language acquisition so that learners can hear and read the language, practice using it, test rules, receive feedback, make adjustments, and build fluency. Interaction is also related to the social environment dimension of self-regulated learning, which indicates the value of help-seeking from a variety of sources, including other learners. Design models that provide the opportunity for socialized learning (i.e., the social environment), which is often primarily associated with face-to-face environments, demonstrate how communities of learners can be created online.

Learners, at times, become teachers and teachers learn from their learners. In the traditional models of education, the focus is on how the subject matter is structured and presented by the instructor. In non-traditional education, the learner can be an equal participant in the process of learning and teaching although the instructor must ensure that the community observes the structure and integrity of the academic discipline. The learners' voice is increasingly amplified in the contemporary social media environment (Sabha, in press).

A course feature that exemplifies what is described in this quote is a discussion board in which learners respond to prompts and to their peers' responses (in writing or orally through a video). They are asked to follow set guidelines for language use and respect for their classmates as they share their understanding of what they are learning, teach and learn from

each other, and are guided by the instructor. In this way, structure and dialogue are integrated to achieve learning outcomes. As the quote indicates, instructors can also learn much not only about their students, but from their students and their students' life's experiences through participation in this community.

As established earlier, the English language courses are designed pedagogically to utilize structure and dialogue to support both language acquisition and the development of self-regulation, or the learners' ability to set goals, self-evaluate, implement strategies, and reflect on progress. The following course components, for example, provide structure through assignment directions and also utilize the social environment, dialogue, and opportunities for input and output.

- Weekly technologically-mediated appointments with native-English speaking peers
- Virtual office hours and conferences with the instructor
- Discussion board postings and responses
- 1-2 assignments per week with written instructor feedback and rubric
- Paragraph and essay drafts shared with peers and the instructor
- A weekly choice of a self-regulated learning activity followed by reflection in a learner journal
- Mid-term and final self-evaluations of performance.

The assignments are based on the content needed to develop academic English language skills, and encourage application of learning strategies and interaction. In their learning reflections, students focus on how they have applied the six dimensions of self-regulated learning (motive, methods, time, physical environment, social environment, performance) to improve their learning skills and English proficiency. The instructor facilitates the development of set learning outcomes through collaborative control (White, 2003), or by varying the amount of dialogue provided, individualizing feedback as needed, facilitating the discussion board, using whole-class feedback (Andrade, in press-c), and other strategies.

Structure and templates

In addition to the structure of the course in terms of organization and sequencing, as determined by the scope and sequence, structure also includes determining the formatting, styles, and templates for the various modules and assignments. Having a consistent look and feel to the course helps learners navigate and know what to expect. A repeated structural pattern in each module or unit is also important. This includes the same order of components within a module (e.g. pre-reading activity, vocabulary preview, reading passage,

comprehension questions, vocabulary activity, reading skill focus and practice, writing skill focus and practice, summary, quiz), style of headings, and consistent assignment submission due dates (e.g., certain assignments due on Wednesday and others on Saturday).

For the English language courses, structure is provided on the course home page, through consistent sequencing of activities and assignments for each weekly module, by standardized formatting and document design, and with templates such as timed reading charts and rubrics for writing assignments. The timed reading charts allow learners to track their reading fluency and comprehension, or to self-monitor their performance, while the rubrics contribute to learner awareness of the need for self-checks and taking responsibility for the application of writing skills practiced in the course to improve the quality of their writing. In this way, structure supports the development of self-regulated learning and autonomy.

Timeline

As indicated in Figure 2, distance course development requires time for thinking and planning and also to allow for possible missteps and changes of direction. Figure 4 indicates the major steps in course development. However, this linear sequencing does not always represent reality. Depending on the context and the time available for the project, planning, building, and piloting may occur simultaneously or courses may be revised as they are being piloted based on immediate feedback from instructors and learners.

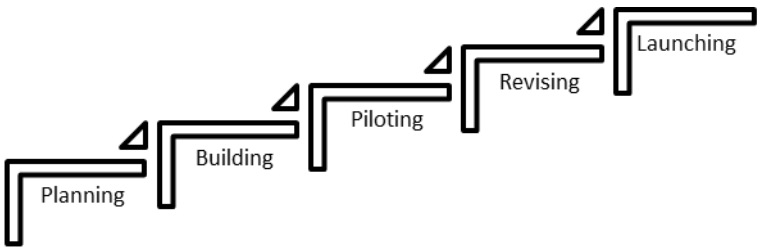

Figure 4. *The iterative process of distance course development*.

Because of the resources needed to develop a course, however, and the countless hours that the development team devotes to it, when development is complete and a course is launched, the life of the course should be 3-5 years unless the content is quickly changing as is the case in some fields. A determination needs to be made as to the types of changes that might occur on an on-going basis and who has the authority to make these changes—for example, minor changes such as errors or unclear instructions compared to major changes such as new content or requirements. A reporting system could be created for the former and the changes made by a centralized agent while recommendations for the latter could be tracked, reviewed at a designated time, and considered for implementation in the next version of the course.

Conclusion

Distance education expands access to new populations of learners. Innovations in course design processes and models support these populations in acquiring new skills not only in designated content areas but in developing autonomy, self-direction, and self-management through active, learning-centered approaches. Online courses can provide opportunity for new types of interaction through which students learn, share, build confidence, create community, and extend global knowledge. The following two student quotations illustrate:

> The opportunity to speak with people from another country gave me confidence to speak English. I realized I am able to communicate in English with other people; this was a great feeling, and gives me security to keep going.

> Interacting with my speaking partners helped me develop confidence in my abilities to continue to learn and grow. I became more comfortable in my speaking, reading, and writing skills. I loved our opportunities to exchange knowledge and experiences. I received so much positive feedback from my essays during this program, that I can now confidently express all my ideas, feelings, thoughts and experiences on a piece of paper.

A team-based design model offers distinct advantages when institutions aim to develop a scalable approach to online education and extend their borders. In addition to the model, a pedagogical framework that supports interaction, community-building, and the ability to manage one's own learning provides learners with lifelong capacity for continued growth and contributions.

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Methodological challenges to evaluation in fully open learning postgraduate studies

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Abstract

In a continuously changing world, where competitiveness demands workers to stay up to date with new advances, sustainable management of knowledge transmission is required. Distance learning is the key tool to provide this on-going education. It is easy for the student to find all required information with information technologies (IT) empowered transmission and storage of knowledge. Universities may also establish strategic alliances that join their strong points and provide better services at lower costs, through networked curricula. So the IT era has the potential to improve the access to up-to-date expertise and to specialist's know-how, to highly qualified workers.

Furthermore continuous evaluation of the success of this transmission is mandatory. This used to be an easy task in a closed and controlled environment such as traditional university exams. However these are costly when come to provide continued education to students who cannot move to university classrooms. On the other hand, professionals seeking self-improvement should be highly motivated and well prepared for a non-guided learning, and fully responsible in writing their reports showing their course progress.

This ideal picture is, however, not real. IT have increased plagiarism in the form of "copy & paste" from different (often un-referenced or un-authoritative) sources. This makes difficult initial, formative and summative evaluations. Thus advantages of full open learning become a drawback for its quality assessment and success.

In this communication, we report our experience in postgraduate studies, summarizing our strategies to overcome these drawbacks through activity innovation and problem based learning.

Keywords: evaluation, open learning postgraduate studies, plagiarism, copy-paste

1. Introduction

The amount of accumulated knowledge grows exponentially with time (Tague et al., 1981). This fast production demands to the workers (in a broad sense) a continuous update of their instruction to keep up to date with new techniques and knowledge. These ongoing learners live outside the regular educative contexts but they need the structured knowledge provided by the university. On the other hand, ever increasing competitiveness in the labor market prioritizes workers with higher qualification certified by the university.

These qualified employees face two problems: the cost of regular university and the time required to attend regular courses. However, they have an advantage: they are already graduates with proven skills and highly motivated. Their best chance to earn a postgraduate university certificate is online distance learning.

1.1. Opportunities and Advantages

Information technologies (IT) assisted learning suggests many opportunities related with resources availability and sharing and organization strategies. For instance, there are many repositories with open contents[1] and open courses[2] provided by universities. Because of their high quality, these materials can be recommended as supporting notes and media to complement regular courses. IT also allows the organization of multicentric regular courses providing the best of each faculty. This strategy often encounters with organizational problems related with the payment for these distributed services, a problem to be addressed by the university administration (out of the scope of this paper). These alliances to improve teaching quality are simpler in distance education than in classical studies where student or teacher mobility is a concern. This distributed model, thus, enables the selection of the best specialist to teach each subject at a lower price and effort. IT may thus get traditional universities (TU) closer to distance teaching universities (DTU): this is leading the XXI century university towards a new organizational model (Antoranz et al., 2013).

[1] See, for instance http://e-spacio.uned.es

[2] http://ocw.mit.edu

The IT distance learning model has already shown its advantages from the point of view of both university and postgraduate students. For the first one, staff and resources are highly optimized. For students, distance learning is compatible with a job. For this reason DTU should be a more affordable option than TU, but they are not, at least, in terms of tuition fees. Moreover, and despite it could be paradoxical, this model allows for student-centered learning in the sense of Bologna's spirit (Rodríguez-Pérez et al., 2008; Antoranz et al., 2009a, 2009b).

1.2. Weaknesses and Costs

Despite these opportunities, actual DTU face several problems. The first one is that new students have to be taught to learn at a distance. Autonomous study is a skill that must be developed first, as it has not often been acquired in TU, where studies have been too directed and supervised; besides the recurrent marketing leitmotif that anyone can study at DTU, this is not immediately true. And this leads to the second problem: the high dropout rate in DTU, which is a major problem for both the university and the students. However, as Powell (2009) has concluded, "you have to drop in before can drop out": most dropouts DTU are not "dropout", but non-engagement. This behavior is similar to collection per instalments: a month after start of the collection, you leave it. Overconfidence in self-capacities and lack of discipline leads to aim to objectives that are not compatible with "real life". The third problem derives from this lack of engagement: it is very difficult to evaluate the student from a few works spread along the course, with no other interaction with the teacher. Students should understand their assignments as a way to show their skills, abilities and competences and not as mere comprehension syntheses or, even worse, as data sampling from the web. In this sense, Internet and Bologna make a dangerous combination. In other words, copy & paste ideology, so many times seen in digital news media (Bosanac, 2009), poses a problem for IT based education: we are accustomed to not knowing the original source of information, and neither caring about it. Some authors even believe that this is the zeitgeist of our culture, i.e. the spirit of our age, and that this all information sharing is jointly beneficial (Maurer et al., 2013). However, more information does not mean greater creativity, even more if there is no quality filter due to the gratuity of Internet information. The students may believe that you can find all you seek on the Web, and thus everything is already written for them.

The objective of this paper is to show and propose strategies aimed at overcoming these drawbacks of bad use of IT in postgraduate studies through activity innovation and problem based learning.

2. Challenges and strategies

Limitations in the access to resources by distance learning students in the pre-IT era have

disappeared as well as delays in feedback by their teachers. This was not, of course, the situation in TU with well-endowed library in each campus as well as students and teachers. This brought up new educational strategies approaching DTU to TU in the framework of the Bologna model. This is particularly remarkable in the case of evaluation methods, that is, to evaluate skills, abilities and competences at the same time in the same assignment, because all students have the same opportunities to reach all information on Internet from their homes. However, information is not enough and knowledge is not the only item to evaluate. The use of information to solve actual problems must be the goal, and the main role of the university teacher is to show the pathway to gain this goal successfully. This was done through see-and-reproduce in TU; in DTU, it can be done through formative evaluation, i.e., critical revisions of assignments with e-mails back and forth. This follow-up process is more time consuming for the DTU teacher.

Even highly motivated postgraduate students (as our students in the Distance learning Master on Medical Physics; J.C. Antoranz et al., 2009a, 2009b) attempt to follow the basic physical "least action principle", by copying and paste from the unlimited documents available from the Web about, virtually, any topic. They see this as something customary because they see it in news media, but also in some university web pages and repositories. This has been called the Google-copy-paste syndrome (Kulathuramaiyer & Maurer, 2007). To avoid this behavior we propose to our students personalized homework, focused on the development of their skills and abilities, as well as open problems about recent techniques (although related to the underlying physical foundations), that each student is expected to address differently. These two approaches have been found highly motivating by most students, as well as teachers: it requires a small continuous research activity, not only during problem statement, but also during the revision of student assignments.

Each assignment passes at least two revisions. In the first ones, teacher indicates all errors and weak points in the work and provides a personalized response to the student. Depending on his/her profile the student is suggested a different or alternative approach to improve the work done. In the last revision, the teacher gives a final mark to the new submitted assignment, taking into account the changes and how closely the student has followed the previous indications. We want to point out that the average time per student and assignment is around 150 minutes.

3. Discussion and Conclusions

We have found that to avoid plagiarism in distance learning assignments, i.e., the bad use of IT by postgraduate students, it is necessary to personalize those assignments, to propose cutting edge topics (simplified real problems) and change these assignments every year. Our main objective was to improve the continuous evaluation in a highly specialized master and

as a by-product; we have got a strategy to discourage plagiarism among our students.

Our master's language is Spanish, although scientific references are almost all in English. Anticopy software is unable to detect machine or human translations from English to Spanish. This is the back-door of all systems.

In any case, all mandatory courses have a final examination in one of our Associate Centers around the world with a board that checks the identity of the student doing the exam. This summative evaluation provides us with an idea about any deviation between the skills allegedly proven in the assignments and the actual ones proven in the exam on site.

We believe that, with motivating activities and feedback and guidance from course teachers (that is, formative evaluation), it is possible to make a good assessment of student's competences (summative evaluation) avoiding plagiarism in postgraduate studies.

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Opening up education the Danish way: Considerations based on the redesign of a Master programme in ICT-based Educational Design

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Abstract

This paper is based on the ongoing experiment of opening up a Danish Master programme in ICT-based Educational Design to a broader public network of students, teachers and learners.

In its present form, the programme is a 2-year full time study delivered in a dual mode of face-to-face seminars and periods of online activities. The programme offers a Master in ICT-based Educational Design to bachelors in teacher training, pedagogical professions and university subjects, who are aiming at teaching in secondary education. The candidates learn to integrate and design digital tools within the teaching and learning practice of their institutions.

The objective of the present renewal of the programme is to open it up to a variety of target groups that would connect to the educational content available as open educational resources (OER) in different ways. The expanded target group includes future/former students, students from other programmes, and teachers and researchers from university colleges.

In order to have an economic basis for the operation we will still offer the programme for full-time students in a dual mode with full teacher/tutor support and an exam/degree in the end (counted as ECTS and financial support). At the same time the Open Educational

resources will be supplemented with a study-guide and offered to the public as a MOOC with very limited tutor support. A special advisory service will be developed for future full-time students using the MOOC as a pre-study introduction.

The considerations behind the opening up process will be elaborated in the paper.

Keywords: Opening up education, Open educational resources, MOOCs, Flexible learning, Didactic, Pedagogy, Educational design.

Opening up education

Information technology and digital media have penetrated everyday life for more and more people all over the world. Especially mobile phones have developed into mini-computers with a great variety of facilities:

- Phone
- SMS & MMS terminal
- Internet connection – email and www
- Camera and Video Camera
- Audio recorder
- Mp3-player
- Radio – and sometimes even TV
- Mobile play console
- Personal assistant
- GPS – positions marker

The mobile phone has rightly been called the Swiss knife of the information age due to the availability – always at hand – and to the many communication tools contained in one device.

But access to information technology and communication does not necessarily improve education and knowledge acquisition. Being a regular user of Facebook does not automatically make you a competent learner using digital media for communication! To become a competent learner involves a learning process in its own right.

In the “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions” from September 25, 2013 the Commission summarises the European educational situation this way:

"Digital technologies are fully embedded in the way people interact, work and trade; yet they are not being fully exploited in education and training systems across Europe. A recent study on the state of digital provision in schools in the Union revealed that 63% of nine year olds do not study at a 'highly digitally-equipped school' (with appropriate equipment, fast broadband and high 'connectivity'). While 70% of teachers in the EU recognize the importance of training in digital-supported ways of teaching and learning, only 20-25% of students are taught by digitally confident and supportive teachers. Most teachers use Information and Communication Technologies (ICT) mainly to prepare their teaching, rather than to work with students during lessons". (p. 2)

The communication has the title "Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources" and advocates the point that

"Open technologies allow *All individuals to learn, Anywhere, Anyway, through Any device, with the support of Anyone*" (…) Most importantly, education and knowledge are able to travel far more easily across borders greatly increasing the value of and potential for international cooperation. Thanks to Open Educational Resources (OER), and namely MOOCs, teachers and education institutions can now reach thousands of learners from all five continents simultaneously, showcasing that language is not always a barrier. Cooperation is enhanced by allowing learners, educators, researchers and institutions to create, share and discuss content with peers from all over the world. (p. 3).

To a large extent we support these visions for the future and aim at realising these ambitions within a Danish context, but, at the same time, we retain a certain scepticism and remember the saying of David Wiley: "If content is all we need, why would we need universities? Libraries could do the job!"

Learning in the 21st century

The new educational technologies offer as pointed out by the Commission, new possibilities for learning to be utilised by the institutions. But the radical challenge is to develop a personalised use of the new media. So far the institutions have been the ones to create the learning environment around the teacher and the weekly scheme for learning activities. The new options are to create a personalised learning environment for the learner – a learning environment built by the learner/student/pupil incorporating all learning experiences, formal as well as informal picked up by the learner (Atwell, 2007, Wilson et al., 2006). Formal learning organised by institutions may be part of this but so will informal learning generating from net-activities, participation in cultural events, media consumption, etc.

The educational challenge is to teach the learner how to build this personalised learning environment and how to further develop it. For the researchers and teachers the tasks are to develop technologies that support the learning process and prohibit barriers to learning through the introduction of learning activities.

A Master programme in ICT-based Educational Design

In order to meet the challenges sketched above with inspiration from the Opening Up Education initiative, Open Educational Resources (OER) and MOOCs (Massive Open Online Courses) the Centre for Teaching Development and Digital Media, Faculty of Arts, Aarhus University, Denmark has developed a Master programme in ICT-based Educational Design.

In 2012, this educational programme was redesigned in order to accommodate a broader public of students. The objective of the initial redesign was to attract students from across Denmark, and not least students with part-time employment. Prior to the fall of 2012, the educational programme followed a structure traditionally employed in Danish higher education with two or three lectures each week. Lectures would typically last three hours. In contrast to this, the redesigned course programme has a minimum of face-to-face meetings and other forms of synchronous communication. Instead, the educational programme is primarily based on online communication, primarily in an asynchronous form. Since the 2012 redesign, it has been a key objective to further develop the programme towards increased openness to accommodate students across the country – at the moment approximately 35 students enrol each year.

During a 2 years full-time programme the goal is to educate key-persons to organise the implementation of IT in educational institutions and/or in relation to the integration of IT-support in informal learning processes based on didactic considerations.

This is a translation of the goals taken from the official Study Guide in a very formal language and without the visions formulated in the Commissions Communication. Nevertheless, the intention to change the educational system in Denmark at all levels (not least at university level in the perspective of lifelong learning) is the same as within the programme: Opening Up Education. This becomes obvious when looking into the website accompanying the Study Guide. Here examples of how the learning process is organised and how the students/learners fulfil their learning activities are presented. Unfortunately this website is at the moment only available in Danish (http://pages-tdm.au.dk/omitdd/) as is the education. When tested, the Centre for Teaching Development and Digital Media will consider offering the Master programme in English.

The Master programme in ICT-based Educational Design is open for students with a

bachelor degree in teacher training, pedagogical professions and university subjects aiming at teaching. The candidates learn to integrate and design digital tools into the teaching and learning practice of their institutions. So far the majority of applicants come with a Teacher Training background and are recruited from all over the country.

The programme is a full-time study programme for two years organised as dual-mode education with on-line activities supplemented with some face-to-face seminars at Aarhus University. The content of the programme is divided into 6 learning modules placed in 3 semesters + a 4th semester for thesis writing:

Table 1. Structure of the educational programme.

1. semester	Learning and Context (10 ECTS)	Learning Theories and Learning Technologies (20 ECTS)
2. semester	Digital Media (10 ECTS)	Design: Theories, Methods and Practice (20 ECTS)
3. semester	Profiling Subject (10 ECTS)	Institutions and Organisations in an ICT Didactic Perspective (20 ECTS)
4. semester	Thesis (30 ECTS)	

The ambition is to present all the educational material (articles, books chapters, slides, etc.) as Open Educational Resources in collaboration with the university library, and to build an interactive and dynamic online learning environment. See more below.

The educational progression of the learners/students are monitored and guided on-line by the staff at Centre for Teaching Development and Digital Media. The face-to-face seminars are also conducted by the staff and may be supplemented by guest lecturers.

The Master programme is financed through the ECTS points the students accumulate via the exams they pass. In Denmark access to a full-time study is based on a numerous clauses principle (highest grade) and the students are not charged any study-fee. The university is paid from the government on the basis of the numbers of students that graduate. At the same time, it is explicitly clear that the income is used to run and improve the study facilities for the students matriculated at the university. Part-time studies in Denmark are financed

through a fee paid by the student and supplemented by a government grant.

Content and pedagogical practice – didactic considerations – learning activities

As already mentioned, the curriculum - the educational resources – are made available for the students as Open Educational Resources and form a fundament for the key learning activities in the programme. The overall pedagogical philosophy behind the educational programme is a student-centred approach. Thus, redesigning the courses has had a primary focus on planning student activities. To engage the students, the courses aim at facilitating student collaboration, discussion/dialogue and production.

First of all, all courses focus on making students produce. Productions could be as simple as text, but also include a variety of media presentations and especially video. Students were divided into groups, and many of the assignments were group assignments that required students to collaborate closely. Finally, students would provide each other with feedback on their assignments and productions, thus engaging in dialogue and discussion.

A range of digital tools have been employed to support the activities of the courses. Forums (Buddypress) are used for each course to communicate on practical issues. A multiuser blogging platform (Wordpress) is used for both student and teacher blogging. A tool for students' collaborative writing (Google Docs/Drive) is used to support group work. Students share documents in groups and with the teachers, enabling teachers to follow the writing process and provide feedback. Google Docs/Drive enables synchronous editing of documents, comments with discussions, and a chat within the documents. The objective of Google Docs/Drive is to support close collaboration between students, who are oftentimes not able to get together. Finally, screencasts are used for short video lectures (YouTube), and videos (YouTube) are used for student presentations. The teacher video lectures are relatively short presentations of themes, concepts and theories from the courses.

Current openness in the educational programme

The Wordpress blogging system combined with YouTube play a key role in opening up the educational programme. At the beginning of the first semester a main blog of the educational programme is created. The blog provides an open space for both students and teachers to write posts related to the course. The blog is open, and everyone on the web

can read it. This blog is used by teachers to set assignments to students and to embed video lectures. Furthermore, the blog is used by students to post their responses to the assignments. At a later stage in the programme, students create group blogs that are also open and available on the web.

As stated above a focal area of the use of digital tools has been to open up the educational programme. So far, this is accomplished in the following ways:

- Assignments from teachers
- Teacher video lectures
- Student assignments and productions
- Communication and discussion

Assignments posted by the teacher are open and available on the web. This makes it possible for people outside the courses to follow the activities of the courses. Also, teachers' academic posts including video lectures on course subject matter is open and available, making it possible for non-students to get an insight into the themes and content of the educational programme.

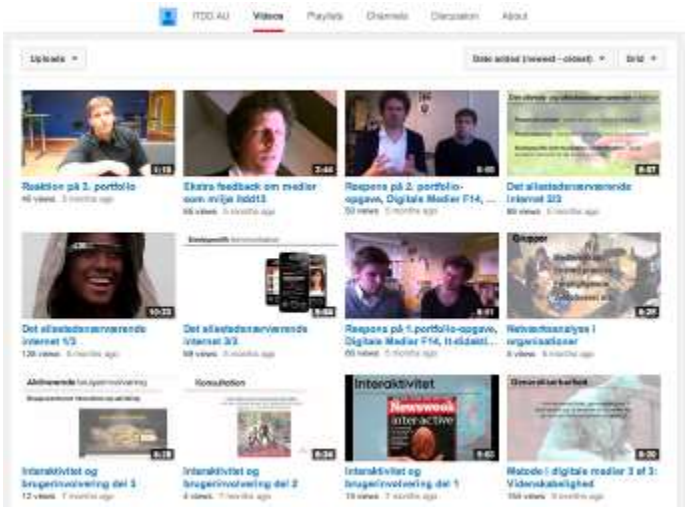

Figure 1. Teacher video channel on YouTube with video lectures.

Although students write some assignments within Google Docs/Drive, many of the assignments are in the form of open blog posts. Thus, it is possible to follow student activities on the main blog of the educational programme, but also within the student group blogs.

Figure 2. Student blog post.

Finally, dialogue and discussions between students and teachers have also been made publicly available in the form of comments within the blog posts.

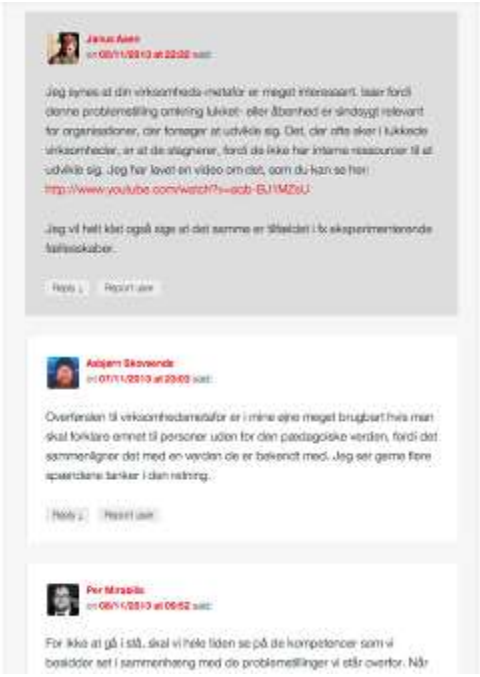

Figure 3. Discussions between students and teachers.

The first step has been to open up as many of the educational activities as possible to the enrolled students, but also with the perspective of opening the programme to a wider audience.

Opening up to a wider audience

The ambition of the Centre for Teaching Development and Digital Media is to reach further with the Master programme in IT and Didactic Design than the above sketched target group. We are convinced that approaches to learning supported by IT and implemented from a didactic perspective is the way forward to renew education in Denmark through the building of personalised learning environments. Therefore we want to offer the content of the Master programme and the research behind, to a larger audience. The group we have in focus is colleagues at other educational institutions – primarily teachers at universities and university colleges, but also teachers at high schools and schools, and staff involved with informal learning. A third target group for our consideration is potential students in the Master programme for ICT-based Educational Design. To reduce the drop-out rate, we want to improve our introduction to the study by giving potentially new full-time students access to the learning environment in order to test their abilities.

In order to build a sustainable model for this operation we have developed the master programme within the formal educational system of the university in order to have the development costs covered – for both the open educational resources, the research and the teaching costs. In the next phase we plan to reuse the open educational resources in a series of MOOCs aimed at our secondary target group with online delivery, but very limited staff support.

As further described below we don't believe in the option of creating MOOCs that are able to meet the needs of inexperienced learners. On the other hand, we firmly believe that MOOCs are a useful and effective tool to distribute knowledge through the combination of educational resources and learning activities to experienced learners in a lifelong perspective.

Our next step is to reorganise the learning environment for the Master programme in ICT-based Educational Design into a series of MOOCs with reduced – if any – teacher support aimed at our second target group (and possible also our third group).

Towards a Danish MOOC model

MOOCs are currently the most hyped initiative within open education, but MOOCs are also the target of massive criticism. It is clear from the criticism of MOOCs that they are not – at least in their present form – the only answer to the challenges of open education. For instance, de Langen & Bosch (2013) conclude that MOOCs should primarily be seen as a supplement, rather than a competitor, to regular forms of education. This is also the perspective of this paper that MOOCs do not replace ordinary forms of studies, but that they can expand the opportunities for education – especially, with the intention of reaching out to new target groups. Despite the criticism, we believe that research on and experiments with MOOCs can be used to push open education in new directions. In a white paper on MOOCs, Yuan, Powell & Olivier (2014) argue that MOOC initiatives show new approaches to online learning that goes beyond institutional borders.

The business models behind MOOC offerings have also been discussed as problematic, and critical voices also argue that MOOCs support an increased commoditisation of education (Dolan, 2014). In this paper, we will address the possibilities and challenges of offering MOOCs within the Danish educational system. Also, the pedagogies behind MOOCs have

been questioned. For instance, Daniel (2012) argues that MOOCs employ old distance learning techniques that date back at least 40 years. Especially, the massive use of video lectures and automated assessment has been criticised for isolating the learners (Chen, 2014; Daniel, 2012; Dolan, 2014). As described above, such instructivist pedagogies do not correspond to the pedagogical approach of the redesigned educational programme described in this paper. Thus, our objective is to develop MOOCs that focus on student communication, collaboration and production.

A key challenge within MOOCs is the relatively low completion rates, that are often highlighted in criticism of MOOCs (Chen, 2014; Daniel, 2012; Kizilcec, Piech & Schneider, 2013; Clow, 2013). This challenge naturally relates to the fact that MOOCs address a large and broad target group. According to a study in Jordan (2014) an average of 43.000 students enrol in a MOOC, and only 6.5% complete the course. This fact relates to the very complex audience that MOOCs invite to join. As Jordan (2014) and Dolan (2014) state, MOOCs are not for everybody. To take one example, the majority of Coursera students are at least at undergraduate degree level (Jordan, 2014). This means that existing MOOCs primarily favour the educationally privileged.

A study of subpopulations of learners in MOOCs by Kizilcec, Piech & Schneider (2013) identifies four prototypical types of learner engagement in MOOCs: completing, auditing, disengaging and sampling learners. In the current paper, we wish to discuss the possibilities of designing MOOCs that do not only address the “completing”, but will directly aim at other types of students, which could be characterised as auditing, disengaging or sampling students.

As a starting point, we operate with at least three different target groups for the MOOC redesign of the educational programme on ICT based educational design. The primary target group consists of regular enrolled students. These students will take the dual-mode courses in a “traditional” way, primarily using online tools and also participating in face-to-face seminars with lectures. These students will receive guidance from teachers throughout the course, and will hand in graded assignments, resulting in a certificate.

The secondary target group will follow a track parallel to that of the enrolled students. This parallel track can be termed a “MOOC track” for the educational programme. This target group is not enrolled at the university, but will participate voluntarily. To accommodate this target group, first of all, a study guide is developed to guide the students in their course.

Since these students cannot get access to teacher help, they need another form of guidance on how to work with the resources and engage in discussions. The MOOC track runs parallel to the regular student track and will be built around the same content, activities and assignments. Ideally, the only difference between the two tracks is that regular students will have access to teacher guidance. Thus, the secondary target group will be able to go through the same activities and content as the regular students, but they will not receive an official certificate for their participation. In addition to content and assignments, students in the MOOC track will also get access to communication and productions from the enrolled students. The aim is to develop an educational environment including both regular students and students in the MOOC track. Potentially, the two groups can benefit from each other by reading each other's work, providing feedback and engaging in discussions. This is, however, something that should emerge on a voluntary basis. Within the educational programme on ICT-based educational design, there is the possibility of asking second and third semester enrolled students to tutor students in the MOOC track. Within the Danish educational system, the "parallel MOOC track" is a viable model for opening up education. We utilise an existing educational programme or course that has been redesigned in an online format as a stepping-stone for opening up education to a wider audience.

Finally, we wish to address a final, tertiary, target group. This group consists of people that find an interest in the subject area of the educational programme; i.e. educational design. This includes potential future students, former students, and in the case of this specific programme, it could be teachers and educational developers in schools or other institutions. This target group will not necessarily follow the MOOC track, but might browse the material and potentially participate in discussions with the aim of getting inspiration and updating their knowledge within the field.

In that sense, the parallel MOOC track will not only focus on distributing content, but will focus on assignments that engage the participants in learning activities. Further, the MOOC track aims at creating a communicational environment surrounding the subject areas in the course.

From the perspective of the "xMOOC" vs. "cMOOC" distinction, this Danish MOOC model draws on both. The MOOC track has centralised content, conversations are also centralised on the main course platform (as opposed to being spread on social media networks) and there is a core course study guide. This could point to a classification of an xMOOC. However, the MOOC track does deviate from this classification, especially concerning the focus on student activities and communication, which is a central attribute of cMOOCs.

Summarily, it can be concluded that our MOOC model constitutes a hybrid xMOOC/cMOOC.

Conclusion

At the moment it is not possible to conclude to which extent the renewal of the Master programme in ICT-based Educational Design has or will reach the goals of opening up education. The project is still in the process of being developed and implemented as a formal educational degree programme with credit and exam. And the parallel - more public service oriented - project in which the university offers the results of research and development in ICT and educational design to the Danish educational sector in form of OER and MOOCs, is also still in progress.

Nevertheless, this paper has some viewpoints of more or less controversial character that we would like to put forward for discussion:

1) To open up education, integration of ICT in education is not enough. The use of ICT in education is not just another add-on like the introduction of the photocopying machine and the power-point. The introduction of ICT in education is a change parallel to the introduction of print and textbooks! A whole new learning process has to be developed as personalised learning taking into account that humans learn both in the formal and informal contexts in which they are participating.

2) The overall pedagogical philosophy behind the educational programme is a student-centred approach. The focus is on the learning activities – how the learners work with the learning material.

Back in 2001 Rob Koper (from the Dutch Open University) gave a description of the learning process: “(…) a lot of learning does not come from knowledge resources at all, but stems from the activities of learners solving problems, interacting with real devices, interacting in their social and work situation. (…) it is the activities of the learners into the learning environment, which are accountable for the learning.” (Koper, 2001 p.3).

In this way “teachers and tutors are reinstalled in a position as responsible for organizing the learning process. He or she is choosing relevant learning resources and creating learning activities needed in order to reach defined educational objectives” (Bang, 2006).

3) MOOCs are effective tools for distributing knowledge due to the combination of educational resources and learning activities. Although MOOCs incorporate certain pedagogical considerations in the presentation, it is not easy for inexperienced learners to use MOOCs for knowledge acquisition. On the other hand for experienced learners MOOCs are efficient tools for providing lifelong learning opportunities. Consequently, we focus on well-defined audience groups when we build our MOOCs.

We don’t believe that MOOCs are the answer to the world wide educational crisis enforced by the economic crisis, but we see huge opportunities for developing further education in a lifelong learning perspective via the use of MOOCs.

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Communication and dissemination in research. The European project ECO[3]

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Abstract

We present the ECO project with an introduction to MOOCs and a presentation about the context of European projects as ways for innovation. We describe briefly the ECO project indicating its general framework, project organization, and participating institutions. We develop further data about innovation dissemination parameters describing the work package 5 that focusses the communication plan. We indicate the tasks of the work package, the communication plan, communication protocols, the internal report templates, the internal training, and the corporate image. We end with conclusions and references.

Keywords: MOOC, massive course, European project, ECO Project, dissemination, communication, research.

[3] ECO Project: Elearning, Communication and Open-data: Massive Mobile, Ubiquitous and Open Learning. Project n. 621127. Competitiveness and Innovation Framework Programme (CIP). CIP-ICT-PSP.2013 Theme 2: Digital content, open data and creativity. Obj 2.3.a: Piloting and showcasing excellence in ICT for learning for all.

1. Introduction

The growing demand for higher education, with 414 million students expected in 2030, coupled with the lack of flexibility of current education systems, the deficit in the acquisition of certain competencies, and the economic crisis, among other factors, have led the European Union[4] (European Commission, 2013) to consider the need for exploring the potential of ICTs to develop an open and reliable learning process.

This sets the scene for a new learning and teaching system characterised by its flexibility. MOOCs (Massive Open Online Courses) were born in 2008 with the aim of providing more accessible and fairer education and training. MOOCs can be defined as large-scale online courses, directed to a numerous – in fact massive – group of students and fully imparted on the web. They have grown to become an online learning phenomenon, with hundreds of thousands of participants in individual courses and millions in aggregated courses. They represent one of the latest advances in open education.

Different Spanish universities, among them UNED, are promoting this type of training, primarily involving non-regulated education aimed at providing easier access to education for broad sectors of the population, at a low cost or even free of charge.

MOOCs are essentially characterised by being free of charge and open to an unlimited number of participants, by the publication of audiovisual and text materials, based on participative and collaboration methodology, and limited teacher participation AS McAuley, Stewart, Siemens & Cormier indicated (2010). Regarding materials, Román and Méndez (2014) stress, among other characteristics, the importance of providing up-to-date visual and audio material, of high didactic and technical quality and characterised by its originality, among other aspects.

One can distinguish between two education communities with different outlooks on MOOCs. One of them is made up by university institutions in the United States, with a high level of participation, pedagogic experimentation, innovative processes, etc. However, among universities we find opposition to this type of training. Smaller or less prestigious institutions that have not undergone a significant development in this field feel they could find themselves excluded from an educational offering with considerable financial prospects.

[4] European Higher Education in the World. 2013. Communication from the European Commission Brussels, 11.7.2013 COM https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/240193/13-1173-maturing-of-the-mooc.pdf

2. European projects as paths to innovation

The European Commission has signalled its interest in the development of MOOCs in different documents and projects. Education and Training Monitor 2012, for instance, highlights the importance of teaching-learning processes for bridging the digital divide[5]. They likewise stress the importance of access to the acquisition of qualifications in an open manner and with academic recognition, currently being developed thanks to the development of Information and Communication Technologies[6].

Several innovation and research projects are currently being generated under European Commission's competitiveness and innovation framework programme[7] whose primary general aim is to strengthen competitiveness and innovation capabilities in member states, with the reinforcement of the use of ICTs as one of its specific goals.

With a view to supporting the objectives of the Europe 2020 strategy[8], the European policy has set out the following goals:

- Stimulate competitiveness by looking for value added activities, supporting qualification, education and infrastructures;
- Promote intelligent specialisation strategies in combination with other European policies;
- Highlight certain commercial sectors;
- Develop governance at different levels;
- Link specific strategic fields to specific regions.

Such a strategy seeks to promote synergies between research and innovation, and

[5] Commission Staff Working Document. 2012. *Education and Training Monitor.*

[6] Commission to the European Parliament. 2012. *Rethinking Education: Investing in skills for better socio-economic outcomes*.

[7] CIP Competitiveness and Innovation framework programme. 2002-2013. *Presentation*. http://europa.eu/legislation_summaries/information_society/strategies/n26104_en.htm

[8] Department for Business, Innovation and Skills, 2013. *The Maturing of the MOOC. Literature review of massive open online courses and other forms of online distance learning*. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/240193/13-1173-maturing-of-the-mooc.pdf

recommends the simplification and harmonisation of the rules of the various programmes with a view to favouring cooperation. Such synergies involve interaction, collaboration, support and grouping between innovating, communicating and promoting agents. This calls for the promotion of development policies and transnational and interregional cooperation programmes. Among such actions the European Union will promote the construction of scientific and technological parks or business incubators.

The planned elements of these innovation stimulus strategies include the creation of innovation clusters for regional growth, the promotion of business environments favouring innovation among SMEs, support for continuous learning in research and innovation, the development of attractive regional research infrastructure and competency centres, the promotion of creativity and cultural industries, the establishment of a digital agenda, and support for public employment.

3. The ECO Project

3.1. General Framework

The ECO (eLearning, communication and open-data: massive mobile, ubiquitous and open learning) project lies within the conceptual framework of OERs (Open Educational Resources) and their application through MOOC (platforms. The aim is the European-wide diffusion of an educational model using the most advanced technologies in the implementation of MOOC platforms, thereby raising awareness in Europe about the benefits of OERs for European citizens and institutions. The project likewise seeks to demonstrate the potential of MOOCs to reduce or eliminate technological barriers in learning processes for users with special needs or at risk of exclusion. The expected impact of ECO will be enhanced through the training of teachers throughout Europe who will create their own courses and distribute them via an open learning platform. The progress of the project and the courses may be followed on its website: www.ecolearning.eu

3.2. Organisation of the Project

The ECO project, with the participation of 22 institutions from 10 different countries, is financed through the European Union's Competitiveness and Innovation Framework Programme (CIP) and has a duration of 3 years. To attain the goals of the project, 6 work packages (WP) have been established based on concrete objectives and specific procedures. The specific aims of these work packages are outlined below.

- WORK PACKAGE 1. Its aim is to support the project through coordination and monitoring, together with constant communication with the European Commission. This includes comprehensive management of the work carried out, verification of compliance with the planned framework, and monitoring of the quality of the work delivered.

- WORK PACKAGE 2. The aim of this work package is to analyse the design requirements of MOOC platforms from a pedagogical standpoint. This includes analysing the architecture of an MOOC platform and setting up a pedagogical framework for its design and implementation.

- WORK PACKAGE 3. This work package involves the specification of the various modules of the ECO project and designing the general architecture of the platform, as well as providing technical support to participants and integrating the social media technologies.

- WORK PACKAGE 4. The aims of Work Package 4 are: 1) carry out ten large-scale pilot projects at the various centres taking part in the project, 2) analyse each of the intermediate results and improve the application of the pilot projects, and 3) evaluate the final results of the execution of the pilot projects.

- WORK PACKAGE 5. The primary aim of this work package is to capitalise on the impact of the work carried out by the ECO project with special emphasis on promoting the use of MOOCs among the European academic community. This work package includes a set of activities to ensure the widest diffusion and dissemination of the project results, as well as the greatest possible external visibility.

- WORK PACKAGE 6. The ultimate goal of this work package is to ensure that the end results of the project (MOOC platforms) are ready for the market and can be easily transformed into commercial products by the ECO participants.

3.3. Participating Institutions.

The partners are Universidad Nacional de Educación a Distancia (leader), Open Universiteit Nederland, Universidad de Valladolid, The University of Manchester, Universidade Aberta, Universidad de Oviedo, Politecnico di Milano, Universidad de Zaragoza, Universidad de Cantabria, Reimer It Solutions Bv, Sunne Hanna Eichler, Fundación Universidad Loyola Andalucía, Université Paris III Sorbonne Nouvelle, Montiel Molina Vicente, Telefónica Learning Services SL, Fundação para o Estudo e Desenvolvimento da Região de Aveiro (Fedrave), Editrain SL, Vereniging Van European Distance Teaching Universities, Humance AG, Prisma Vista Digital SL, Universidad Nacional de Quilmes, and Universidad Manuela Beltrán Fundación.

4. The dissemination of innovation

The execution of the projects within the European framework is designed and organised on the basis of work packages. Most of the innovation projects include certain core packages: management, dissemination, design, practical implementation, evaluation, and marketing.

Project dissemination primarily seeks to promote the product or resource generated through the project, making it known throughout the educational community. The object is to ensure broad diffusion of the project, enhancing its visibility and impact on society. Dissemination may be organised into different stages:

- design of the diffusion and communication plan;
- implementation of the plan; and
- evaluation of the plan.

The actions to be carried out include the following:

- developing the Website in different languages,
- selecting and implementing an overall communication strategy;
- planning dissemination through the social media;
- deciding which content will be published and ensuring it is regularly updated;
- promoting and holding international and local events;
- preparing and distributing brochures at institutions and events;
- establishing direct contact with the interested parties, groups and institutions;
- drawing up internal and external distribution lists;
- participation in blogs and different publications.

5. ECO Project

The dissemination of the ECO project is the primary focus of package 5 (WP5). The first step was the design of an initial communication plan, subject to annual review. The general organisation of the package consists of a combination of elements interacting with each other (figure 1). Based on the commitments set out in the DoW, a plan is drawn up laying down the communication guidelines. Each member must designate a group of persons to take part in the tasks and channels of the plan. To make the plan operational, a number of protocols are specifically designed for the various channels, which serve to unify the various voices and coordinate the working procedures. A monitoring process will be implemented and recorded through periodic performance indicator reports.

Figure 1. General Organization of Communication.

5.1. Work Package Tasks

The packages are structured into tasks, which are allocated to specific members from each entity. This package is structured into three main tasks:

- T 5.1: Communication plan, involving its negotiation, design and updating.
- T 5.2: Website design and support, involving the design of the website, design of interactions with other environments and tools, and regular updating.
- T 5.3: Events organised by the project; this refers to four events to be held in the course of the project for the purpose of presenting and publicising it.

5.2. The Communication Plan

The communication strategy planning document submitted at the end of the second month, known as the Communication Plan, is structured into the following sections:

1. ECO mission
2. ECO communication principles
3. Communication objectives
4. Measures of success
    4.1. Quantitative measures of success
    4.2. Qualitative measures of success
5. Profile audience & stakeholder analysis
    5.1. Core target audience of the ECO project
    5.2. *Sublevel target audiences of the ECO project*
6. Central Message(s)
7. Communicative principles & organization
8. Communication channels and means
    8.1. Online
    8.2. Offline
9. Calendar (Gantt chart) of campaigns, actions & events
10. HUB campaigns & partner tasks
11. Creating ECO direct communication and synergy

Annex I: Contact list & ECO-Knowledge map

Annex II: ECO Corporate identity

A. EU Dissemination Protocols
B. ECO brand guidelines
C. Documents, presentations & reporting templates

Annex III: Communication manuals

A. Technical dissemination obligations & EU/CIP norms

B. Web 2.0 protocol

C. Teacher engagement protocol

Annex IV: Identification teacher associations, intermediaries & ECO synergy partners

5.3. Communication Protocols

Communication protocols are guidelines for using the various tools and channels. Thus, a protocol for given channel, such as Twitter, for example, will set out the specific procedures for that channel, which has its own operating rules and particular patterns, languages and timeframes.

- General organization
- Central message
- Website
- Blog
- Newsletter
- Press release
- Social media
- Database
- Events
- Calendar

5.4. Internal Report Templates

To facilitate the collection of information and its incorporation into the reports for the European Union, specific templates have been designed for these activities:

- Events
- Participation
- Organization
- Blogs and webs
- Mass media
- Press release
- Social media

- Mailing
- Support network

5.5. Internal Training

In order to ensure adequate training of the members for the tasks expected of them as regards communication, a number of different webinars associated with the channels used for the plan are being designed. They are intended for the web conference channel for the virtual community that has been set up, including all the project members.

5.6. Corporate Image

A unified image is a key element of the communication strategy. All the identifying elements have been designed accordingly, including the logo (figure 2), the website, the image of social media accounts, and material intended for printing, such as posters and brochures.

Figure 2. Official logo of the project.

6. Conclusions

The ECO project will involve the design of 16 MOOCs, which will be carried out over the course of three years. The purpose of the European projects is to provide a suitable pathway to innovation. The ECO project has a general framework, is organized into six work packages and has 22 participating institutions. Package 5 focuses on the innovation dissemination strategy, with three tasks established for such purpose, each of them with a designated manager. Specific individuals are designated to participate in the activities pertaining to each work package task: design of the communication plan, communication protocols, internal report templates, internal training, and corporate image. This plan will be reviewed on an annual basis.

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Motivation to transfer: Factors influencing transfer of learned competences to the job

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ABSTRACT

The main aim and also a major challenge for students and instructional designers is to achieve long-term *transfer of learning,* that is the application of newly acquired competences learned in one context to another context. Research shows that this fundamental aspect of education often occurs poorly or not at all, leading to what is called a *Transfer Paradox* The main aim of this study is to identify key variables that influence the decision of the learner to transfer (or not) newly gained competences to the work context. Holton's *Learning Transfer System Inventory,* Ajzen's *Theory of Planned Behavior,* and Deci and Ryan's *Self-Determination Theory* will be used to study this in more detail. Ninety-six adult students of the Open University of the Netherlands following a course on information literacy filled out a newly developed questionnaire before entering the course. Factor analyses were used to identify factors and construct scales. Results revealed that the motivation to transfer prior to the course the newly learned competences of information literacy is influenced by students' self-efficacy and the opportunities students have to apply the new competences on the job.

INTRODUCTION

Transfer of Learning, or the application of what is learned in different contexts, is widely considered to be the 'raison d'être' of education or training. At the same time extensive research in education, psychology, and human resource development (HRD) during more than a century shows that transfer seldom occurs (Haskell, 2001) (Yamnill & McLean, 2001), leading to what is called a '*Transfer Paradox*' (Haskell, 2001; Merriënboer & Kirschner, 2007).

Research on transfer often has been conducted from the perspective of the researcher or educator, narrowing it down to measuring the effects of specific intervention designs in a single test directly after an intervention. Baldwin and colleagues (2009) state that 'research on training transfer could be enhanced in the future by considering transfer as a conscious choice that individuals make. One could study why transfer is attempted, how choices are made to personalize or customize training received or why a choice is made not to try and transfer a trained skill to the job. There are exiting new avenues for pursing these research questions that can lead to a greater understanding of the transfer process' (Baldwin, Ford, & Blume, 2009). In this research the effects of a selected number of key variables on the transfer process will be measured from the perspective of the learner. For this purpose we will combine three partially overlapping theories or models to create a validated, reliable, and theory-based measurement instrument.

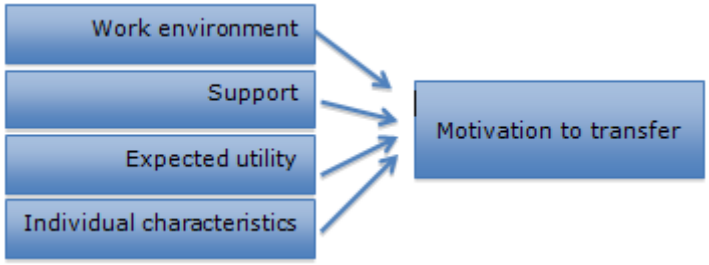
Starting point is Holton's *Learning Transfer System Inventory* (LTSI). It consists of sixteen constructs in four domains (secondary influences, motivation, environment, ability) that are likely to influence transfer of learning to the work environment (Holton, 2005). The inventory is based on Holton's HRD Evaluation and Research Model with an important role for the construct Motivation. Although it does not measure transfer directly, it is a well-tested and validated instrument to measure the influence of the most relevant factors or variables in the entire transfer process.

Cheng (2008) stresses 'the functional role of trainees who choose either to transfer or not to transfer or how much they want to transfer'. He proposes the use of the *Theory of Planned Behavior* (TPB) (Ajzen, 1991), one of the more robust social psychological theories that 'emphasizes explaining human action through understanding the human psychological process – in particular, by uncovering the links between intentions (and their antecedents) and behavior' (Cheng & Hampston, 2008). It postulates that people consciously consider the possible consequences of intended behaviour before taking action. Based on the Theory of Reasoned Action (Fishbein, 1967), intention to perform is seen as the cognitive representation of a person's readiness to perform a given behavior, and is considered the best predictor or immediate antecedent of behaviour. Because individuals not always have volitional control over their behaviour, as was assumed in the Theory of Reasoned Action, a new antecedent to intention was added, namely the perceived and actual control

(opportunities and resources) over the performance of the behaviour. The Theory of Planned Behavior will be used to capture both these reasoned actions and the motivation to perform a specific behavior or competences.

The *Self-Determination Theory* (SDT) (Deci & Ryan, 1985) will be used to further differentiate the influence of the variable *motivation* on the transfer process. This motivational theory makes a distinction between variations in controlled and autonomous motivation. This differentiation is relevant for this research as the participants on the one hand function as controlled students in their educational environment, and as autonomous professionals in their work. Given the above theories we studied the influencing factors on the motivation to transfer competences to be learned in an educational formal learning setting. What factors do determine peoples' motivation to transfer learned competences to the work environment in which they act as autonomous professionals? Figure 1 gives an overview of the studied influencing factors on motivation to transfer derived from theory.

Figure 1. Influencing factors on motivation to transfer as used in this study.



Motivation to transfer: Motivation can be divided into intrinsic and extrinsic motivation (Deci & Ryan, 1985). Intrinsic motivation is characterized as the natural, inherent drive to seek out challenges and new possibilities, which are associated with cognitive and social development. Extrinsic motivation comes from external sources. Deci and Ryan (1985) developed the Organismic Integration Theory (OIT), to explain the different ways in which extrinsically motivated behaviour is regulated. One of the four defined external regulations is the regulation through identification. This is a more autonomy driven form of extrinsic motivation. It involves consciously valuing a goal or regulation so that said action is accepted as personally important. In this research we use this type of motivation to measure motivation to transfer.

Work environment: environmental factors in a work setting refer to the organisational climate. Does the organisation have a certain openness to change and does an employee have the opportunity to bring and use newly learned competences to the job? This organisational climate and the people's perception of this environment will have an

impact on the motivation to transfer the learned knowledge and actually use it in a work environment.

Support: Support on task performance and also on the use of learned competences in a work environment of peers, teachers, and colleagues are expected to influence motivation to transfer. In a study of management training, Facteau, Dobbins, Russell, Ladd, and Kudisch (1995) found that the social support and supervisor support were positively related to pre-training motivation. Their findings further suggested that pre-training motivation, along with subordinate and peer support, were positively related to perceived training transfer.

Expected utility: Clark, Dobbins, and Ladd (1993) argued that students were more motivated if they perceived education to have more job and career utility. These findings are consistent with expectancy theory, which states that individuals will be more motivated to transfer if they perceive that their effort will lead to rewards that they value (Porter & Lawler, 1968). So the expected outcomes in terms of the learned competences help to perform better in the work environment and the cost and benefits seems of importance for transfer of learning.

Individual characteristics: Self-efficacy can be described as a function of self-beliefs with which individuals can accomplish a task (Bandura, 1991). High persistence is associated with self-efficacy which, in turn, is associated with increased performance and productivity. Self-efficacy has proven to be a good measurement with which to predict behavioural outcomes. It is expected that people's confidence of being able to use the learned competences in a work environment will influence the motivation of transfer.

The following hypotheses will be tested in this research:

H1 Self-efficacy to use the skills in a work setting, support of the teachers, the peer students and colleagues, the costs and benefits, the positive outcomes, the openness of the environments to change and the opportunities to use the learned skills in a work setting will each be correlated with motivation to transfer training to the job situation.

H2 Environmental factors (openness to change and opportunity to use) will explain a significant proportion of the variance in motivation to transfer training to the job situation.

H3 Expected utilities (positive outcomes and costs and benefits) will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by environmental variables.

H4 Support (support by peer-students, colleagues, and teachers) will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by environmental and expected utilities variables.

H5 Individual characteristics (self-efficacy) will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by environmental, expected utilities, and support variables.

METHOD

Participants

The participants were 96 adult students of the premaster Learning Sciences at the Open University of the Netherlands. For these students 76 were female and 20 were men. 36 students were younger than 25; 25 students were between 25 and 40 years old; 20 were between 40 and 55 years old; 14 were older than 55; and 1 did not mentioned his or her age. Students are mostly in their first year of study and were following the mandatory *Information Literacy* course. Beside their study students mainly work in primary and secondary education, higher education and training.

Context

For almost all students the course 'Information Literacy' is compulsory to enter the master Learning Sciences of the Open University. In this course students learn to solve information-based problems in an academic context. They learn to define research questions, search for sources in academic databases, judge and select sources and information, and process and organize the information in depth. This is a generic competence that in many situations, especially in a work environment, is of high value. In the course students were provided with a systematic approach and worked on five authentic tasks in which they have to solve an information problem. In these tasks they get different kind of support. In the web-based course (4,3 ECTS, which is 120 hours of study) students solve the information problems using a systematic approach and report on the steps they take during the process of solving the problem using a process worksheet (based on Brand-Gruwel, Walraven, & Wopereis, 2009). At the end the students hand over their work to the teachers who give written feedback on the performance. An example of an authentic task is: Imagine you are a teacher in primary education and you want your students to work more in a collaborative way. But you wonder what pedagogics you can use to teach the children to learn in a collaborative way. Search for sources and information on this topic and write a short essay (500 words). Follow the systematic approach and document the steps you take and reflect on them.

Questionnaire

The questionnaire is a Dutch version and consists of the following LTSI constructs, TPB and SDT aspects, and transfer variables from the literature. It measures the motivation of transfer and different influencing factors derived from literature. The original questionnaire

consisted of 87 items concerning motivation to transfer in a controlled and autonomous setting, intention to transfer in different settings (work, study), support of the environment (colleagues, teachers, students), opportunity to apply learned competences in different settings (work, study), feedback for different people (colleagues, teachers, students), the openness for change, the costs and benefits when applying the learned competences, and self-efficacy.

To identify scales, exploratory factor analyses (varimax rotation) were performed on the items measuring the dependent and independent variables. This led to different scales for motivation of transfer and scales for measuring influencing factors. Table 1 gives an overview of the scales, the amount of items, example items, explanation and the reliability coefficient (Cronbach's Alpha).

Table 1. Overview of the scales

Scale Motivation of transfer	Items	Explanation	α-coefficient
Identification Work	6	Identification with the personal importance of a behavior	.93
Scales **Influencing factors**	**Items**	**Explanation**	**α-coefficient**
Support			
Peer-support	5	Expected support by peer students	.94
Colleague-support	5	Expected support by colleagues	.95
Teacher-support	7	Expected support by the teacher	.86
Environmental factors			
Openness to change	3	The openness to change of the organization	.84
Opportunities to use	4	The opportunities to apply learned competences on the job.	.85

Expected Utility			
Positive outcomes	4	Expected positive consequences at work	.89
Costs and benefits	3	Expected costs and benefits when applying the competences on the job	.93
Individual characteristics			
Self efficacy	3	Confidence of using the learned competences on the job	.92

Data collection

The survey instrument was delivered to the students in a web-based format. The survey was embedded in the course website on the electronic learning environment of the master Learning Sciences. Before starting the course students filled out the questionnaire. Instructions were given on how to complete the instrument and participants were assured of anonymity.

Data analysis

Bivariate correlation analysis was used to test hypothesis 1. Knowing the relationships between each of the independent variables and the dependent variable can give a broader picture of the factors that predict motivation to transfer. Hypotheses two to five were tested using hierarchical multiple regression which partitioned the variance in motivation to transfer that was accounted for by each successive set of variables over and above the influence of the preceding set(s). Thus, the unique portion of the total variance accounted for by each set of variables was estimated by examining the R^2 series and the change in variance explained from one set to another. The order of entry was based on our conceptual model (see Figure 1). The variables were put into the analysis in the following order: (1) environmental factors; (2) expected utility; (3) support; and (4) individual characteristics.

Results

Hypothesis 1

Bivariate correlation analysis revealed that seven out of eight correlations were statistically significant. The variable 'teacher-support' did not correlate with motivation to transfer. The largest correlations with motivation to transfer were opportunity to use (r = 0.69), self-efficacy work (r = .66) and costs and benefits (r = .59). Table 2 presents an overview of all the correlations.

Table 2. Pearson correlation coefficients for bivariate relationships between motivation to transfer and independent variables

Independent variables	N	Motivation to transfer
Openness to change	69	.218*
Opportunity to use	74	.687***
Positive outcomes	78	.439***
Costs and benefits	71	.588***
Peer-support	81	.213*
Colleague-support	75	.367**
Teacher-support	81	.178
Self-efficacy work	69	.663***

*p < 0.05 (one-tailed) **p < 0.01 (one-tailed) ***p < 0.001 (one-tailed) level

Note: One-tail test used for significance

Hypotheses 2–5

In order to test hypothesis two till five a hierarchical regression analysis was conducted. Tests for violations of regression assumptions were all negative, indicating that the data were appropriate for regression analysis. Results are provided in Table 3.

Table 3. Results of hierarchical regression analysis for motivation to transfer

Independent variables	β	R^2	$Adj.R^2$	F/df	ΔR^2	F/df
Model 1		0.420	0.401	22.44***		
				(2.62)		
Openness to change	- 0.142					
Opportunity to use	2.295***					
Model 2		0.434	0.396	11.498***	0.014	0.744
				(4.60)		(2.60)
Openness to change	- 0.541					
Opportunity to use	1.859***					
Positive outcomes	0.137					
Costs and benefits	0.515					
Model 3		0.448	0.380	6.599***	0.014	0.472
				(7.57)		(3.57)
Openness to change	- 0.617					
Opportunity to use	1.791***					
Positive outcomes	- 0.019					
Costs and benefits	0.517					
Peer-support	- 0.130					
Colleague-support	0.410					
Teacher-support	0.334					

Model 4		0.498	0.426	6.947***	0.050	5.630*
				(8.56)		(1.56)
Openness to change	- 0.692					
Opportunity to use	1.455**					
Positive outcomes	- 0.259					
Costs and benefits	- 0.372					
Peer-support	- 0.098					
Colleague-support	0.239					
Teacher-support	0.170					
Self-efficacy work	1.685*					

*p < 0.05 (one-tailed) **p < 0.01 (one-tailed) ***p < 0.001 (one-tailed) level

Hypothesis 2: In step 1 of the regression analysis the environmental factors (openness to change and opportunity to use) were entered as a group. The model was significant (p < 0.001) with an R^2 of 0.420, indicating that 42% of the variance in motivation to transfer was explained by these environmental factors. Only 'opportunity to use' was a significant predictor (β = 2.295, p < 0.001).

Hypothesis 3: Step 2 of the regression analysis added the expected utilities (positive outcomes and costs and benefits) to the model. The model was significant (p < 0.001) and the R^2 increased slightly to 0.434. However, the increase was not statistically significant. Neither of the variables entered in step 2 were significant predictors of motivation to transfer. The variable 'opportunity to use' remained a significant predictor, but its standardised beta decreased to 1.859.

Hypothesis 4: Step 3 of the regression analysis added the support variables to the model. The model was significant (p < 0.001) with an R^2 of 0.448, which was a slight but non-significant increase over the previous model. Neither of the variables entered in step 3 were significant predictors of motivation to transfer. The variable 'opportunity to use' remained a significant predictor, but its standardised beta decreased to 1.791.

Hypothesis 5: Step 4 of the regression analysis added the individual characteristic variable (self-efficacy work). The final model was significant (p < 0.001). With the addition of self-efficacy, R^2 increased to 0.498, which was a significant increase (p < 0.001) over the previous

model. 'Self-efficacy work' is a significant predictor in the final model (β = 1,685, p < 0.05), as is opportunity to use (β = 1.455, p < 0.01).

Discussion

The most important finding to emerge in this study was that environmental factors (opportunity to use and openness to change) explained a large amount of variance in motivation to transfer before entering the course. This group of variables explained 42% of variance in motivation to transfer in the first step of the hierarchical regression. This finding is consistent with research linking environmental influences to transfer of training and subsequent changes in performance (Seyler, Holton, Bates, Burnett, & Carvalho, 1998). Moreover work-related self-efficacy explained a significant amount of variance in motivation to transfer. The addition of this variable in the fourth step of the hierarchical regression increased R^2 significantly. The final model explained 49.8% of the variance in motivation of transfer. The standardised betas in the final model indicated that work-related self-efficacy (β = 0.1685) had the strongest influence on motivation followed by opportunity to use (β = 0.1455). The group of variables concerning support and expected utility did not contribute to the motivation of transfer. In this research identification as regulation of motivation was used as an dependent variable. Although this is a highly autonomous kind of extrinsic motivation, one can question what the influencing factors would be when using intrinsic motivation as an independent variable. Further research should give insight in influencing factors on different kinds of motivation.

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Blogging for learning

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Abstract:

Some of the obstacles to implement digital literacy in K12 are the competence and attitude in teachers and school leaders. As part of a Master of Management program in School leadership at the Norwegian Business School some lectures are replaced by blended learning and blogging as a tool for learning and sharing. The blogs are evaluated and graded. The project reveals some of challenges new pedagogical models face when new models of learning and grading are introduced to the formalities of higher education. The project also shows the importance of change through program design.

Keywords: lecture, blogging, school leadership, K12, program design

Introduction

Research show that the teacher's competence and attitudes are very important factors in the students learning, and that the best schools have good school leaders (Hattie, 2009). In 2006 digital literacy was introduced as a core competence in the Norwegian K-12 curriculum along with reading, writing, oral skill and math. In addition, digital skills and tools should be implemented in all subjects. (St.meld. nr. 30 (2003-2004). English: Ministry of Education and Research, White paper 30/2003-2004). After eight years research shows that digital literacy as core competence in the Norwegian school system varies very much (Hatlevik et al., 2013). Some schools ban social media like Facebook, some schools ban mobile phones, and some schools just don't use digital tools and have no strategy for changing this practice. For many pupils and students there is a huge gap in the use of technology in their daily life, and the use of technology in their learning (Hatlevik et al., 2013). The consequence is that the pupils, who, by some, are considered digital natives (Prensky 2001; Tapscott, 1999; 2009), don't learn strategies on how to use digital tools for learning in school (Krumsvik et al., 2013).

When looking closer into this challenge we may see that many of those who are teachers and, not at least, school leaders, although they use digital tool in their preparation for teaching, they lack knowledge, skill and mindset on how to use digital tools for learning (Krumsvik et al., 2013; Hatlevik et al., 2013). Very often their way of implementing ICT in their teaching and learning is by putting electric power on existing methods by using laptops as advanced typewriters, power points and electric whiteboards replaces the black boards, and their way of communicating and teaching is the same as "it has always been". According to the Norwegian Centre for ICT in Education the current teacher's education and the school leader education in Norway are very traditional (Tømte et al., 2013). It is purely random whether the teachers have the required competence and mindset to implement digital tools in their teaching, and the Centre says that much of the shortcomings are due to the teachers' education. They are given books to read, attending lectures and writing papers. The assessment is a traditional exam, individually and with no cooperation, preferably on paper. I can be questioned whether to expect them to change and use ICT in a pedagogical appropriate way when they have no such experience is realistic. We can see that many teachers, who might acknowledge their shortcomings, reject the use of digital tools in their teaching, and stay in their field of mastery. As a result digital tools don't have the desired positive effect on the pupils learning (Krumsvik et al., 2013).

Literature review

The phenomenon we today refer to as blogs ("weblogs") and blogging started in the 1990s as personal diaries/journals online (Ismail, 2013; Lujan-Mora, 2007; Sim, 2010; Miller, 2004). Blogs evolved as discussion or information sites that are published on the World Wide Web, consisting of discrete entries, referred to as posts or articles. These posts are displayed in reverse chronological order; the most recent blog post appears first. The emergence and growth of blogs in the late 1990s coincided with the advent of web publishing tools that facilitated the posting of content by non-technical users. Anyone with web access could produce, publish and share content online. Many people think of blogs as a phenomenon where teenagers post their daily life, often called "pink bloggers", footballer's wives sharing their jet set life, people sharing recipes or home decoration advice. Many politicians have started blogs to share political views, and so have social activists. In blogs ("weblogs") or online journals you can see a redrawing of the line between public and private (Weinberger, 2002). Hartley (Ong, 2012) emphasizes the difference between printed communication and digital communication, in that digital communication gives more control back to the author. The sharing and communication on the internet, through blogging, is also by some seen as a new openness and sharing of information from a closed, edited universe, to a free and open, unedited universe (Wu, 2010).

Since the early stages blogs have evolved into several different genres. Lujan-Mora and de Juana-Espinosa (2007) lists eight different genres of blogs:

the professional journalist; the non-traditional journalist; bloggers focused on a specific theme (movement, event, topic or interest); the education community; the self-expression/journaling crowd; the business/marketing/promotion community; business weblogs behind the firewall; and the experimenters and innovators.

The personal use of blogs has given prejudices against who are the bloggers and what can blogging be used for. Never the less, the educational community has embraced blogging in a phenomenon called edublogs. According to Ismail (2013) blogs can be valuable e-learning tools for students, to provide resources, instructional material and to improve language and writing skills. Blogs can be used as an instructional tool for learning. Lujana-Mora and de Juana-Espinosa (2007) separates educational blogs into two categories: the instructors blog, used to share information with students and the students blog, a place for the students to reflect on their own learning. Sim and Hew (2010) makes a more detailed distinction when referring to that blogs can be as a learning journal or knowledge log for the student, an online diary, an expression of emotions or feelings, to interact or communicate with others, assessment tool or task management tool. This is not a complete list, nor is the different uses mutually exclusive.

Significance of the study

Despite the fact that already in 2004 (Utdannings- og forskningsdepartementet 2004 (Ministry of Education and Research)) the Norwegian educational authorities launched a program to implement digital competence in Norwegian education, Monitor 2013 (Hatlevik et. al, 2013) reveals that this target is far from reached. Many strategies have been tried to reach the educational community, the Norwegian authorities have even established a Centre for ICT in Education in order to have an organization with sole emphasis on this. The Norwegian MOOC report (NOU 2014:5) describes hybrid competence as a skill how to implement digital tools in teaching and learning. Hybrid competence is the ability to implement the use of digital technology in teaching and learning in a pedagogical way. Digital competence is much about mindset and how to use digital tools in a functional manner. Many people have a tendency to focus on gadgets or social media when it comes to digital competence. Learning how to implement digital tools in everyday teaching and learning is just as much about mindset. Our teachers are set out to be leaders in a world where more and more communication and learning occurs online, and to be able to communicate, share and learn online is expected of leaders today, including school leaders (Rheingold, 2012). Can change in program design for educators have an impact on their practice and attitude?

Research questions

1. The aim of the program was to implement blended learning through change in program design, with the focus on the following two questions:
2. Does blogging bring new dimensions to learning for teachers and school leaders?
3. How do you within the existing academic practice implement new ways of learning and assessing?

Methodology

The Norwegian Business School teaches school leadership to teachers and school leaders as part of a Master of Management degree. As for most Norwegian universities this is done in the traditional way; by having curriculum to read, papers to write and lectures to attend. Because this is a part time master degree the traditional way to do this is by having five 5-days seminars on campus. At the seminars the students are given traditional teaching and learning, curriculum to read and papers to write.

The study program Leadership in education is one of three programs in the degree and consisted of 27 students. One of the aims of this program was to offer it as a blended

learning program and to find digital solutions that would reduce some of the time used on campus; as a consequence the program design was changed. Instead of five 5-days seminars, they had five 2-days seminar. Some of the seminar time was to be replaced by online activity. Because this program had many guest lecturers, who are not so blended in their teaching and the students had a vast curriculum it was a challenge to find the right format. The content of the program was not changed, so blended learning was not part of the syllabus. The way to implement ICT was through program design.

One of the challenges was to find a format that would cover all lectures, all seminars and all students. The tool that turned out to be the most flexible and easiest to implement was the use of blogs; blogs for learning. In this course the use of blogs served several purposes:

- enhancing digital competence by the fact that the students had to use several digital tools and techniques to produce and publish their blog material;
- getting comfortable with producing and sharing information and knowledge online;
- knowing how to do this in a professional manner, using “netiquette”;
- reflecting and producing a “paper”/blog article adopted to the blog format related to the curriculum;
- sharing their knowledge with their fellow students, commenting on each other blogs in order to get different views and thus grow their knowledge and reflection;
- learning new ways on how to use digital tools for learning.

Each student was required to establish a blog, and to make it easy *blogger.com* was chosen as a common tool. Blogger.com is easy to use, and by having all use the same platform there were less technical challenges. In order to make the sharing manageable the students were divided into groups of five, giving them requirement that they should at least comment on the blogs of those in their group. This was to make sure that everyone read and commented on other blogs, and that everyone got comments on their blogs. This was meant to be a social learning process where the students collaborated, where they read their fellow students thoughts and reflections, and where they gave each other feedback.

After each two-day seminar the students were given two assignments to choose from, and then select one to blog about. The blog post should be about a thousand words. There were set requirements as to how the blog should be set up, and what it should include, like illustrations, citations, etc. All together the students were required to write at least 5 blog posts/articles during the program, one after each seminar. The blog post/articles theme was related to the subject taught at the seminar.

At the end of each seminar the students had an hour with instructions and discussions on how to set up the blog, how to blog, how to find material, citation, copyright, use of links and other practicalities. In addition they had one lecture day on the subject digital competence.

The blog posts were graded, and by the end of the course they were given a grade based on the final three blogs posts.

Findings and discussions

The findings of this study cluster into two groups: students practice, competence and attitude, and program design meets academic traditions.

With regard to student practice, competence and attitude some challenges were expected; the mindset of the students - teachers in primary, secondary, upper secondary and adult education. While some were really excited about this opportunity to learn and work, others were skeptical. The skepticism revolved around issues such as anonymity. Some wanted to blog anonymously. That was not an option in this case. Lujan-Mora and de Juana-Espinosa (2006) addresses this issue about privacy concerns when using public blogs in learning. In this case the public side to blogging was intended. Today more and more communication and information is given on public platforms, and young adults read blogs and blog themselves (Trilling, 2009). We may expect that a leader in education is able to express something online and stand for it, and know how to communicate in the online universe (Duffy and Bruns , 2006). This was one of the learning goals of the program, and the students had some interesting discussions on this subject.

Another issue was fear of their reputation. For many of the students (or participants) blogs were something they thought teenagers or footballers wife's did to show themselves of, or people bragging about their homes or cupcakes and they did not want to be associated with these "punk blog"-activities. They were not familiar with professional blogging. As the course proceeded this was less of a concern, and the students reported that they got positive feed-back from colleagues on their blogs.

Technical skills was an issue, some did for example not have a Google account, which is needed to set up a blog on Blogger. These issues were expected and they were pretty soon sorted out. Some students reported after the course that they had not been given full instructions on how to solve all technical challenges, but saw this as part of the learning process: how to use their fellow students and online community to learn and solve this on their own.

The initial intention of the program design was that the students should blog and comment on each other's blogs as a way to use ICT in a blended learning environment. The blogs were intended to be compulsory, being assessed, but not graded. The intention was that by working this way they would develop skills and mindset to take back to their own teaching practice. It turned out that it was not possible for Master of Management students to have compulsory assignments that were not graded. When the blogs were to be graded, they fell under the exam regiment and regulations. This posed two major challenges:

The first challenge was the rules concerning exam papers. They are subject to a heavy regimen of rules and formalities that don't comply with the blog world. For one, because the students can complain on their grades, the blog articles had to be preserved in a way that made them accessible for documentation, like a traditional exam paper. This posed some technical challenges, since blogs are online and dynamic, contains pictures, video and hyperlinks, and are not easily converted to the static format required by the learning management system (LMS), where students are required to hand in their compulsory (exam) papers. This format also made it difficult to catch up on the interaction on the blogs.

The way this was solved was that the students captured a PDF or word document of what they had written and handed this in on the LMS, but first they had to publish their blog article on their blog, so that the blogs could be checked when graded. This way the formal documentation were covered, and the blog requirement were covered. This felt awkward, very bureaucratic and very static compared to the nature of the blog universe. This solution was a bigger problem for the teachers than the students. Handing in papers was the universe the students knew. For the teachers it felt like going back in time because this static format did not give the flexibility intended by using blogs for learning, sharing and collaboration.

The second challenge was how to grade the content. A good blog post is not necessarily a good academic paper, and the opposite. Focus for the program design had to be on the learning goals and the learning outcomes. The intention of the blogs were that the students should reflect, share and comment on the subjects taught in the course in an informal way as a tool to learn how to use blended learning. If they were to be graded, should they be graded as blog posts or as academic papers? In this case there was a collision between the more informal blog universe and the formal academic universe. The solution ended up being something in between, where there were set requirements to the blogs that took into

account that this was blogs, and the intention was for the students to learn how to use blogs for learning, sharing and collaboration, yet still had some of the academic requirements to a text/paper.

In addition to these five blog posts the students had to write a traditional exam paper, so that field of academic work was covered. As for the module on blogging, the context (skills, competence and mindset) was just as important as the content. The students got a set of criteria by which the blog posts were graded. For the first two blog posts they got a personal written feedback. All five blog posts were given feedback in the grading form along with to the total grade. The students really liked this form of feedback. In addition to these formal requirements was the question of who was their audience. For one of the participants the management of her school was so excited about this project so they wanted her blogs to be spread among the pupils and the school community. Some of the students thought that their blog entries should be part of the public debate. However, blogging as well as all other types of writing there are genres and these students did blogging for learning meaning that their target audience was their fellow students. When they wrote their blog posts they should keep in mind who they wrote for. It was emphasized that the sensor was not their target audience, although they got graded, nor was politicians, or the public in general. The aim of this way of learning was to learn how to communicate and share knowledge using a digital platform such as a blog. As a consequence they would get the feeling and competence of what it was like to communicate and learn in cyber space.

So what was the result?

All students completed their five blog entries. There was not one single drop-out. On the feedback they gave they said that this had been relevant for their work and interesting. Some said that they now had a different approach to digital tools in education. Most of them (80%) reported that they had not blogged prior to this course, nor had they read blogs.

What was interesting was when the teacher established a Facebook group; they used this group to get help on how to solve technical problems, and got good help from each other. The same situation occurred in class, when there were technical issues; very often some of the other students had the solution. Some needed some personal assistance, but only for the first two blog posts, after that they were comfortable.

As for their writing that improved during the process. The students were very preoccupied with writing the “perfect” blog post, and wanted to be shown what that one looked like. Especially after the fourth blog post there were several that were frustrated that they didn’t

get as good grades as they hoped for, so they started discussing this in the Facebook group. What was obvious was that this had paid off, and that they now read each other's blogs, because there were remarkable improvements in the final blog posts.

Our conclusions are that using blogging as a tool for enhancing learning and developing digital skills and mindset for teachers and school leaders is a useful approach. They can now use this tool in their everyday life as a school leader. They may use it when communicating with their school community, and they also have gained knowledge and attitude regarding how to approach digital competence in their own school. By being in a transparent process they also learned and got feedback on their own writing, and thus showed huge improvement.

The biggest challenge was to merge the informal way of writing in the blog universe with the academic traditions, as well as the formal criteria's of the assessment system. How do you keep up with academic writing without killing the creative process of blogging? A long the way the students found a way to balance this, and as a teacher to these students it has been great fun to read what they have written.

Conclusion

This was a rather limited study with only 27 students over the period of two semesters. The study indicates that teachers who themselves are exposed to blended learning as a learning tool and practice for learning become more positive towards use of digital tools in classrooms, and that they themselves then open up for new ways of using digital technology in their own teaching (or practice). The study also shows that even though there are good intentions toward implementing blended learning into higher education, this poses challenges to the existing structures. The open and flexible nature of the web collides with the more static rules of the university. It seems easier to use tools as blogs as part of the practice, but when it comes to using blogs as assessment tools, there are some obstacles.

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Student voices. Exploring flipped learning from the students perspective.

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Abstract

Ever since Marc Prensky introduced the term *Digital Natives* there has been an ongoing debate about the digital skills and expectations of today's students. Some, like Don Tapscott, claims that they are grown up digital, others claims that the term digital native is overrated and wrong. Our project have done an in depth interview with students, addressing their experiences, competence and expectations with regard to the use of digital technology in higher education. The study includes students from three different higher education institutions and from different study programs. Some of the students were part of a larger project aiming at flipping the lecture, meaning all lectures were replaced with video instructions, and the "lecture time" used alternatively. Our findings show that the student's expectation to pedagogy and use of technology in higher education is strongly affected by current practice, "this is the way it is in higher education", and the students' prior experiences in K1-13 education. The students, however, quickly embrace new ways of learning when it is introduced to them. The project also reveals differences in the student's use of digital technology for learning.

Keywords: student expectations, new technology, learning, flipped lecture, video

Introduction

In 1999 Don Tapscott (1999) wrote Growing Up Digital, claiming that there were a new generation that learned and communicated differently than the previous generations due to habits as a consequence of digital technology. In 2001 Marc Prensky (2001) introduced the term Digital Natives to explain the habits of this generation. Veen and Vrakking (2006) have introduced the term homo zappiens to describe the same trends and practices. Still, many refuses to accept that there is a fundamental difference between the generation born after 1990 and the previous (Bennet et al. 2008). Whether this generation learns differently as stated by Palfrey and Gasser (2008) or demands different approaches have been heavily debated (Bennet and Marton, 2010). Countless voices (Helsper and Eynon, 2010; Engen et. 2014; Houlton, 2010) have all been questioning these arguments, and according to Rikhye et al. (2009) no significant empirical evidence exists to support Prenskys conjecture. The present study does not take stand in this discussion. What this study aim to do is to find out what are the previous practices students have today when they enter the university, how strong does previous practice affect existing practice and what are their expectations towards what it is like to study at university? The present study also asks: When exposed to what is termed flipped classroom, what are the students' experiences? Do they expect a different approach as have been claimed (Prensky, 2001; UNESCO, 2011)

Literature review

The traditional pattern of teaching has been to assign textbooks for the students to read, listen to lectures and take notes in class, taking tests in class or on campus and work on problem assignments outside school. Lectures have been the main way of teaching in Universities since the foundation in Bologna in 1088, yet it is not the most efficient way of learning according to a metanalysis of 225 undergraduate STEM Teaching methods (Freeman et al., 2014). Studies show that only 10% of students remember what has been taught in the lecture. This has led to some to question the lecture as a way of teaching and learning (Mazur, 2009).

Technological development has lowered the threshold for implementing digital technology in teaching and learning. Even though surveys like the Norwegian Monitor (Hatlevik et al., 2013) show that this progress is slow, there are a lot of teachers and lecturers that are experimenting with new ways of teaching and learning using digital technology. One technology that has become particular popular is the use of video. The success of Salman Khan and Khan Academy is well known. Since 2012 more and more universities are delivering their courses online, as MOOCs, which rely heavily on the use of video for delivering instructions (Kunnskapsdepartementet, 2014).

Lage et al. (2000) published an article where they talked of the advantages of the inverted classroom. Instead of giving lectures, the instructions were recorded and made available to the students to see at home or computer labs, and the time in class were used to do what traditionally had been assigned as homework. In this way the students could watch and listen to the instructor at home, and do tasks with an instructor present, which they could talk to and ask questions. This method has later been known as *flipped classroom* (Baker, 2000; Bergman and Sams, 2012), and has been very popular among teachers in secondary and upper secondary education. In the Norwegian Horizon Report (Johnson, 2013) the flipped classroom is viewed as one of four technology outlooks that will be adopted into Norwegian schools within one year or less, along with bring your own device (BOYD), cloud computing and social media.

Yet there are critics to this method. Some claim that flipping the classroom does not change the fundamentals of learning. Shelley Wright (2012) claims that a lecture is still a lecture regardless of given in class or on video.

Significance of the study

Many people argue today that the students, who are called the net generation, the digital natives and homo zappines, are learning differently compared to previous generations of learners, and thus require different approaches to learning and methodology. Others claim that this is a misconception. By asking the students themselves about their expectations and experiences regarding learning and the use of technology for learning we can get a better understanding of how they learn, what the basis for their expectations are, and what their feed-back on the various methods are? This is especially relevant when it comes to the flipped model vs the traditional lecture. Advocates of the lecture emphasize the personal connection and communication that happens in the lecture hall, even though studies question the effectiveness of the lecture when it comes to learning (Freeman et al., 2014). It can be claimed that videos are non-personal, and over-rated as learning tools because of the non-personal format as compared to the interaction that happens in the lecture. In the present study we aim at getting a better understanding of how the students experience the change from the traditional lecture to the flipped model.

Research questions

The focus of the study was to get answers to three questions:

1. What experiences and strategies do the students have prior to entering higher education when it comes to using technology for learning?
2. What are their expectations to teaching and learning in higher education, with an emphasis on the use of/implementation of digital technology in their learning experience?
3. How do the students react to and experience learning when taking part in the flipped classroom model?

Methodology

In the period 2011-2013 the project "Metodefag i fremtiden" (English: Learning math and statistics in the future) was looking into how to implement digital technology in math teaching in order to improve student learning. The project did initially run three pilots: two pilots at The Norwegian Business School (BI), one at campus Oslo, one at campus Stavanger, and one pilot at Høyskolen Sør-Trøndelag - HIST (Sør-Trøndelag University College). Because of the results from the pilot a BI Campus Stavanger was so interesting; an additional pilot was conducted at HiST. The classes at BI Oslo and HiST were math classes; at BI Stavanger it was a class in statistics. As part of a pilot project students at all campuses (BI Oslo, HiST Trondheim, BI Stavanger) were given various use of video as a supplement to the lecture, or as a replacement of the lecture. In the first pilot at BI Oslo and at HiST the videos were supplements to the lecture. In the pilot at BI Stavanger all lectures were replaced by video, and in the final pilot at HiST almost all lectures were replaced by video. In these two final pilots what used to be lecture time was replaced by work sessions with teacher assistance, according to the flipped classroom model. As an additional study the project Student Voices were established, to see how the students responded to this change in teaching and learning. It was important not only to get the teachers view on the change in methodology, but also the learners. During the study students in the involved classes were interviewed about their experiences and expectations. It was voluntary for the students to attend these interviews. For the classes at BI Stavanger and HiST Trondheim most of the students in the classes attended the interviews. These were classes of approx. 40 - 50 students. For the class at BI Oslo only a group of 20 of approx. 300 students attended the interviews. Apart for the group at BI Stavanger, the students were interviewed in a group, and interviewed once. For the group in Stavanger they were interviewed twice, mid-term, and just before the final exam. They were subject to group interview and individual interviews. The reason

this group was subject to more in depth interviews was because this class had the most extensive pilot. In this class all lectures were replaced with video, and in the lecture time the teacher was available for students who had questions and working on the subjects. The interviews were conducted as conversations with the students, but with an interview guide where the mentioned research questions were in question. The reason for this approach was to get the students voices and experiences without preconceptions interfering. In addition to these conversations with the students in the pilots random groups of students at BI Campus Oslo were interviewed about their expectations and practice.

Findings and discussions

It may look as the students are entering higher education with limited experience of learning strategies. They are used to "lecture pedagogy", meaning that they are being lectured by the teacher and with limited use of ICT. When they are asked about the use of ICT in education prior to entering higher education, they emphasize PowerPoint, Word and the Learning Management System (LMS). It seems like these tools are used as a one-way communication tool, from the teacher to the students. Some students are using Dropbox for storing and sharing documents, and some are using Facebook to organize collaboration in groups. This is, however, something they have initiated on their own and not something they have learned in school. As the conversations progressed, the students revealed more extensive use of digital tools than what were first reported. As one of the students said at end of the interviews: "I am more digital than what I realized". What the conversations revealed is that the students' experiences with digital tools for learning are limited when it comes to their educational experiences. When it comes to their actual use of digital tool they are unaware of how much they actually use technology in their daily lives. All students reported using online video services like YouTube. Some used Khan Academy, some watched TED Talks, and some even reported having attended courses at Coursera.

The findings in this study indicate that when the students enter higher education they have a conservative view on higher education. The lecture has a strong hold in their expectations. The students feel that the lecture is safe and predictable, and important for creating interest and inspiration to the study subjects. The students rely heavily on the advice from their teachers. Even though there are much materials online, many students are reluctant to go and search for this content because they say that there is so much content online and they don´t know what is important or relevant for the exam. When asked about the use of video for learning, students who haven´t been subject to flipped learning says video is great as a supplement to the lecture, but not as a replacement. They fear that by replacing the lecture with video the personal touch and communication will be lost. For a generation that we know spends much time on-line they express fear of losing

the personal face-to-face aspect of their education.

When it comes to the students who have been subject to flipped learning their results differ somewhat from the answers from the rest of the students. Prior to the pilot they had the same preconceptions as the rest of the group. The students reported initial skepticism when the teacher in the first lecture announced that there would be no more lectures this term. When the students were asked for how long this skepticism lasted one of the students replied " One week, - until I got the first video". After being comfortable with the video lecture method, the students did not miss the traditional face-to-face-lecture. In fact the students pointed out a lot of advantages the videos had compared to the lecture. The students themselves pointed out that now when they had the lecture on video they did not need to multitask, meaning taking notes and listening at the same time. In a lecture the teacher kept on talking while they were taking notes, and it was easy to miss out of some of the content of the lecture. They could not make the teacher stop while taking notes, nor ask him or her to repeat. When it came to the video they could stop while taking notes, rewind and repeat if something was unclear. While the videos on average were 7-12 minutes the students reported spending on average one hour on each video due to this process. Most students saw the videos once, but some reported watching them more than once. They all reported that they would re-watch the videos before the exam.

The students also reported that it was easier to understand and remember the content when they had the videos. Like they said: after the lecture they take the bus to commute, go on to other lectures, to work or to the gym – and they forget much about the content from the lecture. The videos they could watch at times of the days that were convenient for them. When asked about their study habits, some reported that the videos were watched as part of a traditional study regimen, they would sit down and watch them like they would do if they were to read a book. Others reported watching in more "untraditional" settings like in the commercial breaks on TV.

The teachers of math often complain that the students don´t "talk" math. The students reported in the interviews that by having these videos, with both oral and written instructions, they got a better understanding due to the fact that the teacher talked math. It made it easier to comprehend the material. One student reported that she had taken this course previously at a different school and had a hard time to understand. Now she felt a different kind of mastery thanks to the oral instructions on the videos.

When it came to the fear of depersonalization of the campus experience due to the fact that the teacher was replaced by video, the students reported the opposite. They said that this teacher was the one they had the closest relation to. Because he did not lecture, but was available for dialogue and questions, they felt that they were more connected in this course than in the other more traditional lecture based classes. The students liked the fact that it

was the same person on the videos and in class. They were skeptical to videos made by other teachers. They showed a strong ownership to "their" teacher. When it came to complaints they revolved around issues like not enough time with the lecturer, having to wait while he was busy with other students and having questions while watching the videos the teacher was not there to be asked. These issues lead to that the students had to be disciplined and write down their questions. Still it was easier to ask questions in these "workshops" that had replaced the lecture, than in a lecture hall.

When it came to the issue of how much time the students spend on working with the material in the course, most of them reported that due to the structure, with the curriculum divided into video lectures, this was the course in which they spend the most time studying. One of the students, who liked the videos, complained that this structure took much time. His fellow students opposed this statement. They claimed that watching the videos, and taking notes, did not take more time than attending lectures, they did only spend their time differently. Also they were more focused while watching the videos, while in the lectures it was easier to loose the attention.

An overall conclusion after speaking with the students is that they were very satisfied with this way of organizing their course. In the final interview right before the exam they expressed that they were not stressed out and in fear of having missed out of anything. They all reported that having these videos, and the structure of the course made them feel in control and empowered towards their own learning.

Conclusions

Our findings show that the students are very much affected by how they have been taught in K-13 education, and that the expectations they have towards higher education is reflected by the traditional practice, more than their digital daily lives. But when you expose them to new ways of teaching and learning they quickly adopt to new use of technology and pedagogy. They like the flexibility given by video instructions, the feeling of control of the learning experience, and contrary to what many would expect this gives them a more personal learning experience than the traditional lecture.

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Do students in a distance learning program use e-tools and digital devices to support their learning?

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ABSTRACT

In this study we research if students (who follow a distance learning program) have digital devices (cf. smartphones, e-readers, tablets), and if they use these digital devices during their study. Secondly, we research if these students use newfangled/modern e-tools (e.g. social media, cf. blogs, Twitter, Facebook, YouTube,…) during their study and if the degree of self-regulation and prior knowledge has impact on the degree of use.

745 students in a distance education program of 1 institution were invited by e-mail to complete an online questionnaire. Only 298 have completed this questionnaire. This high drop-out is probably due to the fact that participation was in no way an obligation. Due to this high drop-out we consider this study as explorative.

The results reveal that participants use in a limited degree digital devices and e-tools during their study. It seems that students who just started their studies and students who are expected to graduate within a year, use more the digital video archive of the institution and the digital forum in Toledo (=digital learning environment of the institution where the research took place).

There was no main effect of degree of self-regulation to the extent that students use e-tools.

No interaction effect between prior knowledge and degree of self-regulation could be retrieved.

Finally, the results show that participants mainly prefer e-mail in their communication with their lectors.

KEYWORDS

Digital devices, social media, self-regulation, informal learning, formal learning

INTRODUCTION

There is the increased amount of research which focuses on the question how to integrate new-fangled/modern e-tools -e.g. social media, cf. blogs, Twitter and Facebook- in a distance learning program. Learning is a continuous process that takes place throughout life and in many settings learning includes formal, non-formal and informal learning ('OECD', 2008). When not explicit used as element of a formal or non-formal learning process, social media may be considered as sources of informal learning.

The use of social media may increase the opportunity for students to study/learn at any time and wherever they want. This freedom of time and place creates de facto learner control. There is the assumption that effectiveness of learner control is partly determined by characteristics of the learner. Regarding the effectiveness of learner control, the research confirms the importance of prior knowledge (Kopcha & Sullivan, 2008; Scheiter & Gerjets, 2007; von Mizener & Williams, 2008), self-regulation (Eom & Reiser, 2000; Orvis, Fisher & Wasserman, 2009; Scheiter & Gerjets, 2007), and epistemological beliefs (Scheiter & Gerjets, 2007). Furthermore, it seems that learner control will be more effective if students actually use the possibilities that conditions with more learner control offer (Large, 1996; Williams, 1996).

As mentioned, learner control seems intertwined with the degree of self-regulation. Students with low self-regulation function better when they have a lower degree of learner control; and vice versa, students with a higher degree of self-regulation are more capable to make effective use of the opportunities that learner control provides (Eom & Reiser, 2000; Scheiter & Gerjets, 2007).

Prior knowledge may affect the effectiveness of learner control (Daniels, 1996; Kopcha & Sullivan, 2008; Park, 1991; Scheiter & Gerjets, 2007; von Mizener & Williams, 2008), since students with higher knowledge are better able to make adequate choices (for instance whether they do or do not need instructions) (Williams, 1993).

Research questions

Since it is increasingly assumed that e-tools can be integrated into the learning process of distance education, we exam in this study which e-tools/digital devices students have and, if they use the e-tools/digital devices as a support for their learning. With the notice learning process we refer to formal and informal learning.

In other words, in this study we research if participants use digital devices (e.g. tablet, smartphone,…) and e-tools (cf. blogs, Twitter and Facebook) during their study. Furthermore, we focus on the influence of the degree of self-regulation and the impact of prior knowledge on the use of e-tools.

This leads to the following research questions:

- Which digital devices have students who follow a distance learning program?
- Which e-tools/digital devices use students (who follow a distance learning program) during their study?
- Is there a main effect of degree of self-regulation on the degree that students use e-tools during their study?
- Does the degree of prior knowledge has an impact on the degree students use e-tools during their study?
- Is there an interaction effect of the degree of self-regulation and prior knowledge on the degree students use e-tools?

Methodology

This is an explorative study in which we investigate with a survey the perception of students. Könings, Brand-Gruwel and van Merriënboer (2005) write that the degree of perception, the interpretation of students on learning matched with the principles of a learning environment, usually will determine also the effectiveness of a learning environment. Also Vermetten, Vermunth, and Lodewijks (2002) write that there is a constant interaction between a learning environment and individual learning, interspersed with the perception of learning about teaching, assessment, course content and structure, etc. Students are considered active, self-regulating participants in the learning process and their perceptions of learning can influence how they learn (Entwistle, 1991). In addition, instructions are always interpreted by students, and this interpretation may influence the effect of the instruction (Struyven, Dochy, Janssens, & Gielen; 2008).

Because it can be assumed that the perception of students affects the degree of effectiveness of a learning environment, it seems interesting to examine the perceptions of students and question their use of e-tools during their studies with a survey.

Participants

A total of 745 students in a distance education program of 1 institution were invited to complete an online questionnaire. 424 students have signed up on the website with the online questionnaire. Only 298 have completed the questionnaire. This high drop-out is probably due to the fact that participation was no obligation.

Table 1 Highest study degree participants

	Frequency	Percent
BSO	12	4.0
TSO	76	25.5
ASO	77	25.8
professional bachelor	86	28.9
academic bachelor	8	2.7
Master	38	12.8
Doctorate	1	0.3
Total	298	100.0

Table 2 Period in which participants think to graduate

	Frequency	Percent
In six months	47	15.8
In one year	29	9.7
In a year and half	29	9.7
In two year	51	17.1
In more than two year	142	47.7
Total	298	100.0

The largest group (76.8%) of the participants are female. 44.7% of the participants have already obtained a degree.

Almost half of the participants (47.7%, n = 142) has just started their study, 15.8% of the participants (n = 47) expects to graduate in six months.

Instruments and procedure

An online questionnaire was used. The use of an online questionnaire seems to be justified this because in general the use of ICT has a positive motivational impact on students (Evers, Sinnaeve, Clarebout, van Braak, & Elen, 2009). The online environment was 'technical' simple, so no specific ICT skills were needed (Evers et al, 2009). Some personal data were asked: for instance when they expect to graduate (in six months, in one year, a year and a half, in two years, in more than two years). Participants were also asked 1) which digital devices they possess and 2) which digital devices and e-tools they use during their study. When scoring the use of e-tools, a Likert scale was used (from 1-7, where 1 means 'never' and 7 'very much'). When scoring the digital devices they possess, participants could choose from two options: yes / no. Finally, participants were asked which tool to communicate with their lectures they prefer. They could choose from phone, e-mail, skype, online forum in the digital learning environment, Q & A in learning environment.

To monitor the workload, a questionnaire with a limited number of questions (=SRQ-L questionnaire; Black & Deci, 2000; Williams & Deci, 1996) was chosen to research the degree of self-regulation. The SRQ-L questionnaire consists of 12 statements. Questions 1, 4, 8, 9, 10, refer to autonomous regulation; questions 2, 3, 5, 6, 7, 11, 12 to controlled regulation. Participants assess (from 1-7, where 1 means 'not' and 7 'very much') how true each statement is for them. Besides the translation, an adaptation of the original questionnaire was done by changing 'chemistry' in ‘course’.

Analysis can be done by calculate the average score for the two subscales (autonomous and controlled regulation), or by determining the relative autonomy index (RAI) by subtracting the mean score on the subscale controlled regulation from the average score on the subscale autonomic regulation.

In this study, the adapted SRQ-L questionnaire has an alpha reliability for autonomous regulation of .706 and .708 for controlled regulation. This corresponds with an acceptable internal validity (Gliem & Gliem, 2003).

With an e-mail the link to the online questionnaire was sent to the students. Participants had two months to complete the online questionnaire.

Data-analysis

First a descriptive report was made. Then, the influence of the degree of self-regulation and prior knowledge (independent variables) on the degree of use e-tools (dependent variable) is examined with a two-way ANOVA (with exceedance probability of 0.05).

The results of the "SRQ-L questionnaire 'in the ANOVA results were regrouped into three categories: score smaller and equal to 0.27, score greater and equal to 0:28 and smaller and equal to 2.41; and score higher and equal to 2.42.

The choice of these three categories happened after taking the questionnaire. To determine these three categories, the difference between the lowest score (-1.60) and the largest score (4.54) was divided by three. The choice of just these categories is arbitrary, another division is possible. On the other hand, with these categories there is ability to get a proper view of the distribution of the scores of the participants.

A chi-square is used to exam if a communication tool is more preferred by students to communicate with a lector.

Results

Most participants have a computer with internet access (93.3%), 90.9% indicates to use the internet while studying. 31.2% of the participants possess a smartphone with 3G internet connection, but only 7.7% (n = 23) indicates to use a smartphone with 3G internet connection while studying. Furthermore, the results show that only 8.1% (n = 24) owns a tablet with 3G internet connection, 12.4% a tablet without 3G Internet. Only a limited number of participants uses a tablet while studying: 6.7% uses a tablet without 3G internet, 5% a tablet with 3G internet. The results show that a limited number of participants owns an e-reader (10.1%, n = 30), only 4.4% uses an e-reader as support during their study.

The results reveal that participants use in a limited degree e-tools as support while studying.

Almost half of the participants (48%, n=143) says that they never use blogs; 78.9% (n=235) indicates never to use twitter; 57.4% (n=171) never uses Facebook; and 56% (n=167) said never to use podcasts.

Table 3 Degree of use of blogs, twitter, Facebook, YouTube during study

		e- tool			
		blogs	Twitter	Facebook	YouTube
1 (not)	Frequency	143	235	171	76
	%	48,0%	78,9%	57,4%	25,5%
2	Frequency	41	34	34	21
	%	13,8%	11,4%	11,4%	7,0%
3	Frequency	17	6	19	20
	%	5,7%	2,0%	6,4%	6,7%
4(sometimes)	Frequency	71	19	39	92
	%	23,8%	6,4%	13,1%	30,9%
5	Frequency	15	2	22	42
	%	5,0%	0,7%	7,4%	14,1%
6	Frequency	8	1	8	31
	%	2,7%	0,3%	2,7%	10,4%
7(very often)	Frequency	3	1	5	16
	%	1,0%	0,3%	1,7%	5,4%
	Total	298	298	298	298

Table 4 Degree of use of digital video archive, podcasts, website, online fora Toledo

		e-tool			
		digital video archive of the institution	podcasts	websites	digital forum Toledo (=learning environment)
1 (not)	Frequency	86	167	23	38
	%	28,9%	56,0%	7,7%	12,8%
2	Frequency	28	36	7	29
	%	9,4%	12,1%	2,3%	9,7%
3	Frequency	25	22	6	5
	%	8,4%	7,4%	2,0%	1,7%
4(sometimes)	Frequency	61	41	51	49
	%	20,5%	13,8%	17,1%	16,4%
5	Frequency	33	13	48	52
	%	11,1%	4,4%	16,1%	17,4%
6	Frequency	39	14	96	79
	%	13,1%	4,7%	32,2%	26,5%
7(very often)	Frequency	26	5	67	46
	%	8,7%	1,7%	22,5%	15,4%
	Total		298	298	298

Yet, 87.9% (n = 262) indicates to use regularly (=sometimes to very often) websites while studying. 7.7% (n=23) said never to use websites during their study. 75.7% consults - sometimes to very often- the online forum of the electronic learning environment (=Toledo, variant of Black-board), 12.8% never. 53.4% of the participants indicates to use regular (=sometimes to very often) the institutional digital video archive (made available via iTunes); 60.8% (n = 181) indicates the use regular YouTube in their study. Respectively 25.5% (n=76) and 28.9% (n=86) mentions never to use YouTube and the institutional digital video archive while studying.

A chi-square reveals that certain tools to communicate with their lectors are significantly more chosen by the participants than others (x^2=474,11; df=4; p=0.00). The results show that the participants prefer email (70.1%) to communicate with their lecturers. Only 4.4% prefers to communicate via phone with a lector (see table 5).

Table 5 Preference tool to communicate with a lector

	Count	Percent
phone	13	4,4
e-mail	209	70,1
Skype	20	6,7
online fora in toledo	38	12,8
Q & A in toledo	18	6,0
Total	298	100,0

The two-way ANOVA (with the degree of self-regulation and prior knowledge as independent variables on the use of e-tools as dependent variable) reveals a weak main effect of prior knowledge on the degree students use the digital video archive of the institution where the research took place (F(4,283) = 2.82; p=0.02; η_p^2=0.03). There results reveal also a weak main effect of prior knowledge on the degree students use the digital forum in Toledo (=digital learning environment of the institution) (F(4,283) = 3.67; p=0.00; η_p^2=0.04).

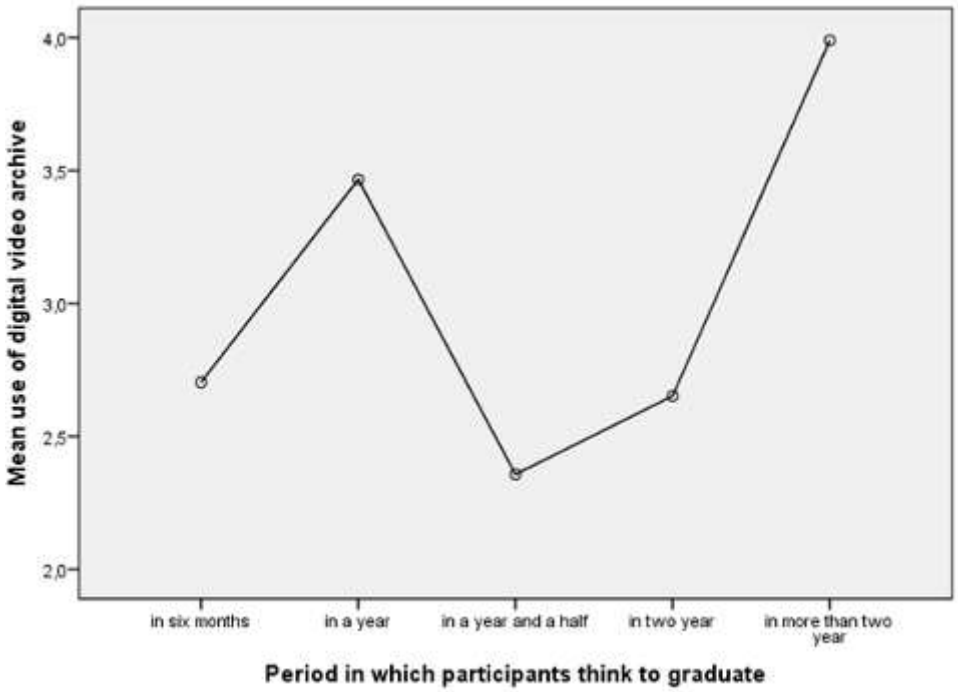

Figure 1 Period to graduate*Use of digital archive

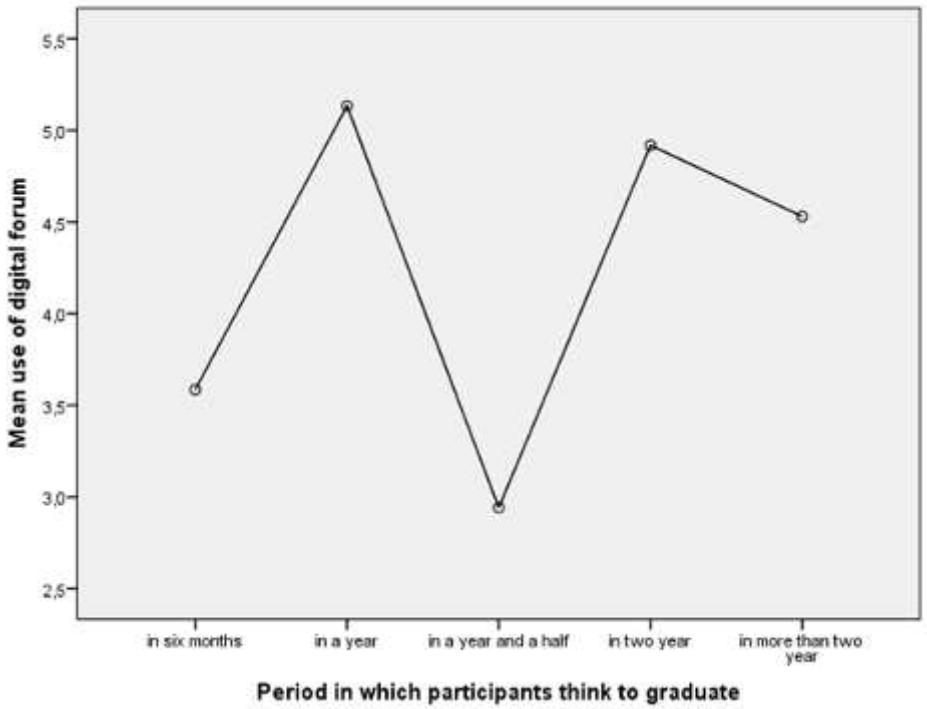

Figure 2 Period to graduate*Use of digital forum

It seems that students who just started their studies and students who are expected to graduate within a year, use more the digital video archive of the institution and the digital forum in Toledo (=digital learning environment of the institution where the research took place).

The results reveal no main effect of degree of self-regulation (cf. RAI) on the use of e-tools (cf. use of respectively blogs, twitter, Facebook, YouTube, iTunes KATHO, podcasts, websites and online forum) in a learning process. No interaction effect between prior knowledge and degree of self-regulation could be retrieved.

Conclusion

It is striking that participants make little use of digital devices (cf. smartphones, e-readers, tablets) and e-tools (cf. social media) while studying. The online forum of the electronic learning environment (= Toledo, version of Blackboard) and websites are more used/consulted. It also appears that participants use videos on YouTube and videos made available through the institution specific platform during their study.

The two-way ANOVA (with the degree of self-regulation and prior knowledge as independent variables on the use of e-tools as dependent variable) reveals a weak main effect of prior knowledge on the degree students use the digital video archive of the institution where the research took place. There results reveal also a weak main effect of prior knowledge on the degree students use the digital forum in Toledo (=digital learning environment of the institution).

It seems that students who just started their studies and students who are expected to graduate within a year, use more the digital video archive of the institution and the digital forum in Toledo (=digital learning environment of the institution where the research took place).

It is possible that freshmen more –then students who expect to graduate in six months- consulted the digital forum of the digital learning environment of the institution and the digital video archive of the institution where the study find place, to get a proper view of the program the follow.

Unclear is however, why students who expect to graduate within a year more consult the digital forum and the video archive. One possible answer is that in the study program, both e-tools and the video archive are more used by the lectures. On the other hand, there were students involved of different education programs, and it should be a great coincidence that the e-tools (digital forum/video archive) are more used at the same time by lecturers from

different study programs (who are not connected to each other).

The results reveal that participants prefer email to communicate with their lectors. This has probably to do with the profile of the participants. Participants were all students who follow a distance learning program. These students very often have to combine work, family and their studies. Synchronous communication (such as telephone, skype, ...) make them less time independent; and thus it is less obvious with these tools to combine work, family and study. There was no main effect of degree of self-regulation on the degree that the students use e-tools in their study.

In conclusion, the finding that participants not often use e-tools (e.g. social media) and digital devices during their study, does not imply that e-tools and digital devices have no value in a formal learning process, but stresses the importance of well discussed educational choices to integrate e-tools and digital devices in a formal learning process.

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Abstract

Significant claims are made for the potential of Open Educational Resources (OER) to widen access to higher education. Most recently, the very large numbers of individuals enrolling on Massive Open Online Courses (MOOCs) has dominated discussion in universities and beyond. Advocates such as D'Antoni (2013) have written persuasively of how OER can potentially open up access to education and redefine the boundaries between institutions and society. However, the evidence from the first wave of MOOCs suggests that the participants are primarily individuals with prior experience of higher education. While this indeed widens access, there is no evidence that it is widening participation from those distanced from education (Lane et al, 2014). Indeed there is limited evidence of significant impact on widening participation by OERs (Falconer et.al, 2013).

The Open Educational Resources (OER) movement, however, has longer and deeper roots (Lane, 2012: 140), roots that are about more than licensing and has engaged in educational practices that break down barriers to education. This paper explores recent examples from Scotland of partnership-based approaches to the development, design and delivery of OERs. Drawing on this experience and ideas from the academic literature on educational technology, pedagogy and widening participation, we draw some provisional conclusions on an approach that combines key elements from all these fields. In particular we note that openness is not simply a matter of barriers to access related to licenses or technological aspects, but are inherently cultural, social and situational. We conclude that while the OER movements early focus on licenses and technology was useful, widening participation requires a shift in emphasis, a shift that accounts for peoples, places and the practices of open education.

Keywords: OER, Pedagogy, Widening Participation

Introduction

A recent report on Open and Online Education from the Welsh Government (2013: 6) notes that in recent years a '*fresh philosophy of 'openness' has made itself felt in higher education and the wider world*'. The report goes on to suggest that in higher education the new spirit is having an impact on the practice of learning and teaching and raising questions about institutional boundaries and ownership. Of course open education; open software and open content are not new concepts. The Welsh report provides useful and clear definitions and notes that the development of OER movement has taken place over an extended period. Some of the early milestones in OER are summarised by Yuan et al (2008). For example the launch of the Open Content Initiative in 1998, MIT's OpenCourseware in 2002 and the Cape Town Declaration in 2007. More recently the UNESCO Open Educational Declaration (2012) highlighted continuing developments in policy and practice and signposted ten important recommendations for further development. Broadly the declaration focuses on policy frameworks, creation of infrastructure and awareness to facilitate progress. In this paper we are concerned primarily with the first recommendation, which calls for action to

'Promote and use OER to widen access to education at all levels, both formal and non-formal, in a perspective of lifelong learning, thus contributing to social inclusion, gender equity and special needs education. Improve both cost-efficiency and quality of teaching and learning outcomes through greater use of OER.'

In part the increased prominence of open education in higher education and in public discourse has been driven in by the success of Massive Open Online Courses (MOOCs) in recruiting very large numbers of students (BIS, 2013) and also in response to the huge increase in ownership of digital devices across the world. Access is no longer restricted to those with a computer but is possible through a wide range of devices including mobile phones and tablets. Despite the increased prominence of online education the impact of this digital revolution has been less apparent in higher education than in other sections of society. For example, Goodfellow and Lea (2013) describe how students operate in a digital world that shapes how they engage with learning materials, how they encounter and communicate ideas and how they learn. They observe only a limited impact on learning and teaching approaches in HE, with discussion and acknowledgement of the importance of digital literacy confined to a limited number of discipline areas and to a minority of staff. Support for this contention was found by (Cannell and Gilmour, 2013) who surveyed staff across all HE institutions in Scotland; the need to develop pedagogy in the context of digital literacy was not mentioned by any of the survey respondents. Alongside this there is evidence that much of the development of open education takes place in an institutional frame where online content is conflated with openness and viewed as something that ought

to be corralled behind the walls of institutional Virtual Learning Environments (VLEs). In a collection of essays on OER in Asia (Dhanajaran and Porter eds, 2013) the contributors from a wide range of different countries find significant similarities in the challenges facing the further development of use of OER. Prominent among these is a disjuncture between institutional policy and staff practice, as is a strong culture of individual academics wanting to retain ownership and control of resources that they have developed.

In this paper we focus on OER defined as free, online educational resources that are in the public domain and are licensed to allow anyone to legally and freely copy, use, adapt and re-share. We are particularly interested in exploring the meaning of 'open' through a widening participation lens. Before looking at some examples from practice in Scotland it is helpful to look in a little more detail about issues of openness and who participates. Rather than simply looking at the "freedoms" that open licensing affords, the means, it is worth looking at what we want those freedoms to do in the world. Dhanajaran and Abeywardena (in Dhanajaran and Porter eds, 2013) highlight Marshal Smith's (Smith, 2011) three principle narratives of OER; making access to knowledge more equitable; enabling users to become producers and transforming opportunities for both learning and teaching. They concur with Smith's conclusion that implementation constitutes an overarching narrative. since it underpins any attempt to successfully realise the first three. Although Smith was writing in the context of the developing world we find this framework and the conclusion helpful in an exploration of the relevance of OER to widening participation in Scottish higher education and we argue in the rest of this paper that it has more universal resonance. Other writers, for example D'Antoni in McGreal et al (2013), note the potential of OER to widen participation in higher education and remove or reconfigure institutional and other boundaries to access. However, that promise is still simply a promise, and it remains the case that there is deep-rooted inequity of access to higher education within nations and between nations. In Scotland, a developed and relatively wealthy nation, reports on widening participation over more than a decade (for example NUS Scotland, 2013) have highlighted persistent and sharp educational inequality driven by socio-economic disadvantage.

The scale on which MOOCs are delivered and the ability to study without charge or prior credentials has the potential to make an important contribution to the equitable distribution of knowledge. However, this promise is not being delivered, and the O for open within MOOCs' is often neglected (Macintyre 2014). Indeed, the evidence to date suggests that the main audience for MOOCs consists of those who have already had significant and successful access to higher education. More than seventy per cent of all the students who registered on Edinburgh University's first wave of MOOCs (offered on Coursera) already had a degree of some sort (Edinburgh University, 2013; Clow, 2013). Similar inequity of participation is apparent in most of the other published analytics. John Holmwood (2013)

goes beyond the demographics of participation to argue that the separation and unbundling of assessment from content in the MOOC model leads necessarily to a strong trend for enclosure of the commons, with content being open but credit being enclosed.

If MOOCs are mainly reaching the educational haves is OER realising the promise of open education envisaged by D'Antoni (2013)? In the developing world lack of infrastructure and equipment presents barriers to developing education at all levels. There are significant instances of OER supporting access to education, particularly at school level. The provision of OER can, for example, provide cost effective ways of providing materials that would traditionally take the form of printed textbooks (for example Garcia et al, 2013). However, developed countries with universal school education and relatively strong technological infrastructure still have significant inequity in access with those from disadvantaged socio-economic backgrounds having much less opportunity to access higher education through traditional routes from school to college or university. An important component of programmes to reduce such inequality of access is the facilitation routes into higher education for mature students and lifelong learners. However, there is little evidence that at the moment OER is contributing to this. Falconer et al (2013) in a study in an OECD study on the use of OER across Europe found only a few instance of OER contributing to the support of lifelong learners. In reviewing the state of play in Scotland, in the context of the OECD report and the broader widening participation literature, Cannell and Macintyre (2014) comment that

'The issues are not just about access to devices or software or familiarity with using new technology. The opportunities presented by OER are also in tension with the social, cultural and material barriers to participation in learning that are well established in the widening participation literature (for example: McGivney1999; McGivney 2000).'

'Digital Scotland', a 2010 report on access to the Internet in Scotland drew a similarly nuanced conclusion, noting that

'People remain unconnected for a variety of reasons of cost, availability and choice. Those well-connected use the internet to access goods and services, jobs, benefits, friends and relations. Those already most disadvantaged are least likely to be connected.'

All the evidence suggests, that at least in the domain of access to higher education, the vision of OER as a way of opening up opportunities to new groups and in new ways is not yet being realised. In the remainder of this paper we look at some emerging practices in Scotland and consider whether they may indicate some possible avenues for progress.

Developing new OER in partnership

The Open University in Scotland (OU) is in a unique position of being a Scottish University by statute, funded through the devolved Scottish Funding System but also part of the larger OU UK. The wider university provides access to free online resources created by the OU through the OpenLearn site launched in 2007, and through a community site OpenLearn Works open to other institutions and individuals. Though uptake for this latter service has been limited to date. Free material is also available through a number of other channels including iTunes U, YouTube and AudioBook.

In an environment where OER is well supported institutionally the OU in Scotland has developed a number of examples of new OER modules and new ways of working with existing OER. In 2010 the first such course, Gaelic in Modern Scotland was produced in response to requests for accessible cultural material to support already existing language learning materials on Gaelic. The new OER was produced using the course team approach that is part of the OU's approach to producing high quality material. In this instance the team involved academic experts form a number of other universities and from key cultural bodies like BBC Alba (the Gaelic Language arm of BBC Scotland). Over the subsequent four years six more free online courses have been created in conjunction with an eclectic range of non-university partners.

We have reported in detail on examples of partnership working elsewhere (Cannell 2013; Macintyre 2013). Here we want to explore the common themes running through these developments. All were built on existing partnerships. In most cases these were established as part of long-term engagement to support our core mission to widening participation. In contrary to mainstream curriculum development, which is most often institution centred, demand has come from the partner and the external context. And in every case the development of the OER has involved combining specialist and contextual knowledge from the partner with academic knowledge, technical expertise and learning design skills from the university. In reality this is a three-way partnership between organisations traditionally outside the domain of higher education, university based widening participation practitioners and educational technologists. The importance of partnership is best exemplified in the creation of 'Caring Counts', a new OER designed to help individuals in unpaid caring roles become conscious of the skills they develop in these roles, and support transitions into education and possibly employment. The value of an OER based approach to reflection, in and through transitions, had been established in a previous project working with a large organisation supporting refugees and asylum seekers. This has resulted in the production of OER that was rapidly taken up by individuals and organisations far beyond the initial partnership grouping. In the case of 'Caring Counts' the collaboration involved national and local organisations supporting carers. Critically the development of the OER involved a team-based approach that included carers themselves who had engaged with earlier OER initiatives and some accredited OU study; professionals working for carers

organisations and Open University staff. The carers were also students and in essence the development of the educational resource became a very particular example of co-creating the curriculum (Bovill et al, 2011).

This ability to focus on widening participation is based on a higher education funding regime in Scotland which is supportive of widening participation and partnership working; between universities and between universities and other bodies Cannell (2013). Indeed it is not just the OU in Scotland that has developed an approach to openness that is about partnership; partnership has been a significant component in the way that educators have approached openness across Scotland. For example, The Co-operative Education Trust worked initially with The University of Aberdeen to develop openly licensed materials on co-operative business models for use in undergraduate degrees, and the University of the West of Scotland is now using these. In this case partnership is about organisations supporting each other to create content.

There are also emerging examples of partnership supporting the use and re-use practices around openly licensed resources. In particular The OU in Scotland has been working with Trade Unions to develop practice in this area. The University of Edinburgh are working with Edinburgh City Council to look at how partnership can enhance the widening participation profile of MOOC users (Woodgate 2014).

In evaluating and recording these collaborations the question that arises is whether this is a something that derives from affordances or a requirement of open education, in that it allows and forces people to work between and across sectors? Is it simply a function of Scotland being a “wee place” and Scottish Government’s focus on partnership? Or perhaps it is pragmatic around how we support the development of OER and its use by students. It may even be an approach that derives from the particular approaches to education within Scotland. More work is required to understand and track the development of these open practices in Scotland in their global context.

There is however another aspect to all these case studies – Marshall Smith’s overarching narrative of implementation. Growing out of existing widening participation partnerships meant that each instance of development, described briefly above, took place in a connected social context embodying relationships of trust, of prior action and shared activity. The evidence emerging from what is now a sequence of diverse partnership developments is that these relationships enable each OER project to be more than simply robust development of content, but also a way of facilitating use by actors in the network. So targeted OER content, created in this way, already had a ready audience for use that enables implementation at significant scale. From a practice perspective, a core part of the widening participation in partnership methodology employed by the university had already been the identification of key individuals in organisations who could promote and facilitate

the use of more conventional educational resources. This approach of supporting individuals embedded in organisations and networks has transferred across to the OER domain. These key individuals have their own networks and communities of practice and it's then possible for good practice to be propagated to other organisations that the university was not necessarily connected to. It's striking that this approach has also been adopted in the Welsh context. The Open University in Wales, operating in a different policy and funding environment, has created a network of community and workplace based 'OpenLearn champions' whose role is to promote the effective use of OER (Welsh Government, 2013).

Opening up educational practice

In 2007 the Cape Town Open Education Declaration stated that '*open education is not limited to just open educational resources*'. Cannell (2013) notes that

'The declaration stresses that developing the potential of open education requires practices that enable educators to share approaches and ideas and promote development in pedagogy.'

This focus on Open Educational Practices (OEP) marks a distinct shift from OER as content to a focus on the facilitation of effective use.

'*Understanding of what is encompassed by "practices around OER" is changing from a narrow view of educational practice which centres on the production of content, to a broader definition that encompasses all activities that open up access to educational opportunity in a context where freely available online content and services (whether 'open', 'educational' or not) are taken as the norm.*' Falconer et al note (2013: 7)

The stress on '*all activities*' is important. In considering OEP it is still most common to think about the nature of platforms, the importance of learning design and the embedding of motivating devices such as badges. We would argue that all of the experience described in the previous section underlines the importance of these technical and pedagogical practices. So, for example, Macintyre in the conclusion to his 2013 paper on a partnership with Community Energy Scotland remarks that:

'One of our original goals was to look at how working with partners outside the academy might make the development OER and OEP more sustainable and more relevant. What we have found is that there is a role for partnership, but that role is not simply as about bringing in new materials, new markets and new finance. This paper suggests that open is not simply

about content and licensing, it is also opening up educational practices more generally.'

But we would also argue for a wider definition of the P in OEP. Opening up educational practices in the projects we have been engaged with suggests that the effective implementation of OER is possible through the integration of the processes of identification and co-construction of content with context specific understanding of social relationships and networks. On the basis of this limited and geographically specific experience we suggest that combining good practice in OER design with approaches to implementation and dissemination that are more familiar in the world of Community Based Adult Education and widening participation can provide an effective way of enabling large-scale use of OER with non-traditional learners. There are echoes here of D'Antoni's aspiration for OER. In particular the process of OER creation involves, as a core and necessary practice, relationships with individuals and organisations that would normally sit outside the academy. One university operating at a relatively small scale in one country is clearly no more than a glimpse of a possibility. However, the importance and potential benefits of this area of work has prompted the Scottish Funding Council to fund a three-year sector wide project on developing open practices in education. The project 'Open Educational Practices in Scotland' (www.oepscotland.org) is led by the Open University in Scotland but involves the other 18 higher education institutions, the college sector and non-university bodies and aims to act as a test bed and a catalyst for a major step forward in the implementation of effective practice in the development and use of OER in Scotland.

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Towards a learning-centered design framework for Blended Learning

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Abstract

The purpose of this contribution is to provide a learning-centered framework for the (re)design of blended learning courses. Our framework uniquely blends theories on the learning process and course design.

In a student centered learning environment knowledge and skills are actively constructed by students themselves and the lecturer is the facilitator of this learning process. Learning is a process in which students undertake learning activities which lead to relatively stable changes in their behavior or behavioral dispositions. Learning takes place when learning functions are being fulfilled. Two theories on the learning functions are the foundation on which this learning centered framework for the (re)design of blended learning courses is built. We start with the three elements of the learning process: orientating, processing and regulating. Each of these elements contain a number of more specific learning functions for example: selecting. To fulfill these learning functions, learning activities need to be organized. Using the theories on learning functions and academic criteria, a list of learning activities has been constructed.

To design effective (blended) learning courses that provide students with these learning activities, we also consulted theories on course design to further strengthen our framework. The lecturers need to select teaching methods and teaching (ICT)resources that fit the objectives set for the course. To help them choose the right ones, teaching methods and resources suited for blended courses have been added to the framework. The lecturers can use this framework to make the course design in a perfect blend of online and face-to-face education. The next phase is testing, evaluating and revising the framework so that lecturers can use the framework to (re)design there courses.

Keywords: *Blended Learning, learning functions, learning activities, course design, teaching methods, teaching resources*

Introduction

To educate engineers who can contribute in an innovative and relevant manner to (the future of) our society for the length of their entire career, the Eindhoven University of Technology (TU/e) has formulated an educational vision on engineering education as it should be at the TU/e in 2030 (Meijers & den Brok, 2013). In this educational vision digital technologies will play an important role in improving the quality of learning as to make it more effective and efficient. This does not mean all learning should take place through digital technologies. Digital technologies should be used when they are either more effective for learning, based on pedagogical theories, or can make the educational process more efficient. Using digital technologies, when appropriate, can put the time reserved for face-to-face education to optimal use. In other words, the educational vision promotes *blended learning* as the future of TU/e education. Blended learning is a mix of online and face-to-face teaching methods and learning activities, in which students actively work with and on the content individually, in interaction with each other and with the lecturer (Vandeput, L. et al., 2011). To create the optimal blend lecturers are challenged to (re)design their courses from a sound pedagogical viewpoint.

To help lecturers (re)design their courses we provide them with a design framework. In developing this framework we have asked ourselves the follow question: *'What does a (re)design framework look like that is based on the learning process of the student, fits the characteristics of blended learning and is easy to use by lecturers?*'To answer this question we started the (cyclical) process of instructional design (research) as described by Plomp (2013). According to Plomp (2013), such a design process consists of the following phases: *problem, analysis, design & develop prototype, evaluating* and *revision*. In this contribution we follow this process. Hence after stating the *problem*, the phases of *analysis* and the *design* have resulted in the current draft of the *prototype* of the framework. This is where we are at, at this point in time. After fine-tuning it, the next phase is *evaluating* our framework in a small scale pilot, using it to (re)design two or three actual courses. Hopefully we can test our framework in the fall of 2014. After such a pilot, we will use our evaluation results to *revise* our prototype, after which there will be a larger scaled pilot to test the revised framework.

In the first section *the problem/current situation* we clarify why it is important to have a blended learning framework for the (re)design of courses. The second section, *the analysis*

shows the theories underlying this framework. We explain how a student learns and how learning environments and course design can be organized in a way that learning is effective. The framework for blended learning will be presented in section three *the prototype*. We end this contribution with points to consider while further developing the framework.

Problem / current situation

While effective blended learning is what the Dutch universities are aiming for, reality has not caught up yet. At this moment digital technologies are being used, but too often not in the most effective way for learning (Dutch Ministry of Education, Culture and Science, 2005). Often lecturers use them as a way of transmitting knowledge. The origin of this problem lies in a traditional perspective on education, which is common in the world of higher education (Laurillard, 2002, 2013). In that perspective education essentially comes down to the transmission of knowledge from an external source to the student. In this so called transmission model the student becomes a passive recipient of that knowledge (Vermunt & Verloop, 1999). The lecturer is the directing agency, who prescribes to a high degree what students should do to achieve the objectives presented by the lecturer (Vermunt & Verloop, 1999). In essence, this approach to education is a teacher-centered or teacher-directed learning approach.

Much more effective for the actual learning to take place is a learner-centered or learner-directed type of education. This stems from constructivist theories that state that knowledge construction occurs when students carry out activities actively in order to learn new skills. Learning is thus focused on the development of competences and on applying content, not just on reproducing it. In a student-centered environment the lecturer is the facilitator of learning, his role is to assist the students in constructing their own knowledge.

For several reasons it is important to go beyond the traditional forms of academic teaching. One of the main reasons, as Meijers & den Brok (2013) state it, is that there are a few challenges that the TU/e among other universities is facing that should be overcome. The TU/e is dealing with a growing number of students each year and an increasing amount of diversity among those student such as the expanding number of women and different nationalities. Next to that there is the growing importance of technology in our society that

influences our education as well. At the same time the TU/e sets out to deliver small scaled, high quality education to educate engineers of the future. High quality education means, among other things, excellence in pedagogy which is achieved by aligning the objectives with the content, materials and the (personal) nature of the students. This framework can help lecturers to (re)design their courses in such a way that students are active learners and the lecturer has a more supporting and guiding role to assist the students in their learning. To do this correctly we have to start with the learning process of the student.

Analysis (theoretical framework)

What makes effective learning? Before answering that question it is important to understand what learning is. Many researchers have been trying to define what learning is. For the purpose of this framework we have formulated the following definition based upon de theories of Shuell (1988), De Corte (2007) and Boekaerts & Simons, 2003).: learning is an goal oriented, constructive, cumulative, collaborative, active and self-regulated process in which students undertake learning activities which lead to relatively stable changes in their behavior or behavioral dispositions.

- *Goal oriented (De Corte, 2007; Shuell, 1988):* the student is more likely to be successful if he is aware of the goal towards which he is working.
- *Constructive (De Corte, 2007; Shuell, 1988):* the student is constructing new knowledge by interacting with his environment.
- *Cumulative (De Corte, 2007):* the student builds new skills, concepts and ideas on skills he already has.
- *Collaborative (De Corte, 2007):* the student is constructing new knowledge by interacting with others (lecturers and peers)
- *Active (De Corte, 2007; Shuell, 1988)*: the student is actively processing incoming information in order to learn the content.
- *Self-regulated (Shuell, 1988):* the student needs to be aware of his progress so he knows what to do in order to achieve the learning objective.

So learning is a process and according to Shuell (1988) there are three different psychological processes involved in this learning process: cognitive, metacognitive and affective processes. All three processes interact with one another in order for learning to be successful. *Cognitive processes* help to acquire, process and store content. *Cognitive processes* lead directly to learning results either on mental level (insight, understanding etc.) or on material level (a paper, a summary etc.). *Affective processes* have a role in coping with

emotions that arise during learning. These emotions can lead to a mood that may foster or impair the progress of the learning process. *Metacognitive processes* regulate and steer the cognitive and affective processes and therefore indirectly lead to the learning results. Each of the three psychological processes contains a number of *functions* that must occur in order for learning to take place. In considering these functions, several things need to be kept in mind. First, although these functions are an essential part of the learning process, each one can be accomplished in a variety of equally effective and appropriate ways. The important thing is that the function is accomplished, not the specific way in which it is performed (Shuell, 1988).

Functions can be accomplished by a wide variety of learning activities. The essence of a learning activity is that it must have one or more 'learning outcomes' associated with it. A learning outcome is what a student is able to do after completing the learning activity. The learning activities can be *initiated by* either the *lecturer* or the *student*, but they must always be performed by the student. In 1988, Shuell is the first to establish a set of learning functions, after which many researchers added and changed this list. In 1999, Vermunt & Verloop conducted a review of all the scientific papers on learning functions and established the below mentioned list of learning functions in which they renamed Shuell's metacognitive processes to regulative processes.

Table 1. list of learning functions (Vermunt & Verloop, 1999)

Cognitive	Affective	Regulative
Relating/structuring	Motivating/expecting	Orienting/planning
Analyzing	Concentrating/exerting effort	Monitoring/testing/diagnosing
Concretizing/applying	Attributing/judging oneself	Adjusting
Memorizing/rehearsing	Appraising	Evaluating/reflecting
Critical processing	Dealing with emotions	
Selecting		

In 2003, Boekaerts & Simons made a different categorization of the learning functions. This followed the more sequential process of performing learning activities and distinguished between preparing, processing and regulating. In developing our framework we have used Boekaerts & Simons (2003) to define the elements of the learning process and renamed them to *orientating*, *processing* and *regulating*.

Orientating: Orientation helps students to prepare themselves to learn a new competence. They are getting insight in the learning objectives and the available learning activities. They discover the correlation between their prior skills and competences and the new ones to develop. While orientating students uses the regulative learning function *orientating* from Verloop & Vermunt (1999) and the preparing learning functions from Boekaerts & Simons (2003).

Processing: To process a new competence a student undertakes learning activities which make it possible to get insight in, to utilize, to give meaning to and to get familiarized with the content. The cognitive learning functions from Verloop & Vermunt (1999) are used for processing. The elements orientating and processing can be seen as a cyclical process which continue until the student is ready to be assessed. Regulating this cyclical process is a requirement to be successful in learning a new competence.

Regulating: Regulating the learning process makes learning effective and the learning process efficient. Both lecturers and students play a role in regulating the learning process. Because of our educational vision the emphases lies on the (development of) self-regulating abilities of the student. He should be able to plan, monitor and adjust his own learning process. A part of the learning result is an inner aspect and therefor it is not always clear when a student masters a competence and is ready to be assessed. To gauge the learning result it is important to have observable tasks or products. This not only helps the student self-regulate but also gives the lecturer inside in the progress the student is making in his learning process. For this element the regulative functions from Verloop & Vermunt (1999) are used.

We have used the aforementioned list of Verloop & Vermunt (1999) to specify the learning functions within the three categories and have added and removed functions to make it fit the specific characteristics of academic engineering education as explained by Meijers, Overveld & Perrenet (2005): *"For the universities of technology justice needs to be done to the complex world of the engineering sciences. Here, design and application play an important role in addition to the development of theories. They are not just concerned with the analysis, modelling, explanation or interpretation of phenomena, but also with the synthesis of knowledge for designing and making new technological artefacts and systems in a concrete social context. This is why imagination, creativity, problem solving, and*

integration of knowledge are important characteristics of an academically educated engineer."

This resulted in the following categorization of learning functions within these elements (see: Table 2)

Table 2. Learning functions used in the framework. *Freely translated from Verloop and Vermunt (1999), Boekaerts and Simons (2003) and Meijers, Overveld & Perrenet (2005)*

Learning process[9]	Learning functions	Learning activities
Orientating *The student orientates on the learning objectives, procedure and content.*	**Orientating on the learning objectives, procedure and content.** *Preparing for learning by selecting specific learning objectives to work on, examining the characteristics of the learning and assessment activities and the available resources. Establishing if the student has prior knowledge, skills and competences that relate to the learning objectives.* (*Verloop and Vermunt, 1999; Boekaerts and Simons, 2003)* *Orientating on the content is limited to reading and scannen the materials and resources. As soon as the student is actively doing something with this content, he is processing the content.*	• Selecting learning objectives • Clarifying learning objectives • Selecting learning activities • Selecting materials and resources • Make an assessment to establish prior knowledge, skills, competences. • Activating prior knowledge
Processing *The student is mastering the competence*	**Structuring** (*Verloop and Vermunt, 1999)* *Bringing order to the individual parts of the content and bring them together into an organized whole. Integrating newly acquired competences with competences one already has.*	• Integrating the main concepts in a document • Clarifying they interrelations between the individual parts of the content into a arranged scheme • Forming an overview of a course and bringing order in the subjects that are dealt with independently under super-ordinate principles or themes.
	Selecting (*Verloop and Vermunt, 1999)* *Distinguishing between main and minor points, reducing large amounts*	• Marking or underlining central concepts in textbooks or articles • Make notes on the main elements

[9] The affective processes have been excluded from the framework because they do not play a part in choosing the right teaching methods or resources.

	of content to the most important elements.	
	Relating (*Verloop and Vermunt, 1999)* *Looking for connections between individual parts of the subject matter, between the individual parts and the whole and between new content and prior knowledge or preconceptions.*	• Trying to think of analogies between problems in the subject domain • Examining the similarities and differences between theories • Comparing the content from the course materials with content they have from others sources
	Concretizing (*Verloop and Vermunt, 1999)* *Trying to form concrete images from abstract information.*	• Thinking of examples and practical applications • Comparing information on the subject matter with personal experience • Connect theory with phenomena in everyday reality.
	Applying (*Verloop and Vermunt, 1999)* *Practicing to master the new competence.*	• Trying to solve problems by using what they've learned • Using the information/competence they acquired through study to understand the surrounding world in a new way. • Using subject matter to interpret experiences and topical events in their subject domain.
	Analyzing (*Verloop and Vermunt, 1999)* *Breaking down a larger whole into the individual parts of which it is composed. Sorting out step by step what different aspects of a problem, line of thought or theory may be discerned.*	• Thoroughly study specific details and factual information • Examining the successive steps in an argument
	Critical processing (*Verloop and Vermunt, 1999)*) *Thinking along with authors, lecturers and fellow students, drawing ones' own conclusions based on facts and arguments, rather than just accepting anything that is said or written. Judging the quality of content, a source or theory.*	• Examining whether conclusions and views of other people are in accordance with the facts. • Forming their own interpretations and opinions • Forming a personal judgment of the correctness of content presented.

	Synthesizing (Meijers, Overveld & Perrenet, 2005) *Constructing new knowledge (through research) or artefacts (by design)*	• Designing artifacts or systems (that add value) • Developing new knowledge and insight (goal oriented and methodological)
Regulating *The student monitors and adjust his learning process .*	**Planning** (*Verloop and Vermunt, 1999)* *Deciding on a plan of action with timeframe.*	• Deciding on the sequence of learning activities • Estimating the time needed to do each of the learning activities
	Monitoring (*Verloop and Vermunt, 1999)* *Observing, whether the learning process proceeds according to plan. Students actively observe whether their learning activities lead to progress in the intended direction.*	• Noticing that they're behind on schedule. • Noticing that a specific activity doesn't help them comprehend the content.
	Assessing for learning (*Verloop and Vermunt, 1999)* *Checking whether one understands, can apply the subject matter sufficiently, where they are in their learning process in relation to the stated learning objectives.*	• Making trial exams • Getting feedback on tasks
	Diagnosing (*Verloop and Vermunt, 1999*) *Determining gaps in one's own competence and mastery of the subject matter and examining possible causes of learning difficulties or successes.*	• Examining why they do not understand something • Tracing the cause of their inability to solve a problem • Trying to find out what exactly they do not understand or are able to apply
	Evaluating (*Verloop and Vermunt, 1999)* *Judging the extent to which the final learning outcomes are in agreement with the objectives and the degree to which the learning process has proceeded as imagined in advance.*	• Comparing learning objectives with learning outcomes • Comparing schedule with executed learning activities and the actual time spent on an activity.

	Adjusting (*Verloop and Vermunt, 1999)* *Introducing changes in the original learning plan on the basis of the results of monitoring, testing and diagnostic activities, deciding on alternative learning activities, goals and/or contents during learning.*	• Selecting other activities for similar goals • Planning more or less time on specific types of activities • Changing the order of learning activities and/or objectives to work on.
	Reflecting (*Verloop and Vermunt, 1999)*) *Thinking about the learning experience.*	• Thinking about the things that have happened during the learning process • Thinking about learning, teaching, learning activities and learning experiences in general.

The purpose of this framework is to give lecturers input to help them choose the right teaching methods and resources to create an effective blended learning course that fulfills the selected learning functions. In the framework for blended learning we regard the learning functions *memorizing* and *rehearsing*, following Bloom's taxonomy, as lower-level cognitive skills. When mastering the higher-level cognitive skills, the mastering of lower-level cognitive skills is implied. As an academic institution we aim at achieving the higher-level cognitive skills. *Memorizing* and *rehearsing* are therefor left out of the framework. In the same line of thought we replaced the words *knowledge* and *information* with the words *competence* and *content* which are broader terms in itself and include knowledge and information. Verloop & Vermunt (1999) place the learning function *orientating* under the regulative learning functions. However this learning function is already included in our element orientating and thus no longer mentioned as part of the regulative functions. We have added the learning function *synthesizing* to our framework because it fits the academic competencies of researching and the competence of designing that is significant in engineering education (Meijers, Overveld & Perrenet, 2005).

Learning environments

In formal education such as a university, learning activities take place in the context of a curriculum. A part of that curriculum is a learning environment which includes the learning activities. The above mentioned list of learning functions and activities is the basis for an effective learning environment. Our framework is developed for the design of blended learning environments. A learning environment can be defined in different manners. For this framework we define the learning environment as the context in which the necessary learning processes are triggered, guided and continued to achieve the intended learning outcomes (Lowyck & Terwel, 2003). A learning environment is thus not synonym to curriculum. Curriculum stands for a 'course' or 'track' that has to be taken to achieve the learning objectives. For the purpose of this paper we regard the learning environment as part of the curriculum (Lowyck & Terwel, 2003).

Designing a learning environment includes decisions on procedures, methods, guidelines and resources for the realization of efficient, effective, productive and high quality education. The product of an educational design is a plan that defines the basis, content and structure of the learning environment (Lowyck & Terwel, 2003). Our framework is foremost intended as a means to design learning environments for a specific course. The level on

which the learning environment is situated is thus on a *micro-level* also known as classroom level as mentioned by Van de Akker (2013)

Curriculum design

When designing a learning environment all curriculum components should be well aligned. For this framework we use the components of a curriculum as mentioned by Van den Akker (2013)[10]. At the core of the learning environment lies the 'rationale' which answers the question; *'Why are they learning?'*. To that nine components are added, that together make up the learning environment. These components are: *aims & objectives, content, learning activities, teacher role, materials & resources, grouping, location, time* and *assessment*. Each of these components provides an answer to a relevant question and they are always connected. Van den Akker (2013) presents these components in his 'curricular spider's web' (see: Figure 1).

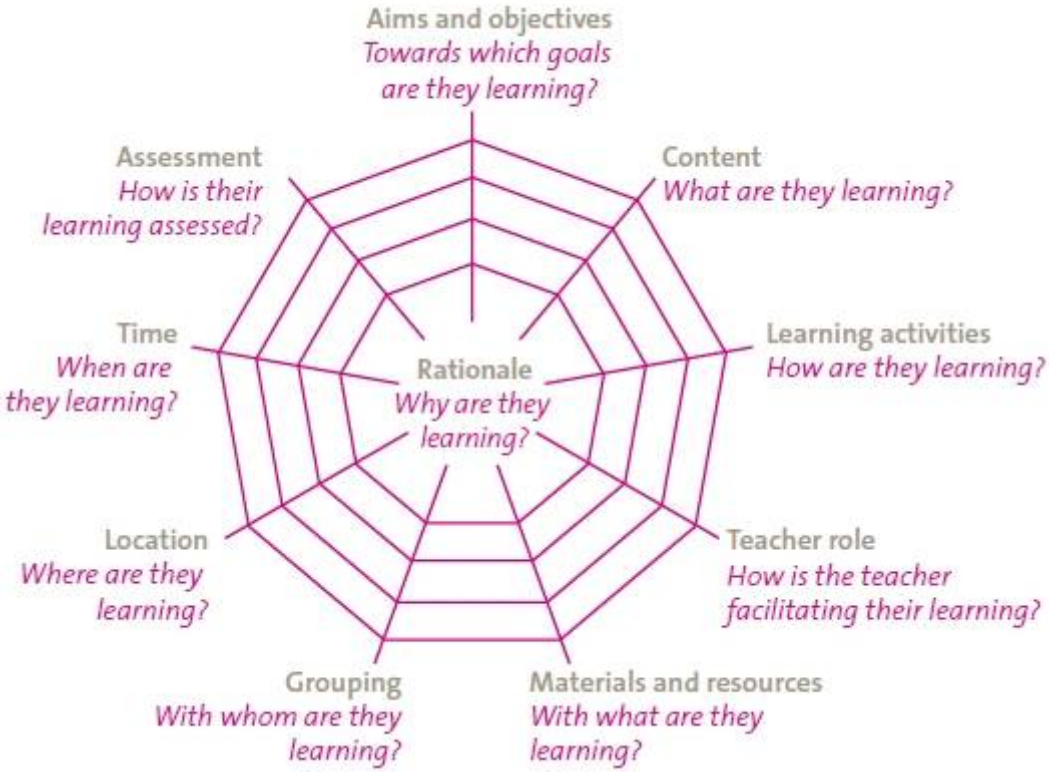

Figure 1. Curricular spider's web

[10] Van den Akker does not distinguish between a curriculum and a learning environment as mentioned above. His model fits our definition of a learning environment, so where he uses curriculum, we use learning environment.

Although this spider's web describes the components and shows they are linked together, it does not prescribe an order in which these element could or should be defined. We have categorized the components to define the phases in which the design should be developed, which has led to the following categorization.

Phase 1:

- *Aims & objectives:* Describe the aims & objectives a student taking this course should achieve. Which competencies should he have at the end of this course and at what level?
  Describe the learning objectives by stating: *the student is able to ……*
- *Assessment:* Define how progress can be measured to help the student and lecturer understand how far the student is from achieving the objective.

The aims & objectives and the assessment are linked together. The assessment should match the mastery level as prescribed by the learning objectives. For example using a written exam with questions that assess if they can reproduce facts is not effective when the objective is that they should be able to apply a specific theory.

Phase 2:

- *Learning functions:* Decide which functions should be fulfilled. Should they be analyzing, applying etc.?
- *Learning activities:* Select the activities that will fulfil the chosen functions.
- *Content:* Define what students should learn. What are the core concepts, which methods, which theories should students learn?

The learning functions, activities and content should not only be aligned with one another but should also be aligned with the objectives and assessment from phase one. So, the learning functions should meet the level of the learning objectives. For example: if a student should be able to use a certain method to solve a problem one of the functions should be applying.

Phase 3:

- *Materials & Resources:* Determine which materials & resources are available for the students to learn from.
- *Teacher:* Decide what the role of the teacher should be for each learning activity. Is the teacher in control or the student, or is it a 'shared control'?
- *Group:* Define with whom students are learning. Learning is a social activity. When and how do students interact with one another or with other experts.
- *Location:* Determine where are students going to do this activity. Is it limited to a specific location or can students work on this anywhere? What are the restrictions within the university?
- *Time:* Decide when students are going to do this activity. Is it limited to a specific time period or can students work on this whenever they want? What are the restrictions within the university?

The above mentioned five components are tied together. If a certain learning activity should be done in a group or the lecturer is 'in control', this might limit the possible locations and time period. These components for the most part decide which teaching methods and resources are available and vice versa. In phase 3 the situational factors should be taken into account. For example the number of students in a course will limit the options a lecturer has in choosing the level of control, the location the activity takes places and the group sizes that are available. Also, the kind of student, being that the student might be a first year's bachelor or a master student, is relevant when deciding on these elements especially for the level of control.

For the choices to be made in phase 2 and 3 we have developed a selection matrix. This matrix uses the learning functions as a jumping off point and helps the lecturer select fitting methods and resources to realize these learning functions. In the process of designing a course the form of summative assessment should be chosen when aims & objectives are defined. As they mark the beginning and the end of the course, together they frame everything to be designed in between. Summative assessment, however, is not included in the matrix as this focuses solely on learning. Assessment in this context is thus limited to assessment for learning, also known as formative assessment. As this framework is meant for developing learning environments (context) instead of curricula we have added situational factors to our design process. These situational factors are: specific context (number of students in a course, amount of time), the nature of the subject (science), the kind of students and the kind of teacher (Fink, 2007).

Prototype

In the analysis phase we have conducted information on the learning process, learning functions, learning activities and the process of designing a learning environment. Our analysis has led to the below mentioned flowchart (see: Figure 2) and matrix (see: Table 3), which are the core of our prototype for (re)design. This is the first step in answering our main question: *'What does a (re)design framework look like that is based on the learning process of the student, fits the characteristics of blended learning and is easy to use by lecturers?'*

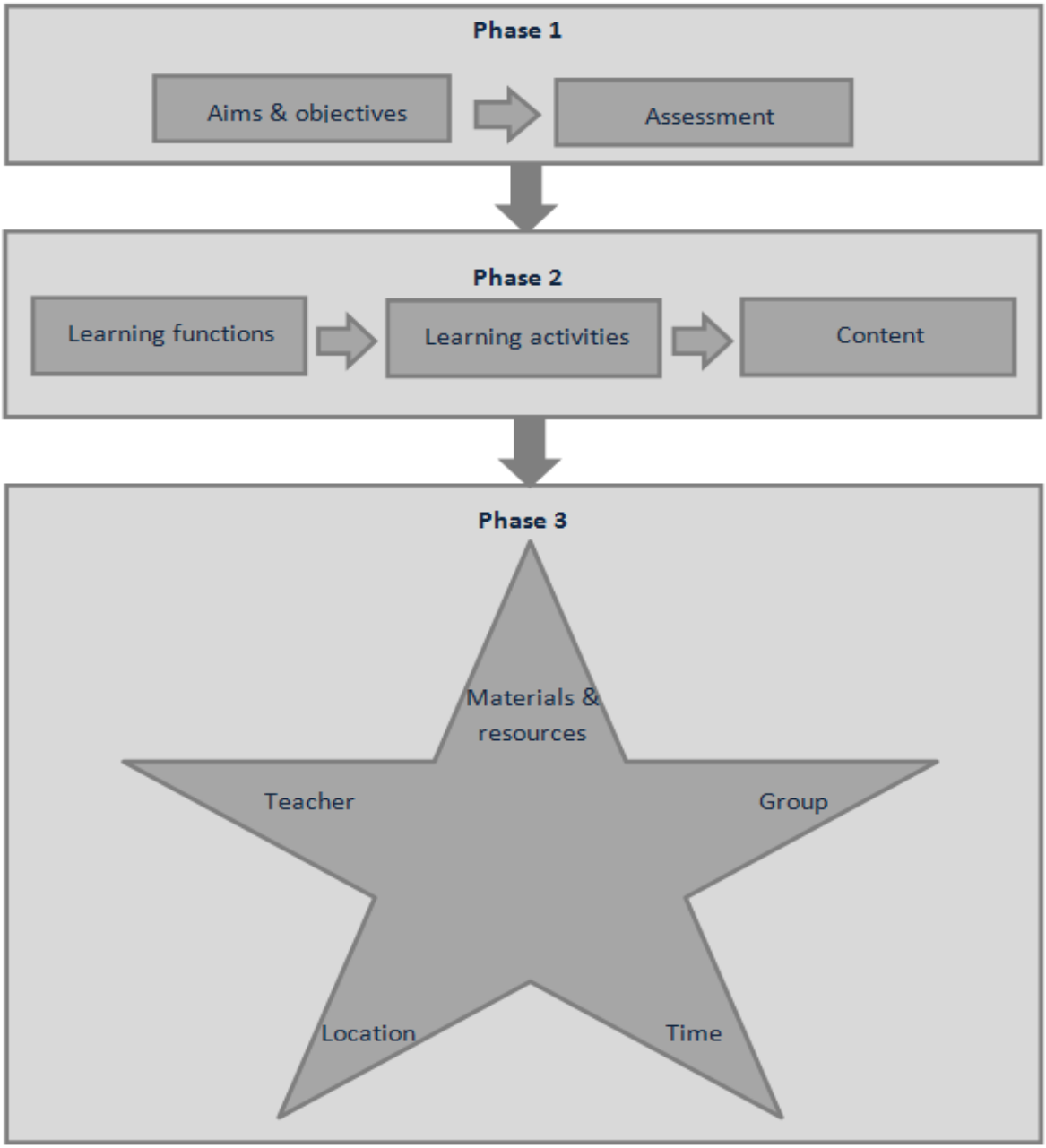

Figure 2. Flowchart course design

Once a lecturer decides on the learning functions that are relevant for his course, the choices for fitting teaching methods and resources can be made. The options are represented in the following selection matrix. On the left side of the matrix the learning functions are represented, each in the element of the learning process it takes part in. These functions are cross-referenced with a list of teaching methods and resources. Each ‘x’ in the matrix links the teaching methods and resources that are effective for this specific learning function.

Teaching method

Learning process	Lecture (to inform)	Lecture (to demonstrate)	Lecture (to interact)	Practicum	Workshop	Seminar	Selfstudy content	Selfstudy assignments	Learning by inquiry (groups)	Learning by inquiry (individual)	Design based learning (groups)	Design based learning (individual)	Groupsdiscussion	Feedback	Peerassessment	Selfassessment
Orientating																
Objectives	x															
Procedure	x															
Content	x	x				x	x									
Processing																
Structering			x				x		x	x		x	x			
Selecting			x				x		x	x		x	x			
Relating		x	x				x		x	x		x	x			
Concretizing		x	x			x			x	x		x	x			
Applying			x	x	x			x	x	x		x				
Analyzing			x	x			x		x	x		x	x			
Critical processing			x				x	x	x	x			x			
Synthesizing					x			x	x	x	x	x				
Regulating																
Monitoring														x	x	x
Assessing for learning													x	x	x	x
Planning																
Diagnosing													x	x	x	x
Adjusting													x	x	x	x
Reflecting														x	x	x
Evaluating														x	x	x

Resource

Learning process	Book (text)	MOOC as a book	Handouts (text)	Articles (text)	Reader (text)	Weblecture (lecture)	Screencast	Videolecture	Tele lecture	Weblecture (internet)	TV/documentaries/youtube	Powerpoints	Website (course)	Website (internet)	Website (students)	Blog	Wiki (exercising)	Wiki (writing texts)	Wiki (reading)	Classroom Response Systems	Discussion forum
Orientating																					
Objectives			x			x		x	x			x	x							x	
Procedure			x			x		x	x			x	x								
Content	x	x	x	x	x	x	x	x	x	x	x	x	x	x					x	x	
Processing																					
Structering															x	x		x		x	
Selecting															x	x		x		x	
Relating															x	x		x		x	
Concretizing															x	x		x		x	
Applying	x	x															x			x	
Analyzing															x	x		x		x	
Critical processing															x	x		x		x	
Synthesizing															x	x		x			
Regulating																					
Monitoring																x					
Assessing for learning																				x	x
Planning																					
Diagnosing																				x	x
Adjusting																				x	x
Reflecting																x				x	
Evaluating																x				x	

Learning process	Report	Product	Presentation (lecture)	Presentation (student)	Videopresentation (student)	Game	Simulation	Experiment	Skeleton concept map	Mind map	Video-conference	Social Media	Instant Messaging	Rubrics	Review (product)	Review (paper/assignment)	Review (presentation/conversation)	Assessment dialogue	Questionair	Pre-test	Trial exam
Orientating																					
Objectives			x																		
Procedure			x																		
Content			x																		
Processing																					
Structering	x			x	x				x	x	x										
Selecting	x			x	x				x	x	x										
Relating	x							x	x	x	x										
Concretizing	x							x			x										
Applying		x				x	x	x			x										
Analyzing	x								x	x	x										
Critical processing	x			x	x						x										
Synthesizing	x	x																			
Regulating																					
Monitoring												x	x	x	x	x	x	x	x	x	x
Assessing for learning												x	x	x	x	x	x	x	x	x	x
Planning																					
Diagnosing												x	x	x	x	x	x	x	x	x	x
Adjusting												x	x	x	x	x	x	x	x	x	x
Reflecting												x	x	x	x	x	x	x	x	x	x
Evaluating												x	x	x	x	x	x	x	x	x	x

For example if the learning objective is that the student should be able to design a building which serves the agreed upon purpose and takes into account the environmental factors and social context in which it should be built, one of the learning functions that would apply would be synthesizing. Possible effective teaching methods for the learning function synthesizing would be *learning by design (individual), learning by design (group), workshop, learning by inquiry (individual)* and *learning by inquiry (group).* Possible resources for the learning function synthesizing would be *a product, a website (student), a blog, a wiki (writing text)* or *a report.* So by using the matrix, the choices following the selection of the learning function are limited to methods and resources that fit the learning function the lecturer decided on.

Discussion/ Further development

As mentioned in the introduction we started the (cyclical) process of instructional design to answer our main question. So far we went, in developing our framework, through the following phases: problem, analysis and design & development of the prototype. Which resulted in the current draft of the framework that answers for the most part the first element of our question: *'What does a (re)design framework look like that is based on the learning process of the student and fits the characteristics of blended learning?'.* Further refinement of the prototype will finalize the answer on this part of the question.

In developing our prototype we deliberately excluded certain elements such as the affective learning functions and summative assessment. We excluded the affective learning functions not because we do not see them as important but they do not play a part in choosing the right teaching methods and resources. We excluded summative assessment because we wanted to focus solely on the learning process and summative assessment determines whether the learning objectives have been achieved, rather than contribute to the learning process. This prototype could be further refined to the level of specific (ICT)tools or applications, guidelines for effective use of the specific methods and resources and the design of specific instructions that accompany these methods and resources. This however, is something that needs to be developed in interaction with the lecturers that are actually working with the specific tools as to define best practices. In this prototype we specifically chose the learning functions as the starting point because this ideally would be the route a lecturer would take in developing his course. However we do realize that we might need to offer other starting points as well to make sure that lecturers can relate to and work with the framework. For example a lecturer who already knows that he wants to work with a

specific teaching resource would want to start from that point. We also realize the cross-references made in the framework at this point are still debatable and the framework is not exhaustive. With this draft we put down the outlines for our framework, but it still needs to be refined in further detail before we enter the next phase.

The next phase is *evaluating* our framework in a small scale pilot, using it to (re)design two or three actual courses. The pilot will provide us with the information we need to answer the last part of our main question: '*is easy to use by lecturers?'.* It will also provide us with feedback on the framework itself and either confirm or make us reconsider the exclusion of aforementioned elements. We will use this feedback to *revise* our prototype. After the revision there will be a larger scaled pilot to test the revised framework. In conclusion we think that this framework will help the lecturers to make the transition from the traditional teaching-centered design of their course to a more effective learning-centered design of their course.

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Innovative didactical strategies based on tablets and u-learning[11]

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ABSTRACT

Tablet is the fashionable device in schools and universities. Many project and experiences are being carried out using them from several approaches. It is the convergence of computers (laptops) and mobile phones (smartphones). Features and possibilities are analysed contrasting it to these previous devices and to traditional learning environment. The communication channels between users and tablets (sight, hearing, touch, and movement) are analysed also regarding to special users' needs and inclusion. Wireless and touch are mainly relevant in its didactical possibilities. Wireless means mobility and ubiquity; touch means intuition and immediacy. We discuss the appropriateness of names (mlearning vs ulearning) when we usually refer to pedagogical practices. Mobility means movement; ubiquity means another place. We suggest that the second one reflects better the sense of usual practices with tablet and other mobile devices. In addition, we explain several didactical strategies, applying them to several fields and topics, using tablets for ulearning.

Keywords: tablets, didactics, mlearning, ulearning.

[11] The present work was carried out within the framework of a research Project on learning through mobile devices (ref.: EDU2010-17420), financed by the Spanish Ministry of Education, Culture and Sport (2011-2013).

Introduction

Given that the world of tablets evolves constantly, our aim here is to focus on the most reliable information, skirting over those innovations that have yet to prove their worth. As Marés (2012, p. 5) says, "Yes, tablets represent a new format for producing and consuming content, together with interactivity, interaction and entertainment. However, in terms of implementation, there are grey areas that we cannot and should not ignore when choosing a device."

The devices we refer to come in a wide range of sizes and models but, before going into detail, we need to define the "essence" of a tablet: what it is exactly that distinguishes it from other digital devices. A tablet is a computerised device designed to meet needs that previous devices could not handle. Since inception their appearance and capabilities have evolved enormously. Physically it is a non-foldable flat surface, one side of which responds to the touch. This is the screen. Inside it has a memory, an operating system, programs and applications. One edge is provided with sockets to plug into internet (either by Wi-Fi or data card) plus a socket to power the device. Users may connect add-on devices to complement the tablet's versatility or use the components provided, such as digital contact pencils.

In one sense tablets bridge the gap between portable computers and mobile telephones, although the experts see them, quite rightly, as a variant on the smartphone. In the same way that mobiles and smartphones underwent formal and technological changes before achieving their present status, we note that they both derived from fixed as opposed to portable installations. Tablets, on the other hand, start life as mobiles in the sense that the hardware is broadly similar. Prior to the appearance of tablets and smartphones, we had other devices such as PDAs and pocket PCs. This growing family of digital devices rapidly expanded to include tactile screens that users could write on, followed by versions incorporating a keyboard, midway between a mobile phone and a portable computer. This innovation was the forerunner of the tablet that, in many ways, looks like, and in fact is, a large smartphone.

On the subject of size, it is interesting to note that whereas mobile phones tended initially to shrink, by mutating into smartphones they began to grow again. A similar path was followed by tablets, with the early models being larger than those now on the market. Despite the similarities, manufacturers maintain both devices as separate articles designed to serve different purposes, thus ensuring that users buy both. This explains why one of the noted features of the tablet is its inability to connect to the telephone network, which is technically feasible. On these and other grounds, the two devices will doubtless continue to evolve, eventually combining the two most widely used electronic devices, computers and smartphones.

The point to make here is the major advance these technological processes have procured for both learning and leisure thanks to their key virtue, ubiquity. Ubiquity comes from the Latin "ubique", meaning "everywhere", i.e., present simultaneously in

multiple places and contexts. In educational contexts ubiquity is used to refer to the acquisition of knowledge via digital mobile technology providing access to Internet. To date, the ubiquitous use of digital resources with respect to academic and non-academic subjects is still relatively undeveloped. It is thus useful to delve further into the range of applications and circumstances to which mobile digital devices provide access.

According to Wang, Wiesemes & Gibbons (2012) ubiquitous learning works to the advantage of students of all ages, via mobile devices, i.e., portable computers, tablets, 3G and GPS telephones, etc., providing greater access to internet. In addition, these resources promote new means of learning, of cooperating and of communicating between students and teachers. In this respect it is worth stressing that the process of on-line teaching and learning contributes significantly to the learning process of university students.

By means of the mass use of mobile artefacts (tablets, PDAs, cameras, smartphones, IPods, pocket PCs, mobile telephones, recorders, consoles, etc.), what we are witnessing is the onset of a new educational medium, i.e., mobile learning, m-learning, or u-learning, etc. As stated by Cantillo, Roura & Sánchez (2012) mobile telephone technology greatly facilitates m-learning, thanks in the main to its development of the learning process via a wide range, physical and virtual, of contexts. Over and above the artefacts themselves, Vavoula & Sharples (2002) consider that learning itself may be regarded as an aspect of mobility, occurring in, among other places, the lecture room, the home, places of entertainment and the workplace. For this reason it is mobile within the various locations of daily existence, meeting the demands of study, work and leisure; equally it is ubiquitous in terms of time, occurring at different moments in the day or life of the learner, be it on workdays or holidays. In this context, both possibilities, that of movement itself and access to different environments, are of key importance in the learning process. It is for this reason that, in terms of English nomenclature, we prefer to call this type of learning *u-Learning* as opposed to *m-Learning*. The possibilities that these devices allow us, combining geographic and digital mobility, foster learning in a broad range of contexts and time periods. In fact, today, time and place no longer constitute barriers to a person's education.

This study is part of a project undertaken at national level on the use of mobile digital devices among university students (ref.: EDU2010-17420). Its main purpose is to enquire into the widespread use of these artefacts within a learning context and to define the level of competence required from and achieved by undergraduates. This part of the study focuses on the use that undergraduates make of tablets. The main central research questions are:

- How do students use tablets?
- Why do students use tablets?
- How is a good tablet user?
- What are the perceptions of tablet users?

Tablets and their potential contribution to higher education

As noted above a tablet is a digital artefact in the form of a small flat touch-sensitive screen. Communication between the user and the tablet is achieved fundamentally by sight, touch and, as an add-on, sound. Tablets today offer students one of the most attractive technological resources to hand, on a par with portable computers and intelligent telephones (Demb, Erickson & Hawkins-Wilding, 2004; Smith & Caruso, 2010).

Although most mobile devices were originally conceived for purposes of communication, they are equally useful as didactic tools. Various studies have demonstrated their ability to improve students' access, control and autonomy in a learning situation (Hussain & Adeeb, 2009; Seibu & Biju, 2008). Thus we can say that the use of tablets in educational contexts helps motivate students, given the proven ability of these devices to handle the multitude of didactic resources that contribute dynamically and practically to the learning process university students undertake. Consequently, the research conducted on the inclusion of tablets within educational contexts should open up new didactic strategies aimed specifically at exploiting this resource in learning/teaching contexts.

Mang & Wardley (2013) have examined the approach undergraduates adopt to tablets. They noted that tablets are fast replacing portable computers as students' favoured information medium. One of their findings was that students can switch rapidly from a computer to a tablet and use the latter to pursue a broad range of educational tasks, with reduced incidence of non-scholastic pursuits such as "chats" and social networking. In fact, uses are different. That said, there can be no doubt that the scope of this tool in stimulating new forms of learning depends to a large degree on the level of students' digital knowhow.

Clearly, from an educational perspective, it is important to obtain maximum mileage from today's wide range of digital artefacts and devices, along with the information and data they convey at all times and in all places, particularly for undergraduates. To this end below we give a brief analysis of the pluses and minuses these tools offer in comparison with others, on the basis that their two main competitors in this context are portable computers and intelligent mobiles. With respect to the former, we see a number of advantages:

- Reduced size and weight.
- Greater ubiquity and learning in terms of lecture-hall presence and elsewhere, together with ease of transport to students' lodgings.
- Students can take their tablets to their directors of studies, thus reducing the latters' need to move from one place to another.
- Tablets foster mobility and freedom, given that they can be used

while their owners are on the move.

- Their advantages extend to other parameters of functional use such as movements / agitation of the device or vibration.
- Tablet batteries last longer and consume less, thus reducing the need for lecture rooms to be fitted with chargers.
- They require fewer resources (RAM and hard drives) to achieve the same performance.
- They can be used in various different positions.
- They have the same basic range of functions as a computer, in terms of both computation and communication.
- They convert, with great ease, into an electronic book.
- Managing by touch greatly enriches activity possibilities.
- They enable an intuitive and spontaneous use that adapt naturally to the psychometric and perceptive characteristics of young people.
- They greatly facilitate activities associated with cameras, thus extending their versatility by, for example, allowing augmented reality, QR codes or measurements.
- They are purpose-built for distributing and consuming contents and communication.
- They provide greater visual contact than the computer screens among people in the lecture room.
- As their presence increases, prices tend to be lower than alternative media.
- They greatly facilitate the development and application of augmented reality.
- They also simplify the use of QR codes.
- They are equipped with solid memory, i.e., the same as that of USB storage components, thus reducing the likelihood of disc read/write accidents.

At the same time, the following disadvantages must be listed:

- They operate on the basis of touch that could present challenges for users' adaptation.
- Occasionally, storage concept on the hard drive disappears, or their storage capacity declines.
- Certain facilities such as the variety of wired connections are smaller in range.
- In most cases they oblige users to have access to a wireless internet connection (wired connections are rarely catered for) thus increasing the need for lecture rooms to be equipped with broadband internet.
- They were originally designed for the distribution and consumption of contents, before working tools.

- Given their portability, they do not encourage students to remain seated in their allocated places.
- Their mobility increases the risk of damage by being dropped.
- Carrying out certain tasks by touch may prove difficult without using accessories such as a mouse, touch-pen or keyboard.
- The interfaces and possibilities of some applications change with respect to their computer versions.
- They do not cater for reading CDs or DVDs.

Vis-à-vis mobile telephones, particularly intelligent mobile telephones, we take the view that tablets offer the following advantages:

- The surface area is larger, giving a better view of the content.
- The handling surface is larger, increasing functionality.
- Functional capacity is greater, i.e., storage, battery, and processing capacity.
- Autonomous operation is of greater duration, thanks to a longer-lasting battery.

We also recognise that tablets present a number of disadvantages:

- They are usually more expensive than mobile telephones and are rarely included in mobile telephone line offers.
- They require a Wi-Fi connection, which increases operating costs and restricts usage to the areas covered.
- They rarely work with a simple mobile telephone connection.
- Standard mobile telephone functions such as voice messaging, SMS and WhatsApp are often defective or non-existent.
- They consume more energy than conventional mobiles.
- They are more difficult to manage one-handed.

On the basis of the above we consider that in both cases tablets have a clear advantage that justifies their success as the preferred technological instrument for academic activity in today's educational environment.

A point worth noting is that as a rule young people are attracted by information and communication technologies (ICT). At the same time the use of digital media is expanding fast across all age groups, particularly with respect to day-to-day and leisure activities. Another important factor with respect to the use of ICT in universities is the attitude adopted by teachers and lecturers (Cope & Ward, 2002) and their own ICT background, which tends to enhance or inhibit their use in the classroom.

Many reports have been written on the development of the different devices available and on the attitude of users towards them. In 2012 tablets were still a minority interest (10%) compared with mobiles (Europe 37%; Spain 44%) that were more frequently used to access internet both in Spain and the EU as a whole (Gimeno, 2013).

In February 2014 the Asociación para la Investigación de Medios de Comunicación[12] reported that in Spain mobile telephones had doubled their access to internet (85.5%) while tablets had increased access by a factor of four (43.0%) though still trailing computers, both portables (77.7%) and desktops (73.3%). 39.4% of users prefer tablets for leisure purposes while only 29.1% consider them suitable for other activities (Asociación para la Investigación de Medios de Comunicación, 2014). On this basis it appears that the preference for a given device depends on the particular use of Internet. Computers may be more practical for certain uses, as noted in the above reference, while tablets, though still behind in that domain, respond well to use for leisure purposes. At the same time it is worth noting that 28% of people experiencing any disability use tablets but to a lesser extent than computers (88%) and smartphones (70%) to access Internet, a circumstance that may be related to the level of accessibility to each of these devices (Gimeno, 2013).

Another interesting study was that undertaken by Del Hoyo, García & Del Olmo (2009) which showed that more than half of Spanish users did not have internet access at home. A new statistic to be taken into account is that internet access at home now covers 69.8% of the population and this percentage is expected to increase (Instituto Nacional de Estadística[13], 2013). Thus, every day more Spanish households contract Internet access, either by cable or Wi-Fi. This increase is the result not only of cheaper connection prices but also the range of services currently available on internet and the interest users have in accessing them.

Research methodology

This research has been undertaken on a multi-case basis using a descriptive and analytic approach. To conduct this research we adopted a combined quantitative-qualitative approach. The key source of information was a purpose-made questionnaire designed to elicit core information, using open questions and scales. Understandably, the questionnaire follows the logical approach validated by experts. It allowed us to discover the perception university students have of tablet use. To gather this data we relied in the main on tele-training and emails, subjected subsequently to statistical analysis using SPSS, version 19.

The study sample covered 433 Spanish students from publicly funded universities. They study a broad range of subjects: Arts and Humanities, Social Sciences, Health Sciences, Experimental Sciences, Architecture and Engineering. They were studying these specialities in the academic year 2011/2012, when the data were collected. The highest level of participation involved third-year students of ages ranging from 18 to 48, the average age being 22.2 years. In terms of gender, there was a balanced mix of

[12] Spanish Association for Mass Media Research

[13] Spanish National Institute of Statistics

male and female students, with a slight predominance of women.

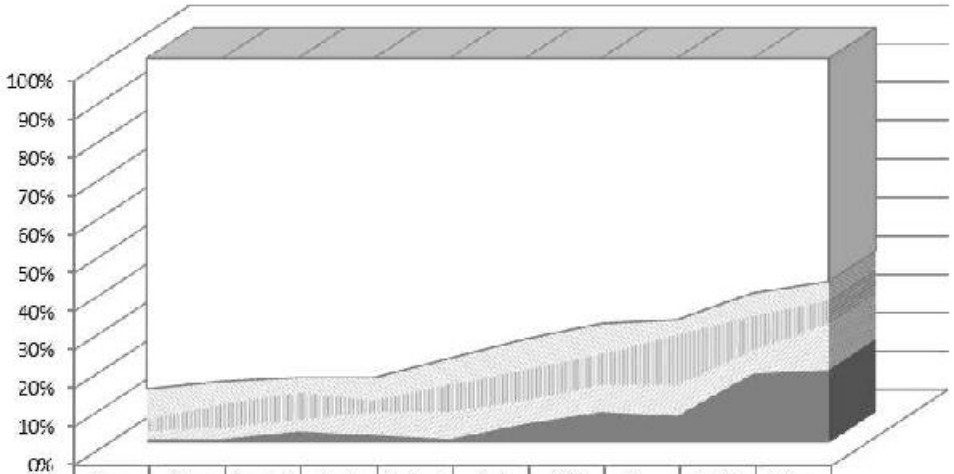
Findings

Results are presented according with research questions.

How do students use tablets?

The first question was about the use of tablets. 45% of students use tablets at some time and for some purpose. Their uses at university are not so high:

- Never: 83.86%
- Rarely: 3.14%
- Occasionally: 4.48%
- Frequently: 4.93%
- Very Frequently: 3.59%



	Group work	Notes	Academic works	Study	Academic information	Chat	Mail	Non academic information	Social media	Leisure
Never	86	84	83	88	78	78	80	68	81	88
Rarely	5	5	4	6	7	5	5	4	6	5
Occasionally	3	5	7	3	7	5	5	13	9	6
Frequently	2	3	3	6	7	6	7	5	6	12
Very Frequently	1	1	3	2	1	5	5	7	18	10

Figure 1. Frequency of uses

Then only 16.14% of students use tablets at university.

The frequency of uses is very variable according to the tasks and activities. The results are reflected in figure 1.

Focusing the usual tasks that the students do in the tablets:

- Group work: 14%
- Notes: 16%
- Academic works: 17%
- Study: 17%
- Academic information: 22%
- Chat: 27%
- Mail: 31%
- Non-academic information: 32%
- Social media: 39%
- Leisure: 42%

Then, the main tasks are not academic: Non-academic information (32%), Social media (39%), and Leisure (42%). Communication is also quite relevant: Chat (27%) and Mail (31%).

In u-learning, one relevant aspect is the place where students use tablets. The most relevant answers were:

- Hallways: 5%
- Cafeteria: 7%
- Classroom: 7%
- Work place: 8%
- Street: 8%
- Outdoors leisure: 11%
- Library: 11%
- Transport: 11%
- Home: 20%

Most tablet uses of students are outside home (80%). An important part of uses are outdoors (30%): street, leisure, and transport. Some uses could be considered at university: hallways, classroom, and library (23%). Very few uses are in the classroom (7%).

Why do students use tablets?

Most students do not use tablets at university (as seen, only 16.14%). For students who use them, the reasons are:

- The device cost is low: 4.62%
- The connection cost is low: 6.15%

- They need it: 10.77%
- It is comfortable: 35.38%
- Their phone rate includes Internet connection: 43.08%

The main reasons to use tablet are economic. As collected, adding Device cost, Connection cost, and Phone rate, 53.85% is challenged. Generalisation of Wi-Fi net would contribute to use them.
In the other hand, reasons why they don't use them at university were also collected:

- They do not know how is the configuration: 7.32%
- Connection cost: 9.76%
- They do not know the possibilities: 9.76%
- They do not have: 11.38%
- It is easier in other devices: 29.27%
- They do not manage it: 32.52%

The lack of knowledge seems the main reason. Adding Configuration, Possibilities, and Management, 49.59% is achieved. Training strategies could encourage tablet use.

As reflected in figure 2, innovation and leisure are the two most identified functions of tablets.

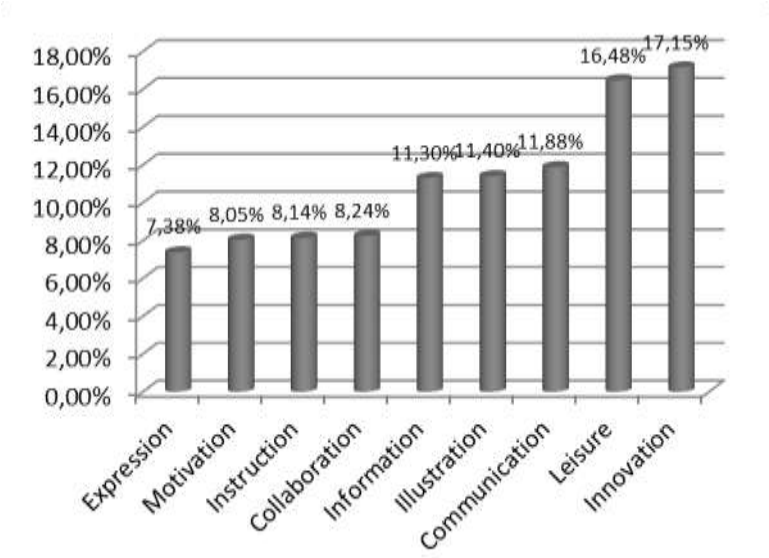


Figure 2. Functions of tablets

Students value very well new applications supported by tablets (17.15%) and leisure uses (16.48%). Information (11.30%), Illustration (11.40%), and Communication (11.88%) are also identified as important.

How is a good tablet user defined?

A good tablet user is defined as using it:

- To take advantage daily: 8.77%
- To connect internet: 8.77%
- To work and develop social relationships: 9.65%
- For multipurpose uses: 11.40%
- With much more applications and tools: 15.79%

The dexterities assigned to a good user require mostly diverse, flexible, plural skills: Use it to work and social relationships (9.65%), Use it for multipurpose uses (11.40%), and Use much more applications and tools (15.79%). In a radial graphic representation, the look is like this figure 3.

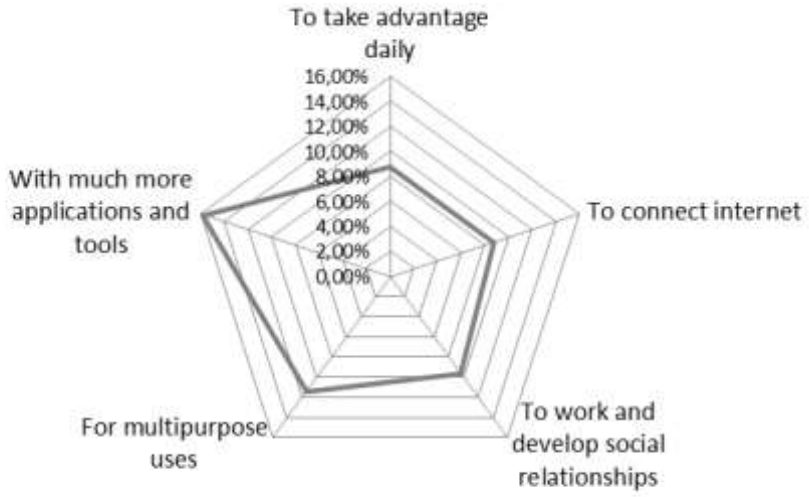


Figure 3. Abilities of good tablet users

The specific skills that students identify to use a tablet are:

- Dexterity: 19.83%
- Eye-hand coordination: 23.97%
- Agility and delicacy: 29.75%

Then, surprisingly they are more motor skills than cognitive ones.

The competences that they identify to use tablets are:

- Search and select information: 6.10%
- Surf the internet: 7.32%
- Adapt to new technologies: 9.76%
- Control touch screen: 15.85%
- Knowledge about software: 30.49%

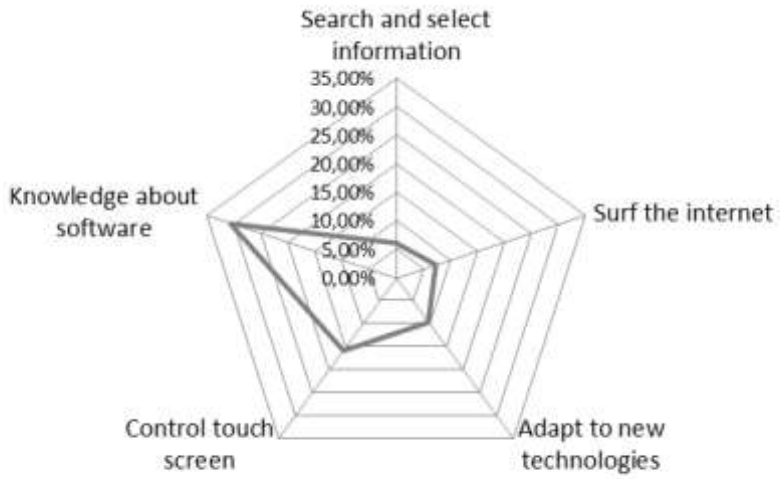


Figure 4. Competences to use tablets

In this case, competences are more cognitive than motoric (only Control touch screen: 15.85%). Technical knowledge (software and screen: 46.34%) is more important than attitudes (adaptation: 9.76%) and procedures (information and Internet: 13.41%). A radial representation produces figure 4.

What are the perceptions of tablet users?

Students valued tablet for vocational future as:

- Unimportant: 17.99%
- Of Little Importance: 11.76%
- Moderately Important: 22.84%
- Important: 20.42%
- Very Important: 26.99%

Starting from the median, students express some importance for vocational future (47.41% consider it as important or very important).

The students' satisfaction degree using tablets was also asked. They are:

- Very dissatisfied: 14.29%
- A little dissatisfied: 4.76%
- Indifferent: 28.57%
- A little satisfied: 26.98%
- Very satisfied: 25.40%

52.38% expressed some kind of satisfaction but an important group is indifferent (28.57%) or dissatisfied (19.05%). That could be related to lacks of knowledge or difficulties in management. The radial graphic looks as below (figure 5).

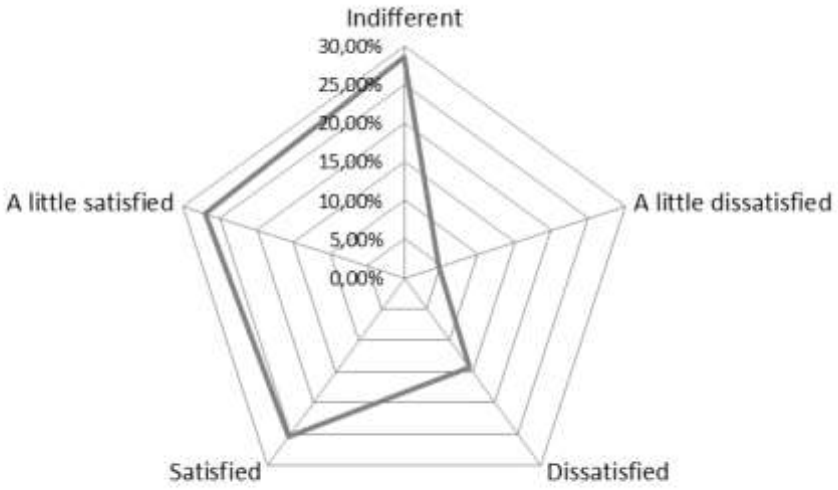


Figure 5. Student's satisfaction

Discussion and conclusions

As basis for discussion and conclusions of the results obtained, we highlight the following:

- The percentage of students using tablets is slightly higher than that of the population in general, a percentage that is rising fast. However, only a certain percentage of university students use tablets, in most cases for non-academic purposes. It is worth noting, as remarked by Walters & Baum (2011), that contexts generated by the users themselves predominate as it is the user that chooses what applications to employ and the content applicable within his or her working environment and personal learning curve.
- In general, users employ the tablet and its accessories in a variety of ways. Both for the general public and students tablet usage focuses primarily on non-work contexts, i.e., hobbies and pastimes.
- Tablets are used in the main outside home and, to a smaller extent, in the open air. Whereas the variety of uses is clear, less information is available on usage "on the move", i.e., in the open air and on public transport. This circumstance makes "u-learning", i.e. ubiquitous learning, more appropriate than "m-learning", mobile learning.
- Only a quarter of users operate tablets in a university context, although usage in university contexts is prompted in the main by economic and convenience factors. Non-use appears to be more closely related to technical difficulties, a factor that may be rectified by training strategies.
- The most significant uses relate to innovation and hobbies, followed by obtaining information, illustration and as a means of communication. Taking a key from Morrone, Gosney & Engel (2012) it is appropriate to mention the potential for multifunction use of tablets in developing active methodologies

and, thus, innovation. At the same time, according to Billinghurst & Dunser (2012), tablet use generally ranges from pure entertainment to learning processes and communication. With regard to the last of these three, it should not be forgotten that, in general, the use of ICT as a tool for short- and long-range communication is fundamental for knowledge-based societies.

- The advantages most closely associated with valid use of tablets related to the plurality and flexibility of usage. Motor skills rank higher than cognitive skills, whereas the required competence derives in the main from cognitive skills.
- Roughly half of university students believe tablets will be of relevance for their future careers. In this context, various studies have found that experience with tablets has proved useful for university graduates and professional workers (Nakano et al., 2013).
- In general, students are satisfied with their tablet use according to research undertaken (Handy & Suter, 2011), even if users also note certain limitations, in general students are happy with the academic and personal performance they obtain by means of tablets.

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Development and Evaluation of an Integrated Platform for Open and Distance Education Students

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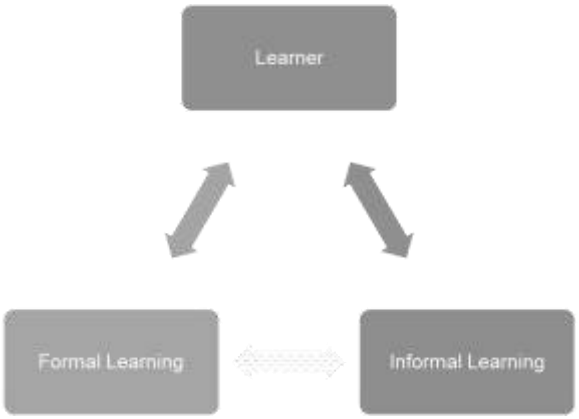
Abstract

Social Web technologies is one of the most active Web technologies used for teaching and learning nowadays. Social Web applications are providing the necessary services for mobile phones, smart phones and tablet computers also. Thus, to collect the services offered by different social web applications in one center has become possible. The opportunities and the educational potential of the Social Web makes it remarkable for lifelong learning, distance education and e-learning environments. In this context, providing integrated sharing platforms that include social Web facilities for learners become an important requirement for Open Education Systems. This study is on continuing "Development and Evaluation of a Sharing Platform for Open and Distance Education Students" project funded by Anadolu University. In this study the subject and scope of project, related literature, purpose of project, the original value and the added value of the project discussed.

Keywords: Lifelong learning, social Web, informal learning

Introduction

Lifelong learning have an important value in today education agenda. This concept point the construction of a society that have learning opportunities for everyone (Fischer, 2001). In other words learning occur not only within the grades or official institutions but also for life at home, at work, on the street and in other environments. And this situation is explained by the concept of informal learning in related literature. According to Coffield (2000) all learning does not occur in formal places such as classroom and school environments, in contrast, most of the learning takes place in informal settings can be defined as a process that occurs spontaneously in life. In particular, with wide spread of Social Web environments also known as Web 2.0 give opportunities to support informal learning and lifelong learning in a more active way (Klamma at al. 2007). Formal and informal learning for learners are given in Graph 2 below.



Graph 1. Formal-Informal Learning

Every day updated Internet technologies provide content interchangeable, reusable media in addition to a high degree of learner interaction and communication (Fırat, 2009). Social networks, wikis, blogs, video sharing sites and folksonomies (RSS, Atom, FOAF, etc.) are considered as the second generation of Internet services. Also in CMSs (Content Management System) like Blackboard, WebCT ve Moodle and LMSs (Learning Management Systems) social web services are provided. However, it is not possible to say that these server-based applications are adapted to the continuously individuated social Web (McLoughlin and Lee, 2010).

Social Web technologies, as a result of learning and teaching carried out on network technologies has become one of the most recent and most prevalent trends in

education as e-learning revolution.(Welsh, Wanberg, Brown ve Simmering, 2003). The reason for this is possibility of providing appropriate training to a wide target group in a short time and cheaper. In addition, in recent years the use and distribution of the content by learner in e-learning environment was found to be more important. (Chatti ve Jarke, 2007). This reveals the potential of e-learning in social network structures emerging with Web 2.0 or social web conversion. Nowadays, widely used social media and web applications are social networking sites (Facebook, Twitter, MySpace etc.), sharing sites (YouTube, Flickr, Instagram etc.), business networking sites (LinkedIn etc.), collaborative web sites (Wikipedia etc.), virtual worlds (Second Life, Active Worlds, There etc.) and educational material sharing platforms (MIT Open Course materials, Merlot etc.) (Mangold ve Faulds, 2009).

In social Web applications most common educational sharing platforms are Facebook, blogger, YouTube and Wikipedia. Previously, because of the luck of Web application that integrates the services offered by social technologies integrated sharing platforms didn't widespread. However, nowadays the social web applications have APIs to provide data or other functions. API (Application Programming Interface) API is a module created to provide some functions of the application for other platforms. Social Web applications not only provide APIs but also support services for mobile phones, smartphones and tablet computers. Thus, it has become possible to collect the services offered by different social web applications in a center.

Anadolu University, by "Lifelong Learning" slogan is a pioneer in the delivery of Open and Distance Education services in Turkey. Anadolu University provide quality e-learning services in hundreds of programs to millions of students since 1982 in Turkey. In parallel with this mass education, a giant material sharing network occurred in Facebook groups, forums, email lists, blogs, web sites and other sharing platforms. Some of these environments created in informal purposes and individual initiatives. And shared materials, assignments, examples may be irregular, unreliable, and contain incorrect information.

Open and Distance Education students use many social web applications such as Facebook, twitter , blogger, wikis and forums. In this environment, students are sharing their questions about courses, their homework, and other materials. But there is neither officially nor unofficially integrated sharing platform that provide multiple social web application opportunities for students. In this context, this project is one of the first study designed to address these needs of Open and Distance Education

students in Turkey. The developing sharing platform which is considered to be an original design in terms of to be for a specific target group.

Purpose

The main purpose of the project is to develop, improve and evaluate an integrated sharing platform for Anadolu University, Open and Distance Education students. For this purpose, the following questions will be searched during the study:

1. Which Web technologies can be used in the development process the integrated sharing platform?
2. What is the first design of the integrated sharing platform based on the needs of the students?
3. How to improve the integrated sharing platform based on students' opinions and suggestions?
4. What are the design principles of integrated sharing platform?
5. What are the opinions of the experts on the benefits and limitations of integrated sharing platform?

Method

Depending on the purpose of the project research will be designed as design-based research. In this context, design-based research methods will be used in the development, improvement and evaluation of the sharing platform. Design-based research process summarized in Figure 2 below.

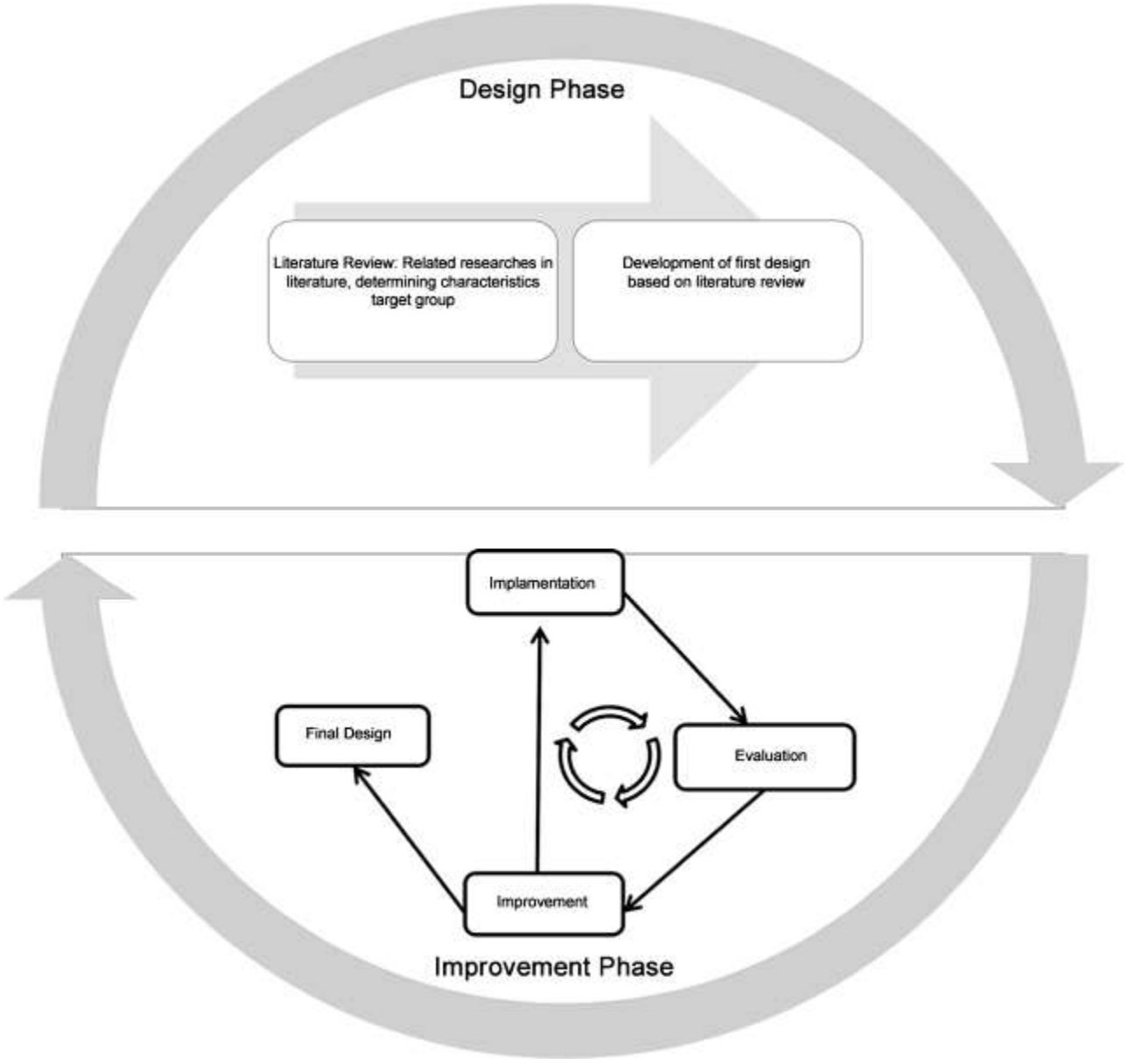


Figure 2. Design-based research process

In the figure, steps of design-based research process are summarized. In the design phase of design-based research, a literature review carried out cover development process of sharing platform for Open and Distance Education students, related researches and applications, and necessary features of sharing platform. In the second step design phase, the first design of sharing platform will be developed based on conducted literature review.

In the improvement phase of design-based research, integrated sharing platform will be opened online and will be assessed by students. As a result of the assessments made, sharing platform will be developed, improved and evaluated based on Open and Distance Education students' opinions and preferences. In the improvement phase of design-based research, as shown in Figure 2 iterative design will be used. In iterative design process, the improvement stages repeat until it reaches a sufficient design.

Participants

The participants of this project are students attending Open and Distance Education programs at the fall semester of 2014-2015 academic year and scholars who are experts on use of Social Web in educational purpose. In the study, purposive sampling will be made. To do this, developed sharing platform will be announced in social Web applications widely used for Anadolu University Open and Distance Education programs. Opinions and suggestions of students on sharing platform will be taken after they examine the platform. Platform will be improved in line with the received opinions and recommendations. Determination of expert participants will be based on research profiles of scholars. Scholar should have researches on the use of social Web in education. Determined experts will be directed to sharing platform. Than opinions and suggestions of will be taken after they examine the platform.

Data Collection Tools

In order to collect data for the project, two data collection tool will be used. These tools are:

1. "Sharing Platform Evaluation Questionnaire for Student" for students' opinions on the platform
2. "Sharing Platform Evaluation Questionnaire for Expert " for experts' opinions and recommendations on the platform,

Both questionnaires will be developed within the project. In questionnaires, qualitative and quantitative data will be collected. In the preparation of the evaluation

questionnaire received expert opinion and pilot application will be utilized along with literature review. Then the developed questionnaires will be transferred to electronic environment and the will be applied to participants online.

Data Analyses

In the analysis of quantitative data obtained from questionnaires descriptive statistics such as percent (%), frequency (f) and mean (X) will be utilized. Within this study, in the analysis of qualitative data thematic analysis of content analysis techniques will be utilized. Thematic analysis is defined as a method used to identify, analysing and reporting themes within the data. (Braun and Clarke, 2006).

Conclusions

Sharing platform, has the potential to one and a half million students. With this platform students achieving incorrect information will be reduced, and a more controlled sharing will be provided. Thus, the validity, reliability authority of the shares will be increased. And these homework samples, sample questions, tests, and other multimedia will be able to contribute students to be more successful in their courses.

In the platform;

- areas can be created for each department and program,
- students can open the topics,
- images, video, text, audio, animation, graphics, multimedia can be shared,
- learners can share media regardless of time and space and can access shared media,
- site administrator, make announcements on the homepage,
- site administrator, can share and check the suitability of the shared material and content.

Project studies currently continues in the design phase of esign-based research process. A screenshot of early design of sharing platform is given below in Figure 3.

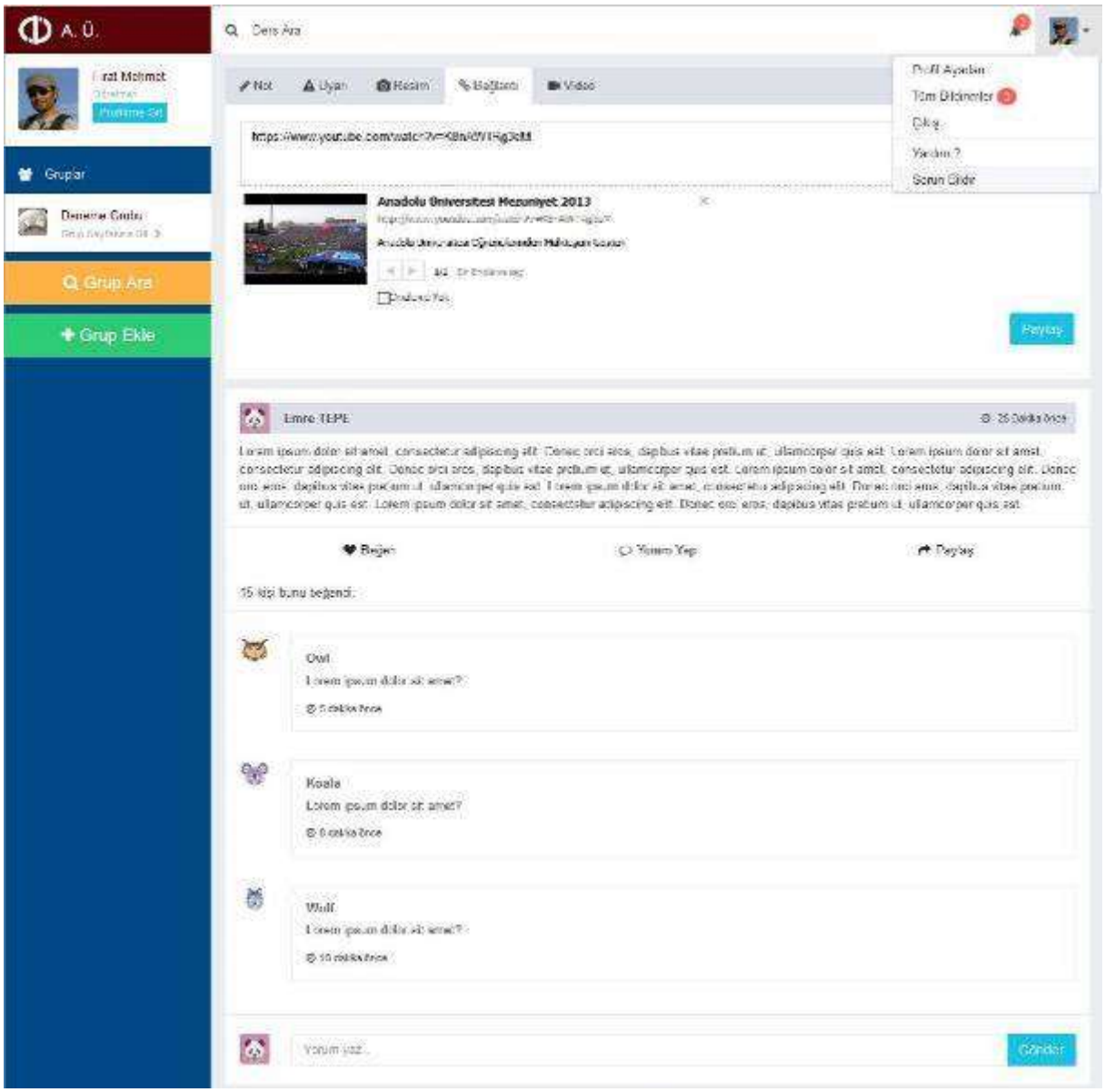


Figure 3. Screenshot of early design of sharing platform

As can be seen on first design of sharing platform it is possible for students to share videos, links, pictures, messages, and alerts. And also students can search and attend groups created for specific purposes. In the literature review, it was seen that the target group specific integrated sharing platform studies are insufficient. There are applications like StudyBlue in commercial purposes for various target groups. However, the scientific studies are insufficient in this manner. This study is thought to contribute to the literature with its original value.

Acknowledgement

This study is the part of an ongoing project entitled “Development and Evaluation of a Sharing Platform for Open and Distance Education Students-1303E057”. This project is supported by Anadolu University Scientific Projects Unit.

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Applying Social Media in Vocational Education Trainers

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Abstract

In this paper, we present an educational platform that aims at filling the online training gap between self-directed learners and VET trainers by developing mobile e-learning 2.0 knowledge and skills of the trainers thus turning them from in-class trainers to skilled e-tutors. More specifically, we present an online course designed to assist tutors in applying the social media tools and techniques in education. Social media are mostly relying on the Web 2.0 tools and principles that focus on the interaction among people, who can create, share, and/or exchange information and ideas in virtual communities and networks. Tutors, by studying the course, can learn the different types of social media tools (collaborative, social networking, blogs, content communities etc) and how each one can be used in classroom or for distance learning. For every type of social media we focus on representative and popular tools, offering learning scenarios and ideas about how they can be integrated in a course to organize and share learning content, attract student's attention with entertaining activities and motivate them to become active and collaborate in the learning experience. The course has been (and is still being) developed in the context of the MOBIVET2.0 LdV project.

Keywords: Social Media in Education, E-learning, Lifelong Learning

1. Introduction

The Mobivet2.0 Project, which runs under Leonardo Da Vinci Lifelong Learning Program, was commenced in November 2012 and will be completed in November 2014. The aim of the project is to fill the online training gap between the self-guided learners and VET trainers by developing mobile Web2.0-based (e-Learning 2.0) knowledge and skills of the trainers thus turning them from in-class trainers to skilled online mobile e-tutors. The project will identify the obstacles to mobile e-tutoring and will address and alleviate these problems by demonstrating existing online learning and tutoring applications and practices based on Web 2.0 technologies to trainers showing their pedagogical and didactical benefits. More specifically, we present how the Web 2.0 technologies may be used simply by non-IT experts, using sample courses and guidelines developed during the project. In the long run the project aims to broaden the e-skills and competencies of European VET practitioners (teachers, trainers and tutors) and help develop adequate online training practices for effective distant tutoring of lifelong self-learning activities at the workplace and on the go without time and distance barriers. This way the project supports the development of innovative ICT-based tutoring services, pedagogies and practices for lifelong learning.

The advent of Web 2.0 enhanced the potential and the capabilities of websites, allowing users to communicate, interact and collaborate in social media and become members in virtual communities [Carmichael et al. (2010)]. Some examples of Web 2.0 technologies include social networking sites, blogs, wikis, folksonomies, video sharing sites, hosted services, Web applications and mashups [O'reilly (2005)]. All Web 2.0 technologies offer new methods for learning delivery by providing teachers with new ways to engage students, and even allow student participation on a global level. Web 2.0 tools are online and mostly free applications that can be used in innovative ways by teachers to support their teaching. Teachers have new ways to express their learning material and share it with the students and other teachers as well, allowing them to collaborate with their own ideas or resources. It really depends on the educators to take advantage of the vast opportunities that these tools provide. Audio and video sharing is easier than ever and allows learning sessions to take place online instead of the classroom in ways that can be more motivating and exciting for students. Blogs, Wikis, Podcasts, RSS and social platforms such as Twitter and Facebook are among the most popular tools that educators can utilize in their classes [Vratulis et al. (2008), Ducate et al. (2008)]. In addition to Web 2.0, mobile technologies such as iPhone and Android devices can further fuel the learning environments developed and enhance the sense of connectedness of tutors, students and learning [Bonk et al. (2009)].

Over the last decade, the social networks and the Web 2.0 platforms, tools and technologies have flourished and are constantly growing offering new and more assistive capabilities. However, in general, many tutors and educational instructors are not familiar with all the new technologies offered by the Web 2.0 and in most cases are not aware of the proper way that these technologies can be used to assist their courses' teaching and all the learning procedures offered to the students.

So, in this paper, we thoroughly present an educational course developed in the context of the Mobivet2.0 project that aims to help the tutors get familiar with various social media technologies and platforms and utilize them in the courses they teach. The online course is designed to assist tutors in applying the social media tools and techniques in education and also learn how they can integrate the social media in their courses' curriculum. The utilization of social media could enhance the interaction between the tutor and the students and also the communication between the students who have the opportunity to create, share and exchange information and ideas in virtual communities and networks.

The rest of the paper is structured as follows: Section 2 presents related works on the utilization of social media in education. In Section 3 we describe the content and the methodologies of the online course developed, the topics it covers and the social technologies involved. Finally, Section 4 concludes the paper.

2. Social Media in Education

Over the last decade, the advent of the Web 2.0 has enhanced the instructional potential of higher education. It has introduced new web technologies and platforms that can be utilized in the learning procedures and activities provided by the education institutes [Schroeder et al. (2010)]. Social networking and microblogging platforms constitute an example of the new technologies offered. Various studies investigate the instructional and educational potential of the social media and the way that can be used in educational procedures [Mason et al. (2008), Churchill (2009].

Ebner et al (2010) report on a research study that was carried in an Austrian University regarding the use of microblogging platforms in Higher Education. The authors indicate that microblogging should be seen and handled as a completely new form of communication that can support informal learning beyond the classrooms.

Hung et al. (2010) explore how social networking technologies can be used to supplement face to face courses and provide a mean of enhancing students' sense of community and promote classroom communities of practice in the context of higher education. The authors indicate that the majority of the participants in their experimental study developed a strong feeling of social connectedness and expressed favorable feelings regarding their learning experiences in the courses where social networks were used as a supporting tool.

A study by Callaghan et al. (2012) shows the potential of social network integration into course curriculum. The Authors point the critical role of the teacher in engaging effective online learning in social networks and indicate that the quality of teacher – student relationships, the extent to which a ' learning ' rather than ' social ' attitude was established, and the online presence that the teacher exerted in the social network facilitate more successful student learning.

Arnold et al (2010) indicate that social networks can extend the community originally formed in a physical classroom into an online social network community. The online environment could provide students and teachers the ability to publicly post and read each other's work, modeling approaches to the assignments and various opportunities to provide feedback.

Roblyer et al (2010) study the integration and the utilization of the Facebook platform in the education field. Authors present how students could communicate and cooperate formulating virtual classes and indicate that students are open to the possibility of using Facebook and similar technologies to support classwork.

Finally, Grosseck et al (2009) examine the potential of the Twitter network in the educational field. The authors describe its capabilities and present various ways it can be utilized by the tutors in their courses. The work indicates that the Twitter can be very useful and assistive for both tutors' teaching and students' learning enhancing their communication and cooperation.

Researches and educators indicate the important role that social media can play in the educational field for assisting the tutors in teaching and students in learning for the best benefit of their learning progress. It is well pointed that teachers should have a strong knowledge and understanding of the way that social networks function, what each social network offers and how they can be utilized and integrated into the courses they teach.

3. Online Course on Applying Social Media in VET

The "Applying Social Media in VET" course is part of the Mobivet2.0 Project and is hosted in a Virtual Learning Environment (Figure 1) implemented in Moodle, a popular platform for learning management. The course consists of a series of *PowerPoint* presentations. The presentations are uploaded in *Google Drive* and converted to *Google Slides* format allowing their easy embedding in web pages. The presentations and the Virtual Environment itself have been adjusted in order to be optimally displayed in mobile devices.

Figure 1: "Applying Social Media in VET" course in Mobivet2.0 environment

The course after an initial introduction to social media provides detailed, step-by-step instructions to use some of the most representative social media tools for education. The social media tools covered are Wikispaces, PrimaryPad, Twitter, TodaysMeet, Facebook, Edmondo and Pinterest. Some of these are very popular tools that the educators may already be familiar with (Facebook , Twitter) and other are not popular, but very useful and easy to learn tools for the classroom (PrimaryPad, TodaysMeet). Each presentation/chapter has an introduction and instructions of how to use the tool and also a section with ideas, guidelines and scenarios to follow for the tool presented. The contents of the course (Figure 3) are the following:

Figure 2: Contents of the "Applying Social Media in VET" course

Introduction:
This chapter provides an introduction about social media and the technologies it involves. It also provides a simple categorization of the basic types of Social Media Tools. Finally we describe the benefits (for both students and educators) of applying social media in education and especially in distant learning.

Representative Tools:
For each type of Social media tools (Collaborative, Blogs and Microblogs, Content Communities, Social Networking, Virtual Social Worlds, Virtual Game Worlds) we refer to specific tools that are popular or useful for education. For each tool there is a small introduction about what it is and the basic functions. We focus on free and open source software that is either popular (so the educators and students are probably already familiar) or simple and easy to use in classroom.

Collaborative Projects:

- *Set up a Collaborative Site/Activity (Wikispaces):* Wikispaces allow creating and hosting wikis for educational purposes. This chapter guides an educator in creating an account for Wikispaces and inviting students to collaborate. There are detailed instructions for creating wiki pages and using the editing tools for inserting multimedia. Furthermore there are instructions for using the available tools for creating projects and coordinating students or groups of students with different tasks and also monitoring their engagement level and assessing their

participation. Finally we provide specific ideas, scenarios and guidelines for the trainer to follow.

Figure 3: Representative tools for the "Collaborative" category

- *Simple Collaborative Writing (PrimaryPad):* PrimaryPad is a simple tool that allows fast setting up of a collaborative activity. It guides the educator in creating a collaborative document and inviting the students to collaborate on it in real time.

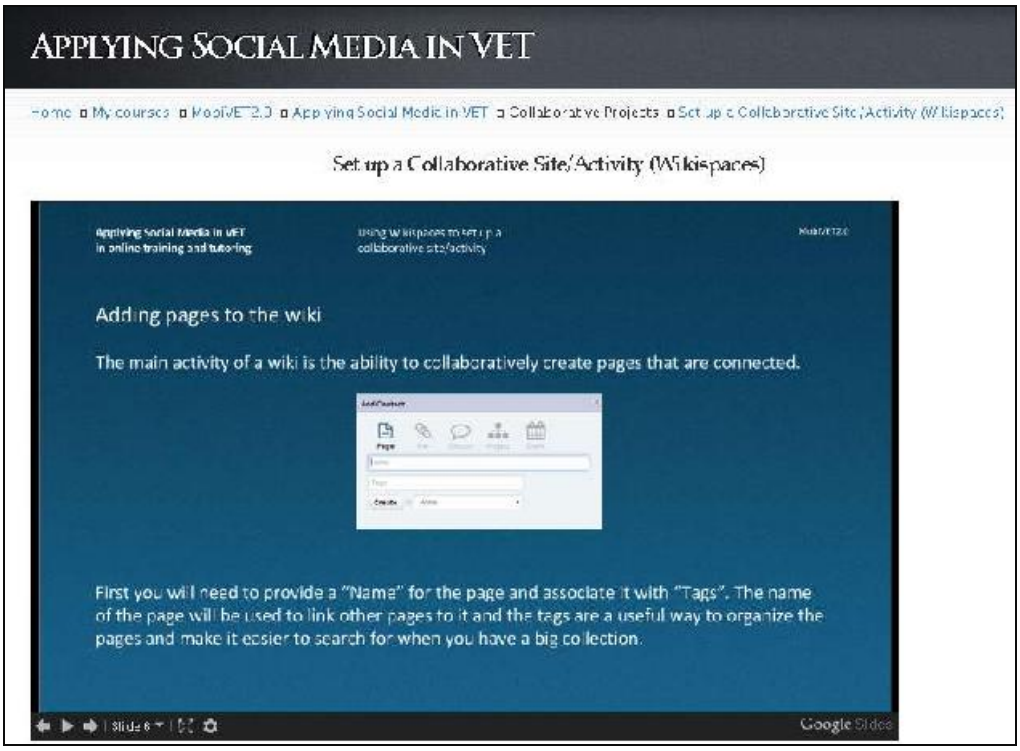

Figure 4: Instructions for creating a page in "Wikispaces"

Blogs and Microblogs:

- *Create a Twitter account of your Course:* Twitter is very popular social media tool that most educators and students are already familiar with. The twitter functionality allows quickly searching for specific topics, get information for current trends and collect feedback from others in an intuitive and very effective way. Educators can easily take advantage of these functions to support the learning process in the classroom. This chapter guides the educator in creating a Twitter account for their class. It also provides a description of the basic functions of Twitter (Tweets, Mentions, Hashtags, Trends etc) and many ideas and guidelines to take advantage of them.

- *Create a simple backchannel (TodaysMeet):* Todaysmeet is a tool that allows fast creation of a simple temporal backchannel that is more appropriate to use for particular events like lectures. It is presented as an alternative to Twitter for educators that want a limited but easy to use tool. This chapter provides instructions for creating a backchannel and ideas for using it in classroom or other learning activities.

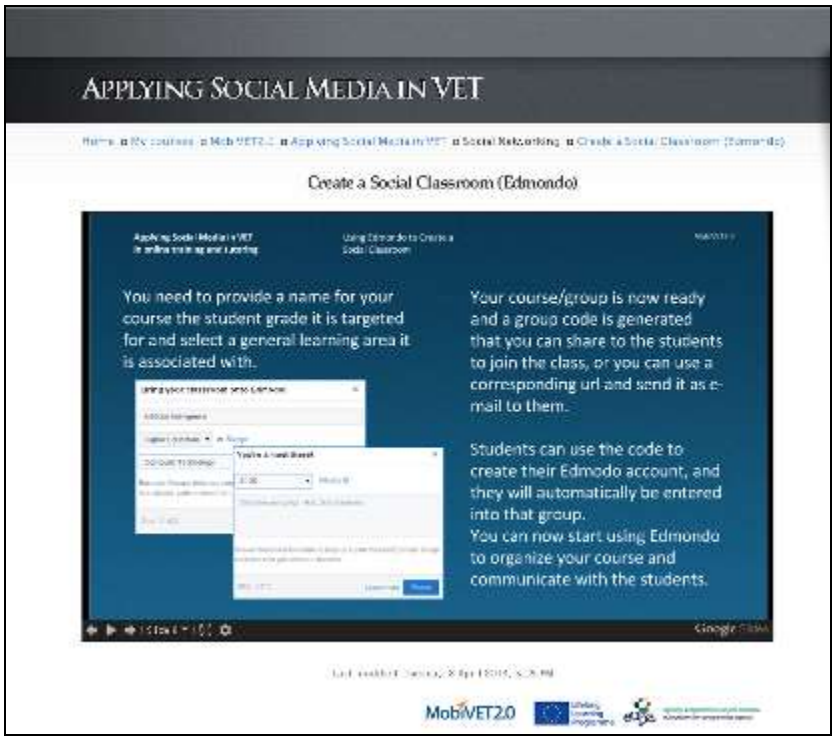

Figure 5: Instructions for inviting students in "Edmondo"

Social Networking:

- *Use a Facebook Page or Group for your Course:* This chapter guides educators in creating a Facebook page or a Facebook group for their course and inviting their students. There are also useful ideas, guidelines and learning scenarios for the educator to follow in order to take advantage of this popular social media tool that students probably already use and are familiar with.

- *Create a Social Classroom (Edmondo):* Edmondo is a social networking site targeted for Educators that allows setting up their own social classroom. This chapter guides an educator in creating an account for Edmondo, setting up a social classroom for his course and inviting his students. There are also detailed instructions about many of the functions like creating Announcements and Assessments, designing complex Quizzes (Multiple Choice, True-False, Short Answer, Fill in the Blank, Matching Questions) that can be automatically assessed, setting up polls for the students to collect the classes' collective opinion or preference, organizing the learning material and planning the course activities in a calendar.

Content Communities:

- *Organize and share your resources in visual boards (Pinterest):* Pinterest allows creating visual boards that can collect material (links to pictures, videos or web pages) in an organized and visually attractive way. It offers an innovative way for educators to organize their learning material and relevant sources and can

also be motivating for students to participate by collaborating with their own resources or as an assignment to create their own visual board. This chapter provides instructions for setting up an account for Pinterest, creating boards and adding pins to it. There are many ideas, guidelines and scenarios for using Pinterest in the classroom in creative and motivating ways.

4. Conclusions

In this paper, we present an educational platform and a course curriculum developed in context of the Mobivet2.0 project. The aim of the educational platform is to fill the online training gap between self-directed learners and VET trainers by developing mobile e-learning 2.0 knowledge and skills of the trainers thus turning them from in-class trainers to skilled e-tutors. The course presented in this paper aims to help the tutors get familiar with various social media technologies and platforms and learn how they can be utilized in their courses. The course after an initial introduction to social media provides detailed, step-by-step instructions to use some of the most representative social media tools for education. Each presentation/chapter has an introduction and instructions to use the tool and also a section with ideas, guidelines and scenarios to follow for the tool presented. Various popular tools are presented covering most social media categories (Collaborative, Blogs and Microblogs, Content Communities, Social Networking). The course is targeted to all kinds of educators regardless of their field or their previous IT experience. All material in the course has been adapted for optimal display in mobile devices. The Mobivet2.0 platform will also host two additional courses ("Web 2.0 Technologies" and "eLearning Practices in VET") and also many examples of good practices with their application. The utilization of social media could enhance the interaction between the tutor and the students and also the communication between the students who have the opportunity to create, share and exchange information and ideas in virtual communities and networks.

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Groot Kormelink Joost

How to cook a MOOC. Experiences with a MOOC based on network learning around case studies

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1. Introduction

This article is about our hands-on experiences with implementing peer review and network learning within the framework of one of the first MOOCs (Massive Open Online Course) of the TU Delft: Next Generation Infrastructures (NGI), part 1[14]. This course (7 weeks) was offered during the period April- July 2014 on the edX-platform[15].

Banner MOOC NGI

One of the innovative elements of this MOOC was that we asked students to work on their own case study (infrastructural problem) from the first course week onwards and to share their insights with fellow-students for review. This was also the condition for obtaining a certificate. In this article we will describe our experiences from a technical and organizational perspective and some of the problems we faced as a project team. We stress that the detailed analysis of all the data (students' experience) is still going at the time (August 2014) this paper is written.

Let us first briefly explain why we followed the above mentioned 'bring your own case study based' approach. The basic reason is that in this MOOC we deal with infrastructures (Water, Energy, Transport, ICT) as so called 'complex adaptive systems'.

[14] NGI part 2 starts on 24.9.2014

[15] In 2014/15, The TU Delft will offer around 16 MOOCs

This means that we are dealing with complex instead of complicated problems/systems. There are many differences between the two:

- Complicated problems or systems are predictable. These systems are often engineered. We can understand these systems by taking them apart and analyzing the details.
- The opposite is true for complex problems or systems. The outcome is unpredictable because of many uncertainties, interconnectedness and interdependencies of networks. We have to deal with emergent behavior, non-linearity and social and technical complexity. From a governance perspective this means a multi-actor game, incremental steps and the need for learning organizations.

Complex problems automatically imply that there is no final answer. It requires a lot of effort to analyze the problems, the actors involved and their interests, and the best way forward. There are always many alternatives and uncertainties. Solutions are very context specific.

From this starting point, we thought that students would derive the greatest benefit from the course if they would work on their own regional or local infrastructural problem on the basis of the concepts explained and on the basis of exchange with other students. In other words, our aim was to engage students by letting them share and discuss their own case studies and to teach them how to review other student's work. Our approach was thus also more problem-centered with feedback from peers rather than content-centered. This is also an approach which we also use in a number of on-campus courses. For the MOOC NGI it implied that we used – among other things- the peer review system of the EdX-platform and a world map to upload case students by students (see also par. 2.3).

From the perspective of the TU Delft, this approach was also an excellent way to get input from students on local infrastructural problems.

In section 2 we will first provide some more background information. We will first outline the open and online education policies of the TU Delft (par. 2.1). In the following paragraph (2.2) we will describe in more detail the MOOC under consideration: Next Generation Infrastructures (further referred as NGI) published on the edX-platform including the way we actually implemented our 'bring your own case study and discuss this with others' based approach.

2. Context

2.1 TU Delft policies

As mentioned above we will start with the general context: the TU Delft policies.

Open Education (OE; or fee) and Online Distance education (ODE, tuition fee) will change the higher education landscape and accompanying business models. The outcome is very uncertain but the TU Delft wants to be a forerunner and a global player. In 2013/14, TU Delft already offered 5 MOOCs on the high profile EdX platform (https://www.edx.org/school/delftx/allcourses). Selection was done on both our experience with OpenCourseware (highly valued courses) as well as an internal tender. The year 2013/14 was a year to experiment.

Screenshot http://www.tudelft.nl/en/study/online-education/massive-open-online-courses-moocs/ *accessed 2.8.2014*

- The main other motives for the TU Delft ambitions and policies when it comes to OE and ODE are as follows:
- Reaching new and unprecedented numbers of global students for the academic niches where the TU Delft is a global leader.
- The chance to explore and eventually generate new revenue streams through the development of a MOOC business model.
- Idealistic. The opportunity to share valuable academic knowledge with parts of the world (especially underdeveloped regions of the world) that need it the most and do not have access to high quality higher education.
- Strengthening world class reputation also online.
- Quality: new course materials gives the opportunity to innovate our courses and improve our on-campus curricula.
- Attracting more international (quantity) and talented (quality) students.

2.2 The MOOC NGI

The MOOC NGI, part 1 focused on the complexity of infrastructures, the corresponding theoretical framework and the challenges in terms of infrastructure design, management and governance for the future.

Box 1: No life without infrastructures

'Imagine how your life would be without electricity to power the devices you use at home and in the office, without reliable drinking water from the tap, without cars, trains and air traffic, without your mobile phone and without internet access. All these utilities create the conditions for livability and economic development and we are becoming increasingly dependent on a secure, uninterrupted and affordable supply of energy, water, transport, telecommunication and information services.
(Quote from Courseware MOOC NGI, week 0)

Starting point for this MOOC was the 10th anniversary of the Next Generation Infrastructures Foundation, in short: NG Infra.

NGI is one of the few institutions in the world that carry out integrated research into the working of infrastructures (Water, Energy, Transport, ICT). The focus of NG Infra is to understand how infrastructures work and to develop practical solutions that will steer infrastructural developments. This implies attention to technical, social and organizational aspects (governance, regulation) from a 'complex system' perspective.

As mentioned above: infrastructures are complex systems, because:

- They contain many actors;
- Are faced with drastic changes because of technical, institutional, economic and social changes (internationalization, privatization, web-based, clean technologies, smart grids, new ways of regulation, liberalization, standardization) and bottom-up initiatives ('inverse infrastructures');
- Maintain and increase strong interdependencies ('network of networks);
- That generate a large number of uncertainties;
- While performing critical roles for society.

Box 2: Learning objectives NGI, Part 1

'After this course you will:
A. Understand why infrastructures are becoming more and more complex from different perspectives (historical, globalization, new actors, emergence, new technologies, new producers) and why the traditional technology, policy and management interventions can be counterproductive.
B. Understand the main driving forces behind these developments.
C. Understand the implications for the design and governance of tomorrow's infra-systems.
D. Be acquainted with tools and instruments to analyse problems of infrastructures'.

Enrolment was 16,500 of whom 412 students obtained a certificate after the completion of a peer reviewed issue-paper.

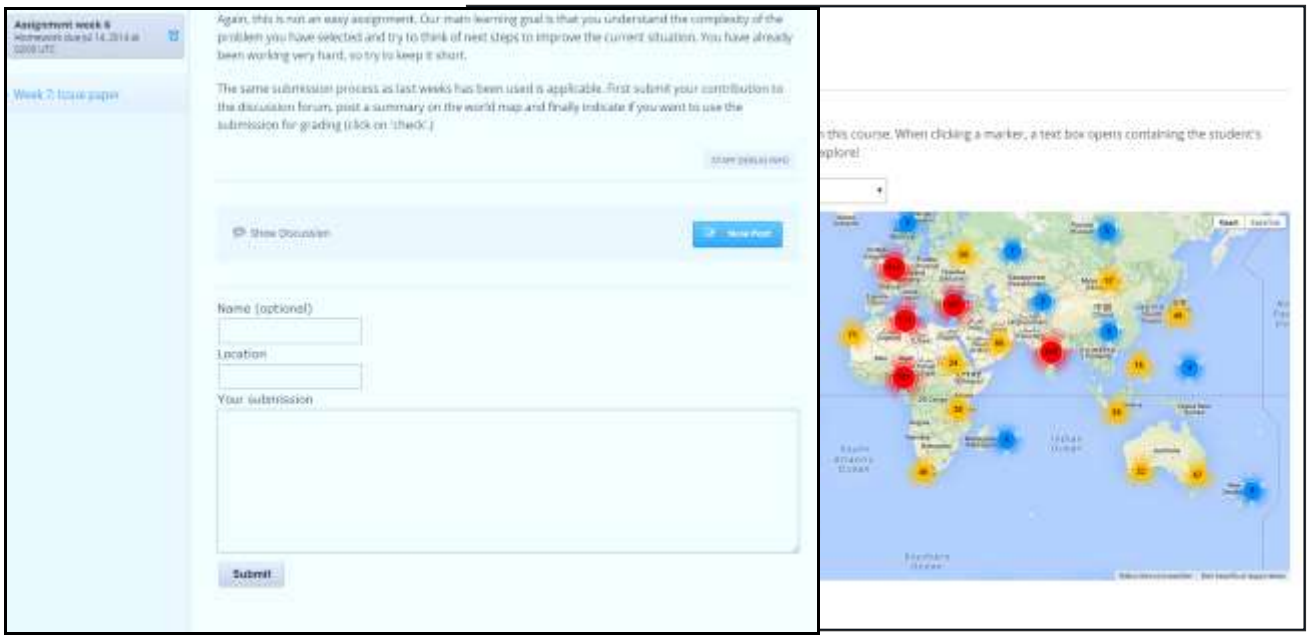
2.3 Learning format: guided open learning by focusing on your own case study.

As mentioned, our aim was that student would learn to work with a combined engineering and social science perspective and that student would understand the implications of complexity. In more prosaic words: embrace complexity and accept this as a given in infrastructure development.

Our ambition was to do so by including network learning as a main component of the course: students learning from each other – and sharing knowledge- in terms of infrastructural problems and solutions.

To do so, we we formulated weekly assignment whereby students were asked to work on their own case study throughout the course and to share/discuss this with fellow students.

The assignments were closely related to each other: from problem sketch, to further problems analysis, then continue with an actor analysis and finally reflect on solutions in terms of governance and regulation. The final assignment was to integrate all these issues into an 'issue paper'. As mentioned the ambition was that students would interact with peers all over the world.
For this purpose we developed a world map which made it very easy for students to upload their case studies (with a link to the discussion forum for further elaboration). The next 2 screenshots shows how this worked from the student's perspective. If you zoom in on the map in the course-environment, you can read the contributions.



Source: screenshots https://courses.edx.org/courses/DelftX/NGI101x/, accessed 2.8.2014

During the design phase of the course (summer 2013) we also decided to use the peer review functionalities of the edX-platform. We took some risk in this respect because we knew that the system at that time was still under development ('beta version) and not yet frequently used. However, we anticipated that the peer review system would be stable and adequate for our purpose before the start of the course. Unfortunately, this was too optimistic and beamed a headache for us as we will explain in section 3.

Some other aspects we included in our MOOC to support our approach were:

- Analytical skills (i.e. in formation skills, problem demarcation, actor analysis) for assessing case studies;
- Frequently stressing the importance of interaction. 'Learning is sharing';
- A weekly feedback video by the professors on the basis of case studies uploaded by students;
- Start with a welcome week based to stimulate that students felt welcome and comfortable in an online environment.

3. Experiences and reflections

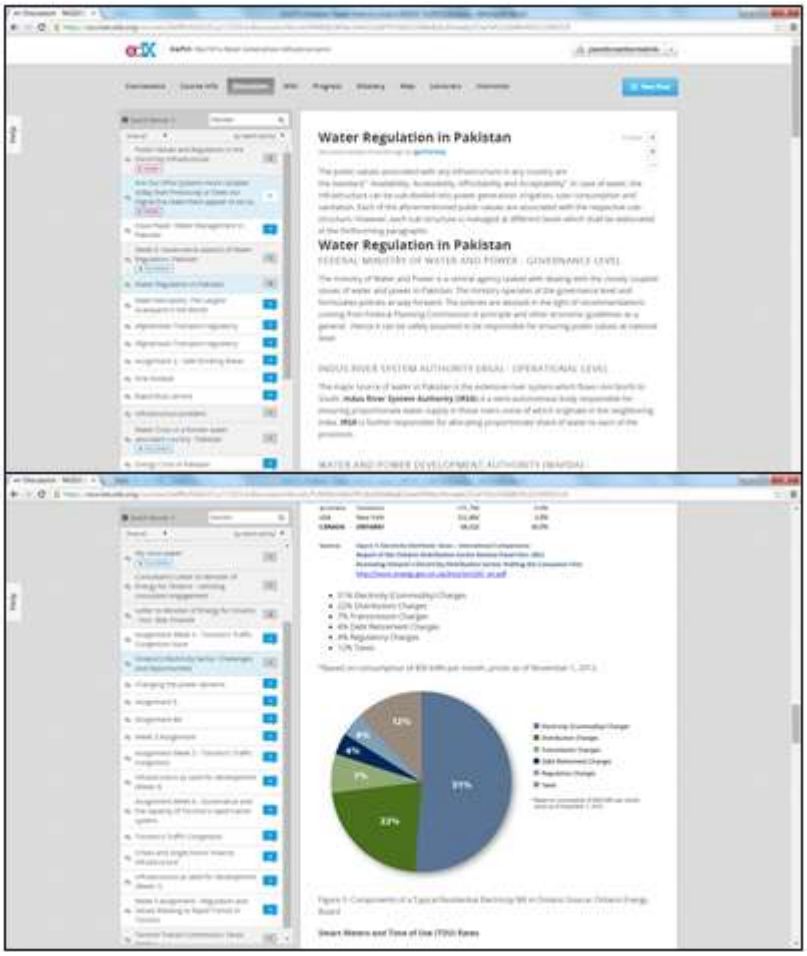
As mentioned above, all the data we have on the course is still being analyzed by the MOOC research team from the TU Delft. It would, for example, be great if we could conclude which type of leaners (age, attitude, prior expectations, professional or not, geographically) appreciated our approach most but this is not possible yet. So in this paragraph we will deal with our main experiences with peer review and 'work on your own case study' from an organizational and technical perspective. Here are some main conclusions:

A. Welcome week

The welcome week was a success; it is now copied by other MOOCs of the TU Delft. It enables students to familiarize themselves with the course and fellow students before the actual start. Students already started asking relevant questions for the weeks after which were helpful for us.

B. Great input

We had indeed great input from many, many students varying from water scarcity in a former water abundant country (Pakistan) to electricity grid challenges in Ontario, Canada. See the screenshots.



Source: screenshots https://courses.edx.org/courses/DelftX/NGI101x/, accessed 2.8.2014

C. World map and use of the discussion forum

The world map - which was developed by a TU Delft student and then 'embedded' in the edX-environment- can be considered as great starting point (literally and figuratively speaking) for sharing discussions. It makes it very easy to track the contributions from students.

However, a drawback was that students could not search for key words on the world map and that there were limited editing possibilities (just plain text) for their contributions. But the world map is now being copied by others (by other TU Delft courses but also from other institutes) with new functionalities.

Not all students uploaded their case studies on the world map. Some posted them only in the discussion forum, some used Facebook (developed by one of the students, so outside the course environment) for sharing. We also noted that our classification of the course discussion forum was not optimal. Some students uploaded their contributions under discussion threads witch had nothing to do with the subject. The search function within the forum did not automatically reveal the relevant contributions. Some contributions got far more attention than others (for example, because of nice pictures), others with a higher quality (from a scientific perspective) far less. We underestimated this problem when we started. Also, students who were late in submitting their assignments had quite a drawback. The first contributions got far more attention and feedback from fellow students and from our course moderators (student –assistants) than contributions submitted in a later stage.

D. Feedback from students (questionnaires)

We got great compliments ('I never learned so much during a course, 'I now look at infrastructures with completely different eyes'.) The overall evaluation of the course was very positive. However, from the initial results of the questionnaires and the feedback in the discussion forum we know that other students did not like too much our focus on sharing local case studies and the lack of clear answers to problems. We also know that because of language problems some students did not submit the assignments.

We checked the 50 best issue-papers (highest scores according to the peer review system) and we found out that these were mainly submitted by professionals. So, with more experience and probable a clear professional interest in the course.

E. Lack of time for monitoring students' input

It might be good to add that this MOOC was new (not yet offered on-campus) and that it involved a large number of teachers (mostly from the TU Delft but also two from England, one from the USA and one from Spain).This required a lot of coordination. Some teachers considered the MOOC in first instance as 'business as usual'. However, making a MOOC is a different piece of cake. For many teachers, standing for the camera in a studio setting with a detailed script and with all the lights and camera's was quite new and meant a steep learning curve. In a later


Recording studio TU Delft

stage, we created our own studio (basically a green sheet and a good camera with tripod) in one of our regular meeting rooms to have some more flexibility (agenda of the teachers).
A few teachers had to withdraw from the course because of unexpected circumstances. So, there was quite some sweating behind the screens. In practice this meant that we had to pay more time on building the course at the expense of monitoring the input of students.

F. Peer review system: problems with Beta version

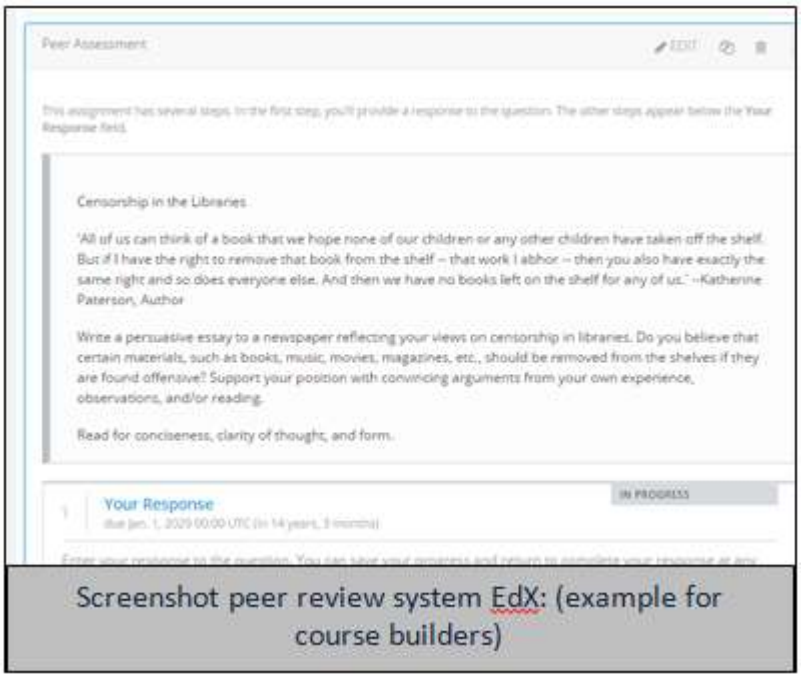
Last but not, the peer review system. It was our initial intention to use the edX peer review (assessment) system throughout the course although it was a beta version. However, we had to change this plan. One of the main problems - which we only discovered at a very late stage - was that students could only insert plain text and that we could not (without support from the edX technical team) monitor the input of students and the quality of the feedback provided. It was also not possible to have a less ad-random distribution of the assignments for review. By this we mean that we would have liked to have students focusing on 'water' to review other 'water' students.
The lack of editing possibilities for students was the main bottleneck for the assignments and the issue-paper which we had in mind (tables, figures, references, etc.). The reason why we did not anticipate this problem was basically quite simple: we never thought that this could be a problem.

So we decided to restrict the use of the peer review system of edX to the last week of the course and we offered the students a work around ('markdown editor) for the editing problems. Still this was far from an ideal situation and did not really solve the problem .

From a 'process' point of view, the peer review system worked very well. After upload of the assignments, students could immediately review contributions from other students and perform a self –assessment. We hardly had any problem in this respect.

Getting the data out of the system (meaning the actual issue papers) was more difficult as mentioned above. We had to wait for data-sets from edX. Reading the issue-papers was tough because of the corrupted lay-out. Some students did send copies of their papers by PDF to show that their 'real' input was far better than the upload by the peer review system.

It should be stressed that the peer review system is already improved by edX, developments are going fast.



Screenshot peer review system EdX: (example for course builders)

4. Some final words: where do we go from here?

Our ambition is to offer the course again in September 2015 in combination with NGI, part 2. We will make a redesign of the course on the basis of the lessons learned and the results of the evaluation.

We will be able to benefit from a number of things. A better world map. A further improved peer review system. Our own learning experience. Content which is ready. Some wise lessons for a better structure of the discussion forum. But most of all the many great contributions from students. Partly, we will turn it-around: we will use these contributions to reflect on during the course. See you online in September 2015!

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Digital badging at The Open University: recognition for informal learning

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Abstract

Awarding badges to recognise achievement is not a new development. Digital badging now offers new ways to recognise learning and motivate learners, providing evidence of skills and achievements in a variety of formal and informal settings. Badged Open Courses (BOCs) were piloted in various forms by the Open University (OU) in 2013 to provide a digital acknowledgement for learners' participation in three entry-level, unsupported courses: *Learning to Learn* and *Succeed with Maths Parts 1* and *2*.

The desire to build on the OU's badging pilots is informed by research (Perryman et al., 2013; Law et al., 2013) into the motivations and demographic profiles of learners using the free educational resources which The OU makes available through its OpenLearn platform. This research activity was repeated in 2014 and found that an increasing proportion of informal learners are keen to have their informal learning achievements recognised.

This paper outlines how the evaluation of the 2013 pilots has informed the development of a suite of free employability and skills BOCs in 2014 that are assessed through the deployment of Moodle quizzes. It also discusses why the University sees the growth in free, 'soft' accreditation to be of strategic importance against a backdrop of MOOC providers issuing certification for fee. The BOC project, which aligns with the University's Journeys from Informal to Formal Learning strategy, will help to provide accessible routes into the University for students who might not otherwise have the opportunity to participate and supports The OU Charter to promote the educational well-being of the community.

Keywords: digital badging, employability, open educational resources, OER, informal learning, MOOCs

Introduction

The application of digital badges in higher education is a recent phenomenon, although awarding badges *per se* is nothing new. The range of methods that have been developed to allow individuals and organisations to deliver digital open badges has rapidly expanded in recent years (Bull, 2014).

Across educational sectors, and largely in the US, badges have been used to recognise participation in learning i.e. that a learner has been present in a group activity or has completed a task. Anderson *et al.* (2014) studied the effect of awarding badges to learners who had participated in a discussion forum within a MOOC where the badges demonstrated progress towards milestones, not the milestone itself: "Our badges were based on … contributing to threads, reading content, and voting on content". Their findings showed that learners were more engaged than those not offered badges and that badges were delivered as an incentive to participate, not the motivation to complete a course of study overall. In addition, learners' badges were clearly visible to other learners participating in the MOOC.

Within higher education, Bixler and Layng (2013) note that digital badges 'hold great promise' but that 'policies on badges for higher education institutions do not exist'. This remains largely true over the higher education landscape as a whole although the Badge Alliance (a group of volunteers discussing the potential use of badging, see http://badgealliance.org), is, amongst other things, taking case studies and innovations from contributors to build a picture for badge use within the sector.

The OpenLearn free learning platform

The creation of open educational resources (OER), whereby individuals and educational institutions make their learning content freely available, has grown rapidly over the last decade. It is now a by-product of the module production process at The OU. OER more generally ranges from tutors posting lecture notes online, to philanthropically-funded content production projects and educational institutions resourcing free content creation as business as usual activity. The OU uses OpenLearn (http://www.open.edu/openlearn) to deliver its OER and also syndicates much of this content to third party platforms.

OpenLearn was launched in 2006. It hosts hundreds of online courses and videos most of which are available under the Creative Commons 4.0 licence and is accessed by over 5 million users a year. It also serves as the channel through which the OU promotes its partnership with the BBC and the related broadcasting and free content that is created as co-productions with it.

Since its launch, OpenLearn has received 33.4 million unique visitors (internal OU data) and has grown from being a platform that hosts samples of existing decommissioned units from undergraduate and postgraduate courses, to one which delivers specially commissioned interactive games, videos, audio and free online courses. Much of the

course extract content is developed using structured authoring tools and then made available to users in multiple formats such as Microsoft Word and epub, which are then syndicated to other platforms as ebooks. Around 5% of OU module content is released each year under a Creative Commons licence in support of The OU Charter "…to provide education of University and professional standards for its students and to promote the educational well-being of the community generally". This 5% now equates to around 780 study units available on the platform as OER.

The development of OpenLearn was funded by the William and Flora Hewlett Foundation in 2006 along with OpenLearn Works (http://www.open.edu/openlearnworks), a platform where NGOs and philanthropically-funded projects can publish, reuse and remix courses targeted to specific populations globally. With the end of the Hewlett Foundation grant, OpenLearn became a mainstream activity for The OU and now forms part of one of the University's strategic priorities – 'the Journey from Informal to Formal learning'.

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

Methods

This paper reports the results of a large-scale study of users of the OpenLearn platform. This work was undertaken in 2014 to build on a similar study undertaken in 2013. It is intended to inform the commissioning process for informal learning at The OU and to contribute to research in this area. OpenLearn is a large platform with a great diversity of content delivered in large quantities, spanning all subject areas of the higher education curriculum. It is important to understand the profile of learners using it and to constantly review their activity in order to improve The OU's offering to them and its commitment to free learning.

The studies from 2013 and 2014 aligned with two of the hypotheses of the OER Research Hub project, and hence will form part of the data set collected by that project (see http://oerresearchhub.org):

- Open education models lead to more equitable access to education, serving a broader base of learners than traditional education, and
- Open education acts as a bridge to formal education, and is complementary, not competitive, with it.

A survey was produced and distributed across the OpenLearn platform across all areas of the website i.e. to reach those that are viewing whole study units and those who are viewing short editorial pieces. The survey was live for four months from April to July 2014 and received 1,177 responses.

In addition, data was analysed using the Google Analytics and ComScore software tools

for the period August 2013 to July 2014.

The purpose of gathering data using these two methods was to:

- Review the demographic profile of learners, students and teachers using OpenLearn,
- Understand how the content serves learners' needs,
- Examine how the availability of free educational content is impacting informal learners and their motivations to take up formal study,
- Understand learners' challenges and successes when using the platform, and
- Examine where learners are visiting within the platform, what they are searching for and where they go next.

In addition to the research activity described above, pilot projects around digital badging at The OU were undertaken in 2013 on OpenLearn through open courses using the Mozilla Open Badge Infrastructure (OBI) (see http://openbadges.org/). Digital badges were awarded via three entry-level *Openings* courses (access level) – *Learning to Learn* and *Succeed with Maths Parts 1* and *2* – for the successful completion of the course and passing of quizzes. The courses were unsupported and open, in that they had no start and finish date, but ran over a period of notional 'weeks' with a set number of hours. Hence the provision of badges as a motivating factor was a key driver to examining the completion of these courses over non-badged open courses also delivered on the OpenLearn platform.

The evaluation of these badged open course pilots aligned with wider OpenLearn research around informal learners in that it gathered the same demographic data and asked questions about learner motivation in an open, unsupported environment, learners' challenges and successes.

Findings and interpretation of the 2013 studies

Findings from both the badging pilot and the 2013 OpenLearn studies have been reported (Law, et al., 2013; Perryman et al., 2013; and Law et al., 2014) and recommendations were delivered internally to inform the business of informal learning commissioning at The OU. Many conclusions were drawn from the studies; those relevant to this discussion are given below:

- Students that use free learning content during formal paid-for study declare improved performance and self-reliance,
- University-provided OER acts as a taster to those considering paid-for, formal learning,
- Work was needed to improve the usability of OpenLearn as an open course environment,
- The provision of digital badges enhances learners' motivation to complete an online course,
- The badged open courses attracted learners who were more inclined to take up formal study. These learners appeared to be key to meeting The OU's widening

participation agenda inasmuch as there were significant variations in relation to existing educational qualifications, the numbers of retired learners and numbers of learners reporting a disability compared to the OpenLearn demographic overall, and

- Where content is syndicated across different platforms, it can meet the needs of both professional and personal development and can serve very different demographic groups.

Based on these conclusions, a number of recommendations were made within The OU. Those relevant to this study are reported here:

1. Create an entire (BOC) curriculum targeting access students (courses to be released on OpenLearn in October 2014, see Law et al., 2014),
2. Improve the usability of the OpenLearn platform especially around the user experience of moving through an online, unsupported course, and
3. Extend syndication of free content to reach new audiences (in 2013, syndication beyond OpenLearn was to iTunes U and YouTube only).

These three recommendations are expanded upon below.

1 Create an entire Badged Open Course curriculum

To expand on the first recommendation, a curriculum of assessed, badged courses aimed at improving employability and skills is being developed and will be launched on OpenLearn from October 2014. These Badged Open Courses (or 'BOCs') will comprise of 24-hours of learning each (8 notional weeks of 3 hours study per week), and will be assessed through the deployment of a set of Moodle quizzes. Again, these will be open, unsupported courses (no tutors) that learners can access free of charge and study at their own pace and will be released under a Creative Commons 4.0 licence. Content from the courses will be a mixture of existing modules released under a former 'access' curriculum, plus new material.

Test quizzes will feature each week to both function as a tool for formative assessment, but also to get learners used to the Moodle quiz environment. To achieve the OU badge for a course, a learner will need to have viewed every page of the course and passed the quizzes at Weeks 4 and 8 with a pass mark of 50%. Learners can attempt each quiz three times. If they fail on the third attempt, they can return in 24 hours, whereby their attempts will have been reset. In addition, learners will receive congratulatory emails from the course tutor at Weeks 4 and 8. Those learners who have stumbled at Week 3 will receive an email to encourage them to continue with the course. As each BOC is a standalone, unsupported environment, the 'course tutor' is the lead academic who devised the BOC and who features in a video at the start of each week.

The titles of the BOCs released from October 2014 to March 2015 will be:

1. Succeed with Maths Part 1
2. Succeed with Maths Part 2
3. Succeed with Learning
4. Succeed with English
5. First Steps in HE
6. Digital Literacy
7. Reflections Toolkit
8. Succeed in the Workplace

2 Improve the usability of the OpenLearn platform

The OpenLearn platform has been developed using a mixture of Drupal and Moodle software. Courses displayed in the platform run on Moodle, which is also the platform used for the University's VLE. In 2013, there was a great deal of signposting around all learner content on the site irrespective of the kind of activity someone was engaged with. For example, someone reading a short article in support of a BBC co-production was confronted with as much extra information regarding what to look at next, what might be of additional interest to them etc. as someone who had enrolled in a course.

Comments around usability and navigation problems were picked up in the qualitative data gathered in 2013 and from in-house usability testing. It was felt that a learner embarking on 15 hours of study would want a less cluttered visual experience that someone looking a news-type article. Hence, a range of IT developments were specified to 'tidy up' the course experience and provide learners with a cleaner interface when they had actively enrolled on a course with markers to show progress through it.

These IT developments were considered alongside a desire to recognise achievements and interests logged by learners in their My OpenLearn profile. The new profile layout will display digital badges, provide an opportunity for learners to view their Activity Record (an HTML page that summarises their progress through a course) and to print a Statement of Activity (a PDF certificate obtained on successful completion of a BOC or other non-badged open course). See Figure 1 below.

Figure 1 Example of the My OpenLearn profile showing courses in progress and badges achieved

3 Extend syndication of free content

New channels for syndication of content have been established to reach new learners aside what was already provided on iTunes U and on YouTube (https://www.youtube.com/user/OUlearn): free eBooks are now distributed through Google Play (https://play.google.com/store/search?q=open%20university&c=books) and shortly through Amazon for Kindle; audio files are now shared on AudioBoo (http://www.audioboo.com/); and audio and video on Bibblio (http://www.bibblio.org/u/open-university/content) where thousands of new learners have already found free educational content.

Findings and interpretation of the 2014 study

As discussed, the purpose of the 2014 study, which combined research data with platform analytics, was to provide a richer understanding of learners' motivations and activities on OpenLearn and to provide a comparison data set with the 2013 study.

Reviewing the demographic profile of learners using OpenLearn

Table 1 shows a summary of the demographic data for studies undertaken in 2013 and 2014 on OpenLearn. (There are some variations in age range following a revision for the 2014 surveys.) The demographic data collected from this 2014 survey are broadly similar to those of the 2013 data which increases confidence that the data observed in 2013 is a good representation of users.

Given our social and business mission to engage underserved groups, we were concerned with the relatively low percentage of unwaged learners and apparently high percentage of well qualified learners when analysing data in 2013. We understand this to be a feature of learners finding OER more generally and we take consolation in the fact OpenLearn reaches such a high number of learners each year, that even a small percentage of 5.5 million visitors a year is still a lot of new learners when considering our reach to underserved groups.

Table 1 Comparisons of demographic data for OpenLearn between 2013 and 2014

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

* Other = ‘transgender’ and ‘prefer not to say’.
** Other = ‘other’ and ‘prefer not to say’.

Understanding how the content serves needs

Results show that not all survey respondents were actually looking for free learning resources; some may simply have been looking for information or following a link. Around half (47%) of those responding to the OpenLearn survey said they had visited OpenLearn when looking for free learning resources. Platform analytics supports this finding, as the search criteria for learners visiting the OpenLearn **homepage** (i.e. not linking to a subject area within the site) is dominated by those looking for The OU specifically and for free courses. (See Table 2.)

Table 2 Known search terms for learners visiting the OpenLearn home page for the period August 2013 to July 2014 (data excluded where search term is not known)

open university / the open university / open university uk	47%
free online courses / open university free courses / online courses / free courses / free online courses uk / free open university courses	32%
openlearn / open learn / study skills	21%

Other observations from the data revealed that:

1. Fifteen percent of respondents said they were teachers and of those, 52% reported a positive impact on their teaching after using OpenLearn.
2. Almost half of those with disabilities who responded to the survey were between 46 and 65 years old. Indeed, in the 46-55 year old age group, 28% of respondents had a disability. This contrasts with 16% in the 19-25 year old group. 18% of male respondents reported having a disability compared to 26% of female respondents.
3. Over a quarter of all unwaged and retired respondents using OpenLearn were disabled. Whilst the largest two groups were full-time employed and retired, the proportion of those in full-time employment and disabled and using OpenLearn was only 14%. The data would suggest that OpenLearn may be more attractive to disabled people not in work or part-time work/study (see Table 3).

Table 3 The proportion of each main employment status group who said they had a disability

	Percentage of respondents declaring a disability
Full-time employed	14%
Part-time employed	20%
Part-time voluntary	14%
Full-time student	12%

Part-time student	24%
Unwaged	27%
Retired	27%

4. Thirty two percent of respondents with a disability had an undergraduate or higher qualification (compared with 48% of those without a disability). This may partly reflect the age profile as a greater proportion of younger people had university degrees. Also, 17% of OpenLearn users with a disability only had a school leaving qualification (at 16 years) which is higher than those users without a disability (9%).
5. Fifty nine percent of respondents with a disability said the materials on OpenLearn had improved their confidence in their ability to study. This compares well with those without a disability for whom 58% said the materials had improved their confidence.

Respondents declaring a disability had much to say regarding what they wanted from OpenLearn and how using free learning resources impacted them:

> 'I wanted to study maths and stats as much as I could so I could change my career prospects'
> 'I feel more confident and able to question activities'
> 'Dissabily means I need most content verbally (eg. Podcast) and minimal requirement to interact'
> 'more for dyslexia people'
> 'the learning helps me feel more positive and confident'
> 'I take courses to keep my mind sharp, since I am disabled.'
> 'My age and health make it unlikely that I will do further serious studying but that is why I like Open Learn as it helps to keep my brain alert without too much pressure and I find it enjoyable'
> 'I feel free with a course without professors sometimes, the pressure in the universities are so strong, we need sometimes to learn without this pressure'
> 'In order to provide people, of all ages and situations, to improve their lives and opportunities, it is essential that high quality courses and resources are FREELY accessible'

How the availability of free educational content is impacting informal learners and their motivations to take up formal study

As a result of using the materials on OpenLearn, around a third of users said they are more likely to take a paid-for course and around 80-90% are more likely to take a free course.

The groups with a greatest increase in likelihood to take a paid-for course (i.e. responded 'more likely') are part-time students (56.5%), part-time voluntary (50%) and disabled (46.7%) (see Table 4) and the least likely are full-time students (16.7%). These

are not necessary the largest groups using the platform and it is not surprising that of the retired people (the second larger respondent group) only 25.6% said they were now more likely to take a paid-for course.

Table 4 Consequences of downloading materials by employment group

Group	**More likely to take a paid-for course**	**More likely to take a free course**
Full-time employed	43.8%	81.5%
Retired	25.6%	80.7%
Part-time employed	39.8%	83.5%
Unwaged	32.1%	87.1%
Part-time Student	56.5%	85.7%
Full-time Student	16.7%	92.6%
Part-time voluntary	50%	91.3%
Unwaged with domestic responsibilities	37.5%	76.5%
Disabled	46.7%	77.4%

In concurrence with 2013 data, learners expressed a great deal of concern about the cost of studying in higher education. This is reflected in comments gathered in the 2014 study:

> '… I had expected in early retirement to study some (paid for) arts-based courses (OU or conventional university) to round out my education. The OU is no longer affordable for that scenario. Therefore, I need to explore other options, both free and payable.'
>
> 'Like many others, the present economic crisis has forced us to do everything we can to safeguard our personal finances….. Also because even at the age of 82 my brain still needs stimulation.'
>
> 'I don't expect to have such material free of charge - that is an unreasonable expectation. However… I am looking for a middle ground - I want to undertake further study but have no need of yet another degree, and can neither afford not justify extortionate tuition fees for what would essentially be a private pastime in early retirement.'
>
> 'I would love to study but most course are simply unaffordable to me'
>
> 'it's free! I can't afford the costs of the full OU courses'
>
> 'Can't afford to study with the OU'
>
> 'Free is all I can afford...sorry.'

> 'I'm interested in online education only. Would leap at the chance to take a MOOC degree, if available, and would consider tuition fees, perhaps, for the right content, but cannot afford fees for a full degreed program. Thank you so much for the high-quality MOOC thus far.'
> 'Fees are now far too high for me to consider continuing with my studies towards a degree'
> 'It is important to have free courses as the price for education is soaring'

And more generally regarding reasons for study:

> 'Conducted a test to give confidence my next module choice is appropriate for me'
> 'I am 70. Learning is like o2 to the mind'
> 'open access at my convenience, free to explore new ideas before committing to a specific direction'

Seventy five percent of learners responded 'Yes' or 'Maybe' that they would be prepared to pay for educational content provided online; of these 85% selected 'Online courses with certificates or qualifications'.

Qualitative data collected in response to the question 'What other features would you like to see from The OU on OpenLearn?', also revealed a desire to see certification awarded for informal learning:

> 'Certificates paid/unpaid'
> 'Certificates'
> 'Certificates!! (Paid or unpaid short courses and certs).'
> 'Better format of Statements of Activity for printing for CPD purposes'
> 'I tend to use sites where the student is able to print off a certificate of completion. I wish OU did this as it enables me to see who has completed which mooc. I like the idea of students studying an OU course at the point where they are deciding whether higher education is for them or not - again, they feel a sense of achievement when given a certificate of completion'
> 'certificates of completion'
> 'Printable certificates on completion of a course'
> 'The ability to do a complete degree on Open Learn and print off a degree certificate in the subject of one's choice.'

Understanding learners' challenges and successes when using the platform

Approximately 80% of respondents said that The OU materials were of the high quality they expect from a university. Over half of respondents (58%) said that using the materials had improved their confidence in their ability to study. Around four fifths said that after using OpenLearn materials they are more likely to recommend OU content to others.

Respondents report finding OU content in different ways: for those with no knowledge of the OU, the use of search engines was by far the most common method, whilst for

those familiar or with some knowledge of The OU, subscription to emails, prior use and search engine were the three most common methods. Relatively few had heard about the platform via Twitter or from newspapers or magazines.

A small number of learners expressed concern over site usability, despite efforts to improve this. Some of these comments are reflected below:

> 'The problem was that the materials I looked at were standalone bits and pieces and just not a properly conceived course. I felt disheartened. Perhaps I am mistaken in my impressions - but I found it difficult to find relevant stuff. The videos were just entertaining rather than instructive, for example. If the free content starts to emulate the paid-for courses, then that would be something!'
>
> 'I could not find relevant material due to the badly-designed website (ditch the word clouds, fancy pictures and "most popular" lists etc, give me a simple list of free courses that can be filtered by subject area and level)'

Examining where learners are visiting within the platform, their dwell times, what they are searching for and where they go next

Platform analytics show that 16% learners who searched using a search engine to arrive directly on the free courses page of OpenLearn (http://www.open.edu/openlearn/free-courses) were specifically searching for "free online courses with certificates".

Not surprisingly, dwell times for those looking at free courses and study units on OpenLearn are considerably higher (average 8.34 minutes) than those looking at interactive games and editorial pieces (average 3.57 minutes). However, significantly, 14% of those in the former category then go on to click through to the main OU page to learn how to become a student, versus 9% of those looking at shorter pieces of learning.

Recommendations

Based on this data, initial recommendations from the 2014 study fall into two key categories:

1. Usability and technical infrastructure of the OpenLearn platform, and
2. Approaches to commissioning and evaluation of free content.

These are summarised in Table 5 below.

Table 5 Initial recommendations

Technical infrastructure	**Commissioning and provision of free content**
Better site navigation and signposting to free courses as this is the dominant content people are looking for.	Over half of respondents (58%) said that using the materials had improved their confidence in their ability to study. We will evaluate open courses without badges as well as BOCs to compare learners' confidence levels.
Better signposting to 'soft certification'.	Prioritise the expansion of open courses that provide certification over the provision of sample study units.
More engaging and signposting of content for those looking at shorter pieces of learning to improve the informal learning journey.	Undertake a separate analysis of disabled learners using OpenLearn to gain deeper insight into their motivations for use of free learning and how we might better meet their needs.

Implications

Hickey (2012) identifies three possible functions for digital badges:

1. Summative functions, which are often called assessment OF learning.
2. Formative functions for individuals, which are often called assessment FOR learning.
3. Transformative functions for systems, which a few are calling assessment AS learning.

Clark et al. (2006) were clear that motivation is key to learning and that the subsequent application of this theory with the issuing of digital badges supports this (Law et al., 2014). Abramovich et al. (2011) state that: "…the potential benefit of an assessment is determined by its ability to both maintain learning motivation and accurately communicate a student's learning." By providing formative and summative assessment through Moodle quizzes in an open course environment as Hickey identifies above, The OU is attempting to both communicate feedback and provide motivation to otherwise unsupported learners. Moodle quizzes have challenged our

ability to measure reflection through learning though and this will be the subject of future studies.

Cross (2007) describes informal learning as 'the unofficial, unscheduled, impromptu way people learn' but in an environment where "...no one assigns grades…" and "...no one takes attendance." However, we are currently experiencing the growth of paid-for certification by MOOC providers and where participation in informal learning is not always anonymous. We have moved from Cross' anonymous world to one of **identified informal learning**. Whilst learning is still taking place as a supplement to formal learning there is a growing demand and expectation that informal learners want recognition for their achievements and engagement that can be acknowledged beyond a closed forum of learners.

The data shows that learners in an informal environment are seeking to pay for certification and recognition of unsupported informal learning. The challenge to our understanding of informal learners over the coming year will be to understand whether the **free badge and associated certificate** proposition presented by The OU for substantial commitment and assessment through BOCs be perceived to have a different value to a **certificate that has been bought** from a MOOC provider. Equally, will a digital badge have meaning as currency for achievement and credibility with employers, or is it purely a motivational tool, in this context, to support informal learners on an open platform?

Anecdotal evidence from colleagues working on digital badging projects in the UK utilising an open badging infrastructure, indicates that learners do not always find the display of a digital badge to be easy to grasp. If we are intending to reach underserved learners with a suite of access-level BOCs, we must also expect that whilst we will endeavour to make badge display in the My OpenLearn profile as easy as possible, wider linking with the Mozilla Backpack, LinkedIn and other social media sites may not seem like a straightforward proposition. It may be that the printing of a badged certificate is as desirable (and easier to manage) than the display and sharing of a digital badge itself.

This isn't so much a pessimistic approach to the practical application of the badge when achieved, but a recognition of its use in an open unsupported setting. Indeed Abramovich et al. (2011) note that "The symbol, in the form of a badge, can then be displayed by the learner to let others know of their mastery or knowledge" in a closed, supported environment. This element of badge display contrasts with informal open learning when learners progress at their own pace and not in a cohort, and may be less important in this setting.

Future evaluation activities

It is hoped that the BOCs will enable learners to:

- Gain recognition for informal learning activities,
- Achieve a sense of progression and confidence in their capabilities to help them feel more able to take up formal study, and
- Demonstrate to potential employers their achievements through public display of achievements.

In addition, the Badged Open Courses that are applicable to formal students ('Digital Literacy' and 'Success in the Workplace') will present an opportunity to measure not just their uptake, but their relevance to supporting career development and digital literacy as an essential adjunct to formal study. Hence an evaluation project is in place to measure the success or otherwise of this approach and will examine:

- Demographics (in alignment with data collected in studies reported in this paper),
- Tracking data to show informal to formal movement of learners,
- Performance/completion rates in an informal setting on an open course,
- A picture of the types of learners who are more likely to convert to formal learning,
- The application of digital badges:
    - Numbers of learners who linked their badge(s) to a CV or equivalent
    - Feedback from learners who linked their badge(s) to a CV or discussion with an existing or potential employer, and
- Analysis of all five widening access target groups: carers, BME (black, minority and ethnic groups) who are also low socio-economic groups, offender learners, disabled learners and low socio-economic groups. (This would be both quantitative and qualitative analysis and would use the same methodology as the main study.)

These future evaluation activities will be key to understanding more about digital badges and badge motivation in a higher education setting, and further, in an open, unsupported one.

Conclusion

The OU sees the growth in soft accreditation through digital badges and issuing of certificates to be of strategic importance. Not only does the data from this study and from those undertaken in 2013 on the OpenLearn platform show that learners are seeking acknowledgement for their informal learning activities, it also demonstrates a positive impact on the learning journey to formal study. The OU needs to keep pace with other digital badge developers and there are risks for not investing in digital badging, which include:

- **Potential financial loss** – if informal learners do find badges desirable, they could go elsewhere to obtain them and the opportunity to inspire them is lost; and

- **Reputational** – The OU being perceived as being 'behind the curve' in this domain.

We know that an increasing proportion of informal learners are keen to have their informal learning achievements recognised. The impact of MOOCs is demonstrated in peoples' expectations of gaining a certificate for informal study and in the search terms they are using to seek learning material on OpenLearn. As we move to an **identified informal learning setting**, we must endeavour to support and manage expectations of informal learners through soft accreditation, without adding a layer of complexity that might exclude the underserved groups that we aim to reach.

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Using learning analytics to enable purposeful conversations with online distance learning students: some reflections

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Abstract

Distance learning students are usually fitting their studies into busy lives, with diverse demands on their time for which compartmentalisation is a common coping strategy. They are also likely to have a personal support network largely unconnected with study; hence initial conversations about any difficulties with study are often hidden from the institution. This leaves the institution with fewer of the warning signs at individual level that would be commonly seen in campus-based education environments. Nevertheless, human contact and support from the institution is no less important for enabling distance learning students to succeed, meaning there is a greater burden on the institution to recognise early warning signs and intervene with effective support.

Virtual Learning Environments (VLEs) now enable extraordinary opportunities to gather data about the behaviour and engagement of online distance learning students. It is critical that institutions analyse VLE data effectively, to build learning analytics which accurately capture the student experience and thereby identify struggling individuals. To achieve the greatest impact, interventions should be embedded in a carefully managed ongoing dialogue with the student. By applying well-structured learning analytics to target these interventions where they are most needed, greater improvements in student success can justify a greater investment in an individual student.

Keywords: Student experience, Student support, Learning analytics, Virtual Learning Environments (VLEs)

Prologue

In his 1920 poem, *The Telephone*, the American poet Robert Frost invites us to think about distant conversations. It starts:

> WHEN I was just as far as I could walk
>
> From here to-day,
>
> There was an hour
>
> All still
>
> When leaning with my head against a flower
>
> I heard you talk.

Introduction

Distant learners are about as far as they can walk from their higher education providers as it is possible to be. Moreover, they are usually fitting their studies into busy lives with diverse demands on their time. By providing a more flexible and usually less costly option, distance learning is commonly a solution for people whose work or caring commitments prevent them from taking up or returning to campus-based higher education. Investigations into the experience of part-time learners, which include learners who are both part-time and distance, support this (for example, Callender et al, 2010a); as does data for the UK Open University (hereafter OU). In 2013/14, over 70% of OU students reported that they were in full-time or part-time employment and 9% declared themselves to be carers. Over half of those who declared themselves to be carers were *also* in full-time or part-time employment. However, it is these very commitments which are commonly cited when students withdraw or as the reason why they do not participate in face-to-face activities designed, at least in part, to build students' sense of belonging.

This paper argues that if and when distance learning students talk about their studies and, importantly about their study problems, this talk tends to be hidden from their institutions. But conversations between us and students, we believe, can and do enable students to integrate their studies with the rest of life in a more constructive way. We consider the role of learning analytics and conclude that by tapping into the data generated by students' engagement through Virtual Learning Environments (VLEs) we could find out who needs to talk to us, when and what about.

Isolation in distance learning

It has become widely accepted that nurturing a culture of belonging should be central to universities' strategies for student retention (Yorke, 2004; Longden, 2006; Thomas 2012). It is also widely accepted that this presents unique challenges for distance learning providers. Distance learning is understood to be a lonely and isolated experience in which students are deprived of the networks available to sustain students in face-to-face environments (Woodley, 2004; Wilcox et al, 2005; Leach, 2007; Cannell et al, 2007).

Research on transactional distance in distance learning has explored the nature and (negative) impact on students' success of the psychological and communication space between: learners and tutors; learners and other learners; and learners and content. A small scale study by Kassandrinou et al (2014) into the factors which contribute to the increase of transactional distance concluded: (i) that, despite the value which their student respondents placed on interaction with their peers when they encountered hard times (both personally and academically), learner-learner communication was restricted; and (ii) that they expected tutors to lead and facilitate community building rather than being proactive themselves. Falling attendance at face-to-face events such as tutorials and residential schools has been a feature and concern at the OU for some years and, though hard to measure, is often cited as contributing to declining student completion rates at both the module and qualification level. There is some evidence that replacements in the form of online options for interaction – such as academic forums, online student cafes and tutorials – have yet to deliver hoped-for benefits in terms of student engagement, peer network building or reduced feelings of remoteness (e.g. Macintyre & Macdonald, 2011).

Issues related to the support that distance learners derive from personal, work and social networks and whether that might compensate for their relative isolation from other learners, tutors and the institution do not appear to be well developed in the literature. It has been suggested (Gibbs, 2004) that, in contrast to campus based students, distance learners' social support is established outside of education and their stable social lives help them to progress. Callender et al's study (2010b) of career decision-making among part-time students demonstrated that although, for the vast majority do not rely on professionals for their careers information, advice and guidance. Instead, they turn to those close at hand – their informal social networks at work and at home. Studies which have investigated the relationship between family and studying part-time have identified both positive and negative effects in terms of both pressure and support (Callender & Feldman, 2009). Findings from a survey involving UK OU students suggested that the most valued form of support - beyond tutor, peer or institutional support - was that given by partners, family and friends

(Asbee & Simpson, 1998). This could be both practical (giving students time and space) and emotional (at stress points such as examinations). But negative as well as positive responses were reported. Responses to another OU study (Edwards, 2010) included instances in which students had not considered involving family or partners in discussion about their studies until prompted to by engagement in a reflective learning inventory.

Research findings on the impact of online social networking on student success also seem mixed. One US study (Morris et al, 2010) demonstrated a positive impact of computer-based social networking (in particular Facebook) on persistence among campus-based students, while another (Kirschner & Karpinski, 2010) found a significant negative relationship between Facebook use and academic performance. So far the current authors have failed to identify any similar findings relating to the experience of distance learners.

Support for the need for pro-activity on the part of institutions is found in Ross et al. (2013) who explore the concept of "nearness" for online distance learners. They conceive nearness as a "temporary assemblage, where students engage and disengage with the institution at varying intervals and with varying degrees of affinity" driven by outside commitments, shifting priorities, technologies, and their relationships with the programme, the subjects they study, the academic community and the institution (p63). Students' resilience, they argue, is a measure of their ability to navigate their programme in the face of this inevitable variation in nearness, and conclude that institutions should adopt proactive strategies for "supporting students' resilience to shifts in engagement" (p63). In the rest of this paper, we shall consider another facet of distance learning isolation, the exploration of content, and use our experience of designing and implementing proactive interventions (involving purposeful conversations with struggling students) on the basis of data gathered about students' learning behaviour.

The advent of VLEs and their analytics

When the OU was launched in the late 1960s, learning resources were sent by post and broadcast on national television. Students received and investigated the content off-grid, isolated from the institution and other students. The University needed to find ways to support students without any immediate indications of their engagement with, or comprehension of, the course content. Part of that support has been the discussion and reflection at face-to-face tutorials and residential schools which have both been in decline as regular features of the OU student experience.

The internet revolutionised distance learning. As provision has migrated online, the increasing opportunities for students to engage immediately and interactively in a learning environment have gone hand in hand with the developing opportunities for institutions to gather more data about learning.

Automated logs from Virtual Learning Environments (VLEs) now offer extraordinary opportunities to capture data about student learning behaviour which might otherwise be unseen in distance learning. VLE usage is, however, by no means limited to distance education. By 2006 almost all Scottish HEIs were using a VLE for some or all of the delivery of the majority of their courses (Ward, 2006); the 'flipped classroom' is one example of the increasing use of digital content in face-to-face education. HEIs are exploring the potential of online education to deliver learning at scale and low cost, which has helped to drive the rapid growth of research interest in education data from VLEs.

The Educational Data Mining (EDM) and Learning Analytics (LA) communities are both interested in how we can use data for improving the student learning experience. EDM research primarily uses automated methods such as social network analysis to analyse the data about students to discover patterns of behaviour and predict outcomes. The knowledge gained is then typically used to build education systems and tools that are more adaptive and intuitive. LA research primarily uses human discovery methods, such as to investigate the learning process, using the knowledge gained to build data to inform and empower both learners and teachers (Baker & Siemens, 2014).

Data drawn from the automated logs created by VLE systems must be used with caution as it can be easily misinterpreted. Consider, for instance, the length of time a student spends viewing a page of course content. A short time would seem to indicate the student has not read the content fully, but they may instead have copied it into a device outside the VLE. A long time would seem to indicate that the student is having trouble absorbing the content, but they may instead have left the browser page open while they paused to reflect and make a cup of tea. There is a crucial distinction between the length of time a *browser window remains open* on the page and the length of time for which a student is *engaged with the content*. Indeed, the relationship between student behaviour and learning is itself an area of ongoing research. To understand the student experience, there must be an understanding of the distinction between system logs and the human interaction with the system (Shih et al, 2008).

We believe that the development of learning systems and teaching should be strands in a single strategy; the research findings of the EDM and LA communities and their implications for supporting students should therefore be examined together.

Designing interventions

Intervening without an understanding of what we're doing is "like throwing a paper bag at our students – half the time we don't even know what's in it".

An OU in Scotland academic tutor manager, in conversations about approaches to student retention.

Once struggling students have been identified, the challenge becomes how to decide what – if any – action can be taken to help support them to success. A survey by the National Audit Office (2007) highlighted that many UK HEIs do not have a clear strategy for retention. While this may have improved in recent years, there is evidence suggesting that it is not straightforward or obvious how to link learning analytics and strategic planning, even with significant investment and expertise (Macfadyen & Dawson, 2012).

As VLE systems continue to evolve, the data that can be collected by them will become increasingly varied and complex. Being able to analyse and interpret the data will become more difficult, yet it could yield great improvements in our understanding of student learning and success. We believe that developing and embedding a strategic approach to the analysis and use of VLE data will be one of the defining challenges for higher education of the next few years.

"Struggling students want to be noticed – they feel the OU should reach out to them, instead of them reaching out to the OU."

Internal OU review of student withdrawal from study

When deciding how to help students, consideration of the potential negative outcomes must be considered. For example, by informing a student that their characteristics indicate they may fail we may unintentionally trigger the Stereotype Effect. Nevertheless, many believe that by neglecting to use analytics to identify and intervene, institutions are failing in their duty of care for students.

Thomas' (2012) summary report of the findings from a three-year HEA programme entitled 'What works? Student Retention & Success', highlighted the importance of "meaningful interactions between staff and students" to ensure success. Speaking to students as individuals, at key points where their resilience might fail, is necessary but is not sufficient to ensure student success. It is rare that students only ever face one problem. As discussed earlier, distance learning students, particularly those studying part-time, are almost certainly balancing multiple priorities whose influence on study will wax and wane throughout the student's journey. While much OU in Scotland

research has positively impacted on the immediate issue, such as a missed assignment, we have found that long term aims such as successful completion of the course are not so easily influenced. Institutions need to be vigilant for signs of faltering students throughout their entire study journey, making decisions at regular points about who might need help.

OU research has found that conversations with students about structured reflection prompted reflection on the connectedness of study (Edwards, 2010). Students who had previously chosen to be isolated realised the benefits of conversation about their study, including people outwith the learning environment. Large scale research in the US (Bettinger & Baker, 2014) has also shown that an ongoing dialogue with students about their study skills and goals can significant improve students' likelihood of success.

Student retention at the OU in Scotland

The OU in Scotland adopted a new strategic approach to student retention in 2006, forming a Retention Action Group (RAG) which has co-ordinated and supported a myriad of bespoke projects across the curriculum and student groups. The projects could be considered to fall into three high-level types:

1. Analysis projects: looking at student success patterns, aiming to improve our knowledge about and understanding of the most important factors.
2. Investigation projects: discovering more about how the students are learning, with a view to developing the curriculum, teaching practice and support processes.
3. Intervention projects: implementing actions aimed to improve individual learner outcomes.

Primarily we use analysis (of varying complexity) to identify (i) spaces where retention is relatively low, and (ii) student characteristics and behaviours which appear to reduce the likelihood of completion, viewing the data as symptoms to be investigated. We then draw on teaching expertise and deeper knowledge of the curriculum and students to construct a rich picture of the influences on this space. Considering this, along with the aims which are, in general, to improve student support through teaching methods and structures rather than systems, the RAG projects to date have been more closely aligned with LA than EDM research.

The projects to date have varied in scale from small ones focussed on a particular cohort of students or module, to longitudinal studies charting a module over several years of presentations, through to cross-faculty projects. A collaborative approach has been taken, working with academic faculties, tutors and student support staff to gain a deep understanding of the specific issues before setting out an intervention plan. Information from these projects is also fed back, where relevant, to developing teaching practice and support processes.

One aspect of planning interventions for distance learning students is deciding how to contact them. Unpublished RAG projects have highlighted several key points of advice:

- If intending to telephone students, warn them first by email or text message to expect your call. Many students will now refuse calls from unknown numbers and those who answer are more likely to respond positively if they know who you are and why you're calling.

- Select people with the greatest interest in students and their success. We have found a correlation between the level of detail that tutors record about their conversations with students and the positive outcomes for the student.

- Don't stop after one email. Where tutors have persisted with contacting students, the response has had far greater impact on behaviour. In one example project tutors were contacting students to encourage them to reconsider potentially unwise study intentions. By giving gentle, individual advice over email and telephone, the vast majority were not only persuaded to change their study intentions but were more reflective about their approach to study and more likely to succeed.

We recommend that institutions should develop and maintain a library of information about interventions that can be used to select the best approach to helping an individual student at a particular point in their study journey. The library should detail, but not be limited to, the type of intervention, the method used and groups for which it was found to be most successful. This library could then be used as a lookup system for a process of continually assessing whether a student is likely to succeed and whether the institution is likely to be able to help them. This process is described by Figure 1.

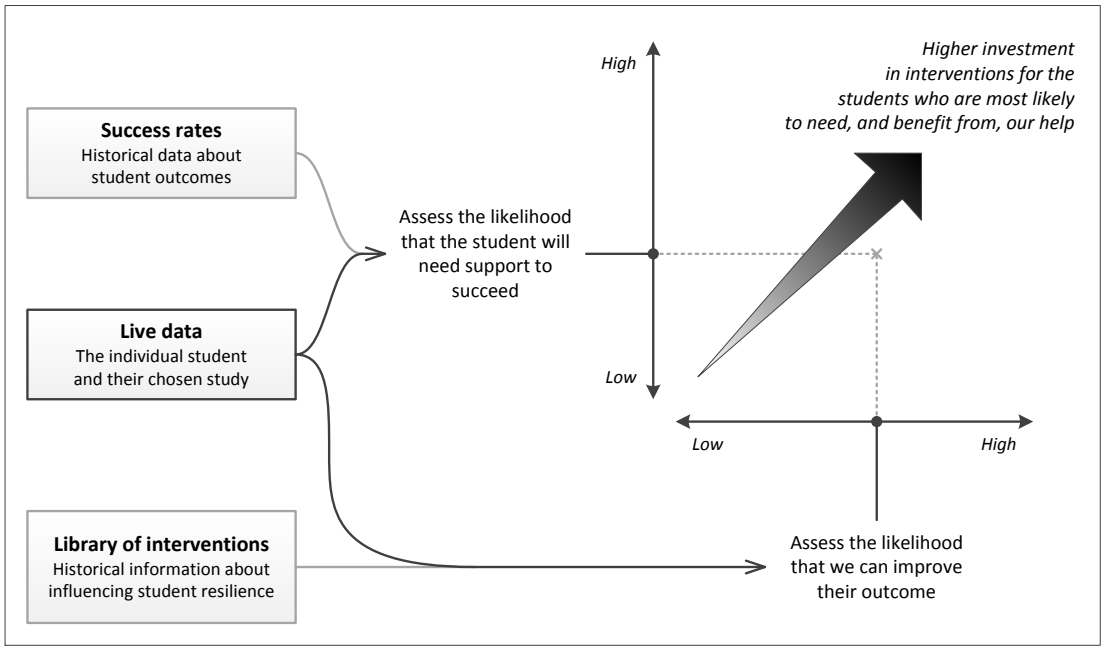

Figure 1: A process for assessing whether to intervene

Conclusions

We argue that a robust retention strategy should combine learning analytics and a library of interventions to continuously assess the student's journey and whether we can help. By identifying the students who are most likely to need our help and whom we are most *able* to help, we can target our investment where it is most likely to improve retention. We have provided examples that show, by taking a long term approach to supporting students using carefully structured interventions, great improvements can be made. Moreover, there is evidence to support our claim that this is a cost-effective approach (Bettinger & Baker, 2014).

Epilogue

I listened and I thought I caught the word—

What was it? Did you call me by my name?

Or did you say—

Someone said 'Come'

Extracts from The Telephone by Robert Frost, 1920

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Opening up the University of Athens

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Abstract

The "open online education" paradigm is challenging the future role of Universities, open or conventional, as well as that of their faculty members. Some say that large traditional universities will have the fate of the dinosaurs, unless they adapt quickly to the new environment. This issue has been at the heart of a debate among faculty, administrators and students at the National and Kapodistrian University of Athens (UoA), the oldest public University in Greece, since the launching in 2013 of OpenUoA, an ambitious project aiming at opening up approximately 500 courses selected from the undergraduate and graduate curricula of UoA's 32 departments. The developed open courses will be made freely available to the general public through an open course-friendly LMS and videolecture platform. The current status and progress of OpenUoA are presented, including the specifications of the online courses, and the support services and technological infrastructure. UoA's views and policies regarding the development of OER and online courses, and the new opportunities and risks are also discussed.

Keywords: open courses, course specifications, support services and technologies, OER policy, opportunities and threats for universities

Introduction

Offering open educational material of high-quality, free over the Internet, has started the revolution of "opening up higher education" [1-3]. At the same time, the emergence of MOOCs (Massive Open Online Courses) [4-6] has created new potential and has raised intense debate about their future role in higher education.

Following its past steps in creating online courses targeted to its students, the National and Kapodistrian University of Athens (UoA) [7] has launched in 2013 the "Open Academic Courses in the University of Athens – (OpenUoA)" project [8]. OpenUoA is an ambitious project aiming at opening up approximately 500 courses selected from the undergraduate and graduate curricula of UoA's departments. UoA is the oldest university in Greece and south east Europe, and the second largest in Greece - a conventional large state university with 32 academic departments, 1.900 faculty members, and an enrollment of about 10.0000 undergraduate and graduate students. The project offers participating UoA faculty members support services, technology, infrastructure and training to effectively support the development of high quality digital educational material, which is also accessible to people with disabilities, and the handling of intellectual property issues. The developed open courses (OC) will be made freely available to the general public through an open course-friendly LMS and educational video platform.

In this paper, the current status and progress of OpenUoA are presented, including the OC specifications, and the support services and technological infrastructure. UoA's views and policies regarding the development of OER and OC, and the new opportunities and risks are discussed.

The "OpenUoA" project

OpenUoA aims to develop approximately 500 open academic courses freely available over the Internet, as a compliment to face to face instruction to UoA students, but also for online learning for individuals who wish to acquire new knowledge or to renew knowledge acquired during their formal studies, through self-education.

Creators of the open academic courses are faculty members who teach these course in the UoA curriculum. In the context of the project, an **Open Academic Course** is defined as an undergraduate or postgraduate, curriculum based, online course that allows for independent study and is freely available over the Internet under an open Creative Commons (CC) license [9]. The concept of openness of a course is twofold and refers to i) the open, unrestricted access, and ii) the openness of Creative Commons licenses.

The project objectives include the following:

- Upgrade of existing online courses in terms of content and structure, along with the creation of new, based on best practices and standards.
- Distribution of the open academic courses to the general public and the parallel strengthening of the educational and social role of the University.
- Dissemination of the rich educational content and courseware developed at UoA.
- Definition of an institutional policy for open courses.
- Handling of intellectual property issues.
- Development of educational material accessible to people with disabilities.
- Promotion of open access.

The project allows UoA to take an active role in the international scene of higher education institutions that offer free and open online courses.

The overall objectives of the "OpenUoA" project are i) to support and encourage the UoA faculty members towards the exploitation of disruptive internet technologies for opening up educational resources, ii) the creation of appropriate support mechanisms, services and infrastructure, and iii) the promotion of open access to UoA's courses and rich educational resources.

The aforementioned objectives contribute to the upgrading of the whole educational process at UoA, as well as to the social profile and mission of a public university opening its courses to everyone who wants to learn.

The horizontal project

Most of the Greek higher education institutes (HEI) - universities and technological education institutes - have launched similar projects for developing open courses, which are funded by the Greek Ministry of Education in the context of the Operational Programme "Life Long Learning" [10], co-financed by Greece and the European Union.

Additionally, the horizontal project "Central Repository of Greek Open Courses" has been launched at national level in order to coordinate and support the aforementioned HEI projects. The horizontal project aims at supporting the Greek HEIs in developing and providing open academic courses, which will be available to the general public. The horizontal project is carried out by the Greek Academic Network (GUnet) [11] - a non-profit organization formed by the Greek HEI.

The main target of the horizontal project is to develop, and make available to the public, a national open courses search (NOCS) portal as a means for searching centrally the open courses provided by the Greek HEIs. A percentage of the open courses will have accompanying educational video, such as video lectures.

Briefly, the main objectives of the horizontal project are

- the design, development and operation of
  - the horizontal NOCS portal [12],
  - the Open Delos platform [13], a rich media and lecture platform for education,
- the upgrading of the Open eClass platform [14] in terms of architecture, user interface and functionality in order to support open courses,
- the drafting of specifications for the open courses development and the required equipment for the development phase,
- the provision of guidelines, training and consulting services, related to the development of open courses, to the HEI and their staff,
- the central hosting of open courses to achieve economies of scale,
- the raising of the awareness of faculty members, and the training of HEI's support staff,
- the launching of annual best open courses awards,
- conducting promotional activities, publicity and dissemination of results.

Other objectives of the horizontal project are

- the upgrade of the structure and content of existing digital courses, based on international practices and standards, for the resulting open courses to become facilitators of face to face teaching,
- the promotion OER development,
- the definition of institutional policies for the open courses and OER,
- the handling of issues related to intellectual property and the creation of educational material accessible by disabled people.

Building based on accumulated experience

To understand the design parameters of the horizontal and institutional projects, it is important to review the picture at the beginning of the projects as regards the landscape of online courses that have been developed by the Greek HEI under past actions. The design of these projects was based on the accumulated past experience. The Greek academic community has been active in the development of online courses since 2003. The online courses were used as complimentary to the traditional face-to-face teaching. Table 1 depicts the figure of the online courses offered by all the Greek HEI and UoA in September 2013.

		All Greek HEI	UoA
1	Total number of online courses	> 27.000	4252
2	No. of courses with open access	> 11.400	2309
3	No. of courses with open registration	> 11.500	1483
4	No. of courses with restricted access (only to students)	> 4.140	460
5	No. of faculty members involved	> 11.000	1591
6	No. of registered students	> 517.000	117.165
7	No. of platform types	6	1
8	No. of different installations	60[16]	1

Table 1. Quantitative data on online courses (September 2013)

The first conclusion is that an active community of online course creators (over 11.000 faculty members) has already been established. Moreover, the involved faculty members have a positive attitude towards the open access of their content, either as direct open accessed courses (over 11.400) or via open registration (over 11.500).

The second conclusion is that there is already a large number of beneficiaries (> 517,000) of the online courses, composed by the current or recently graduated students, who are registered as users of the online courses.

The third conclusion is that the online courses are dispersed in a large number of different installations (60), each one not being widely known beyond the students of each institution. Aggregated information about the available online courses of the Greek HEI or a central search facility for finding online courses that match specific search criteria is missing.

[16] 55 are based on the Open eClass platform [14].

As regards the qualitative characteristics of the courses, they are heterogeneous in their structure and content. Specifically,

- a small percentage of the online courses consists of a shell that includes a brief description of the course without much content, such as notes or slides;
- a significant percentage of the online courses includes, in addition to the description, educational content, such as files structured per thematic unit, but without reference on the learning objectives of each unit. These online courses are used in practice as a repository for educational materials used in teaching. This is rather expected, because the use of online courses was considered complementary to face-to-face teaching, and the target audiences were students enrolled in the courses; a percentage of the online courses, which mostly belong to the category of courses with restricted access, is structured in thematic units, with description and objectives per unit, and contain all the information needed by a self-learner;
- a very small percentage of the online courses contains multimedia content, such as video lectures, educational video, or podcasts;
- a small number of faculty members uses the functionality of the asynchronous learning platforms for interacting with the students;
- finally, most of the course creators (faculty members) were not aware of issues related to the copyright or the design of educational material according to the rules of accessibility for people with disabilities, or the principles of "Design for all" [15].

The above qualitative characteristics highlight the need for upgrading i) the structure of the online courses, and ii) the presentation of the content to cover minimum standards, especially in light of open access by the general public. This upgrading is the main goal of the aforementioned institutional and horizontal “Open Academic Courses” projects.

Design parameters

During the design phase of the “Open Academic Courses” projects, the following issues were considered. One of the main issues was the feasibility of the project objectives. The key design parameter in order to motivate the faculty member to participate was to increase incentives and to reduce disincentives.

A disincentive would be the adoption of uniform and strict standards for all the open courses. Instead, it was chosen to define three categories of standards, each one drafted to attract receptive creators with a degree of maturity close to one of the three categories. Thus, a faculty member has to decide whether to make a single step, for which s/he will likely be ready, and not many steps, for which s/he will probably be unprepared.

In the context of strengthening the incentives, the main target was to minimize the extra time and effort of the faculty members involved in the development of the open courses. This was accomplished by developing a mechanism to support faculty through qualified support staff, who would take the biggest load of the open course development, under the guidance of the faculty.

An additional target was to strengthen the culture of open content and long-term development of open courses, and this is done through the development of guidelines for faculty members and support staff, and the dissemination and promotion of the best open courses and practices.

Regarding the interaction with the public, it should be noted that the "Open Academic Courses" projects were not designed to produce MOOCs; while they target open educational content structured as a course, they do not include interaction with the general public. The issue of interaction, in a massive way, under a sustainable business model is currently under investigation, and will be a core item in the next design phase.

Course development, classification and specifications

Based on their educational content, the open academic courses are classified into one of three types: A-, A or A+. This classification is common for all the institutional projects and have been specified by the horizontal project [16]. The specifications were based on a state of the art review carried out in 2012 of the structure, information and content type of most known open course and MOOC initiatives. Table 2 summarizes the specifications for the three open course types.

Specifications	A-	A	A+
Course description	√	√	√
Course objectives description	√	√	√
Keywords or basic terms	√	√	√
Teaching material organized in thematic units or groups of lectures	√	√	√
Objectives per chapter, unit or group	√	√	√
Keywords or basic terms per unit	√	√	√
Presentations, notes per unit or lecture	√	√	√
Bibliography	√	√	√
Self-assessment elements or exercises			√
Use of digital library sources			√
Multimedia material:			
• **Video lectures**			√
• **Video lectures synchronized with slides**			√
• **Podcast and slides**		√	

Table 2. Open courses classification based on specifications

Publication with Creative Commons licenses

The educational material of the open academic courses will be available to the public under a Creative Commons (CC) license [9]. The CC is the most widespread licensing scheme for open licensing of digital works. The digital version of educational material with CC licenses automatically allows its use by others, with the requirement to attribute the creator - author, while the creator reserves the right to publish in the "traditional" way through a publishing house. Additionally, the CC licenses define with accuracy the permitted ways of use of educational material.

OpenUoA has chosen the Attribution - Non Commercial - Share Alike (BY-NC-SA), 4.0 International [17] license as the main license for the content of the open courses. The "Share-Alike (SA)" license element was chosen in order to promote the creation and sharing of OER among the faculty and the HEI. The element "Non-Commercial (NC)" was chosen to protect the university's and faculty member's interests on the

educational content.

Open academic courses platforms

For the hosting and searching of the open courses, which are being developed in the context of OpenUoA, three different platforms are used.

The open courses and the non-multimedia content are hosted in the Open eClass platform [14] and are available publicly through UoA's Open Courses service [18].

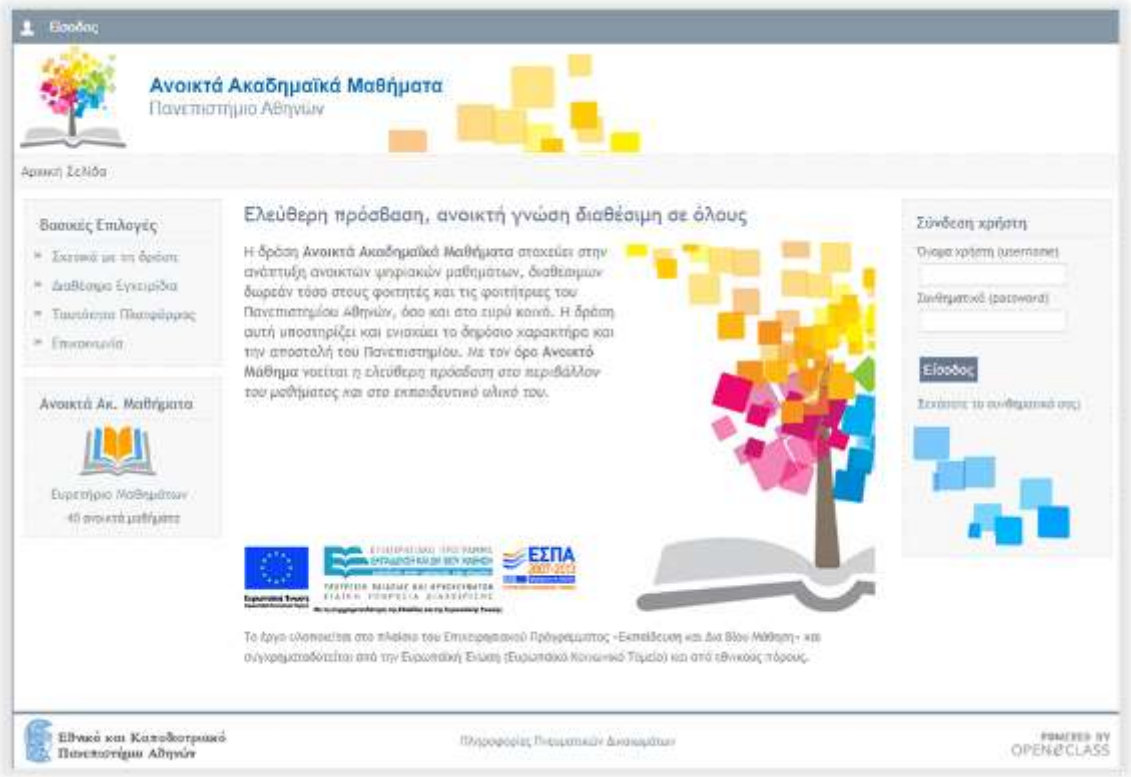

Figure 1. UoA's Open Courses service

The multimedia content is hosted in the Open Delos platform [opendelos.org] and is available through UoA's educational video portal services [19].

Moreover, an open course can be found through the NOCS portal [12], which is fed with metadata from the institutional open courses installations maintained by all Greek HEI.

The Open eClass platform

The Open eClass platform [14] is an open source multilingual Learning Management System (LMS) being developed and supported by GUnet since 2003. The Open eClass platform is characterized by its friendly user interface as well as its capability of serving large number of users. The majority of Greek HEI do use Open eClass as their institutional LMS. Its friendliness, intuitive UI, short learning curve, and constant

support by GUnet has strongly contributed to the formation of a strong culture on creating online courses by the Greek academic community during the last decade.

The Open eClass platform plays a key role in the Greek Open Courses project. It is the core infrastructure for organizing and presenting the educational material into open courses, following the proposed OC instructional design.

In the context of the horizontal project, the Open eClass platform is being upgraded in terms of architecture, user interface and functionality in order to support open courses that is to, become open courses-ready. Additionally, it communicates the OC metadata to the NOCS portal through a standardized API, making them available for search.

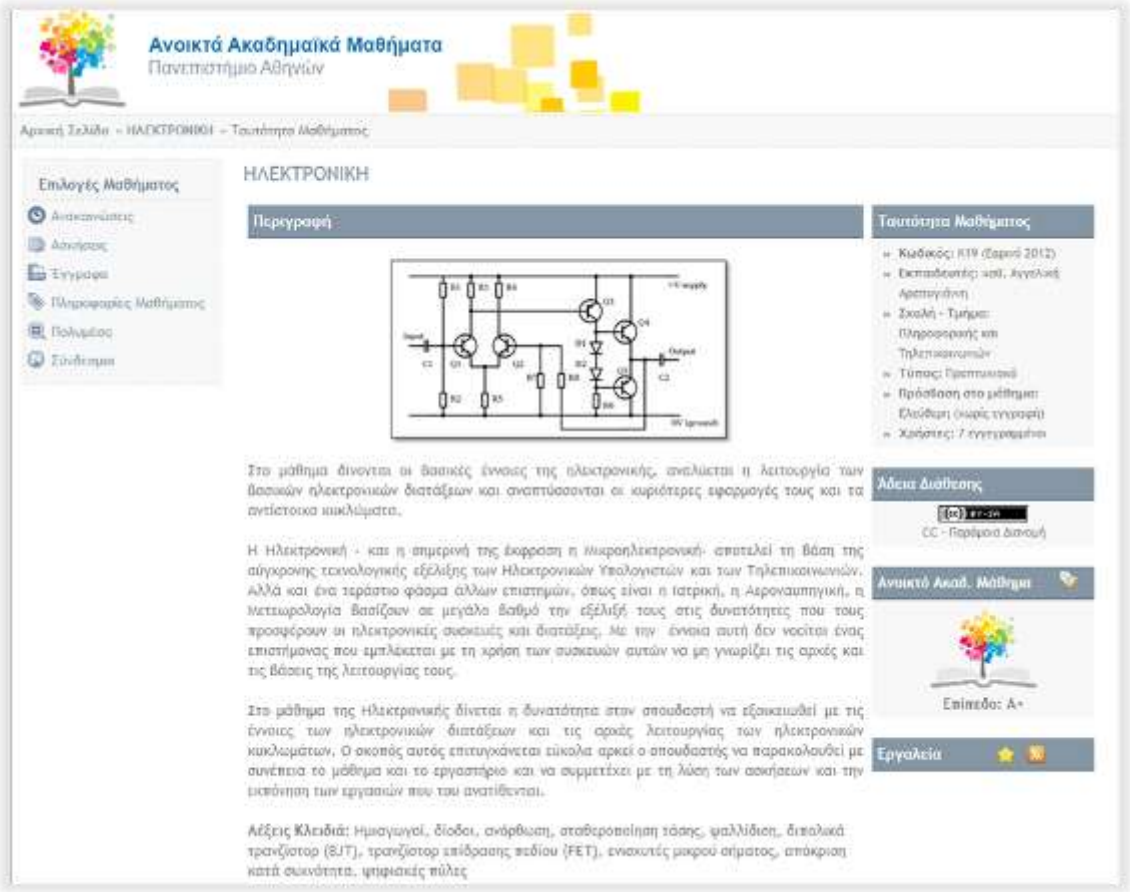

Figure 2. An example of an Open Course in Open eClass platform

The Open Delos platform

The Open Delos platform [13] is a rich media and lecture platform for education currently being developed in the context of the horizontal project. The platform provides functionality for managing both live broadcast and recorded lectures and academic events.

Regarding the live broadcasting of lectures, in each Greek HEI, a number of high definition IP cameras connected to the Internet are installed in teaching rooms and amphitheaters, e.g., 55 such cameras are being installed at UoA. These cameras are used for both live streaming and automatic recording of the lectures. The Open Delos platform provides the functionality for managing the schedule of the broadcast and recorded lectures, the playing of the live streams and the uploading of the recorded lectures. Additionally, video recorded by camera operators can be uploaded as well, along with the presentations and video-to-slides synchronizing timing information. The content editors can edit the metadata of the videos and apply online basic video processing operations, such as video editing, synchronizing video with the uploaded slides, and creating short video or knowledge clips based on the uploaded video files. Multilingual subtitling will be provided in a next version of the platform. The content editor and the faculty member may review the multimedia content and publish it, whereas a responsive rich media player is provided to play the content in desktop devices or tablets.

Figure 3. The video editing user interface

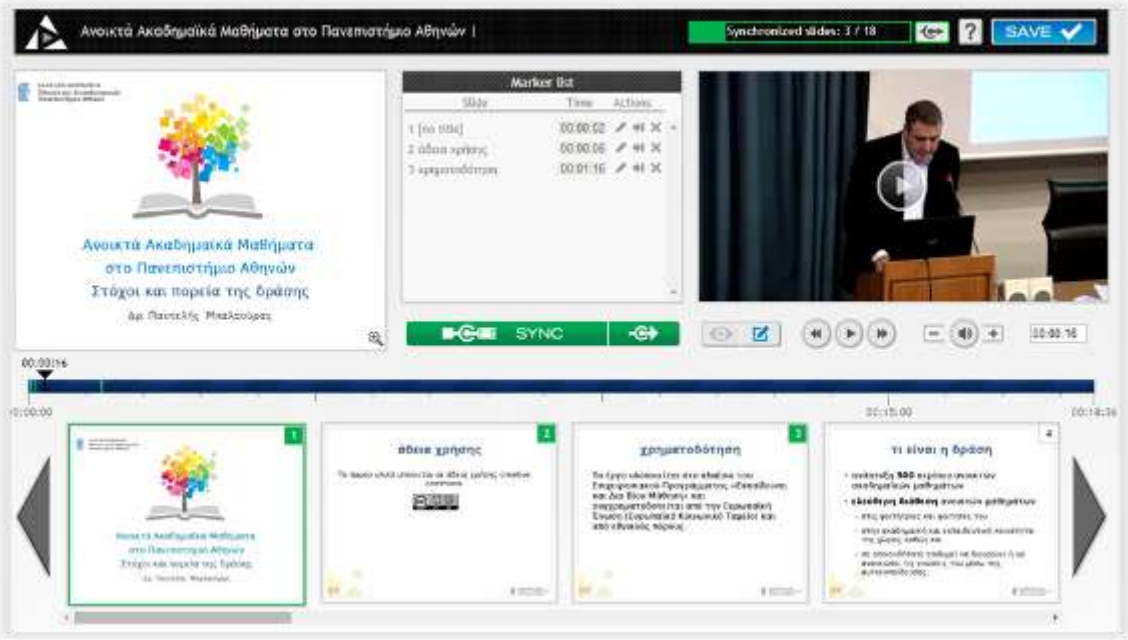

Figure 4. The slides to video synchronizer interface

The Open Delos platform communicates with the LMS through a standardized application programming interface, so that the multimedia content of a specific open course will be presented and accessed via the integrated environment of the LMS. Additionally, the lectures' metadata are communicated to the NOCS portal. The study in [20] shows how video production affects student engagement.

Figure 5. The player interface

Figure 6. The National Open Courses Search portal

Institutional policies on open courses and OER.

An important objective of OpenUoA is to contribute to the definition of a comprehensive UoA policy on open courses and OER. Such a policy includes individual policies for a range of issues, and provides directions for organizational and business models [21],[22] . Specifically, the list of policy items presently under study includes the following:

- General policies: Knowledge Dissemination and Personal Data/ Privacy Policies.
- Provision and exploitation of online, restricted access courses and open courses..
- Policy for OER development.
- Quality assurance policy for open courses and OER, which includes general principles, qualitative criteria, specifications for the online courses as well as for the accessibility of the content and online services, institutional templates for the presentations and the notes, and the needs for compliance with the qualitative criteria and evaluation mechanism for the end users.
- Policy regarding the interaction with students (restricted access courses) and public (open courses).
- IPR issues, such as central support for faculty and open licensing policy.

- Quantitative targets and milestones regarding the development of open courses for the undergraduate and postgraduate programs.
- Incentives for the faculties and departments to be active in creating open courses.

Regarding the organization model, the need for upgrading the central support unit for e-learning services [23], and the policies for the infrastructure (i.e., servers, storage systems, platforms, content hosting) has been identified.

The faculty view: OpenUoA - opportunity or threat?

OpenUoA has created mixed feelings among UoA faculty. Some have openly expressed skepticism; here are some examples: "I will lose even those few students that still come to my lectures", "I do not like my lectures to be videotaped because I feel more reserved and less spontaneous and free to express myself", "my work will be stolen", " I will have to work harder", "I have to clear third party IPR in my existing teaching material."

Many see it as an exciting opportunity for blended curriculum innovation, new forms of interaction with students, more time for in class discussions and activities, and personalized student mentoring.

Some feel that OpenUoA will reward good teachers, promote faculty cooperation and best teaching practices, and facilitate the wider dissemination of high quality teaching material. A good open course, which is very popular among users and is highly ranked by students nationwide, irrespectively of the university they are enrolled at, is strong evidence of teaching effectiveness and could be used as such in faculty teaching evaluations.

This is very important since in Greek public universities "being a good teacher" is presently valued much less than "being a good researcher". One of the reasons for this is that undergraduate student enrollments and university budgets are controlled by the Ministry of Education; thus, universities have no incentives to attract more undergraduate students, which in turn is reflected in the faculty promotion and tenure criteria. In most cases, such criteria weigh much more a good research record than teaching effectiveness. This situation leads many faculty members to put most of their time and effort on research and very little on teaching, at the expense of instruction quality. OpenUoA will help changing this attitude, by exposing and promoting good teachers and courses to much wider audiences.

Acknowledgement: This work has been co-financed by the European Union (European Social Fund - ESF) and Greek national funds through the Operational Program "Education and Lifelong Learning" of the National Strategic Reference Framework (NSRF).

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Moerkerke George

Modern Consumers and Open Universities: Can Open Universities Develop a Teaching Model in which Students Become the Co-creators of Value?

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Abstract

In the last 10 years marketing specialists are redefining the roles consumers and producers play in the economy. Recent theories model markets as places where consumers and producers interact and create value. Modern customers are connected, informed, mobile, educated and internationally oriented. They seek firms that empower them to co-construct personalized experiences. This view of the customer-firm relationship has a great impact on the ways markets function. In order to survive firms need to see the individual costumer as a partner and interact with them. According to Prahalad and Ramaswamy (2004), the core principles of this interaction are Dialogue, Transparency, Access, and Risks-benefits. Open universities can apply these principles to optimize the value of their programs for professional students. In the last five years a so-called *capita selecta* course within the Open University of the Netherlands gave students the opportunity to personalize learning. Within the limits of the formal Master program students were encouraged to define personal learning goals, study tasks and work to be produced and formally assessed. In this paper the course will be analyzed according the principles of the Prahalad and Ramaswamy model and the related Vargo and Lusch model. The goal of this analysis is exploring the following question: Can open universities develop a teaching model in which students become the co-creators of value?

Keywords: Innovative pedagogical models, course design, co-creation of value, DART model, New Dominant Logic, lifelong learning, good practices of transitions to open and flexible learning

Introduction

Open universities have played an important role in providing access to higher education to those without a previous degree. Nowadays, in developed countries, this traditional target group of students is shrinking, sometimes dramatically, as was the case at the Open University of Hong Kong (Butcher, 2013), sometime gradually, as is the case at the Open University of the Netherlands (OUNL) (Moerkerke, accepted). At the same time, the need for lifelong learning for professionals who have previously graduated is growing. This is a long-term global trend (World Bank, 2003). There is a need for courses and degree programs that will optimally prepare professionals for the roles they aspire or already hold. Some of these learners may enroll in bachelor's programs, but more and more they want to enroll in master's programs or postgraduate courses relevant to their professional development.

The Open University of the Netherlands is at the center of this significant trend. Recently, the Executive Board provided an extensive analysis of the challenges facing the OUNL (Open Universiteit, 2012). This has led to a number of strategic choices regarding the educational services the OUNL will be providing. One of the objectives is to expand the educational services for professional lifelong learning.

This paper reflects upon the question whether educational services for professional learning will demand for a change in the teaching models. The OUNL is a typical first generation open university. Like many others, it was established to deliver degree programs for non-traditional students. These degree programs were highly academic and concentrated on domains of scientific knowledge. The adult learners were accepted and approached as novices who studied academic domains, regardless of their professional backgrounds or professional needs. The production, delivery and exploitation of courses were fully in the hand of the content specialists, media specialists, educationalists and tutors of the university. From a marketing perspective one could argue that the teaching models are part of a traditional product driven relationship with the customers. However, according to marketing theories for modern consumers, this product-driven firm-consumer relationship should be replaced by a service-oriented relationship. In order to survive in a modern global economy, firms need to see the individual costumer as a partner and approach them in that spirit. According to Auvinen and Smith (2012), the standard instructional design methodologies for professional online education are challenged by the concept of a service-oriented relationship between universities and students. In their paper they claim that economic value in lifelong learning is not created by effective provision and planning of courses, but rather through a continuous dialogue with learners.

First, this paper explores grounding theories on the relationship between consumers and firms in a modern web-based society. These economic theories have inspired

some teachers in rethinking their pedagogy. The aim of the paper is to extract specifications on teaching models for the design and delivery of educational services for lifelong learning. Finally, the experience with an existing course where students already take the role of co-producers will be described. From this experience some lessons learned will be discussed.

Theories on the Relationship between Modern Consumers and Firms

In the last decade micro economists are redefining the roles consumers and producers play in the economy. From an economist point of view economic theories and models on consumers and produces apply to education as well as to any other service or product. The services of universities are just one of the many services provided in society. According to influential economists, like Prahalad and Ramaswamy (2004) and Vargo and Lusch (2004), the consumer-firm relationship has been drastically changed in the modern society.

The Co-creation Experiences Model

Prahalad and Ramaswamy (2004) present a consumer behavior model in which producers and consumers interact and create value. They state that in the economy, markets are shifting from a product-centric view to a view embracing personalized customer experiences. Modern customers are connected, informed, mobile, and educated. Modern customers seek firms that empower them to co-construct personalized experiences. Instead of being the prey of the firm, customers are becoming hunters, looking for the firms that co-create the most interesting experiences. This view of the customer-firm relationship has a great impact on the ways markets function. Attractive firms see the individual customer as a partner. They seek interaction and use the following building blocks for designing that interaction:

1. *Dialogue*. Dialogue implies interaction, deep engagement, and the ability and willingness to act on both sides. Firms and customers become equals and joint problem solvers.
2. *Access*. Access to information is critical for a dialogue with equal partners. Traditionally, firms have a monopoly of information. They decide how to inform customers.
3. *Risks-benefits*. Dialogue, transparency, and access provide customers with the opportunity to make informed choices about their consumer actions and decisions.
4. *Transparency.* Transparency is also critical for a dialogue.

The work of Prahalad and Ramaswamy has had a great impact on thinking about redesigning marketing strategies of services. In order to survive firms need to see the individual costumer as an equal partner in every step of the formation of the service.

The New Dominant Logic for Marketing

Vargo and Lusch (2004) proposed a renewal of marketing theory, the so-called New Dominant Logic for marketing. This service centered view on marketing postulate that producers should try to collaborate with their customers, try to learn from their customers, and should to be curious to the individual and dynamic needs of the customers. Vargo and Lusch describe the marketing as a continuous learning process aiming at improving resources of the firm. If one should apply this on learning services of universities a service-centered view should involve the following strategy:

1. Identifying and developing the fundamental knowledge and skills of the university that represent potential competitive advantage (also called core competences).
2. Identifying potential customers that could benefit from these core competences.
3. Cultivating relationships that involve the customers in developing competitively compelling value propositions to meet their needs.
4. Improving the university's offering to customers by analyzing the financial performance.

These strategic activities are grounded in a theoretical background. Vargo and Lusch (2004) defined eight so-called Fundamental Premises (FP1 to FP8) for New Dominant Logic. In 2008 they reformulated some of the Fundamental Premises and added two new ones to the set (FP9 and FP10). Five of these premises are really pinning down the relations between enterprise and customers (Vargo & Lusch, 2008). These are:

- The customers is always a co-creator of value (FP6).
- The enterprise cannot deliver value, but only offer value propositions (FP7).
- A service-centered view is inherently customer-oriented and relational (FP8).
- All social and economic actors are resource integrators (FP9).
- Value is always uniquely and phenomenologically determined by the beneficiary (FP10).

The articles with changing views on customers as co-producers of services and the co-creators of value have inspired many commercial producers to actively engage customers in the design and production of services and goods. Recently, these theories are finding their way in the field of education.

The Lack of the New Dominant Logic in Instructional Design Models

In a paper presented on the 28th Annual Conference on Distance Teaching & Learning, Auvinen and Smith (2012) use the New Dominant Logic and the concept of value co-creation to reflect upon the production of professional online education. Traditionally, the value chain approach of universities is to produce instruction according to a product-oriented systematic design methodology for instruction. These methodologies streamline the production of instruction in a number of steps performed by instructional designers, media specialists and content matter experts. The role of learners is limited.

In their paper Auvinen and Smith argue that value is not created by effective provision and planning of instruction, but rather through a continuous dialogue with learners. They see these courses as "an arena for value creation with learners" (p. 3). According to Auvinen and Smith, the standard instructional design methodologies for professional online education are challenged by the ideas on a service dominant logic for marketing and value co-creation by consumers looking for personalized experiences.

A closer look to one of the leading textbooks on instructional design confirms the statements of Auvinen and Smith. The System Approach Model approaches instruction as an entire system, focusing on the interrelationship between context, content, learning, instruction and assessment. The System Approach Model consists of ten logically interrelated steps, starting with the identification of instructional goals and ending with a summative evaluation. The model is explicitly "offered" as a production guide for instruction to professionals, like teachers, ID professionals and professors and instructors (Dick, Carey & Carey, 2009). Instruction is defined as "a set of events or activities presented in a structured or planned way, through one or more media, with the goal of having learners achieve pre-specified behaviors" (p. 375). For each step of the System Approach Model Dick et al. present dozens of questions to evaluate the quality of that step. In Table 1 a selection of these questions illustrates the passive role learners have in the System Approach Model. In the design and the development process the actions of learners are limited to providing information in evaluation procedures.

Table 1

Some typical evaluation questions evolving learners for the steps of the System Approach Model (Dick, Carey & Carey, 2009) the involving learners

Steps in the System Approach Model	Typical evaluation questions involving learners
Identifying instructional goals	• Does the instructional goal statements describe intended learners?
Conducting a goal analysis	• Are the steps focused on learner actions rather than

	trainer/teacher actions?
Identifying subordinate and entry skills	• Does the analysis use appropriate size chunks/depth for learners?
Analyzing learners and contexts	• Does the analysis include whether goals and skills are relevant to target group and managers in the workplace?
Writing performance objectives	• Do the conditions specify the cue or stimulus provided to learners?
Developing assessment instruments	• Are the items congruent with target learners' developmental level, experience, vocabulary level, and interest?
Developing instructional strategy	• Does the plan inform learners of objectives and purpose for instruction?
Developing and selecting instructional materials	• Are the instructional materials appropriate for learners' vocabulary, background, experience, environment?
Conducting formative evaluation of instruction	• Was information collected on the learners' ability to transfer the new knowledge and skills?
Revising instruction	• Were issues and problems linked to learner participation?
Designing and conducting summative evaluation	• Is there a feasibility analysis addressing acceptability to learners?

Rethinking Teaching Models: Some Examples on Changing the Relationship between Teachers and Students

The economic theories of co-creation of value and the service dominant logic inspired some teachers to rethink and redesign their classes. The first examples come from marketing educators applying the new consumer behavior and marketing models in their courses. Sautter and Jones (2009) used the co-creation of value model as an inspiration; Baron and Harris (2006) applied the New Dominant Logic model.

Sautter and Jones (2009) explore the co-creation of value model of Prahalad and Ramaswamy as an approach to enhance the quality of instruction and the level of customer loyalty. For each of the four building blocks of interaction (the DART model) they indicate actions that can contribute to better instruction (see Table 2). A number of the actions Sautter and Jones mention are rooted within the idea that a student needs to be encouraged to take greater responsibility for his/her learning process. The novelty for them is that all these actions – often based on existing learning theories – are integrated in the institute's strategy to create environments, which stimulate co-creation in learning and instruction.

Table 2

Activities contributing to better instruction according to Sautter and Jones (2009)

Element of DART model	Functionality of the element in instruction	Action contributing to co-creation in learning
Dialogue	Focuses on collaborative information sharing	• Instructor needs to provide clearly specified learning objectives. • Instructor needs to provide frameworks for delivery of learning processes. • Student is responsible for identifying (lack of) progress in learning. • Instructor and student collaborate in finding resources to fill the gaps in learning results.
Access	Focuses on the availability of alternative learning experience environments which allow greater access to co-creation opportunities	• Content delivery is multi-modal. • Content delivery is provided when and where students need it most. • Students can self-select the context of their learning experience. • Interactions are scheduled to support the learning experiences. • Interactions are planned when interventions are needed.
Risk assessment	Focuses on the reality that the students are getting greater responsibility for the successes and failures of the instruction.	• Learning management systems, which document student's usage of learning resources and interactions in the learning community.
Transparency	Focuses on the availability of information to the students as part of the strategic relationship.	• Online posting of lecture materials and podcasts. • Integration of open source materials in courses. • Sharing objectives and assessment rubrics. • Examples of quality learning outcomes (products).

Baron and Harris (2006) apply the concepts of New Dominant Logic for marketing in redesigning courses in marketing. They suggest changes in the content of the marketing courses but also in the delivery of the courses. For the latter they apply the principles of NDL to teaching as a service provided by the university in what they call a 'new teaching and learning focus' or the 'NDL pedagogy'. In Table 3 their theory is summarized.

Table 3

Principles NDL theory on marketing applied to the delivery of a course according to Baron and Harris (2006, pp. 294-295)

Element of delivery of a course	Traditional pedagogy	NDL pedagogy
Student role	• Students are passive recipients of instructional materials. • Students are required to evaluate ideas of others that are presented in textbooks and journals. • Students 'act' as advocates for companies.	• Students have an active role. • Student gather their own data. • Students start with their own experiences. • Students are encouraged to be creative and develop their own ideas. • Students 'act' as advocates for consumers.
Student skills	• Emphasizing analytical skills and critiquing skills.	• Emphasizing research, reflection, self-awareness, creativity and innovation.
Teacher role	• Teachers concentrate on teaching. • Curricula are dictated by textbook chapters and associated exercises. • Course boundaries are rigid.	• Teachers actively encourage student learning. • Curricula are determined by debate with students. • Course boundaries are fluid.
Use of information technology	• Use of electronic resources for gaining access to secondary data.	• Use of electronic resources to code and retrieve their own primary data.

Case: An Experimental Course in Learning Sciences with Students as Co-producers

In 2010 the 60 EC MSc Program in Learning Sciences started with a non-mandatory course called *Advanced Studies in Learning Sciences* (in Dutch: Capita Selecta). The target group of this MSc program is heterogeneous: some students work as young teachers at primary schools, some are experienced consultants; some have bachelors' and masters' degrees in education, some have bachelor's and master's degrees in health, human resource management, educational leadership, science, arts, hospitality, or technology; some are motivated by intellectual growth, some seek job opportunities. The purpose of this course is to stimulate students to follow their interest in their development in the domain of Learning Sciences. Before a student is allowed to enroll the course he or she has to write a proposal. This proposal is treated as a course plan. Within the limits of the formal Master program students is asked to define personal learning goals, study tasks and work to be produced and formally assessed. There are two requirements: the course plan has to match the objectives of the program and the staff should be able to support and assess the student. The examiner of the course decides whether a student may enroll. In Figure 1 the specifics of this course are described (based on the text of the Study Guide in 2011).

Overview on the Proposals of the Students

The first student enrolled the course *Advanced Studies in Learning Sciences* in February 2010; in February 2012 the course was evaluated. During that period, 14 students from the MSc Program in Learning Science took the course.

Advanced Studies in Learning Sciences

The purpose of the course is to allow students to follow their interest in their development in the domain of Learning Sciences. In essence, this course is empty. There are two requirements: your plan has to match the objectives of the program and the staff should be able to support and assess you.

You need to get permission to enroll this course. Prior to enrollment you create a proposal. This proposal may be in line with your intended thesis project, but this is not necessary. Based on your proposal, the examiner of the course decides whether the proposal (1) fits within the Master of Learning Sciences and meets the requirements of content and level, and (2) whether the supervision and assessment are doable. After a positive decision of the examiner, you can register and enroll.

You can take the helm. Do you want to deepen, do you want to develop a bird's eye view, do you want an internship, you want to read a classic textbook, do you want to do research in the Faculty's lab, follow a summer school in Germany, would you come into a working relationship with that one investigator? Maybe this course gives you the opportunity to find or create your personal learning experiences.

The length of the course is 4.3 EC or 8.6 EC (equivalent of 1 or 2 modules).

Figure 1

Description of the non-mandatory course Advanced Studies in Learning Sciences (in Dutch: Capita Selecta) as part of the OUNL MSc program Learning Sciences.

Twelve students passed the course, six students conducted a literature review, three students performed and reported applied research, three students did an internship. Most students formulated projects that were close to the regular assignments within MSc program Learning Sciences. They addressed (research) questions within their own schools or universities in a systematic and scientific way (applied research). Others took the opportunity to really dig in a subject that interested them (literature review). From a developmental perspective these projects can be seen as a sound base for the master's thesis. Three students took internships. The Ministry of Infrastructure and Environment and the Ministry of Finance offered those. For them the course proved to be an orientation on the strategic problems learning specialist have to address in large organizations. Two of them failed the course. One student stopped with the Master's program, one student could not reach the acquired academic level with the project of her choice. In Table 4 these results are summarized.

Examples of Individual Projects

One of the students who did an internship was an experienced teacher in special education. She worked with 12-14 year old students with both deafness and intellectual disabilities. She experienced a big difference between the day-to-day work in the classroom with ten students and the jobs where learning scientists are employed. She did an internship at the Ministry of Infrastructure and Environment on competency development program for all public servants of the Dutch Government. The main learning results in her case were developing the soft skills one needs in a bureaucratic organization and gaining insight in the use of theoretical knowledge in instructional projects.

One student failed the course after starting. She worked as a senior adviser at the Ministry of Education and Science and was selected for a prestigious European Summer school for Senior Public Servants. She tried to connect the activities in that Summer school to objectives of the Master's program. Although she performed good at that Summer school, and presented a paper on her projects with illiteracy, she and the supervisor where not able to bring that work related experience to a more abstract level of learning and reflecting.

Table 4

Content of the proposals of active students, number, result and main motive for the non-mandatory course Advanced Studies in Learning Sciences (in Dutch: Capita Selecta)

Content of proposal	N	Result	Main motive
Applied Research	3	Passed	Doing a research project in their own institute
Literature review	6	Passed	Preparing for the thesis proposal
Internship	3	Passed	Better orientation on job demands for learning scientists
Summer school	1	Failed	Connecting a job related opportunity to the Master's program
--	1	Failed	Student stopped with the program

Evaluation of the Course by the Supervisor

In February 2012 the supervisor of the course wrote an evaluation indicating the strengths and weaknesses of the course and the actions needed for improvement. The supervisor wrote the following to the program manager (G. Moerkerke, personal communication, February 15, 2012) .

> "The non-mandatory course *Advanced Studies in Learning Sciences* provides a lot of freedom to students. For some participants it was a relief, because could really work on their personal needs in their growth towards a Master's degree. However, there were also problems to tackle. This module has a number of aspects that makes it difficult for some students and supervisors to perform efficiently and effectively.

For students conducting an *applied research project*, there is no real problem. Before enrolling this course, our students already studied courses on research methodology. Their pre-knowledge is sufficient to perform a limited research project with great autonomy. Also, assessment procedures are standardized and rubrics are available. The students and the examiner can use the standard rubrics for research papers.

For students conducting a systematic *literature review* there is a lack of study material. A book on the methodology of literature review (for instance, Jesson, Matheson & Lacey, 2011) would be welcome. It also facilitates the supervisor when giving feedback. Assessment procedures are standardized and rubrics are available. The students and the examiner can use the standard rubrics for research papers.

For students doing an *internship* there is lack of assessment procedures and there is a lack of guidelines for structuring the internship. This is a problem for the student, the organization where the students does the internship and the supervisors.

Students and teachers *interact* by personal email and phone. When the course started we did not plan to use the standard electronic learning environment. Since this a regular course there should be standard support for exchanging papers, providing feedback or planning the interaction in this course.

The following aspects of the project plans could be strengthened: content on methodology, guidelines for internships and assessment forms. The advice is to take the following actions:

- Select a book on how to conduct systematic literature review.
- Formulate guidelines for the didactical processes and interactions involved in internships.
- Formulate an assessment procedure for internships.
- Implement interaction and archiving tools in the electronic learning environment."

Interpreting the Results of the Case using the DART Model and the NDL Pedagogy

The course of Advanced Studies in Learning Sciences allowed students a maximum of freedom to personalize their own learning experiences. The role of teachers was to support them in writing a project plan (or better: a personalized course plan) and to guide them during the execution of that personalized course plan. After piloting for two years the supervisor advised to improve the design of the course. How do these improvements relate to the DART model and the NDL Pedagogy?

Table 5 shows an attempt to categorize the suggested improvements according the DART model for educational services by Sautter and Jones (2009). Table 5 shows that the categorizing is not one-to-one. The suggested improvements contribute to several elements of the DART model. The selection of books on methodology and criteria and rubrics is part of the Dialogue between teacher and student (collaborating in finding resources), but also part of the Access (providing content delivery when and where students need it most). The selection of criteria and rubrics also is part of the Transparency (sharing objectives and assessment rubrics). The suggested implementation of (shared) interaction and archiving tools contributes to Dialogue. Perhaps it also contributes to the risk assessment, but that is not so straightforward, since Sautter and Jones (2009) emphasized the accountability of *student* for this category in their paper. The selection of guidelines for the internships is part of Access (interactions are scheduled).

Table 6 shows the categorization of the suggested improvements according the so-called NDL pedagogy by Baron and Harris (2006). According to the NDL pedagogy three out of four suggested improvements are all categorized as part of the teacher role (curricula are determined by debate with students). The fourth improvement (implementing interaction and archiving tools) could not be satisfactory be categorized in the NDL pedagogy.

Table 5

Interpreting the results of the case using the DART model

Element of DART model	Action contributing to co-creation in learning	Course needs improvement?	Suggested improvements
Dialogue	• Instructor needs to provide clearly specified learning objectives.	No	-
	• Instructor needs to provide frameworks for delivery of learning processes.	Yes	Implementing interaction tools and archiving tools
	• Student is responsible for identifying (lack of) progress in learning.	No	-
	• Instructor and student collaborate in finding	Yes	Selecting books on

	resources to fill the gaps in learning results.		methodology Selecting of criteria and rubrics for formal assessment
Access	• Content delivery is multi-modal.	No	-
	• Content delivery is provided when and where students need it most.	Yes	Selecting books on methodology Selecting criteria and rubrics for formal assessment
	• Students can self-select the context of their learning experience.	No	-
	• Interactions are scheduled to support the learning experiences.	Yes	Selecting guidelines for internships
	• Interactions are planned when interventions are needed.	No	-
Risk assessment	• Learning management systems which document student's usage of learning resources and interactions in the learning community.	Yes	Implementing interaction tools and archiving tools
Transparency	• Online posting of lecture materials and podcasts.	No	-
	• Integration of open source materials in courses.	No	-
	• Sharing objectives and assessment rubrics.	Yes	Selecting criteria and rubrics for formal assessment
	• Examples of quality learning outcomes (products).	No	-

Table 6

Interpreting the results of the case using the principles of the NDL pedagogy

Element of delivery of a course	NDL pedagogy	Course needs improvement?	Suggested improvements
Student role	• Students have an active role.	No	-
	• Students gather their own data.	No	-
	• Students start with their own experiences.	No	-
	• Students are encouraged to be creative and develop their own ideas.	No	-
	• Students 'act' as advocates for consumers.	No	-
Student skills	• Emphasizing research, reflection, self-awareness, creativity and innovation.	No	-
Teacher role	• Teachers actively encourage student learning.	No	-
	• Curricula are determined by debate with students.		• Selecting books on methodology • Selecting criteria and rubrics for formal assessment • Selecting guidelines for internships
	• Course boundaries are fluid.	No	-
Use of information technology	• Use of electronic resources to code and retrieve their own primary data.	No	-

Discussion

According to influential economists Prahalad and Ramaswamy (2004), the base of success in business is an equal relation between consumers and producers. The core principles of this relation are like Dialogue, Transparency, Access, and Risks-benefits. In the same spirit Vargo and Lusch (2004; 2008) defined New Dominant Logic for marketing of services. Sautter and Jones (2009) and Baron and Harris (2006) applied these theories in rethinking their teaching methods. They defined characteristics of teaching according DART and NDL principles. At the OUNL the staff started – without being influenced by the economic theories – in 2010 with a course were students where addressed as co-producers of their personalized course. In 2012 a limited evaluation was reported indicating that a number of actions could be taken to improve the course.

In this paper the results of this evaluation were reanalyzed by linking the four improvements to the characteristics of sound "co-creation in learning" and to the NDL pedagogy. The first impression is that the linking went very naturally. This is an indication that these models on teaching could support teacher in rethinking the way they teach. Of course, this is a weak conclusion, considering the limited data and the limited methodology.

Auvinen and Smith (2012) stated that the standard Instructional Design methods are challenged for the development of instruction based on het DART principles and the NDL premises. The experiences with the course *Advanced Studies in Learning Sciences* support this statement. When the staff of Learning Sciences at the OUNL started with the personalized course they were aware of the standard instructional design methods, including the System Approach Model. But if one takes closer at that model one finds literally dozens and dozens of decisions to be considered and none of them are aiming at involving the students as an active partner. The staff knew all the steps and the questions, but they did not know which were critical. It was unknown how to prioritize the elements of instructional design in the dialogue with the co-producing student. Now, in hindsight it seems obvious that the most critical challenge in an ill-defined problem is to find ways to structuring the journey to an acceptable solution and to find ways to decide whether an acceptable solution is reached. The need to structure the journey is visible in the advice on the selection of books and guidelines on lacking procedural knowledge (*how to perform a literature review; how to organize an internship)*. The need to define a stopping rule is visible in the advice on the selection of criteria and rubrics for formal assessment. Based on the analysis in this paper the following design rule for instruction with the students as co-producers of their personalized course could be added:

- Do not start the personalized course until both teacher and student have decided upon the necessary procedural or methodological knowledge base.
- Do not start the personalized course until both teacher and student have decided upon the necessary criteria and rubrics for formal assessment.

But how to decide upon this procedural or methodological knowledge base and the criteria and rubrics? Helmstedt, Ehlers and Reinhardt (2011) present a number of activities within a quality framework for user generated content in higher education. They suggest a quality conference – 'an onsite attendance event where experts and students reflect and exchange their quality criteria for a given task' (p. 55) - as a means to discuss and decide upon criteria. The concept of a (online) quality conference could become a major part of a teaching model in which students become the co-creators of value in distance education.

In this paper the co-creation of value in the relationship between a university and individual students was discussed. Value can also be created between institutes. Suzuki (2013) describes how in Japan, at the Kumamoto University Online Graduate School, programs are aligned from the competences for working professionals. The development of an online program in engineering started with a dialogue with associations of professionals. The goal of this dialogue was to decide upon a program that provided a high level of job certainty for the students. Every course needs to contribute to the graduates' capability of meeting the demands of the real world of work. In order to gain relevance and authenticity a new teaching methodology was introduced: the Story-centered Curriculum, based on the work of Schank (2011) on teaching cognitive processes and reforming curricula.

If open universities should succeed in developing teaching models in which students become co-creators of value, it could represent a step towards more student-centered and more profession oriented learning. The question whether particular open universities should consider implementing the principles of co-creation or the NDL approach in marketing is a strategic one. According to an influential report of the World Bank (2003), traditional educational systems need to innovate to lifelong learning systems in order to provide people the tools they need to function in the global knowledge economy. Lifelong learning systems should reach people with diverse learning needs, should foster competences, like teamwork, learning by doing and problem solving, and should contribute to the employability of workers. Within this line of thinking bachelor's programs and master's programs should focus on skills that are necessary and relevant for the professional roles students and graduates fill in society and work. There seems to be a worldwide movement towards more authentic, more competence-driven programs. For instance, in publications on the future of distance education, educationalists of the public Korean National Open University identified the need to approach higher education from a "market and economy"

perspective (Nam & Sin, 2009, p. 101). In 2013, Jung (2013) concluded in a book on the development of distance education in Asia, that private and public Asian institutes should give more attention to supporting employability and career enhancement.

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Extending the reach and richness of learning opportunities at Stellenbosch University, South Africa: Building an integrated ICT strategy on the successes achieved

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Abstract

The recently released South African White Paper for Post-School Education and Training, *Building an Expanded, Effective and Integrated Post-school System* (November 2013) recognizes the important role that online education can play to achieve two of its main policy objectives:

- A post-school system that can assist in building a fair, equitable, non-racial, non-sexist and democratic South Africa.
- Expanded access, improved quality and increased diversity of provision.

Stellenbosch University has in response to these national objectives acknowledged the importance of ICT to broaden access with success in its Strategic Intent and Vision 2030. A task team created a business model as part of a comprehensive ICT in Learning and Teaching Strategy in 2013/2014 to expand the richness and reach of flexible learning opportunities for both the typical 18-24 student cohort as well as the so-called "learn-and-earn" knowledge market. This paper will report on:

- Successes already achieved as demonstrated in the analysis of data from surveys conducted as part of a longitudinal research project to determine the effectiveness of existing off-campus technology-enabled learning opportunities to enrolled postgraduate students as well as additional academic support to school children from disadvantaged communities in partnership with the provincial education departments.
- The integrated funded ICT in Learning and Teaching Strategy focusing on curriculum innovation, support for lecturers and students and the enabling technology systems and infrastructure.
- The appropriate technology delivery methodologies within the African context that include live interactive free-to-air satellite and Internet video streaming to

broaden access to formal as well as informal learning opportunities.

Keywords: Open and flexible learning; Information and Communication Technology strategy; Organizational business model; New knowledge markets; School partnerships; Live interactive video streaming; Live interactive free-to-air satellite broadcasts.

Introduction

The recently released South African White Paper for Post-School Education and Training, *Building an Expanded, Effective and Integrated Post-school System* (November 2013) recognizes the important role that online education can play to promote access with success for a larger proportion of the South African population. The current participation rate in higher education is 17.3% and the goal is to increase this to 25% by 2030 by also ensuring access to groups from previously disadvantaged communities to progress towards a more fair, equitable, non-racial, non-sexist and democratic South Africa. Brick and mortar solutions will however not suffice to reach this ambitious target.

Stellenbosch University has in response to these national objectives acknowledged the importance of Information and Communication Technologies (ICTs) to broaden access with success in its Strategic Intent and Vision 2030. A task team created a business model as part of a comprehensive ICT in Learning and Teaching Strategy in 2013/2014 to expand the richness and reach of flexible learning opportunities for both the typical 18-24 student cohort as well as the so-called “learn-and-earn” knowledge market. This strategy was built on the existing successful utilization of learning technologies to support on- and off-campus students as well as learners in previously disadvantaged communities. These successes are evident in research and evaluation reports as part of a research based approach followed to evaluate all learning technology interventions.

This paper therefore reports on:

- The South African national higher education priorities as outlined in the recently published South African White Paper for Post-School Education (Building an Expanded, Effective and Integrated Post-school System)
- The Stellenbosch University context as articulated in its Strategy and Intent statement and Vision 2030
- The successes already achieved
- The ICT in Learning and Teaching Strategy

- Issues to consider in terms of building an appropriate technology platform for the (South) African context.

A) National Context

The South African White Paper for Post-School Education (Building an Expanded, Effective and Integrated Post-school System) published in 2013 aims to drive and deepen transformation of the entire post-schooling sector. It therefore provides a framework to build on the achievements since 1994 as well as to address the challenges that are still present (DHET, 2013:xiii). Some of the specific challenges relate to schools in rural areas that are still reminiscent of apartment with these schools disadvantaged in terms of infrastructure, teaching facilities and staffing. According to the White Paper (DHET, 2013:1), "Opportunities in rural areas are far more limited than those in urban areas."

The Higher Education landscape consists of 25 public universities (two new Universities were established in 2014) and 50 public technical and vocational education and training (TVET) colleges (formerly known as further education and training [FET] colleges). Within this landscape the main policy objectives of the White Paper are:

- a post-school system that can assist in building a fair, equitable, non-racial, non-sexist and democratic South Africa;
- a single, coordinated post-school education and training system;
- expanded access, improved quality and increased diversity of provision;
- a stronger and more cooperative relationship between education and training institutions and the workplace;
- a post-school education and training system that is responsive to the needs of individual citizens, employers in both public and private sectors, as well as broader societal and developmental objectives (DHET, 2013:xi).

The current participation rate in South African universities is 17.3% and it does not compare favorably with the European participation rate. The aim of the White Paper is to increase the participation rate to 25% by 2030, that would imply an increase from just over 937 000 students in 2011 to about 1.6 million enrolments in 2030. Increased participation without paying attention to student success and through put rates is however doomed for failure (DHET, 2013:xiv). In this regard, the DHET acknowledges the "role that online and blended learning could play in achieving the objectives, the participation targets as well as the role it could play in terms of student success (DHET, 2013:xvi)". This participation rates not only refer to University enrolments, but also to

support open learning opportunities as well as alternative delivery models in the entire post-schooling sector (DHET, 2013:53).

The White Paper further acknowledges the value of ICT not only in terms of meeting the national participation targets, but also in terms of the graduates' meaningful participation in a globalized world (DHET, 53). Access to infrastructure and connectivity could be a major barrier in terms of realizing these objectives and the DHET recognizes this challenge and commits the Department to also extend the infrastructure to all post-school students. According to the White Paper, the "[r]ecent increases in the availability of bandwidth, cloud services and affordability of end-user mobile devices such as laptops, tablets and smartphones make this goal attainable" (DHET, 2013:53).

B) Stellenbosch University Context

Stellenbosch University currently has 28 000 students (including more than 3 000 foreign students) as well as just under 3 000 permanent staff members (including 939 academic staff) on five different campuses. The University is a research-intensive institution and internationally recognized as an academic institution of excellence. It rates among South Africa's leading tertiary institutions based on research output, student pass rates and rated scientists (SU, 2014).

Stellenbosch University has in response to the national objectives as outlined above acknowledged the importance of ICT to broaden access with success in its Strategy and Intent statement and Vision 2030. The University's vision is focused on: *Stellenbosch University is inclusive, innovative and future focused: a place of discovery and excellence where both staff and students are thought leaders in advancing knowledge in the service of all stakeholders* (SU, 2014:17).

ICT for Teaching and Learning in terms of the promotion of learning is identified as one of the key priorities to achieve this vision (SU, 2014:35). In this regard the role of technology to maintain the success rate is highlighted as an element that is already encouraged on campus in that student technological literacy and lecturers' innovative and critical use of learning technologies to support learning are actively supported (SU, 2014:37).

The University furthermore recognizes the opportunity to increase access to new knowledge markets such as the "learn and earn" market through the utilization of ICT. These are students who cannot typically interrupt their careers to study full-time at the University. The University in this regard would like to move away from the

distinction between “on” and “off” campus to a more blended approach that contains limited face to face contact sessions and further synchronous and asynchronous technology-mediated learning activities (SU, 2014:37).

C) Successes already achieved

It is important to note that this strategic direction of the University as well as the integrated strategy described under D below was built on the successes already achieved in terms of specifically the provision of learning opportunities to off-campus learn and earn students.

A vital part of the activities to support the effective utilization of learning technologies is regular feedback from all stakeholders and evaluation of initiatives. This enables the University to not only improve its services to the students, but the results can also inform strategy as well as the determination of whether the services are aligned with the national as well as the University context.

Regular surveys are conducted as part of a longitudinal research project to determine the effectiveness of existing off-campus technology-enabled learning opportunities to enrolled postgraduate students as well as additional academic support to school children from disadvantaged communities in partnership with the provincial education departments. In terms of the learner support in schools, a contribution is made with regard to supporting expanded post-school educational opportunities as one of the objectives of the White Paper and in terms of providing additional learning opportunities to high school learners in rural areas. This learner support could of course also potentially lead to expanded participation in higher education opportunities by better prepared students.

Postgraduate students

The academic support of postgraduate students via the telematic technology platform consisting of a blend of live satellite broadcasts, web-based and mobile technology is the core application of the Telematic technology platform. Lecturers are encouraged to complement face-to-face methodologies with the telematic technology platform that consists of a continuum of learning opportunities ranging from synchronous interaction (satellite-based technology) to asynchronous interaction via the LMS (SUNLearn) discussion groups and the student portal. In this way lecturers can improve connectivity with students through broadcasts but at the same time provide continued support and tracking via web-based interaction. Contextual factors determine the blend of activities selected by the academic departments.

The main participating departments are in the Health Sciences (Nursing and Nutrition), Business Science (HIV/Aids Management in the workplace, Public Administration and Futures Studies) and Education. These are all areas where there are critical skills shortages in terms of the further development of the South African economy. In 2014, 1 517 students were enrolled in the respective postgraduate programmes.

As part of continuous evaluation to improve the services provided to the postgraduate students on the telematic technology platform a survey was done in 2013 to ascertain the satisfaction levels of the students with the platform. A total of 915 questionnaires were distributed with the exam papers and 461 were completed which constituted a representative sample of the population of students. A selection of the results is presented here covering the areas of student participation, the perceived value of the broadcasts, access to computers and Internet as well as their overall satisfaction with the technology platform. Where applicable, some of the results from the 2013 survey are compared with the results of a similar survey that was done in 2009 to ascertain whether the perceptions and technology access levels have shifted.

Maximum student attendance at the learning centres is a very important ingredient in the success of the telematic platform. It is encouraging to note that the majority of the students (71%) attended 75% or more of the broadcasts with only 17% attending less than 50% of the broadcasts.

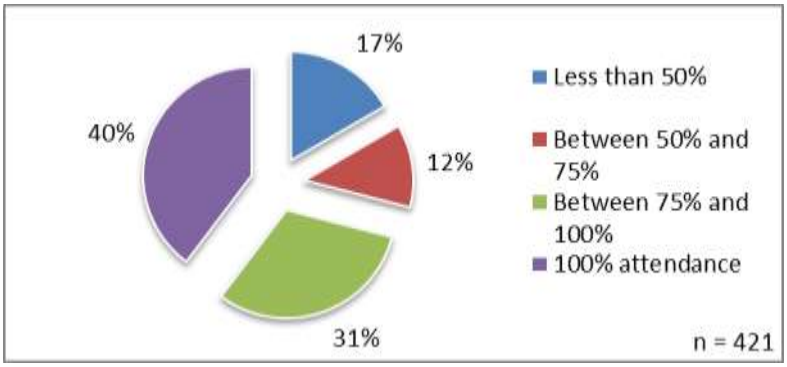

Figure 1: Percentage respondents' frequency of attendance

Respondents were asked to rate the level in which certain aspects contribute to their motivation to attend broadcasts and influence their learning experience. Aspects included the location of the learning centres, time of the broadcasts, DVD availability after the broadcasts, understanding the content better, networking with fellow students and interaction with the lecturer. Not all the respondents rated all the aspects. The average number of ratings per aspect is 393 responses. Figure 2 clearly

demonstrates the value that these broadcasts have for students with close to 80% of the respondents indicating that the biggest factor for attending the broadcasts was the fact that their attendance helped to understand the content better.

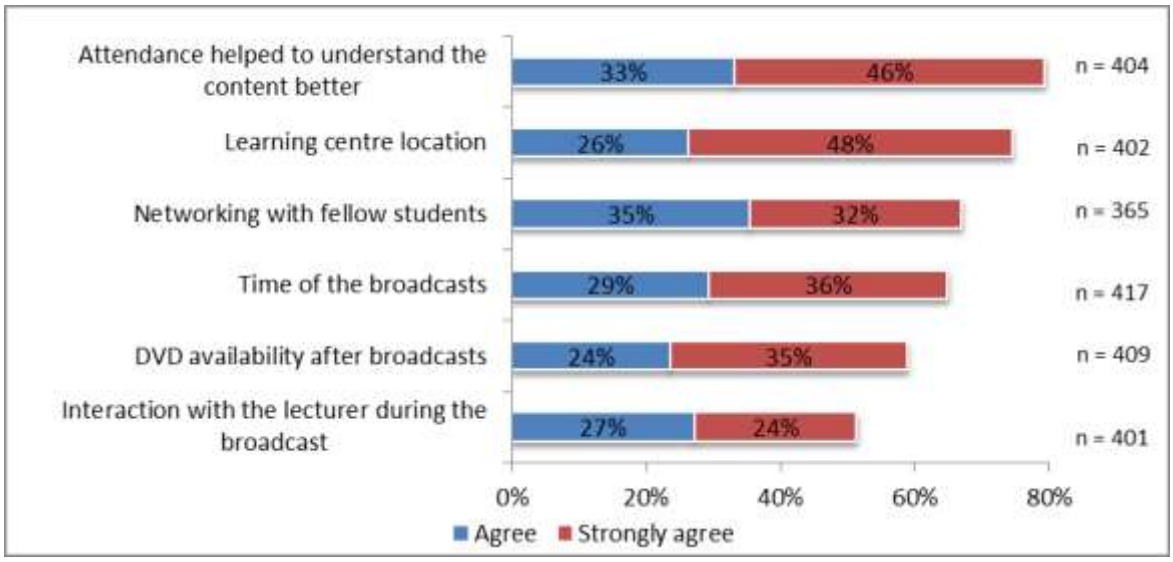

Figure 2: Percentage respondents (agree & strongly agree) indicating the best motivators for attending broadcast at the learning centres

Computer and Internet access is vitally important because a blended approach is followed and students do not only attend the broadcasts, but also have to access learning material, submit assignments and do assessments on the institutional web-based learning management system (SUNLearn). It is encouraging to note that both computer and Internet access of respondents increased from 2009 and 2013 (Figure 3). Computer access increased with 10 percentage points and Internet access with 17 percentage points from 2009 to 2013. Figure 4 shows the computer and Internet access by location for the 2009 and 2013 survey. The majority of students have access to a computer at home or at work. The computer access at home and work increased by 19 and 14 percentage points respectively but the Internet access showed the most significant increases. Internet access at home increased to 81% and at work to 49%. Smart phones contributed 37% of Internet access. These trends are extremely important in terms of designing the appropriate technology platform within the South African context (see E below).

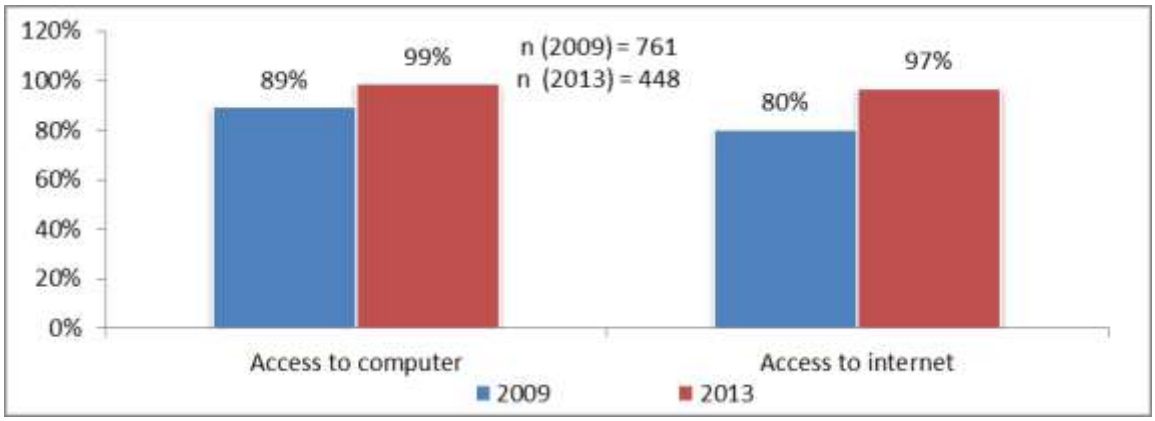

Figure 3: Comparison between 2009 and 2013 percentage respondents' with computer & Internet access

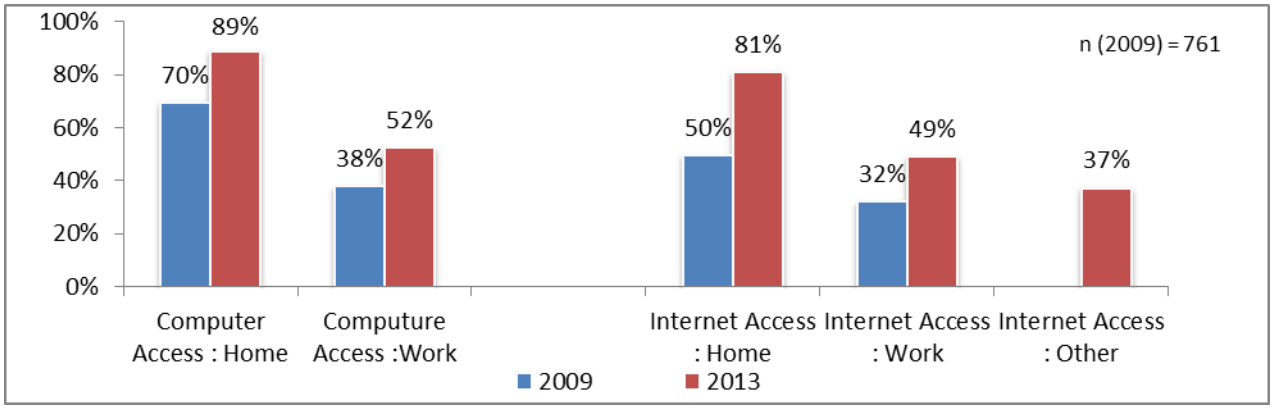

Figure 4: Comparison between 2009 and 2013 percentage respondents' with computer & Internet access

Respondents evaluated the Telematic services broadcast experience by indicating their preference regarding the number of broadcasts and also indicated whether their overall satisfaction was positive, average or negative.

Figure 5 shows that in 2009 57% of the respondents would appreciate more broadcasts. During 2013 54% of the respondents were happy with the current number of broadcast, 39% would appreciate more broadcast and only 6% would reduce the number of broadcasts. The decline from 57% to 39% indicates an overall satisfaction with the quality and frequency of the broadcasts in that the vast majority of the respondents prefer the same number.

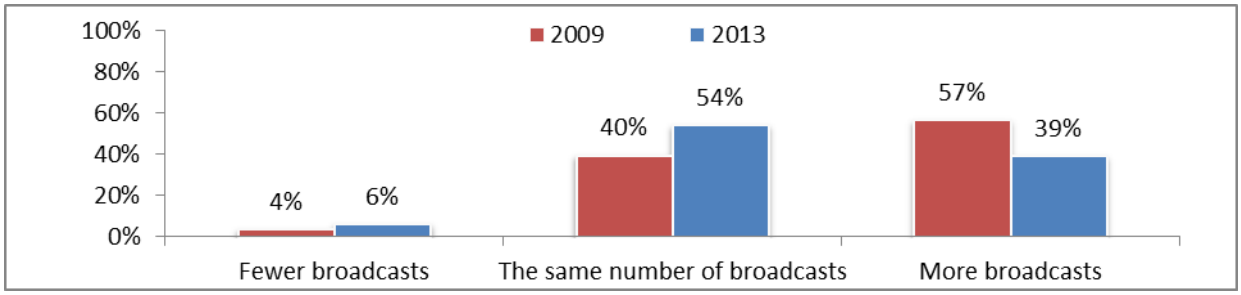

Figure 5: Comparison of percentage respondents' recommendation regarding number of broadcasts: 2009 and 2013

The majority of respondents had a positive (and very positive) experience attending the Telematic broadcasts and overall experience of the service delivered with only 4% indicated to have had a negative experience (Figure 6). This trend is absolute identical to the previous survey in 2009, which indicates an overall high level of service delivery and experience by respondents.

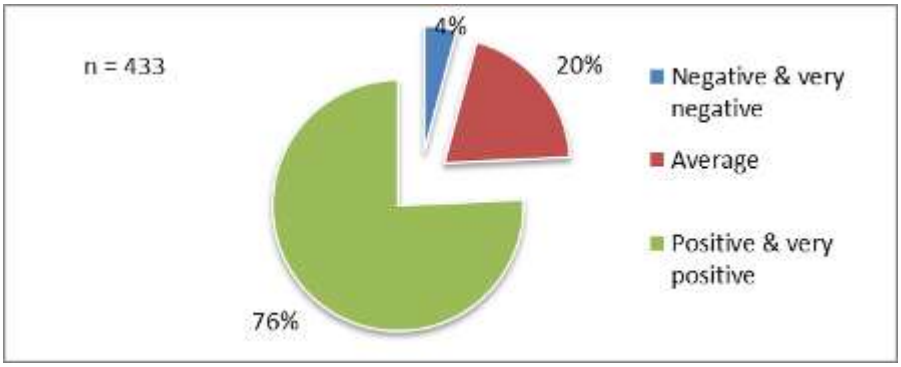

Figure 6: Percentage respondents' overall experience of the telematic broadcasts

Partnership with Education Departments to support learners from previously disadvantaged communities

At the end of 2008, the Western Cape Education Department (WCED) requested the Stellenbosch University Division for Telematic Services (DTS) to make available spare capacity on their interactive technology platform to provide additional learning opportunities to Grade 12 learners from underperforming schools in their preparation for their final school examinations.

Stellenbosch University responded positively to the WCED request because of the growing recognition that, above and beyond its core mandates of teaching, research and community outreach, Higher Education has a responsibility to develop the leaders and citizens of the future. To achieve this, the University believes that the integrated technology platform is an applicable instrument to enable learners to overcome the

barriers of geography, time and cost that might prevent access to quality education. With this innovative approach, the face-to-face teaching in the schools can be blended seamlessly with the virtual learning spaces offered by the University to provide authentic places of learning. In this educational strategy, the telematic platform serves as an important vehicle to enhance the virtual mobility of all learners, irrespective of their locality, to interact with teachers recognised for their expertise and pedagogical skills in stimulating and fully interactive virtual learning spaces.

Stellenbosch University is responsible for the creation of the virtual classroom in the Western Cape province, mainly by providing the on-campus television studio from which, in 2010 to 2013, more than one hundred hours of satellite broadcasts took place to the schools per annum. The necessary infrastructure (e.g. satellite dishes, sound systems and MPEG4 decoders) was installed at the schools to enable reception. During the broadcasts, synchronous interaction between the teachers and learners occurs via a web interface and mobile technology.

The project is closely monitored by the WCED and, as part of the continuous evaluation of the project, two structured questionnaires were developed to solicit feedback from Grade 12 learners and principals regarding their experiences and perceptions of the additional learning support provided via the telematic platform. These surveys form part of the continuous assessment of the suitability of the technology platform to provide additional support to the participating schools.

In 2010, the learner questionnaire to solicit feedback from the learners regarding the schools support programme was distributed during September to 120 schools that formed part of the WCED project. The questionnaire consisted of 33 questions divided into sections relating to the profile of the respondents, travel arrangements, broadcasts and subject workbooks, interaction between broadcasts, computer and Internet access, DVDs of broadcasts and general impression. A total of 6 330 completed questionnaires were received from 76 schools and the data was captured in October/November 2010. A similar but shortened questionnaire was distributed in September 2011 to 18 participating schools selected for the survey by the WCED from all the districts. A total of 1 034 completed Grade 12 questionnaires were received from the 18 selected schools. In 2012, the study was repeated with a similar questionnaire to that used in the 2010 and 2011 surveys. A total of 2 825 completed questionnaires were received from 29 out of 32 participating schools.

The feedback received indicate that the broadcasts were generally very well attended in all the years (2010, 2011 and 2012) (Figure 7), and these attendance figures are even more remarkable when taking into account that most of the broadcasts took place on a Sunday afternoon. It is also encouraging to note that there was a marked increase in the number of learners who attended all the Afrikaans broadcasts in both 2011 and 2012. There also was a sharp increase in the percentage of learners attending the Accounting lessons (Figure 7).

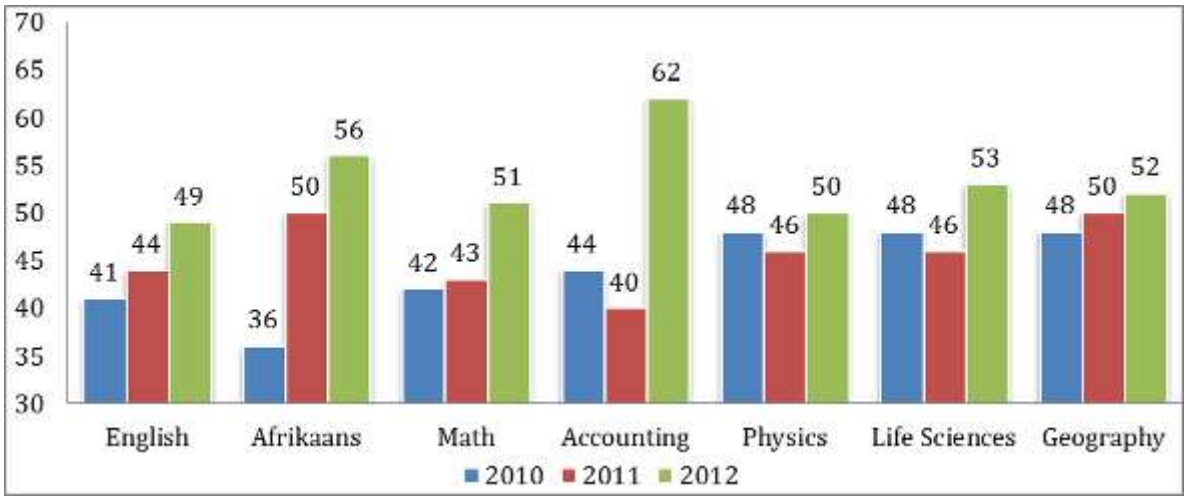

Figure 7: Percentage of learners who attended all the broadcasts in 2010, 2011 and 2012

It is encouraging to note that the most important factor according to the learners' responses in 2010, 2011 and 2012 was that the attendance produced a better understanding of the content (Figure 8). A total of 85% of the learners in 2010 and 81% in 2011 indicated that having the broadcasts on a Sunday had a positive influence on their attendance (Figure 8). A major decrease (of 30%) was experienced from 2011 to 2012. The majority of the respondents preferred weekday broadcasts in the afternoons. The Sunday broadcasts were subsequently stopped and only weekday broadcasts were done from 2013 onwards. The feedback also strongly reflects the learners' appreciation for the interactive nature of the telematic platform and the opportunities created to enhance interaction between the learners and the teachers (Figure 8).

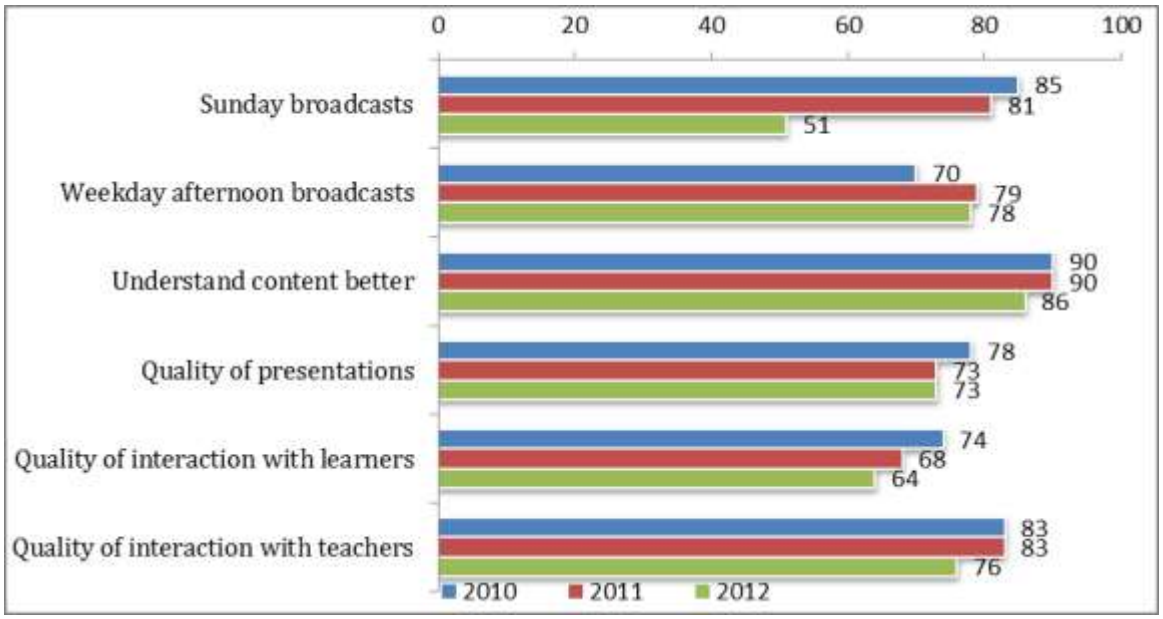

Figure 8: Factors contributing to attendance (% Yes responses) in 2010 and 2011

Learners, as with the postgraduate students, were also asked about their access to computers and the Internet. In 2010, more than half of the learners indicated that they had access to a computer (61%) and to the Internet (51%). A fairly similar pattern of computer and Internet access was reported in 2011, with a marked increase in access to computers and the Internet at school. In 2012, more learners had access to computers and to the Internet than in 2010 and 2011 (Figure 9).

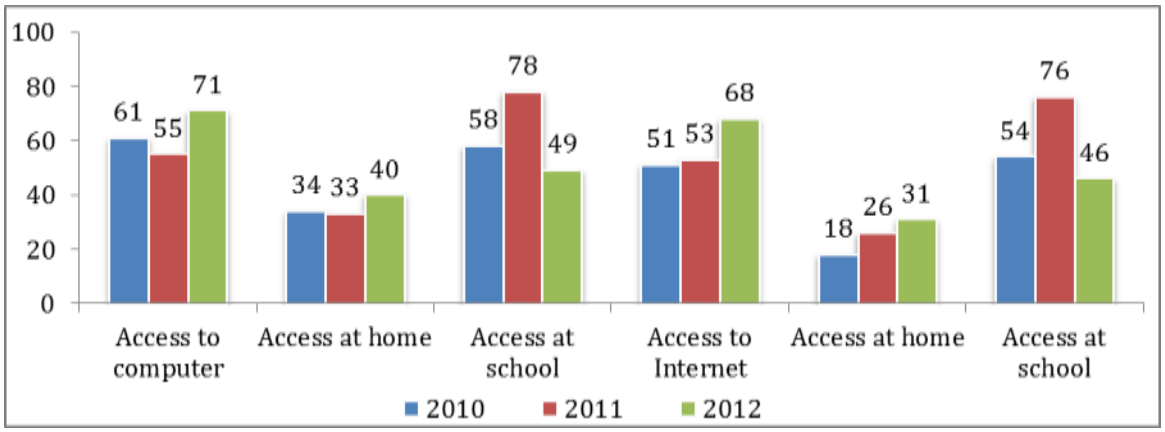

Figure 9: Computer and Internet access (% Yes responses): 2010, 2011 and 2012

With regard to the overall impact of the telematic intervention, Figure 10 reflects that as in 2010, the 2011 and 2012 cohorts of learners strongly agreed/agreed that the telematic intervention was not only helpful in their preparation for the final school examinations (82%), but also expressed the view that they were motivated to improve

their school results (80%). They also confirmed that their attendance improved their interactions with both the teachers (61%) and fellow learners (65%). The fact that the intervention motivated them to study further (76%) is very encouraging, since the low participation rate of South African communities in higher education is a national concern as mentioned under the national context and the challenges as identified by the Department of Higher Education and Training in the November 2013 White paper.

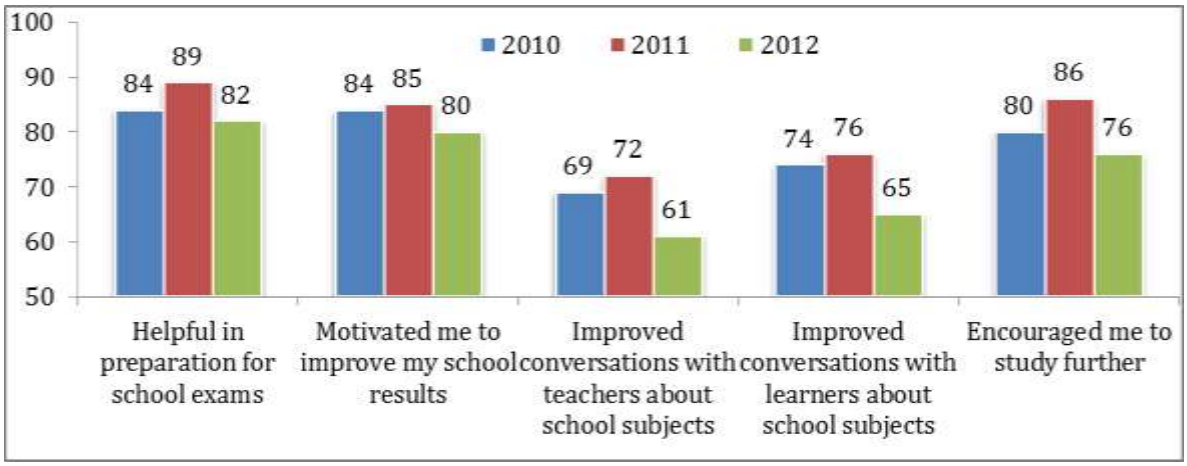

Figure 10: Overall experience of broadcasts (% Strongly agree/Agree): 2010, 2011 and 2012

A principal / teacher questionnaire was also distributed to the schools in 2010, 2011 and 2012 to solicit feedback from the principal and teachers involved. These questionnaires focused on demographic information, management and logistics, teacher attendance and experience of broadcasts, interaction between broadcasts and DVDs of broadcasts, and perceptions of the overall experience of the intervention. Only a selection of the results pertaining to subject teacher attendance, whether they would like the programme to continue, preference with regard to the number of broadcasts and their overall experience of the broadcasts.

In all three years (71% in 2010, 68% in 2011 and 65% in 2012) the schools strongly agreed or agreed that the teachers participated in and supported the programme throughout the intervention period. Secondary outcomes of the project were also that, in all the years, the teachers in the schools should have benefited in terms of acquiring new teaching methodologies and improving their subject knowledge by attending the broadcasts and observing the presenter teachers. The feedback received confirmed that these outcomes were realised to a large extent (Figure 11).

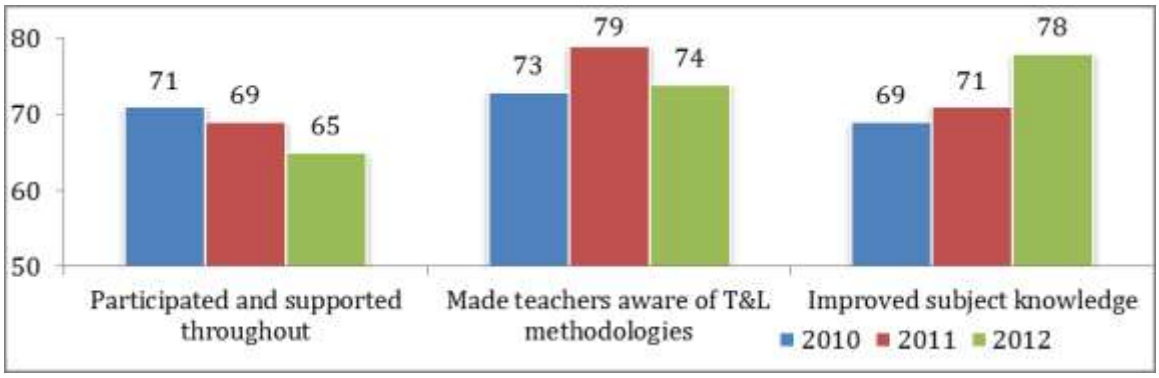

Figure 11: Participation of subject teachers (% Strongly agree/Agree) in 2010, 2011 and 2012

The request from the schools to the WCED to continue with the Grade 12 telematic support programme in 2012 (91%) remained strong *vis-à-vis* the request to continue in 2011 (94%). This certainly reflects the schools' appreciation for the support programme offered via the telematic platform (Figure 12).

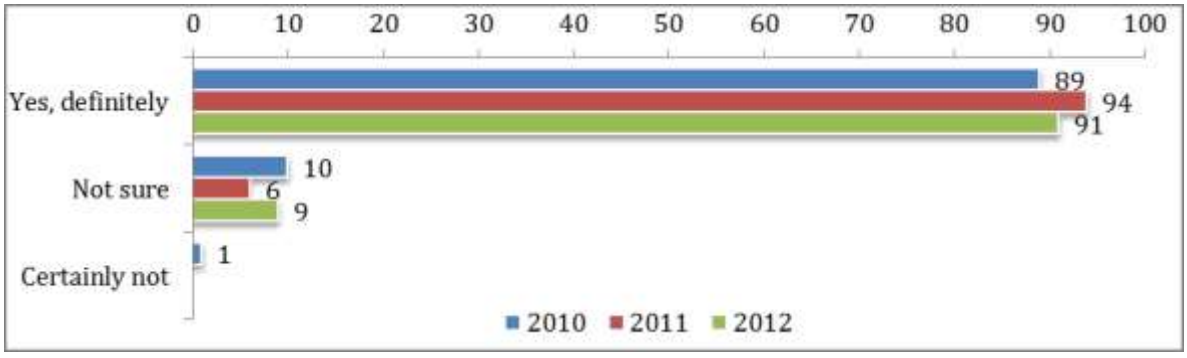

Figure 12: Continue with the Grade 12 telematic support programme: 2010, 2011 and 2012

In 2012, the schools (48%) clearly expressed a need for more broadcasts to their schools than was expressed by the respondents in 2010 and 2011 (28% and 40% respectively) (Figure 27).

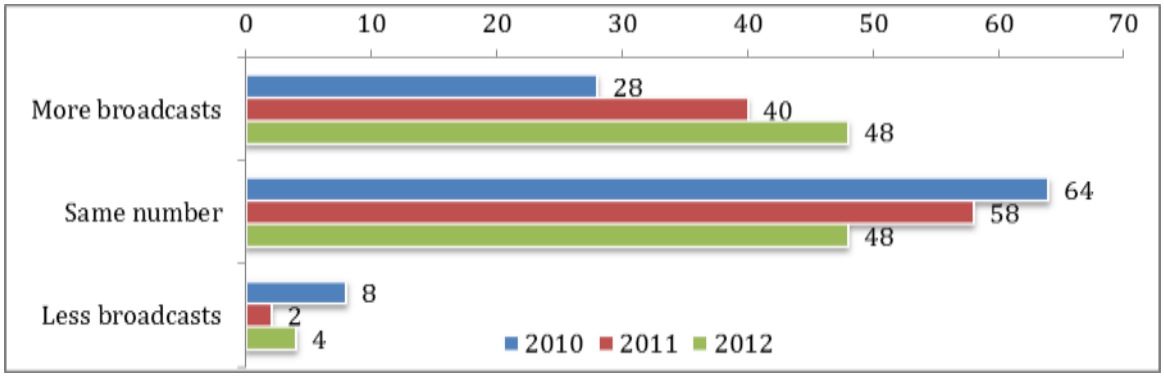

Figure 13: Number of broadcasts (Percentage): 2010, 2011 and 2012

The very high appreciation that the schools have had over the period 2010 to 2012 for the quality of the broadcasts is reflected in Figure 14 with the overwhelming majority of the teachers indicating that they are either positive or very positive about the broadcasts. This is surely a strong compliment for the WCED presenters, who unselfishly share their subject and pedagogical knowledge as well as their teaching skills with all the participating schools (Figure 14).

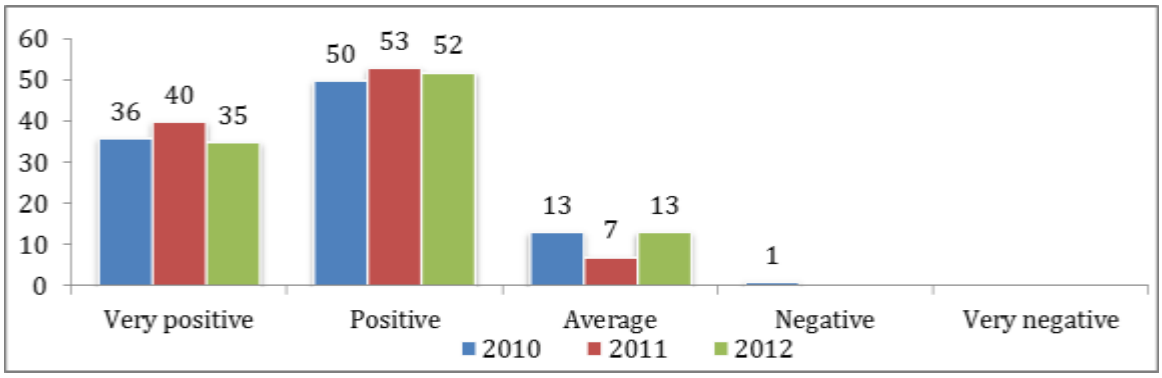

Figure 14: Overall experience (Percentage) in 2010, 2011 and 2012

D) An integrated ICT in Learning and Teaching Strategy

Stellenbosch University has in response to the national objectives outlined in the White Paper acknowledged the importance of ICT to broaden access with success in its Strategy and Intent statement and Vision 2030. Building on this successful application of the telematic technology platform for off-campus students and school learners as well as the utilization of web-based and mobile learning technologies to support on-campus students, a task team created a business model as part of a comprehensive ICT in Learning and Teaching Strategy in 2013/2014 to expand the richness and reach of flexible learning opportunities for both the typical 18-24 student cohort as well as the so-called “learn-and-earn” knowledge market.

During this process the University remained cognizant of the important principle as outlined in the White Paper on Education. The White Paper states that “[t]eaching and learning interventions using ICT must be carefully planned and implemented. The success of an educational programme will be determined by its pedagogical strength and not by the integration of ICT, which can sometimes be used poorly or as a gimmick. Furthermore, sufficient capacity is required in terms of financial and human resources. Staff and students require not only meaningful access to technology, but also the ability to use it effectively (DHET, 2013:53)”. The University’s integrated strategy is therefore driven by the academic project and focuses on curriculum

innovation, support for lecturers and students, the enabling technology systems and infrastructure. It furthermore focuses on using learning technologies to improve the reach of the University in terms of off-campus postgraduate students but also to enhance the richness of the under- and postgraduate programmes.

This strategy consists of four main components:

- Learning and teaching renewal including the effective integration of ICTs, support for lecturers and students and the enabling learning technology systems
- Renewal of business systems including student and financial systems
- Network and infrastructure renewal
- State of the art new learning and teaching centre

It is important to note that the strategy was built on a blended learning model whilst acknowledging the need to also invest in the underlying enabling technology systems, infrastructure and business systems. The strategy also acknowledges affordable access to students to devices, but does not make this provision the driver of the strategy. It rather provides for a variety of strategies for academic departments and students to obtain affordable access to devices.

This strategy was approved by the University Council in May 2014 and significant funding was provided for a five year period. A governance structure has been put in place that includes the appointment of programme and project managers, a financial management system as well as a reporting system to allow regular feedback to Council on the progress of the overall project.

E) Building an appropriate technology platform for the future

One of the greatest challenges within the (South) African context when devising and implementing a strategy as described under D is the availability and cost of Internet access. Unfortunately Africa still lags behind the rest of the world in terms of the percentage of households with Internet access as can be seen in Figure 15 with only 6,7% of households in Africa compared to the World average of 41,3% of the households having Internet access (ITU, 2013).

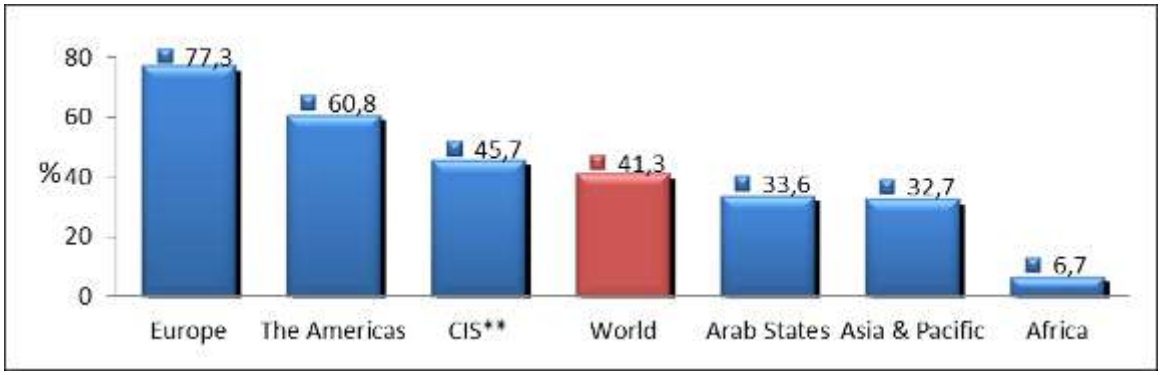

Figure 15: Percentage of households with Internet access by region (ITU World Telecommunication/ICT Indicators database, 2013)

South Africa is in a slightly better position than the rest of Africa in that according to Census data (2011) 35,2% of households indicated that they had access to Internet (Figure 16). This is close to the world average of 41,3%. The high cost of this Internet access however still remains a big barrier.

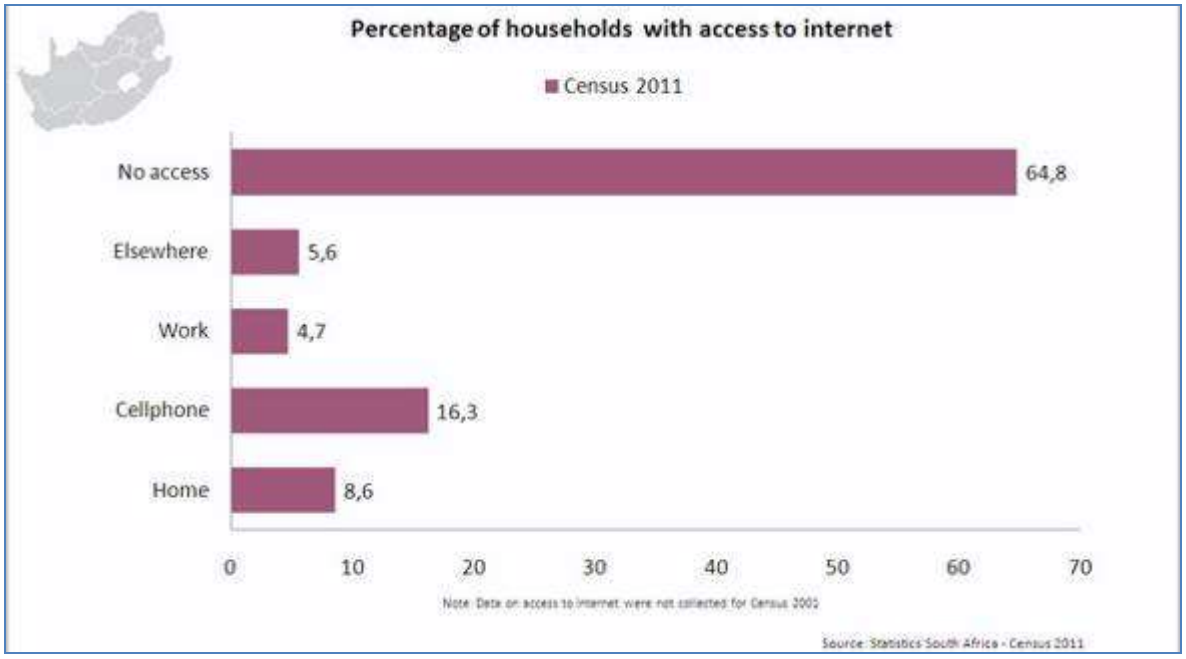

Figure 16: South African Internet Access

The challenge therefore remains to create the appropriate technology delivery methodologies within the African context that include live interactive free-to-air satellite and Internet video streaming to broaden access to formal as well as informal learning opportunities. Stellenbosch University is in the fortunate position that it has access to this whole spectrum of learning technologies. It could therefore make a significant contribution to the national objectives to ensure increased participation whilst maintaining student success and throughput rates.

F) Concluding remarks

In response to the national priorities with regard to the provision of increased participation in Higher Education as well as supporting learners academically to be better prepared for higher education studies, Stellenbosch University is in the unique position to be a major role player in this arena. The University not only has a unique technology platform consisting of a blend of satellite, web-based and mobile technologies, but also has a recently formulated Institutional Intent and Strategy and Vision 2030 that commits the University to be inclusive, innovative and future-focused. In this regard the innovative utilization of learning technologies to extend the reach and richness of learning technologies has a special focus. This is built on the research based evidence of the successful utilization of learning technologies to provide academic support for postgraduate off-campus students and learners as reported in this paper. This together with the successful utilization of learning technologies to also support on-campus undergraduate students has led the University to formulate a integrated ICT in Learning and Teaching strategy that is comprehensive in terms of its focus on learning and teaching, the renewal of business systems as well as the provision of the enabling technological systems and infrastructure. All of this is done taking the unique (South) African technological landscape with limited and often expensive Internet access into account. The University is therefore committed to further extend its academic offering in terms of reach and richness through the innovative and appropriate utilization of its unique technology platform.

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Open Educational Resources (OER) Initiative at the Open University of Tanzania: Challenges and Lessons Learned

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Abstract:

This paper is one of the six series of studies that describes the process of designing and development of an OER based course titled "*Academic Digital Fluency for 21st Century Lecturers*" at the Open University of Tanzania. Through a *descriptive* research design approach, the study employed *documentary analysis* (particularly of the proceedings and records from the course development workshops and planning meetings) and *review of literature* to systematically describe the process of designing and development of the OER course on "*Academic Digital Fluency*". The study has demonstrated that, given the institutional commitment at OUT and the critical role that OER will play in the university, it was feasible to produce five (5) initial drafts of the modules of the OER course on "*Academic Digital Fluency*" within the shortest time possible. All course designers worked tirelessly to ensure that the drafts were ready in time for review. On the other hand, the reviewers also played their part very well by providing timely and constructive comments which enabled further refining of the contents and improvement of the courses in order to produce high quality OER course materials before being uploaded into the MOODLE Learning Management System (LMS) of the OUT. However, despite being interesting, the process of designing and development of an OER course is often quite challenging because it is an "added load" to the lecturers. Furthermore, it demands team work and also to undertake a comprehensive review of literature and the available course materials. The experience from OUT was shared with the ACDE member institutions during the meeting of the Technical Committee on Collaboration (TCC) of the African Council for Distance Education (ACDE) as well as the ACDE Executive Board meeting, held in 14th July, 2014 in Nairobi-Kenya that in turn deliberated on how to eventually develop the OER course into an African wide Massive Open Online Course (MOOC) that suit local the context of each of the respective institutions.

Keywords: *Open Educational Resources, Massive Open Online Course, African Council for Distance Education, Technical Committee on Collaboration, Open University of Tanzania.*

BACKGROUND

Integration of Open Education Resources (OERs) in Open and Distance Learning (ODL) delivery is a growing phenomenon not only in the developed world but also in the developing countries. Recent developments indicate that OERs are used in ODL not only as a strategy to address challenges of limited learning resources (Atkins, Brown & Hammond, 2007; World Bank, 2006; Vest, 2006; OECD, 2007) but also as a strategy to save cost, improve teaching and learning practices, enhance academic performance of learners and policy change (roer4d.org/sp-10-impact-of-oer-case-studies). Several initiatives are reflected in the literature including the famous project called *Bringing Educational Resources to Africa* (BERTA) by UNESCO in collaboration with the South Africa Institute for Distance Education (SAIDE) (www.saide.org.za) and International Council for Distance Education ICDE (http://www.ieee-icde2014.org), *Research on Open and Educational Resources for Development* (ROER4D) (http://roer4d.org) and *OpenUpEd* programme by UNESCO (www.unesco.org). This indicates the critical role and potential that OERs have in terms of contributing to the enhanced quality of education globally.

Given this trend, the integration of OER in ODL institution in the African higher education sector becomes critical as emphasized in the African Council for Distance Education (ACDE) Policy on Collaboration (ACDE-TCC, 2011). In the African context, OERs are necessary because they prevent duplication of efforts in the areas of design of programmes and development of materials amongst ACDE member institutions, thereby enhancing learning flexibility in Open and Distance Learning (ODL). In recognizing this, ACDE in its 8th Technical Committee on Collaboration (TCC) meeting of contact persons held in 13th July, 2014 made a firm recommendation to develop and mainstream OER in ODL delivery with a possibility of evolving them into Massive Open Online Courses (MOOCs) in future whenever possible ACDE believes in having a high quality MOOC useable by all its members.

It is on the basis of this background that, the current study on development of an OER based course was conducted so as to systematically describe the approach that when used to design the course, to chart out the processes involved, analyze challenges that the team and the OUT faced during the entire process of designing and developing the course. Furthermore, this study has been clearly pointed out some lessons learned for other ACDE member institutions or any other institution of higher learning to borrow

leaf from when designing and developing OER/ MOOCS based courses which will ultimately be adopted. It is important to stress at this juncture that, this paper is one of the six studies which describes the process of design and development of the *Academic Digital Fluency* OER course that OUT developed with the technical support from SAIDE (Southern African Institution for Distance Education) through OER Africa programme.

APPROACH USED IN THE DESIGN AND DEVELOPMENT OF THE COURSE

The initiative to design and develop the OER course on "*Academic Digital Fluency*" involved three major approaches that included *preliminary meetings of stakeholders, capacity building workshops for course developers and reviewers and workshops for actual course design and development.*

Preliminary Meetings of Stakeholders

A total of three preliminary meetings of stakeholders were conducted. The first meeting was held in April, 2013 which involved stakeholders from OUT and SAIDE/OER Africa team which in its part was lead by the Director of OER Africa and the learning technologies specialist. The meeting aimed at planning and discussing the content of the subsequent workshop. Similar meetings were conducted in August and October, 2013. The last meeting was conducted in April, 2014 which aimed at kick starting the design and development of the OER course on "*Academic Digital Fluency*".

Capacity Building Workshop

Two capacity building workshops were conducted in April, 2013 and October, 2013. Both workshops were facilitated by a staff member from OER Africa/SAIDE, Ms. Brenda Mallinson. The capacity building workshops focused on promoting capacity in the areas of OER and Instructional Design (ID), promote knowledge of MOODLE using the Leicester University "Learning Design in the Open" methodology and the 7Cs OER template resources. Both workshops took place at the Open University of Tanzania's Kinondoni Regional Centre.

Actual Course Design and Development Workshop

A total of two workshops were conducted to provide a conducive environment for actual design and development of the "*Academic Digital Fluency*" OER course. These were hosted between May and June, 2014. Both workshops were conducted at Tanga Regional Centre of the Open University of Tanzania to ensure maximum concentration

of the staff members and away from their process.

However, in order to achieve a lot during these workshops, an electronic survey on Academic Digital Fluency course was conducted so as to solicit inputs from OUT Academic staff regarding the expected content of the course. Findings from the survey and insights from literature reviewed as well as experience from previous course designs in other courses not being part of the OER were useful in identifying five modules for the course, namely *Digital Literacy, Academic Integrity, Storage and Access of Digital Resources, Working with OERs* and *Learning Design.*

DESIGN OF THE OER COURSE ON "*ACADEMIC DIGITAL FLUENCY*"

The design of the course was guided by the 7Cs of learning design framework (Armellini, 2012; Canole, 2012). The framework guided design through 7 stages that included: conceptualize, capture, create, communicate, collaborate, consider and consolidate (Canole, 2012; Canole, 2013) as illustrated in Figure 4.1.

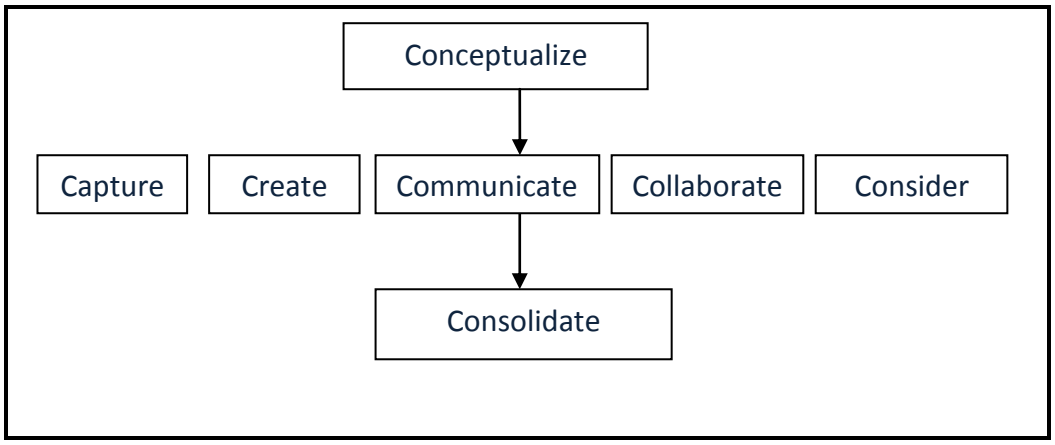


Figure 4.1: The 7Cs of learning design framework (Canole, 2012)

According to Conole (2012), Conceptualization stage, involves initiation of the design process by deciding about the vision for the course and the essence of the course designed for lectures and learners as agreed, for the current course the vision of the course was and still is to increase academic digital literacy of lecturers.

According to Blois (2013) digital literacy is important because it promotes high order thought skills, breaks down the walls of learning and information and prepares lecturers for the digital world in general. The essence of the current OER course in this

study focused on increasing the lecturers' digital literacy in order to help them take full advantage of what the digital age can offer and particularly when it comes to teaching, learning, research as well as administrative responsibilities.

The Capturing stage of the 7Cs of learning design framework involves establishing what OERs are being used for and what other resources need to be developed. This involved retrieving literature, materials and courses that are already available under OER. At this stage, lecturers identified existing courses that in one way or the other were related to the OER course being developed. The courses include OCP 100 (Introduction to Micro-Computer I), OCP 200 (Introduction to Micro-Computer II), ODL 601 (Development Studies) amongst others. Furthermore, lecturers retrieved additional physical and electronic resources that could be included in the OER course.

The Creation stage covered both the creation of the content and of the activities for the course. Lecturers at this stage as mentioned earlier on, were able to identify five (5) modules for the course that included: digital literacy, academic integrity, storage and access of digital resources, working with OERs and learning design. Each module covered a variety of issues in that particular module and these ranged from 5 – 6 lectures and each lecture was organized in such way that it contained introduction, learning objectives, activities, text (body), summary, review questions and references. Furthermore, all modules had variation in the number and range of activities depending on the nature of the module and the specific purpose for such a module.

The Communication stage made lecturers reflect on the types of communication that the students will be using. As for the "Academic Digital Fluency" OER course, lecturers agreed to deliver the course through the MOODLE Learning Management System (LMS) that provides options for asynchronous and synchronous forums (where necessary).

At the Collaboration stage, lecturers considered and thought about which technologies will be used to foster collaboration and how to work in virtual teams. Ultimately lecturers identified technologies such as wikis, e-portfolios and blogs as critical for the course in order to foster enhanced collaboration with all stakeholders.

The Consideration stage covered an analysis of the ways in which learning technologies can be effectively exploited to promote reflection and assessment. At this stage, lecturers opted for e-portfolios, blogs and wikis as appropriate for promoting reflection and assessment during the course delivery.

The last stage of the 7Cs of learning design framework is "consolidate". This stage involves taking stock of what has been learned so as to create an action plan for taking things forward. At this stage, lecturers agreed to finalize course development within a week before uploading it on the MOODLE LMS and piloting of the course is

undertaken. The design process culminated in an OER course design as presented in Figure 4.2.

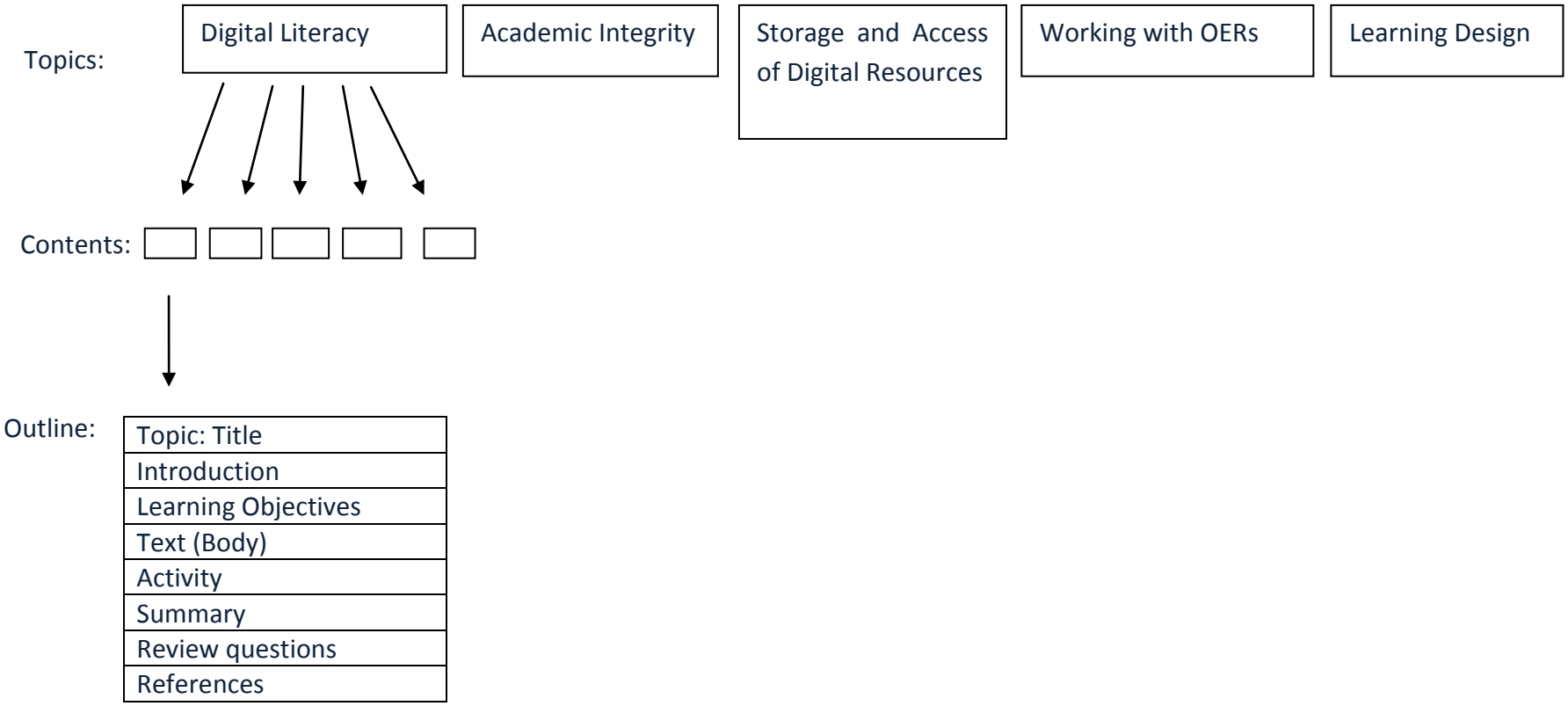
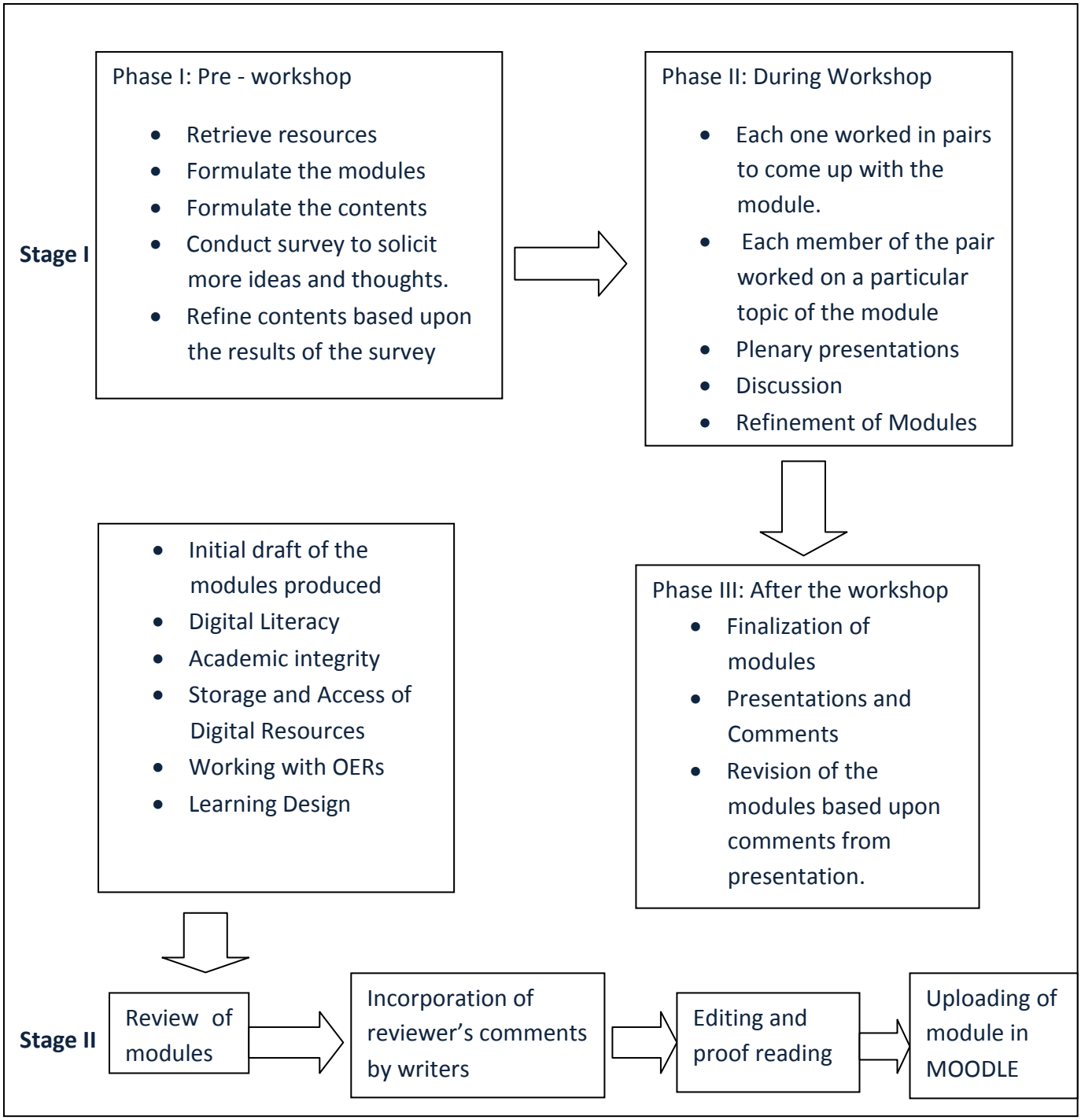


Figure 4.2: *Design of the course*

THE OER COURSE DEVELOPMENT PROCESS

The OER course on "*Academic Digital Literacy*" was eventually developed based on the 7Cs of learning design framework (Canote, 2012; Canole, 2013; Armellinim2012). The Course development involved activities split in three phases namely phase I (i.e. pre-workshop activities), phase II (i.e. activities during the workshop) and phase III (i.e. after the workshop). Activities for the three phases are summarized in Table 1.

Table 1: *Activities done during course development process*



possible inclusion in their respective modules. These materials included (i) OUT study

Materials of existing courses such as OCP 100 (Introduction to Micro-computer I), OCP 200 (Introduction to Micro-computer II) and ODL 610 (Development Studies) (ii) Relevant Literature for specific modules from different search engines and print – based journals.

In order to convene the writers for phase II, the coordinator for this new course sent out invitation letters to a total of ten (10) writers all from the Institute of Educational and Management Technologies (IEMT) to participate in the workshop. The writers worked in pairs and the distribution of the modules among the writers was as shown in Table 2.

Table 2: Distribution of modules amongst writers

Writers/Lecturer(s)	Academic Unit	Module
L1 & L2	IEMT	Digital Literacy
L3 & L4	IEMT	Academic Integrity
L5 & L6	IEMT	Storage and Access of Digital Resources
L7 & L8	IEMT	Working with OERs
L9 & L10	IEMT	Learning Design

Note: L1-L10 = The 10 writers involved in the writing of the OER course

During phase II i.e. at the workshop in Tanga, each writer within the pair worked on a particular topic of the module from morning until lunch-time when the team convened for plenary presentation. During plenary session, each individual member of the team presented what she/he had worked on which was later followed by discussions. The discussion session helped to further shape the retrieve modules as presented in Table 3.

THE NEW OER COURSE ON "*ACADEMIC DIGITAL FLUENCY*"

Contents of the Course

The contents of the new OER course are presented in Table 1. The course consists of five (5) modules. The contents include: *Digital Literacy, Academic Integrity, Storage and Access of Digital Resources, Working with OERs* and *Learning Design.* Each of the modules has several topics.

Table 3: Contents of the "Academic Digital Fluency" course developed by OUT

		Course Contents	
S/No.	**Module**	**Before the Workshop**	**After the Workshop**
1.	**Digital Literacy**	Internet searching, secure use, online behaviour. Virtual Learning Environment "(Moodle) & Learning Analytics Fundamentals Use of multimedia Office Suite (Word, PowerPoint) Information Literacy	Basic computer concepts and operations Internet fundamentals Multimedia fundamentals Virtual learning environments
2.	**Academic Integrity**	Intellectual property correct referencing &styles Plagiarism detection software (Viper-OSS)-formative not punitive	Academic integrity Academic work and adherence to academic integrity Intellectual property practices in academics Referencing of academic work and referencing styles Causes of academic integrity Reducing misconduct in academic work Academic integrity and types of academic dishonesty Ways to prevent plagiarism
3.	**Storage and Access of Digital Resources**	OUT digital library & website & external resources General file management (personal, and institutional)	Web 2.0 technologies Digital storage Cloud storage

		File sharing – using Dropbox etc	Digital library
4.	**Working with OERs**	Understanding Creative Commons licensing OER-mixing, adapting, re-using, producing Production work flow process for OUT	OER concepts Understanding Creative Commons licensing OER mixing, adapting, re-using, and reproducing Production workflow process for an institution
5.	**Learning Design**	Using the 7Cs process model and OER templates Incorporating digital technologies (including social media	Models, frameworks and elements of learning design and development Design for learning Matching the tool to the pedagogical purpose Assessing and evaluating of online course

Structure of the Modules

Table 4 presents the common structure of the modules in the new OER course. Each module consists of a course code (to be determined later), course title, course description and learning objectives / outcomes. This is followed by extensive text which addresses respective objectives / outcomes in a module. The text is well elaborated by the use of images, figures and other relevant illustrations including video clips (wherever possible).

Table 4: Structure of the modules of the new OER course

S/No.	Structure
1	Course code
2	Course title
3	Course description
4	Learning objectives / outcomes
5	Topics / Contents
	5.1 Topic title
	5.2 Introduction
	5.3 Learning objectives
	5.4 Text (body) (which addresses the learning objectives)
	5.5 Activity (ranging from 2-6)
	5.6 Summary of the topic / content
	5.7 Review questions
	5.8 References

Between the texts of each learning objective, there is an activity for learners to practice and explore more knowledge in relation to the content in the module. The activities range between 2-to 6 per topic in each module.

At the end of the last activity, a summary of the topic / content is presented. This provides an overview of the topic / content for effective comprehension by learners. The summary is followed by review questions which help learners to make critical self-reflection of the topic and references are provided at the end of the topic.

CHALLENGES

The idea and plan to come out with an OER course accustomed to OUT was a mammoth task from then very conception stage simply because, not so many institutions especially in the

Southern hemisphere which have not only achieved this task but also dared to do. It follows therefore by OUT being one of the early developer, required a lot of courage, support and management buy-in which is lacking in most institutions. It must be kept in mind that OUT was somehow walking in unchartered territory due to its determination to ultimately develop a MOOC out of the developed OER.

The second challenge which faced this exercise was the fact that all course writers are members of staff at the Institute of Educational and Management Technologies (IEMT) with full responsibilities hence finding spare time to attend the training, writers workshop and sit down to write was equally challenging because it meant compromising with either quality of this OER course or leave some of their daily cores unattended which could also affect the work of IEMT which has support function to the OUT academic and administrative units apart from the consulting and research.

The other challenge worth mentioning at this juncture is the fact that this task was to be accomplished within a very short time to enable the decision making bodies within OUT approve the course prior to the meeting of the ACDE Board in July, 2014 that was to assess the potential of developing a quality MOOC for ACDE.

Similarly this task did not have a specific budget line within OUT, hence the management had to mobilize funds internally in order to accomplish this very important task in record time.

Lastly each module was to be prepared in pairs and that presented a challenge in several ways from agreeing who does what and why to being able to inculcate team spirit and team work which at times was hard to achieve given the fact that each writer had several other commitments to do.

LESSONS LEARNED

The design and development of the OER course on Academic Digital Fluency at OUT has taught staff several lessons worth sharing. One of the lessons is that we have been able to learn is that commitment is the mother of all and dedication to purpose is key in whatever one seeks to achieve. This has always been the secret behind OUT being able to pioneer in several fronts and development of the OER course is only one of them.

The second lesson worth of sharing is that management support played a very key role from the very beginning to the end of the process. The OUT management was always in the driving seat and whenever things seemed to be not moving or going slow, the top management would either convene meetings or require an immediate explanation or

clarifications.

It is also important to stress that the choice of the right team of writers and reviewers played a strategic role too in ensuring that the task is not only finished but also finished in record time without compromise to its quality.

Similarly the role of the coordinating unit namely the Institute of Educational and Management Technologies and the individual coordinator cannot be under-estimated as they were the ones who made sure that regular meetings are convened, management is kept informed of the progress, writers are taken to the workshop when required, reviewers are kept informed when drafts are ready and reminded reviewers when to submit their comments but more important, partners and trainers are also well informed and when required are invited for training or progress review meetings.

In the same vein partners such as SAIDE played a very critical role in the success of the preparation of the OER course material on Academic Digital Fluency at OUT. Without their support, may be OUT would not have reached this far and at this pace we were able to move.

CONCLUSION

The study described in this paper is one among a series of six sub-studies in relation to OER course development in ODL at the Open University of Tanzania. This particular study aimed to systematically describe the process of designing and developing the "Academic Digital Fluency" OER course at the Open University of Tanzania.

It has been demonstrated that, the process of design and development of an OER besides being challenging but also is very interesting. It was challenging because it was an "added workload" to writers whose plates are already full. Since each module was written in pairs it required a very strong teamwork and team spirit else the task could not be accomplished.

The process was interesting because it was rewarding realizing that OUT is one of the pioneering institution in Tanzania to develop an OER on "Academic Digital Fluency". Furthermore, it was challenging to meet the deadline of designing five modules within a span of very short time. However, it is interesting to note that all writers were able to deliver the drafts for review within the time allocated. It was even more interesting as all reviewers were able to work on the drafts and submit their review reports and comments in record time.

As a way forward, a workshop to orient writers on how they can upload their modules in OUT's MOODLE Learning Management System (LMS) has been scheduled to take place at

the end of August, 2014 before a piloting phase of the course with a group of students is implemented in the beginning of September, 2014. Two institutions have so far volunteered to participate, ie. Open University of Tanzania (OUT) and Catholic University of Mozambique (UCM). Other institutions such as Tumaini University-Dar es Salaam College (TUDARCO) and Dar es Salaam University College of Education (DUCE) shall be invited to also participate in the piloting phase.

It is our expectation that the experiences from this endeavour (i.e design, development and implementation / piloting of OER course) shall be a recipe and catalyst for other institutions not only to adapt and adapt OER course from OUT but also to design and develop OER materials that appeal to their local circumstances and needs.

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A new conceptual frame for group work: group connoisseurship

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Abstract

Digital and global education is opening up new pedagogical strategies with an increased focus on group learning and assessment that acknowledges the collaborative, co-constructed nature of meaning making. Online forms of assessment surface issues such as notions of authorship, academic quality and the integration of different modalities, and challenge traditional understandings of summative assessment. Collaborative assessments in digital environments are particularly troublesome, requiring both educators and learners to grapple with these complexities and come to a consensus in often time-limited and high stakes circumstances.

Drawing on our recent research (O'Shea and Fawns, 2014a; 2014b), this paper offers a new model for understanding group work in online, distance environments. We argue that moving toward "group connoisseurship" is a way of creating situated and shared understandings between group members, and bringing group members into academic alignment. We outline some key themes that require negotiation of consensus for group connoisseurship to develop and propose two interconnected pedagogical strategies (dialogues and disruptions) for helping scaffold the development of those themes. We argue for a curriculum design in which disruptions of individual ownership, authority and environment are progressively rebalanced through unfolding dialogues around expectations and processes, leading the learning through a network of threshold concepts.

Keywords: group connoisseurship, collaborative assessment, digital education, dialogue

Introduction

Digital and global education is opening up new pedagogical strategies as new technologies allow different ways for learners to engage with content and peers. The potential of these environments aligns with a developing interest in group learning and assessment that emphasises learning as collaborative, co-constructed meaning making (e.g. Boud et al. 2001; Carless, 2007; Gibbs, 2006; Nicol, 2014).

Online forms of assessment surface issues of authorship, academic quality and the integration of different modalities. These can challenge traditional understandings of summative assessment. For instance, a multimodal assignment disrupts our past assumptions about the nature of assessment and academic literacy as the construction of an argument depends not only on the (possibly non-linear) interplay of various modes of communication (text, image, sound, etc.) but also on the ways in which the student and assessor bring these different components together (Sorapure et al. 2005; Goodfellow and Lea, 2007). Students and assessors have yet to fully understand and articulate what counts as academic quality within these multimodal practices and how they might be judged according to current assessment criteria (Bayne and Ross, 2013; Goodfellow and Lea, 2005). In this respect, 'assessment is a creative crisis as much as it is a statement of knowledge' (Ross et al., 2011: 15); one that can lead to greater pedagogical innovation. As we have argued in earlier work, the use of multimodal content for assessment 'can, and should, be used to question power relations, support risky ventures and redefine the boundaries of academic discourse' (O'Shea and Fawns, 2014a: 259).

An additional layer of complexity in online assessment comes with collaborative assignments. While collaborative work can involve powerful learning, encouraging the articulation and discussion of metacognitive processes and the development of lifelong learning capacities (Carless, 2007; McCune and Hounsell, 2005; Nicol, 2014; Sadler, 2010), the production of a shared artefact (the co-authored assignment) demands both educators and learners to grapple with complex challenges and come to a consensus in often time-limited and high stakes circumstances. In online environments, in particular, the additional pressure of asynchronous working can make developing consensus even more problematic.

Collaborative assessments must also work against the traditional culture of individual assessment and competition so embedded in higher education (Boud et al., 2001; Forte and Bruckman, 2007; Paulus, 2005). While humans are naturally small group beings, the educational group is a highly artificial environment for collaboration (Johnson and Johnson, 2003). There is no existing collaborative culture, as one might find in a work situation; roles are often unresolved; and there is a tension between the most effective strategies for the individual's own learning and that for producing the best group product (Hargie, 2010).

Gibbs (2006: 3) argues that 'Assessment frames learning, creates learning activity and orients all aspects of learning behavior.' If this is the case, then collaborative online assessments must be designed to support authentic engagement with peers as well as with the assessment task (O'Shea and Fawns, 2014b). This means reconsidering the balance between assessment of learning to assessment for learning (Hounsell et al. 2007a; 2007b).

In this paper, we offer a new model for understanding group work in online, distance environments using the example of our own teaching. We will firstly outline the concept of 'group connoisseurship' as a way of creating situated and shared understandings between group members. We will then outline the case study of our course, part of the MSc in Digital Education at the University of Edinburgh. We propose two interconnected pedagogical strategies - dialogues and disruptions - for helping scaffold the development of group connoisseurship and draw on some key themes (authorship, technologies and social practices) to argue for a curriculum design in which disruptions of individual ownership, authority and environment are progressively rebalanced through unfolding dialogues around expectations and processes, leading the learning through a network of threshold concepts.

Group connoisseurship

Dialogue, reflection and transparency are key in supporting the development of both subject knowledge and understanding of the assessment process (Carless, 2007; Gibbs and Simpson, 2004; Nicol and Macfarlane-Dick, 2006). For both students and tutors, meeting the challenges of multimodal collaborative work requires developing such understandings beyond the individual to a group level, with ongoing conversations and iterative refinement of ideas. For this reason, we argue for the concept of 'group connoisseurship'. This is the where 'individual understandings of quality align with a co-constructed group understanding of what constitutes "good" work for a shared task' (O'Shea and Fawns, 2014a: 267). It draws on existing notions of individual understandings of quality, such as evaluative acumen (Hounsell et al., 2007b), judgment (Eisner, 1976) and self regulation (Pintrich and Zusho, 2002) and supports the goal that the individual is able to both appreciate and critique relevant work in a way similar to that of the educator (Sadler, 2010). Connoisseurship is developed through the experience of appraising a range of work, enabling the learner to develop their own strategies for evaluating and regulating quality (Carless, 2007; Hounsell et al., 2007a).

In group work, individual notions of quality may not only vary but may be in conflict. A key component of collaborative assessment, then, is ensuring that group members aim for a

shared understanding of quality. Our concept of group connoisseurship draws on some aspects of Pieterse and Thompson's (2010) notion of academic alignment, where there is homogeneity of purpose, skills and abilities, yet differs in several important ways. Here, homogeneity is necessary in terms of purpose, while skills and abilities can remain disparate (indeed this can be seen as a positive) (O'Shea and Fawns, 2014b). What is more important is that the group negotiates an effective distribution of skills and practices. This is essentially a negotiation of interdependence: developing group connoisseurship requires unlearning some aspects of individual working and individual self regulation so that learners can take on attitudes and practices that move the whole group forward (Karasavvidis, 2010; Naismith et al., 2011).

As will be seen below, developing group connoisseurship in online, collaborative assessments is particularly challenging as the processes of discussing, negotiating and moving towards some consensus for the development of a final, graded product unfold across both technologies and time in ways that are often unfamiliar to students. The additional layer of risk for students engaging in new forms of multimodal academic writing, layered with the complexity of collaboration, can make for a perception of such work as high stakes, which can in turn stifle creative thinking (O'Shea and Fawns, 2014a).

For these reasons, we argue that group connoisseurship is best achieved through a dynamic balance of disruptions and dialogues; that is, through combining challenges to old ways of thinking and practising with opportunities to think and discuss creatively, critically and constructively.

Group connoisseurship in practice: 'Online Assessment'

Throughout this paper we will be drawing on concrete examples from recent research (O'Shea and Fawns, 2014a; 2014b) into our own facilitation of a postgraduate, online, distance course that used a collaborative wiki assessment. 'Online Assessment', part of the MSc in Digital Education, was a twelve week course with a cohort of 19 part-time learners in professions related to digital education (such as lecturers, teachers and learning technologists) delivered through a combination of Moodle, Skype voice and wiki activities. Formal assessment consisted of two assignments: a class wiki assignment (with a class-wide mark weighted at 25% of the student's overall grade) and an individual critical review (worth 75%). In this paper, we focus on the class wiki assignment.

The wiki assignment was intended to be an opportunity for students to experience an online, collaborative assessment first hand and to challenge them to consider critically the principles of assessment and feedback discussed in the literature (e.g. Carless, 2007; Gibbs and

Simpson, 2004; Nicol and Macfarlane-Dick, 2006). Students self-selected into groups of two to four members to co-author a response to one of five challenging and highly-interpretable topic statements that drew on course themes in overlapping, complex and nuanced ways (e.g. 'Collaboration is just bringing together multiple individual efforts' and 'In the age of online assessment, plagiarism is an outdated concept'). Students also self selected to be a 'critical friend' (effectively, a peer reviewer) for at least one of the other topic statements. This encouraged links between groups' work and ongoing dialogue across the class around meaning making, wiki practices and forms of academic discourse in online environments. A class-wide mark, rather than a group or individual one, was used to further encourage collaborative working and foreground the underlying tension between individual assessment and collaborative work (c.f. Forte and Bruckman, 2007) .

The assignment was undertaken during weeks four to nine of the semester in parallel to other teaching and learning activities. There were several cumulative activities that led into the assessed task that supported students' technological skills, group writing practices and dialogue around the social behaviour and values necessary for collaborative work. These activities included: adding introductory images, text and links to the wiki during orientation week; using the comment facility in week one to respond to wiki entries; co-authoring small summaries and then critiques of single papers in weeks two and three. Importantly, these example activities gave tutors opportunities to diagnose the particular cohort's needs and adapt support accordingly. As such, tutor support was available throughout the course via email, the Moodle discussion forum and Skype.

At the midpoint of the wiki assignment, each group nominated three specific points for tutors to provide feedforward on (where feedback from one task feeds directly into the next task, Hounsell et al., 2007b). Feedforward was given in the form of an audio recording of seven to ten minutes for each group, along with generalised written commentary on the wiki as a whole. The recordings were intended to model the critical friend role, as well as support and offer guidance for the final product. The recordings were available to the entire class on the Moodle forum and discussed both within and between groups.

Research into this teaching, learning and assessment process took a constructivist stance, with ongoing reflective discussions between tutors (both in tutor and research roles) and course participants generating meaning making (Berger and Paul, 2011; Cousins, 2009). Data[17] was generated in multiple forms: through observation and participation in the discussion forums, wiki pages and comment tools, and the end of course survey. However, the data generation informing this paper was particularly drawn from email interviews at the

[17] Data quoted in this paper is left in the original form generated by students, including typos, in order to preserve authenticity.

middle and end of the wiki assessment activity. These aimed 'to provide an environment conducive to the production of the range and complexity of meanings that might occur to all interview participants' (Holstein and Gubrium, 2004: 152).

While our role as tutor-researchers could be construed as problematic, particularly in relation to subjectivity and power relations, it did allow a very open, dialogic discussion with participants that both challenged and supported our analytic process. This meant that we could test and re-test concepts that emerged from the data analysis with our student-participants, which proved invaluable for understanding the processes we were researching.

Dialogues and disruptions

In our view, successfully developing a balanced approach to online, collaborative assessment requires a supportive course design that allows multiple opportunities for developing the relevant skills, values and understandings needed to successfully engage with assessment criteria and the ways in which the digital context shapes academic discourse (Bloxham and Boyd 2007; Sadler, 2010; Hounsell, 2008; Hounsell et al., 2007b). For this reason, we argue that the most suitable course design strategies for developing connoisseurship include cumulative learning and assessment opportunities which build on concepts, skills and thinking across multiple, inter-related tasks, multiple instances of feedforward and feedback, and multiple opportunities to test and re-test understandings. Of course, not all of these tasks should be summatively assessed, but creating opportunities for explicit formative assessment through reflection and discussion can help students learn and prepare for later tasks.

In balancing structure and responsiveness, feedforward in particular offers a useful strategy for understanding and adapting the formal course design to individual learners and to group needs. Feedforward supports constructive alignment of teaching, learning and assessment activities, linking formative and summative work through a learning oriented approach that embraces transparency, dialogue and reflection (Biggs, 2003; Carless, 2007). By taking a multimodal approach to the feedforward process, for instance by using audio, video or imagery, tutors can also model aspects of multimodal academic literacy to their students. These pedagogical strategies do not design out confusion and uncertainty. Instead, they embrace such disruptions, turning them into constructive stimulus for discussion and learning.

Disruptions are necessary to allow reformation of embedded beliefs and practices. They are the various forms of destabilisation that come about through the ongoing combination (and recombination) of assessment demands, the requirements of multimodal and collaborative

authorship, and the affordances of the digital environments that mediate the learning and assessment process. In a study of tutor control and student self-regulation, Vermunt and Verloop (1999) suggest that such a loose, unfolding dialogic approach would only be suitable to intermediate and highly self-regulated students. While this does fit with our experience (students who display lower self-regulation seem to struggle more with the task), we would suggest that even our "high-regulation" students experience what Vermunt and Verloop describe as friction, suggesting that these regulation levels are relative to the complexity of the task at hand.

Importantly, disruptions are not a negative element of the learning process. They are not the equivalent of Vermunt and Verloop's (1999) destructive frictions (which cause decreases in learning or thinking skills), but are more akin to their constructive frictions, providing an opportunity for students to adapt and develop those skills. Disruptions require engagement with troublesome and transformative threshold concepts (Meyer and Land 2003) as students negotiate new ways of thinking (O'Shea and Fawns, 2014a).

Dialogues, in contrast, are the rebalancing element in the pedagogical process, though this rebalancing is constant and dynamic, where meaning does not become absolutely fixed and concrete. Dialogues are negotiations of disruptions, ways of working on and through the threshold of understandings. In collaborative and multimodal work, these dialogues are a process through which shared understandings develop and grow for students and tutors alike. In this respect, there is a mutuality between dialogues and disruptions, with each bringing about the other, creating an interplay that enables students and tutors to work their way through a network of threshold concepts and develop connoisseurship. In collaborative assessments, dialogue must allow for a discussion between participants that is multi-voiced and that problematises the concepts being strived for and the processes that underlie learning and assessment.

Vermunt and Verloop (1999) explicate different learning styles that are either teacher or student regulated. They argue for *shared* control, where educators have responsibility to stimulate learning (cognitively, metacognitively and affectively) and students have responsibility to do the learning. In some respects, this is similar to Vygotsky's (1978) 'zone of proximal development', with choice of stimulus acting as a guide for learning. Although we concur that, with assessment as an end goal, educators have a responsibility to guide students to learning that enables them to meet assessment criteria, we wonder if this element of assessment undermines the creative possibilities of a 'real' dialogue. That is, an exploration of ideas that is neither teacher-led nor student-led, but rather a space where 'interthinking' can occur without assumptions as to who will lead (as Mercer (1995, cited in Wegerif, 2013) proposes with his 'Intermental development zone').

In this respect, dialogue becomes not about the actants (e.g. teachers and students), but about the process itself. As Wegerif (2013) suggests, dialogue then creates a new space for meaning opened up between participants. Taking a dialogic approach, then, is not simply about the quality of meaning constructed through discussion, but about that quality of the space within which meaning is constructed and the quality of the dialogue through which it is constructed (Wegerif, 2013: 5). It is not about specific authorities ('teacher', 'assessor'), and, indeed, it provokes us to reconsider teaching from a one-to-many model to a many-to-many one as 'In dialogic education it is not always possible to say who is learning and who is teaching' (Wegerif, 2013: 31). In doing so, genuine dialogue insists that participants be critically aware of the collaboratively constructed and always fallible nature of knowledge. Dialogue becomes "a chain of questions and answers and each answer gives rise to another question [...] dialogue is shared enquiry and shared thinking" (Wegerif, 2013: 14), one where there is genuine respect for other perspectives and voices, where there are genuine questions made about the shared enquiry.

Authorship

Wegerif's (2013) conceptualisation of dialogue is one that is open ended, an ongoing inquiry with no fixed endpoint. In this respect, it is at odds with the demands of assessment, where dialogue needs to lead to a final product fixed in space and time. Our course attempted to straddle the problematic divide between allowing for multiple voices and perspectives in thinking and learning, and having a single outcome for marking. This conflict of purposes was most apparent as students grappled with issues of authorship in collaborative working. On the one hand, our wiki topic statements were ideally designed for critical and creative dialogue - there was no 'right' answer. While the key criteria of academic quality were established (e.g. critical synthesis of concepts and literature), the form and argument this would take were determined by the students. On the other hand, each group needed to resolve its disparate voices into a consistent tone, and the group's argument was expected to be coherent and consensual.

For Wegerif (2013: 31), 'Learning does not progress well if we think we have all the answers and do not need to listen to other perspectives'. Students must value each other's perspectives and be open to the opportunities for peer feedback that come with a dialogic approach. On our course, students who seemed more closed off to other perspectives exhibited occasional behaviour or attitudes aligned with Pieterse and Thompson's (2010) concept of 'diligent isolates': students who disrupt group cohesion by preferring to work in isolation. While no student was ever fully and only this 'type' of learner, we did observe moments where students saw collaborative work as an additional burden on their learning process, one that involved extra effort on their part to create or maintain momentum. At

those times, the students did not seem to have confidence that their fellow group members were capable of contributing useful perspectives to the group work. Despite explicitly studying group assessment and being aware of literature on related student behaviour, some of our students fell prey to Davies's (2009) 'sucker effect', reducing their initial efforts to avoid being responsible for non-performing group members (or 'free-riders').

> *I've recognised the sucker effect in myself - having taken a lead to get things going, which was followed by a limited flurry, I've consciously not actively encouraged others, hoping they would take initiative. Probably some unconscious sucker effect too as I've used the excuse of being busy to not check forum or wiki for a few days.*

Interestingly, voices could be silenced not only by those unwilling to hear, but also by those unwilling to speak. An important challenge for multi-voiced dialogue was encouraging students to have enough confidence and trust in the dialogic process to feel their perspectives were worth bringing to the conversation.

> *felt nervous about my effort being insufficient: contributing enough to the team while not being in everyone's face*

This was partially navigated by students through a variety of what we now think of as 'politeness practices', the social behaviours intended to reduce concerns about how an individual's actions might be interpreted. This included gentle and often apologetic language (e.g. 'I'm sorry, I must be missing something, but I don't quite understand...'); emphasising positive aspects of the work before adding a single suggestion for improvement at the end of a comment; and focusing on additions to the work, rather than challenges or changes to developing arguments. While these strategies were helpful in facilitating group cohesion and consensus, this cautious approach may have reduced the extent to which students freely expressed the ideas and arguments they were developing.

As they approached the submission deadline, groups had to move from a dialogic process to an agreed upon product suitable for grading. Arguably, consensus was a dialogue killer, the point at which there were no longer different perspectives to continue the conversation. We noted three things students particularly did as the deadline approached and they became concerned that consensus had to be reached. Firstly, they turned to the authoritative voice of the tutor, weighing those words more highly than those of their peers.

> *Anyway, I absolutely agree with the general thesis, but [the tutors] were extremely helpful here. Apart from stakeholders and needs or a comparison of product-process, we have to go a step further down the road and answer a more important question as*

> *[tutor] suggested in the forum… I feel that until we answer that question, we'll only be scratching the surface of the assignment statement. Or even missing the point.*

Secondly, some students relinquished their voice, surrendering their position in the dialogue to achieve a false consensus:

> *I strongly disagree here as tutors' feedback clearly suggests leaving it out. However if you insist on your thesis and the rest of the group agrees with you, I'll have to go with it.*

Others took the seemingly opposite but similarly homogenising approach of trying to bring about consensus:

> *Because we are running low on time, I took the liberty and started to work on formulating our position. Does everyone agree? Feel free to through darts at it.*

In the case above, while other views were explicitly welcomed, the sense of haste may have undermined the likelihood that dialogue would emerge.

Finally, many students reverted to cooperative rather than collaborative practices. Foregoing dialogue, students took on more specific functional roles and divided up work for individual completion (e.g. taking responsibility for particular pages or acting in a wider capacity across the work, such as editor, reference manager, etc) (c.f. O'Shea and Fawns, 2014b; Paulus, 2005). For one group, coherent collaborative writing seemed unachievable and attempts could only result in an incoherent outcome which they described as 'the duckbilled platypus'. Nonetheless, they saw collaborative working (discussion, resource sharing, consensus building) as possible within a more cooperative approach:

> *I think you can't write by committee, but you can allocate writer/reviewer/synthesiser roles and this all comes down as you say to communication particularly early on. In terms of platypus stylee writing, in work we accept we contribute but one person perhaps at any time has a lead and edits into a self-consistent piece? No different here for me, we've contributed, discussed now I'm really happy for someone to edit my contributions to death - I trust us!*

The concern about submitting a final product meant there may have been a coercion toward consensus that undermined the opportunities for rich dialogue (and thus, perhaps, for deep, critical thinking). Ultimately, we found, as Wegerif (2013) did, that members of successful groups seemed to have a more engaged and open attitude towards each other and were

willing to listen, change their minds, ask for help and 'take on each others' work and words' (p.15). In contrast, it seemed that members of less successful groups competed to see who could get the right answer, avoided challenging and criticising each other, or identified 'with limited images of self in opposition to others or with the group image' (Wegerif, 2013: 22) .

The writing process itself was seen as disruptive of individual ways of writing. Many of the practices we saw emerging indicated an ongoing tension between individual authorship, where only the end product needs be understood by others, and collaborative authorship, where understanding must be continually developed throughout the process. It was generally felt that the final product should contain a unified group voice, despite the hypertextual, multimodal nature of the wiki affording a more nuanced response. Some students believed that coherent, collaborative writing was possible, but were not certain of achieving it:

> *I think we can do better and contribute to a self-consistent whole without the need to presever discretely individual sections (at our level/professional status) perhaps? I'm not certain though...*

For us, group connoisseurship can encourage individual perspectives while discouraging individual ownership of elements of the process (and product) - indeed, as Wegerif (2013) argues, these individual, different perspectives are essential for dialogic learning to take place.

For this reason, we suggest that it might be useful to position a group assessment as a snapshot of a process at a particular point in time and space. It should not be seen as the end of the dialogue, the end of the exploration of the topic, or the end of the development of critical thinking, but rather as a captured moment, one graded and marked, while the participants in the dialogue continue their explorations. For us, this fits particularly well with the positioning of feedback as feedforward in formal education, since it flags more clearly to students that thinking and learning should not lose momentum at the point of assessment. Like the artist's study, which is done to indicate a vision rather than to contain it, a dialogic work should be persuasive rather than perfect, convincing rather than complete.

Technologies and writing practices

The multimodal nature of online education surfaces the mediating role of the material within the learning process. Technology is not a neutral backdrop to learning. Instead, different environments offer different implications for dialogic practices (Bloomfield et al., 2010; Engeström, 1999; Selwyn, 2011). The possibilities for interaction are in the combination of interfaces, environments and actors with the same tools opening up or

closing down different ways of working according to how they are used by the group.

While wikis allow for transparent writing processes and wider opportunities for discussion during the learning process through features like page history, comments and formatting changes (see O'Shea and Fawns, 2014b), these same features can also undermine collaborative authoring and turn the focus from dialogue to fragmented monologues. For instance, one group made use of the wiki's formatting possibilities to tag individual contributions via font colour while others created new wiki pages with initial or sole authors who researched and wrote sections in isolation. While each member encouraged editing of their work ('I'm in green ;) And of course feel free to edit as you see fit :)'), such territorial markings served to discourage others from entering that space.

Even technological decisions made in the interest of encouraging dialogue could have ramifications that closed off possible dialogic opportunities. As an example, one group decided that the affordances of the wiki were not best suited for group writing and chose to work in Google Docs instead. While this environment allows for threaded comments and synchronous editing (which the particular wiki platform we used did not), it also meant that visitors to the space were anonymised. This created a barrier to ongoing discussions between participants about the work. Further, this group's work was not included in the wiki's automated notifications of recent activity, meaning the rest of their cohort was not as informed and engaged with their writing process. Finally, this additional tool required a new layer of competence for the group that may have formed a barrier to contribution as not all group members or critical friends were confident in its use.

Familiarity with a technology influenced its 'credibility' - that is, how conducive the technology was perceived to be to the collaborative process; how it was used by the group; and how competent members felt in its use. This in turn mediated levels of comfort and trust in the group process. To feel they could contribute meaningfully, all members needed to agree on a technology's usefulness in helping the group achieve it's goals, yet different people had different criteria for judging tool credibility. One student from the GoogleDoc group explained:

> *I was skeptical about using Google Docs to brainstorm and then draft, still am, but went along with it for the group. I think it's 50/50 in balance with PBworks. [Tutors] not being able to 'look over our shoulder' (even though we had others drop by) was a problem because you missed out on some context which you said would have been useful to give us feedforward. There's a real issue of affordances for the group -vs- 'manageability' for the assessor here. Google Docs allowed highlighted text comments which was a real winner.*

Another student from that group was also uncertain about the choice of technology:

> *I'm up for trying Google Docs if everyone else is. ... Not ecstatic at learning a new tool in a short time and will have to dig out my little uses google account but if someone can lead, I'll go for it!*

In practice, the difference in levels of comfort each member had with different tools was mostly resolved by engaging across multiple spaces so that the use of each tool complemented other ways of working. Where competence and a perceived intuitive design were combined, collaborative practices seemed more fluid, facilitating direct engagement with tasks rather than requiring conscious attention to the technologies (Norman, 1991; Williams et al., 2013). In this respect, particular technologies could ease a sense of risk and enable trust amongst group members:

> *[W]e had a lot of cutting to do. I think talking together in Skype made a really big difference here, it was much easier to address the emotive subject of people's babies 'live' and more 'touchy feely', for sure. What felt like a daunting task was eased by this. We cut two big babies altogether and we all agreed on it after some initial anxiety.*

Indeed, several students noted the way different technologies came together as part of the group's working space, forming a complex system of communication and meaning making.

> *[T]he 'sideline' communications are important energising, reassuring glue for a working group.*

In this regard, 'sideline' spaces were not secondary to the main work of the group, but an important, complementary space for the relationship building and maintenance functions that are as key to successful group work as task-specific functions (see Mudrack and Farrell, 1995).

> *[W]hat we think we're adding though is regular Skypes to talk through the content, critically discussion and give feedback to each other and then work together to 'weave' an introduction and conclusion. I think this kind of sharing and discussing is real collaboration?*

Conclusion

In collaborative learning and assessment, group connoisseurship provides a useful means for examining the creation of shared and situated understandings of quality between group members. Such shared understanding is best developed and supported through an iterative cycle of disruptions and dialogues that destabilise individual ways of learning and thinking. By adopting a course design that balances structured activities with flexible, supportive environments in which dialogue can emerge, tutors can help students cultivate an evolving understanding of the perspectives and practices of the group. Although formal learning activities can be designed to support the development of this dialogic space, facilitating group connoisseurship in students requires 'contingent responsiveness' (Wegerif, 2013), a balance between planning and adaptation to individual and group needs as that formal design plays out.

By positioning learning as the interplay between disruptions (of understanding and ways of working) and dialogues (unfolding, collaborative attempts to resolve these disruptions), we have surfaced some key challenges and responses to issues of authorship, individuality and technological influence within online, collaborative work. Where disruptions were experienced in the learning process, students explored different writing, working and technological practices in an attempt to resolve them. In collaborative writing, the asynchronicity of the wiki and forum was offset with synchronous Skype chats; the linearity of the wiki comment tool was addressed through in-text notations and the use of GoogleDocs. Each prospective resolution to a particular problem in the collaborative learning process opened up further opportunities for dialogue and further possibilities of disruption (such as the clarifying yet territorial use of coloured fonts or the silo-ing effect of the GoogleDoc).

As Oakeshott (1989) and Wegerif (2013) argue, the aim of dialogic education is a high quality, ongoing conversation. While no digital environment 'solves' the problems of collaborative assessment, the dynamic and complex dialogue that can develop through multiple environments can provide a rich, collaborative learning experience. We suggest, then, that engagement with different technologies can act as a catalyst for understanding collaborative processes and help students develop a shared understanding of quality that, while it can never lead to a perfect, collaboratively-authored product, can stimulate an ongoing conversation about what counts as quality.

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IMPOERS - Implementation of OER in a nursing programme

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Abstract

UNESCO stresses the pedagogical benefits of using OER, and the use of OER is increasing in higher education. The IMPOERS (Implementation of OER (Open Educational Resources)) project will implement OER in a nursing programme at Dalarna University, Sweden. The University and its nursing programme have long engaged in eLearning, and the nursing programme has recently been awarded the European Association of Distance Teaching Universities (EADTU) E-xcellence Associates Label (Ubachs 2009). The quality award was based on the creation of a roadmap for the continuous development of e-learning and the implementation of OER.

Introduction

The IMPOERS project will implement Open Educational Resources (OER) in the nursing programme at Dalarna University, Sweden. The University and its nursing programme have long engaged in eLearning, and the nursing programme has recently been awarded the European Association of Distance Teaching Universities (EADTU) E-xcellence Associates Label (Ubachs, 2009; Williams K et al., 2012). The quality award was based on the creation of a roadmap for the continuous enhancement of e-learning and the implementation of OER (Santesson et al., 2012).

Background and aim

The use of OER is currently increasing in higher education (Camilleri, Ehlers & Pawlowski, 2014; Ossiannilsson 2012). Major world education organisations, including The United Nations Educational, Scientific and Cultural Organization (UNESCO) (UNESCO 2012), The Organization for Economic Co-operation and Development (OECD) (Hylén et al., 2012) and the Commonwealth of Learning (COL) (McGreal et al., 2013), have emphasised the pedagogical benefits of using OER. Furthermore, the purpose of the European Commission's (2013a) "Opening up Education" initiative is to boost innovation and digital skills in schools and universities. The primary goal of this initiative is to stimulate methods for learning and teaching through ICT and digital content, mainly by developing and increasing the availability of OER. Furthermore, the initiative argues that individuals of all levels and in any setting or at any time, whether in formal or informal educational and learning settings, should at minimum be granted access to all existing high-quality European OER. The European Commission (EC) considers technology and Open Educational Resources as opportunities for reshaping EU education (European Commission 2013b). To stimulate increased use of OER, it has launched Open Education Europa, a website on which one can find, share and conduct in-depth searches for articles, projects, research, etc. (http://www.openeducationeuropa.eu/).

Open Educational Resources (OER) are teaching, learning or research materials that are in the public domain or that have been released with an intellectual property license that allows for their free use, adaptation, and distribution (UNESCO, 2012). OER provide a strategic opportunity for improving the quality of education, fostering pedagogical innovation in teaching and learning, and improving knowledge sharing and capacity building in Europe (Punie & Haché, 2013).

Today, the use of the web as an open source for knowledge acquisition is accepted in higher education, providing new pedagogical possibilities and support for competence development. These circumstances impact students' and teachers' roles and responsibilities for learning, creating learning content and activities and fostering interaction. The pedagogical issues related to OER are highlighted because OER are seen as change agents in learning and education transformation processes (Punie & Haché, 2013). Implementation of OER can reinforce an open culture of learning in which students have more opportunities to achieve ownership of their own learning and thereby take greater responsibility for their studies. This environment may enhance both motivation and individualised learning. In addition, according to Ossiannilsson (2012), OER can improve learning progress and contribute to and support lifelong learning. Furthermore, OER may stimulate networking among students, which can be maintained after the education period has ended. OER has been described as one of the strongest driving forces for personalised learning (Kelly, 2014;

Ossiannilsson, 2012; Punie & Haché, 2013).

Though OER are prioritised by some educational policies/institutions, their use in education is not mainstreamed. According to Punie and Haché (2013), obstacles to their implementation include

- Awareness: Low amongst policymakers and educational practitioners
- Expertise: Methods and practices that enable learners, teachers and institutions to best engage with OER are not yet established
- Recognition: Reasons for engaging in a Commons-based peer production are not recognised or rewarded
- Technological barriers
- Accessibility, reusability and interoperability of resources
- Standards: Search and retrieval functions, interoperability and quality are required
- Quality: Control of OER quality and applicability require improvement
- Sustainability

Currently, emphasis is shifting from OER production towards Open Educational Practices (OEP). OER and open education in general are considered to have enormous potential to increase general participation and educational opportunities and to promote broader participation in lifelong learning. However, developments in the past decade have shown that openness itself is not sufficient to realise this potential. It is important to shift the focus towards practices of using, reusing, or creating open educational opportunities: open educational practice (Camilleri & Ehlers, 2011; Kelly, 2014; Punie & Haché 2013).

OER engagement prepares individuals for employment and promotes the development of e-health among communities and individuals. Thus, it is valuable to learn and study in an OER context throughout the nursing programme.

The overall goal of the IMPOERS research project is to introduce and implement OER as a pedagogical framework in the nursing programme at Dalarna University. The project describes how OER can be implemented and used for learning. OER will then be implemented in a course within the nursing programme, and the effects of the implementation process will be studied.

Specific research questions:

- What types of OER are used?
- How are OER used?
- Who is the initiator (students? academics?)
- When are OER used?

Setting

The "Person-centred care" course has been identified as appropriate for implementing OER. The course includes a variety of practical skill exercises, from basic care tasks to advanced medical technology tasks. The course currently operates through the apprentice system, in which the teacher shows the student a technique and the student imitates the teacher. This means that certain sets of skill steps are repeated as many as 10 times for each student. This traditional teaching method is resource intensive and not particularly effective.

Implementation

OER will be implemented in the course during fall 2014. Its effects and the process of introducing OER will be studied using a mixed method that includes questionnaires, diary entries and interviews (narratives).

First, we identified and analysed existing OER that can be used in the course. Based on this analysis, we recorded scenarios for several tasks that were not found externally. A combination of our recorded material and learning materials adopted from others will be used as the foundation of the course. Course examinations will be designed so that students are required to use OER but also to critically examine the material available on the Internet.

Involved teachers and students will participate in two workshops that will be led by a facilitator familiar with OER in higher education. At the first workshop, OER as a method will be described to explain what it is and its purpose and to provide specific examples. At the second workshop, teachers involved in the course will develop a plan for implementing OER in the current course.

Evaluation

The project will be evaluated using a mixed method (questionnaires and interviews/narratives). The project will focus on students' participation, knowledge, empowerment, responsibility for their own learning processes and attitudes towards using OER.

Expected results

There are several results that we hope to achieve with the project. One goal is to create a welcoming, accessible and stimulating learning environment. Teachers will have time to focus on interacting with the students and course examinations; time for these activities is often inadequate in traditional courses. It is also expected that the entire workgroup will achieve increased knowledge of OER and of its use and parameters. We also expect to obtain in-depth knowledge of what, where, when, who, why and how OER is used in the course.

We also believe that engagement with OER can provide a strong incentive for a qualitative research-based nursing education in which the individual student can directly access and possibly continue networking with international researchers of topics of interest. In addition, we hope that this project increases students' flexibility in assimilating knowledge and attaining skills through self-education. Finally, it is expected that the teachers will shift from being experts who demonstrate various technical skills to resources that support students in discussing and reflecting on their learning.

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Evaluating the Quality and the Success of Online Courses

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Abstract

Measuring the quality of a b-learning environment is critical to determine the success of a b-learning course. There are a lot of materials related to the quality process, namely different approaches and perspectives but none of them is specific of the product of a b-learning context. In this paper we identify the indicators that should be analyzed in order to determine the quality of a b-learning course, since its success reflect not only the student's perception, but also what should be taken into account. B-Learning environments are relatively new and combine educational characteristics with technological elements that support the learning process and the training delivery. Our main objective is to know what a high quality b-learning environment is in students'' perception and what are the main quality dimensions of these courses, in the perspective of the products and services offered. After a literature review concerning the quality process and in particular the b-learning quality field, a structure that provides the main elements that should be evaluated by students when we are measuring the quality and the success of b-learning product/services was created. The structure obtained was applied to a case study of the Polytechnic Institute of Oporto. Results presented will help institutions to deliver services with more quality and improve their long-term competitiveness.

Keywords: e-learning, b-learning, quality measure, case study, personal learning environment.

Introduction

E-learning has become widely used in all kinds of education (traditional and formal education, continuous education and corporate training) because of its characteristics such as flexibility, richness, resource-sharing and cost-effectiveness. In this work we paid more attention to the blended-learning (b-learning) systems, which combines "face-to-face instruction with computer-mediated instruction" (Bonk & Graham, 2005). E/b-learning has been largely used in the context of higher education. It includes a wide range of learning formats including self-study and instructor-led in an asynchronous and synchronous mode. The e/b-learning systems always represented an alternative to traditional teaching/learning and training and, therefore, has had to battle for recognition, which lead to the development of procedures in order to demonstrate its quality (Rekkedal, 2006). Evaluating the quality of a b-learning environment is not an easy task since this concept is not an objective one. The analysis of the quality of such a system depends also on the perceptions of students. A series of several multi-dimensional variables also needs to be taken into account. Furthermore, b-learning may be viewed as an educational service that is influenced by many external factors such as the technologies used and the students' experience on the field.

According to the ISO (International Organization for Standardization), quality is defined as a set of products and services features that matches the client's demands. Client is considered anyone who uses the system. According to the American Society for Quality[18] in technical usage, can have two meanings:

"1. The characteristics of a product or service that rely on its ability to satisfy stated or implied needs.

2. A product or service free of deficiencies. The totality of features and characteristics of a product or service that relies on its ability to satisfy given needs.

Besides the different approaches to the concept of quality, it is consensual that quality is a subjective term for which each person has her own definition".

As the number of b-learning courses is increasing, it is important to evaluate the quality offered in order to help the potential users to choose the best course. The problem is, therefore, what does a b-learning service with quality mean? What are the most important dimensions of quality that should be analyzed/evaluated? And how can the institutions measure the quality and the success of their b-learning services in order to improve them? We believe that if we answer these questions we will be able to help institutions to deliver

[18] http://asq.org/index.aspx

services with more quality and improve their long-term competitiveness.

There are some management models to support the development of an e-learning environment but there is a lack of knowledge when we try to evaluate them. So, how can we measure the quality of a b-learning service? To bring some light into this question, we gathered and analyzed different perspectives and added some issues specially related to b-learning environments that emerged from our previous experience.

In this paper we describe the research carried out in order to develop a framework that can help institutions to measure the successful of their b-learning services. Thus, in the next section we provide the background information concerning the quality of the b-learning system that was used in this research.

General Models for Quality

The EFQM excellence model (EFQM, 2012) is a general no-prescriptive quality process model that includes good practices for quality in an organization. They consider that excellent organizations measure their work in a broader way and give high levels of client satisfaction. This model is based on nine elements: leadership (10%); procedure and strategies (8%); people (9%); partnership and resources (9%); process (14%); client results (20%); people results (9%); society results (6%); strategy performance (15%). The higher value is set to the client result. In the same perspective (general quality process approaches) the ISO (ISO, 2012) refers that it is important to consider eight quality management principles: costumer focus; leadership; involvement of the people; process approach; system approach to management; continuing improvement; fact based decision-making and mutually beneficial supplier relationships - supply approach. These models constitute two sides of the same quality process and improvement coin, both referring the importance of analyzing the client satisfaction but any of them considers the scenarios of eLearning. In this work, we are especially concerned with this issue in a prescriptive approach in order to better implement it. Still about this topic, there are some institutions that provide a set of recommendations and good practices oriented to the quality of the process such as IHEP, ODLQC, EFQUEL etc. These recommendations are mainly related to the learning programs and continuous improvement, institutional aspects, delivery of course design and programs, teacher and students support, pedagogical aspects and evaluation. These recommendations are very important when we are designing an e-learning solution and may have effects on the successful of an e-learning service reflected on the costumers' satisfaction.

Related to the product orientation we can refer some generic models as Quality Function

Development[19] or Kano Model[20]. The QFD suggests using customers' necessity as input to the creation of a product while in the Kano model the customers satisfaction is measured using three approaches – Basic quality, quality of performance and enthusiasm quality. These approaches uses customers' expectations and try to overcome them by a high quality of products and services.

Still oriented to the product, we can refer some specifications from the industry of learning objects such as ADL, IMS, IEEE, ARIADNE , AICC, DCMI, etc. This kind of specification conducts the process based on the concept of re-use and interoperability of the learning objects. They focus on the specification of the internal structure of the learning objects (metadata, XML, etc.). They do not include pedagogical issues (objectives, evaluation, feedbacks, etc.).

In summary, the approaches oriented to the process lead to the e-learning process and continuous evaluation, institutional aspects, features related to the design and how the course and progress work; support to the teacher and learners, pedagogical and evaluation aspects. The orientation to the product leads to the quality in the services and product and is related to the client's expectation and requirements.

In this work we will pay more attention to the specific product approach instead of the process approach (general or specific) as we want to evaluate if the learning results and students' satisfaction were reached, which means the b-learning service success. Thus, we will need to combine element from different perspectives.

Main Dimensions of quality in a b-learning environment (product and services)

According to the Khan's model (Khan, 2005), institutions should consider students as education customers and training in a competitive market. Khan's model (2005), called "e-learning platform", was developed from the critical factors of the development of an e-learning experience and is based on eight dimensions: institutional, pedagogical, technological, interface design, evaluation, management, student support, and ethics. The combination of positive responses to all these dimensions, according to the author, provides sustainable paths to success.

[19] http://www.qfdi.org/

[20] http://asq.org/learn-about-quality/qfd-quality-function-deployment/overview/kano-model.html

Peres et. al (Peres, Ribeiro, Tavares, Oliveira, & Silva, 2011) presented a structure that integrates, consolidates and lists the elements identified by Khan, as well as other elements prompted by b-learning contextual practice in higher education and that have been validated in successive evaluation cycles. According to Peres et. al (Peres, Ribeiro, Tavares, Oliveira, & Silva, 2011) services and products offered in a e-learning context may be grouped in three categories: Institutional, Technical and Pedagogical. According to these authors the success of technology-enhanced learning relies deeply in the harmonious combination of the correct technologies with the most efficient pedagogies, allowing the implementation of innovative, authentic and diversified teaching and learning opportunities, requiring the need to work on three levels: institutional, technical and pedagogical. The basic level considers the institutional aspects and supports the progress of the project. This level includes the aspects related to management and ethics in Khan model (Khan, 2005). Without the clear support of the school's Board and a Management team, it is difficult to be successful in a b-learning institutional project and reach the school's full dimension. This means that any evaluation of a b-learning service must take into consideration its institutional and technical environment, besides its pedagogical perspective. This analysis includes the identification of the technological structure offered by the institution. The quality of all these dimensions will be reflected on the success obtained.

Related to the b-learning product/services, it is important to determine the elements that should be analyzed in each group. This analysis will contribute to prevent any problem that might arise. The Garvin's Quality Dimensions (Garvin, 1987) provide some light into this discussion since they offer eight categories for the quality of a product or a service. These are: performance, features, reliability, conformance, durability, serviceability, aesthetics and perceived quality. In the next paragraphs we briefly explain the meaning of each of these categories.

The performance is the primary characteristic of a product or service. In the b-learning system, it can be included in the three dimensions, namely in the pedagogical, technical and institutional one. To measure the performance means to evaluate the ability to give a quick reply to students concerning the technical, pedagogical or institutional system (Merisotis & Phipps, 2000)(EFQUEL, 2011)(ODLQC, 2005). The performance is also referred in the e-learning success model by Lee-Post (Lee-Post, 2009). The analysis of the quality of a system should include the ability to be fast and responsive related to the technical and institutional dimensions (Lee-Post, 2009) (ODLQC, 2005). In the perspective of Zhang and Wang (Zhang & Wang, 2005) in general, the performance concerns the technical support, but if we are referring to the learning support, it relates to the b-learning teaching process (pedagogical dimension). The EFQM (EFQM, 2012)excellence model of quality refers this learning support as tutor support that should be in time and useful (Merisotis & Phipps, 2000) (EFQUEL, 2011) (ODLQC, 2005).

The features in the Garvin's Quality Dimensions (Garvin, 1987) refer to the add-ons, supplements or secondary characteristics that increase the product's basic functioning. Related to this, the MELSS model (Hassanzadeh, Kanaani, & Elahi, 2012) refers the importance of adding tools to include more interactivity to the technical system with appropriated functions and menus. This system should also offer the possibility to be personalized (Hassanzadeh et al., 2012) (ODLQC, 2005) and to have some security issues (Merisotis & Phipps, 2000) (Hassanzadeh et al., 2012).

Related to the pedagogical dimension, according to the MELSS model, the system should offer facilities such as chat, forum, etc., tools for communicating with others, providing a social collaborative and active learning. To ensure the quality of pedagogical features besides the exploration of the communication tools, it is important also to define clear objectives, offer contents adjusted to the different learning styles, promote active learning and give organized contents (EFQUEL, 2011) (Merisotis & Phipps, 2000) (Hassanzadeh et al., 2012). It is also important to provide different learning paths (Hassanzadeh et al., 2012), clear evaluation (EFQUEL, 2011), single units for contents (Merisotis & Phipps, 2000), accurate, update and clear contents (ODLQC, 2005) (Hassanzadeh et al., 2012), give sufficient number of contents (Merisotis & Phipps, 2000)(ODLQC, 2005) and useful contents (EFQUEL, 2011) (ODLQC, 2005). Our experience in the field demonstrated that more and more we should include the informal learning in the formal contexts.

The features related to the institutional dimension include the incentives given by the institution for innovation (Merisotis & Phipps, 2000), the ability to offer a variety of ways to communicate with students, to have a good management of the course and complains (Merisotis & Phipps, 2000) (EFQUEL, 2011) to provide information about the course (Merisotis & Phipps, 2000) (ODLQC, 2005)(EFQUEL, 2011) and the global evaluation of the course (EFQUEL, 2011).

The Reliability in the Garvin's Quality Dimensions (Garvin, 1987) refers to the probability of malfunctioning or failing within a specified period of time. This element is more related to the physical structure of the system, the technical dimension identified by Peres et. al (Peres, et. al, 2005) but can also be applied to the pedagogical and institutional dimension, considering the probability of their services to fail. The e-learning success model (Lee-Post, 2009) also refers, in the group "service quality", to the importance of maintaining the availability of the system. Donabedian (1980, quoted in (Ehlers & Pawlowski, 2006)mentions this aspect as the availability or capability of the technological infrastructure.

The conformance relates to the degree to which the design and operating characteristics of a product meet specifications and establish standards.

Related to the technical dimension it is important to evaluate if the digital environment

follows the rules of Interface and if it is user friendly. Constantine (Constantine, 1994) presented a summary of the main principles related to the usability: structure (objectively organize the interface, with significance and utility); simplicity (communicate in a simply way); visibility (maintain all options visible when they are necessary); feedback (keep the users informed with the tasks); tolerance (make available the option to "undo" an operation; re-use (reduce the necessity to memorizing information) (Constantine, 1994). It is important to guarantee that the system is easy to use, easy to access, user friendly (EFQUEL, 2011) (Hassanzadeh et al., 2012) and adequate to the target group (EFQUEL, 2011).

Concerning the pedagogical dimension it is important to guarantee that it has followed a pedagogical design (EFQUEL, 2011)(ODLQC, 2005) (Hassanzadeh et al., 2012), that there is an adjusted evaluation (Merisotis & Phipps, 2000) (Hassanzadeh et al., 2012) and adequate evaluation (Merisotis & Phipps, 2000)methods (Merisotis & Phipps, 2000) (EFQUEL, 2011). It is also important to measure if the blended online methods are adequate and meet the needs of learning (EFQUEL, 2011) and if the workload and schedule are consistent with curriculum of the learning objectives (EFQUEL, 2011) (Merisotis & Phipps, 2000) (Hassanzadeh et al., 2012). It is also important to guarantee that all tasks and activities are coherent with learning objectives (EFQUEL, 2011and the assessment is aligned with learning objectives as well (EFQUEL, 2011) (ODLQC, 2005). Peres et. al. (2005) underline the importance of the alignment between learning objectives, learning strategies and the evaluation process. In the same perspective Ghalayini & El-Khalili (El-Ghalayini & El-Khalili, 2011) suggest the alignment between the objectives, the contents and the level of interactions. Both authors recommend a specific type of technologies in order to get this alignment. Donabedian (1980, quoted in (Ehlers & Pawlowski, 2006)) refers the learning process (process quality), which includes the interaction of learners and desired training goals. Ehlers adds to the quality field the aspect of collaboration. Collaboration can take many forms and its value can vary a lot. According to Peres and Pimenta (ref) the highest objective level the more important is the inclusion of collaboration elements. These concerns are closely related to the pedagogical dimension. In order to get this alignment, it is important to clearly define the learning objectives. Differences in learning outcomes for online education, in comparison to face-to-face traditional education have been subject of attention. According to Cação (Cação, 2009), the literature has pacifically accepted that the learning outcomes for online education are equal or superior to those of face-to-face instruction. It is important to classify all the learning objectives using a specific model or taxonomy. Still related to conformance (El-Ghalayini & El-Khalili, 2011) underline the importance of evaluating the format used to present information, the interaction level and the collaboration type. Redeker's taxonomy classifies learning objects into three types: (1) Receptive: where the learner is consuming information, mainly reading texts, graphics and multi-media; (2) Internally interactive: where the learner interacts with the

learning objects using text based, multi-modal and immersive environments; (3) Cooperative: where the learner is required to perform communicative activities with other learners – Asyncronous and assyncronous (Redeker 2003).

Concerning the institutional dimension it is important to guarantee that all pre-requisites are defined for those who want to enroll in the course and follow the ethical rules (ODL).

The Durability refers to the measure of a product's life. Technically, durability is the amount of use that one gets from a product before it physically deteriorates. It refers to the durability of the version of the LMS, the number of times we need to install a new version. The price of constantly changing a LMS is high and sometimes it requires new hardware. Moreover, one needs to produce new manuals and to prepare tutorials to train tutors and professors, etc. The feature is also referred in the MELSS model (Hassanzadeh et al., 2012).

The serviceability is related to the speed, competence and time of repairing eventual crash (technical dimension). It is important to react quickly when a service or product is broken in order to restore the system. A quick response can become critical in certain circumstances. As it refers to the ability to restore the system, it is more related to the technical dimension. This feature is referred in the MELSS model by maintenance.

The aesthetics feature refers to a more personal opinion about a product or service such as the look, the feel, the sound, the taste or the smell. It is a matter of personal judgment and a reflection of individual preferences. It is related to personal learning environment and here we evaluate the flexibility of students to personalize their learning environment. Zhang and Wang (Zhang & Wang, 2005) refer to these elements considering the web site utilization and flexibility offered. The reflection on the personalization of the learning environment leads us to the learning styles concepts. It is also important to offer different kinds of material on the same subject and different learning paths in order to get a more diversified and adaptive learning environment. This feature is referred in the MELSS model by attractiveness.

The last feature referred by Garvin (Garvin, 1987) is the Perceived quality. The perceived quality refers how quality is viewed by a customer, client or student. As stated by Hassanzadeh, 2012 (Hassanzadeh et al., 2012) a higher user satisfaction leads to an increasing success of e-learning systems. All features referred above influence the student's perception of the quality system. As stated by XX in the D&M model, the technical, pedagogical and institutional systems quality influence the intention to use the learning environment, through the indirect effect on user satisfaction. According to Hassanzadeh (Hassanzadeh et al., 2012) user satisfaction leads to achieve users' personal and educational goals. When a user of an e-learning system is more satisfied, the loyalty to the system will increase. In addition to the possibility of him/her intention to use the system for the future

periods, he/she might suggest it to others. Product evaluation measures the learners' degree of satisfaction, teaching effectiveness, learning effectiveness, and any other possible additional outcomes.

Peres and Pimenta (Peres & Pimenta, 2009) refer the motivation as an important feature in order to get students involved in the system. In a training situation, motivation can be seen as a force that influences enthusiasm about the program, a stimulus that leads participants to learn, attempt to follow the program and a strength that influences the use of newly acquired knowledge and skills (Noe & Schmitt, 1986). In order to know the behavior of a student after a course we can use the Kirkpatrick mode (Kirkpatrick & Kirkpatrick, 2006) that tries to determine the answer to the following questions: Reaction or satisfaction: Did the learners like the training? Learning: Did the learners learn the contents? Impact: Did the learners apply the learning in their work contexts? Results: Did the training have impact in the learners business? We can also include the Phillips and Stone (2002) and consider the evaluation of the ROI (return of investment) looking for the answer to the question: "Was the investment worth it?" According to the e-learning success model (Lee-Post, 2009), in order to measure the user satisfaction, it is important to evaluate the overall satisfaction, enjoyable experience, overall success, the probability to recommend to others. It is also important to measure the level of time saving, academic success, isolation and technology dependence. According to our experience in a specific b-learning context it is also important to determine the perception of students related to the workload and the number of face to face and synchronous sessions.

The MELLS model refers the importance of determining the user satisfaction, its perception of usefulness, its satisfaction with the system. They underline the importance of keeping the user pleased with the system and providing education needs to users, achieving education and personal goals. The users should benefit from the system (effect in learning, increase knowledge, self-confidence, cost-saving, time saving) in order to get a system loyalty (Hassanzadeh et al., 2012).

Evaluation of the quality and success of a b-learning environment

Taking into account the categories identified (Garvin, 1987), as well as the topics for each category and the indicators of measurement, we were able to develop a framework and adapt it to the specific context of the b-learning environment. Our experience in teaching/learning in this kind of context facilitated a better analysis and the selection of the main elements that should be considered when measuring a b-learning environment. We use the eight Garvin's elements to identify the main issues to evaluate and crossed them with the technical, pedagogical and institutional categories forming a matrix (see table 1). Then, for each element crossed with a factor, we identified indicators related to the b-learning system. Some resulted from our research work while others derived from our experience in the field. As we believe that a quality product results in a success product we use the elements identified in quality models and the elements identified in success models that fit a b-learning environment. We took special attention to the elements related to the products instead of to the process. Table 1 and 2 summarizes the result obtained.

Table 1 Objective Elements to measure the success of a b-learning environment

Quality Indicator	Technical	Pedagogical	Institutional
Performance	System speed Speed of provide support	Timely Tutoring Useful Tutoring	Provide guidance service Speed of provide service
Feature	Interactivity Personalization Security Functions and menus Support	Communication features Clear learning objectives Contents Adjusted to Learning Styles Active Learning Different learning path Accurate of contents Updated contents Clear contents Useful contents	Incentive for innovation Variety of ways to communicate with students Management Course and complaints Course Information Evaluation of the course

		Organized contents Single units of contents Sufficient number of contents Clear evaluation Informal Learning	
Reliability	Probability to fail	Probability to fail	Probability to fail
Conformance	Easy access Easy use User friendly Adequate to the target group	Pedagogical design Blended Methodology is adequate Workload and Schedule Course Evaluation Method Learning Activities are coherent with Learning Objectives Assessment is aligned with LO Tools are based on Learning Outcomes Adjusted Evaluation	Pre-requisites Ethic
Durability	Durability		
Serviceability	Maintenance		

Table 2 Subjective elements to evaluate the success of a b-learning environment

Indicator	Technical	Pedagogical	Institutional
Aesthetic	Attractiveness		

Perceived of quality	User satisfaction Use the system	Achieving Goals Perceive usefulness Improving performance Effective learning Workload demanded Number of face to face sessions Number of synchronous sessions	User satisfaction Use the system
General	Cost-saving Time-saving Suggest use the system Tendency to use the system		

Case Study

In order to test and validate the framework developed, we applied it to the post-graduation in communication technology and business innovation that is offered in a b-learning environment at the School of Accountancy and Administration of Porto, which belongs to the Polytechnic Institute of Porto (Portugal). The main objectives of the course are: Use the web technologies in internal and external communication processes of an organization; Plan and implement e-learning and e-commerce systems; Plan and implement a communication system and technology project;

This course is supported in the Moodle platform. The structure of the course is as follows: The course takes one academic year and has 10 units. Every unit runs for 6 weeks. After the 1st curricular unit starts, 3 weeks later, the 2nd one starts. This means that there are always 2 curricular units running together but at different stages. According to this structure, the student only has to concentrate and dedicate his / her time to 2 units at the same time. This allows him / her to better control his / her time, concentration and effort. Also during these 6 weeks the students have 3 face to face contacts with the teacher and other colleagues: one at the beginning of the unit, the 2nd one in the middle of the 6 weeks and the last one at the end. Usually in the 2nd face to face contact, teachers invite speakers to talk about new topics / ideas. The last face to face contact is used for evaluation. Throughout the

course, in each unit, there are at least 8 synchronous sessions with technology such as BigBlueButton, Skype, AnyMeeting or Hangout. The platform common to all teachers is the Moodle. Then, each teacher can additionally use other tools, usually freely available in the internet. This course has already had 4 editions, there are now about 50 students that have already concluded the course.

Survey

In order to assess the success of the course taking into consideration the subjective elements of the framework developed (table 2), a questionnaire was prepared and delivered to students. This tool had 2 parts: the first part contained biographical questions while the second one comprised questions encompassing aspects related to the technical, pedagogical and institutional dimensions. The questionnaire ended with a question about the student' overall opinion about the course. The questions for each dimension were:

Technical dimension	Pedagogical dimension	Institutional dimension	Overall opinion
Did you like the interface of the technical structure? Were you satisfied with the technical infrastructure? Did you really use the technical system?	Did you get your personal and professional goals with the course? Do you think that the competences that you got were useful? Did you improve your performance in your workplace? Did you learn effectively with the course?	Were you satisfied with the institutional support? Did you ask for institutional help with the system?	Were you satisfied on what you got related to the cost-saving? Were you satisfied on what you got related to the Time-saving? Would you suggest the use of the system/course to others? Would you have the tendency to use a b-learning system again? Was the workload demanded appropriated? Was the number of

			face to face sessions appropriated? Was the number of synchronous sessions appropriated

For the second part of the questionnaire we used a 5 points scale. It was administered at the middle of 2014. Below we present results.

Results Obtained

For the technical dimension, generally speaking students like the interface of the technical structure. Their answers were distributed between the "I like it very much" and "I totally like it". Just one student says he likes moderately the interface. When asked about the satisfaction concerning the technical structure, answers were distributed between "I like it very much" and "I totally like it". These answers show us that students were generally satisfied with the technical infrastructure. There were no major problems or concerns about it. These opinions reflect the real experience students had with the system. According to the results, students did use the system very often. This is not a surprise since the course was offered at distance and there were at least 8 synchronous sessions for every unit. Although not all students attended those sessions synchronously, teachers always used tools allowing the record of the session so those that could not attend it would have the dialogue and access to all the materials presented during the session later.

As for the pedagogical dimension, the figure below synthetizes the most important results.

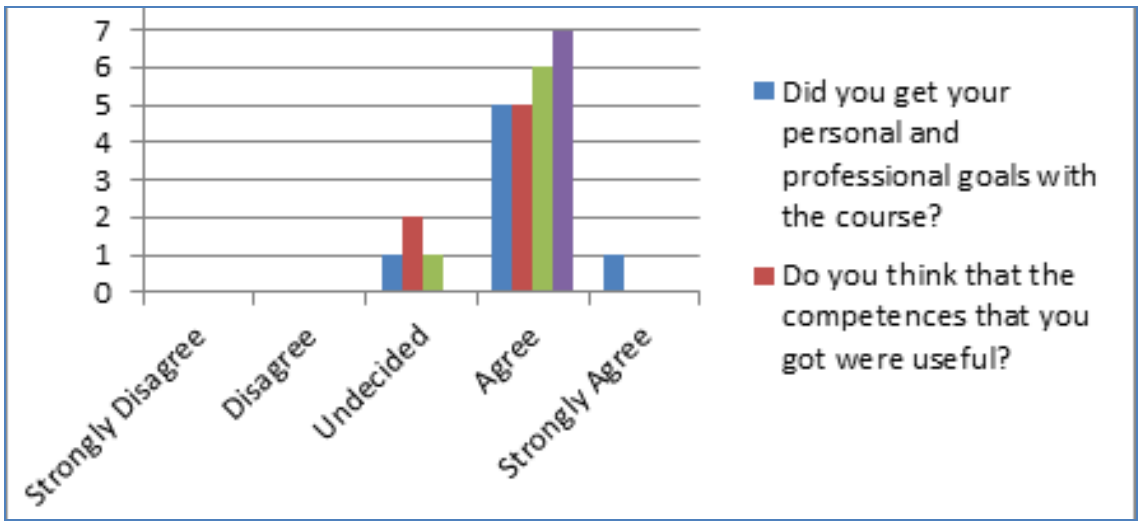

Figure 7 Pedagogical Dimension

Results show a positive attitude towards the learning process and outcomes. Generally speaking, the majority of students agree that their personal and professional goals were met and one of them even states there was a high impact (strongly agree). Just one student is not sure about having met his / her goals. As for the usefulness of the competences developed, the majority agrees that they are useful while 2 respondents are not sure yet. We also asked about the impact of the course in the workplace. Here, the majority answered they agree that there was some kind of improvement while one student state is not sure about it. Finally, all students agree that they effectively learn with this course and methodology used. These answers show that students were satisfied with the results. Learning at distance is a good solution. Results can be effective,

Finally, for the institutional dimension, we asked if students were satisfied with the institutional support. According to the results obtained, respondents are satisfied. Just one student says he / she is not satisfied with it. When inquired if they have asked for institutional support, none of them says “never”. These students have asked for support and they know how it works and what kind of answer and help they can get.

Finally we asked the overall opinion of students concerning the course.

As for the relation between cost-benefit, students are not sure about the result yet. The majority of the respondents opted for the answer in the middle. Concerning the time saving, answers are more positive. In fact, the majority of them say that this kind of solution helps to save time. Just one student disagrees with this perspective. The majority of the respondents would recommend this course to others. As far as the workload is concerned, the majority of students agree that this was appropriate (whether some agree and some totally agree and one is undecided). Just one does not agree with the adequacy of the workload. Of course the workload varies according to the unit being delivered and there might be units demanding more work from each student than other units. Finally as for the number of face to face sessions and those synchronous, the reaction of students is positive, and sometimes very positive.

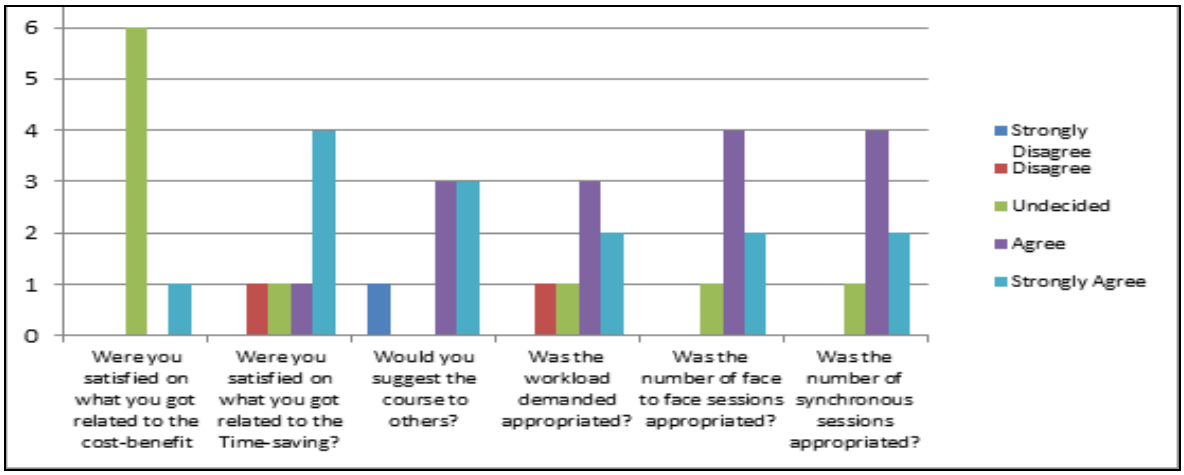

Figure 8 Overall opinion about the course

We also asked if they would use the b-learning system again and all of them said yes.

Additionally, we interviewed the coordinator of the course taking into consideration the indicators mentioned in table 1. According to her, the promotion of informal learning seems to be the major gap concerning the pedagogical dimension. As for the technical dimension it seems to be important to create service guidance in order to help students to interact with the institution. Concerning the institutional dimension, in order to improve the service and be excellent, the institution needs to promote mechanisms to increase the speed of the service offer and some kind of incentive to innovation. In order to reduce failure of services, the institution needs to provide specific training of staff, since this is a course that does not fit the same rule as the traditional ones. Related to the pre-requisites plus the existence of technical pre-requisites, the coordinator stated that the institution needs to spread the cognitive pre-requisites in order to support the decision of those who want to enrol in the course. As for the pedagogical dimension is it important to create a mechanism that makes sure that all teachers provide a timely tutoring. The coordinator also refers that sometimes students claim that the tutoring is not on time. To solve this, it is foreseen to offer training to teachers in the context of tutoring systems in order to make the tutorial really useful. As the most learning contents were adapted from the traditional classroom, they do not include the elements in order to meet the different learning styles, learning paths. Furthermore, some of them are not as accurate as desired. Additionally, the organization of contents is not all fitted for an online environment or / and are not in a sufficient number. She also refers that in this kind of environment the number of contents should be less, when compared to the number of a traditional classroom. This scenario enhances the importance of preparing teachers on how to develop online contents (creation and organization) and the lack of pedagogical training for online environment. Concerning the technical dimension, the

Moodle revealed to be a good platform but it is also necessary to offer training on how to adapt the Moodle platform to a specific learning context (interface and ad-ons).

Final Remarks and Future work

More and more institutions are offering courses at distance. This might be a good solution to overcome some difficulties (e.g. time and distance) but it is necessary to promote a reflection about the quality of these practices as well as of the b-learning product offered. Moreover, the success of a course also depends on the expectations of students and in the ability of the educational institution to meet them. These may concern the technical, pedagogical or institutional dimension. According to the students' point of view, they were satisfied with the technical infra-structure used. Concerning pedagogical aspects they considered that the return of investment in the course was worth it. Most of them were satisfied with the institutional support. In a global view, they were satisfied with the course and have tendency to use again a b-learning system. Nevertheless, the analysis of the questionnaires revealed the importance to reflect on the balance between the workload, the time saving and cost-benefit in order to make the course really worth it. Furthermore, it was also expressed by the coordinator, the need for specific training of those teachers that will work in this online environment. What teachers usually do is to adapt the content for face to face classes and place them online, which is obviously not enough or adequate. This is a not a finished project since results show that there are areas for improvement. However the framework developed helped to identify the areas to be analysed and reflected upon. Moreover, this is also a research in progress since the next step is to inquire teachers and then cross the information to identify other aspects for improvement. One cannot forget that teachers, in this particular situation also might operate as customers, especially of a system (technical aspect), although they are those providing the pedagogical dimension. Both student and teachers depend on the institutional aspect which sometimes none of them can change.

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The Model for Transition of Traditional Lectures to Online Open Educational Resources

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Abstract

There are many technologies used to transfer various aspects of teaching and learning to virtual learning environments, still video remains the closest thing technology has got to classroom face to face teaching. Nevertheless, existing solutions are too complicated or too expensive and this prevents wide adoption of lecture recording at Universities.

We are aiming to develop a simple and cost effective solution that could be easily installed in any classroom and could provide live streaming and recording of lectures without intervening to teachers' pedagogical scenario. We have been experimenting with different solutions for more than 10 years and implemented several research projects where our own system of Video lectures was developed and deployed at a national scale, so we have strong capacity to identify weaknesses of existing technological solutions and possibilities to build upon advantages of several open source and commercial products.

Currently implemented lecture capturing models are usually involving either specially trained teachers or assistance of technical staff. Recent advancements in video communication and capture technologies can enable automatic lecture capturing from traditional auditoriums without the need for teachers' training or technical assistance. Another important issue is integration with other information systems so all the records would be automatically amended with available metadata and published as open educational resources. The paper presents a prototype implementation of this kind of solution at Kaunas University of Technology and examines potential problems to be solved in

institution-wide adoption.

Keywords: lecture capturing, video recording, open educational resources.

Introduction

Scenarios for traditional lectures, workshops, seminars or other face-to-face trainings have evolved during decades and proved to be effective in knowledge transfer and learning process. Rapid development of information technologies and broadband Internet services creates new possibilities to communicate on-line and to transform physical meetings in many ways. There are many technologies used to transfer various aspects of teaching and learning to virtual learning environments, still video remains the closest distance education has got to face-to-face teaching (Carvalho, C., 2000). The most advanced technology for synchronous communication that allows two way video and audio interactions is videoconferences. S. Whittaker and B. O'Connail show in their work that video supports visible behaviour and supplies important non-verbal information. It also provides visible environmental information, specifically on the availability of other people, which in turn facilitates initiation of spontaneous interactions (1997). Video conference technologies has been used for few decades as an alternative for physical meetings in lecture delivery but it requires special preparation and usually has limitations to number of participants. Internet broadcasts and video on demand technologies allowed extending auditorium of participants making it possible lecture recording and streaming to virtually unlimited number of learners. Nevertheless, existing solutions are too complicated or too expensive and this prevents wide adoption of lecture recording at Universities.

We have gone through different stages of technological development here in Lithuania and have been experimenting with different solutions for more than 10 years. In this paper we present our experience, some of the findings as well as the future plans in adopting large-scale cost effective lecture capture solutions in Kaunas University of Technology and Lithuanian Distance Education Network.

Development of Distance Education in Lithuania

Development of DE in Lithuania has started with the PHARE programme “Multi-country cooperation in distance education” (1995-1999) where two distance education centres established at major Lithuanian universities, and three study support centres in other main institutions of higher education.

After implementing the PHARE programme, the Lithuanian investment programme “Development of Distance Education Network in Lithuania” was started in 1998. The Lithuanian Distance Education Network - LieDM was founded alongside the program "Information Technologies for Higher Education and Science – ITMIS (2001-2006)". After the 2006, further development of LieDM has been coordinated under the Lithuanian Education and Science Ministry programmes “Lithuanian Virtual University – LVU (2007-2012)” and “Lithuanian Information Infrastructure for Science and Studies – LITMIS (2013-2019). As a result of those programs LieDM has evolved as a network of more than 60 educational institutions connected with modern communication technologies and providing following services:

- organising of video conferences,
- broadcasting of video lectures and presentations,
- hosting and administration of learning management systems,
- developing of e-learning courses and implementing of various e-learning solutions,
- providing with technological and methodological consultations regarding e-learning implementation.

Figure 1. Lithuanian Distance Education Network LieDM

Initial Infrastructure for Videoconferences and its Recording

LieDM has been started as a videoconference network and has evolved gradually introducing other technologies such as live webcasts, video on demand, learning management systems, etc. LieDM videoconference infrastructure was implemented using IP H.323 standard that allowed utilising existing communication channels of Lithuanian Academic and Research Network LITNET. Initially infrastructure solutions for multipoint videoconferences required expensive MCU server (Tandberg MPS800) and other supporting servers (see picture bellow) as well as costly endpoints hardware. This infrastructure was capable to support up to 100 parallel connections from H.323 endpoints in standard definition (SD) quality.

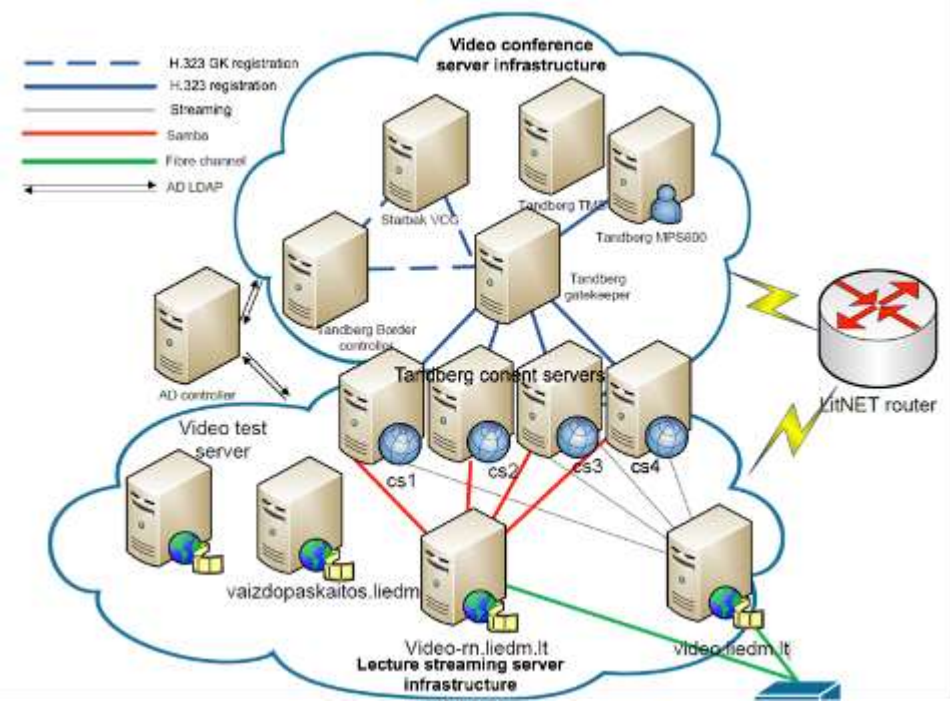

Figure 2. H.323 videoconference and streaming server infrastructure

There were four Tandberg Content Servers dedicated for recording of videoconferences, still the solution with Content Servers wasn't very reliable and playback or the records was not compatible with all popular browsers.

Extending Videoconferences with Lecture Recording and Web-Conferencing Systems

Thought having this powerful infrastructure was more than enough to connect all available endpoints, evolving technologies has influenced users' behaviour and raised demands for more personalised learning solutions. Thus, alongside with videoconference infrastructure, lecture broadcasting and recording solution – ViPS system (http://vips.liedm.lt) was developed by Kaunas University of Technology and provided to all LieDM network members. This allowed teachers to broadcast and record lectures from theirs' work places and enabled students to connect to the live lecture or watch it as a video-on-demand.

During the last 10 years ViPS system went through several development phases and has been used for broadcasting of more than 10 thousand lectures and presentations. Gradually ViPS evolved and became the repository of video lectures and presentations were most of the records are available as open educational resources.

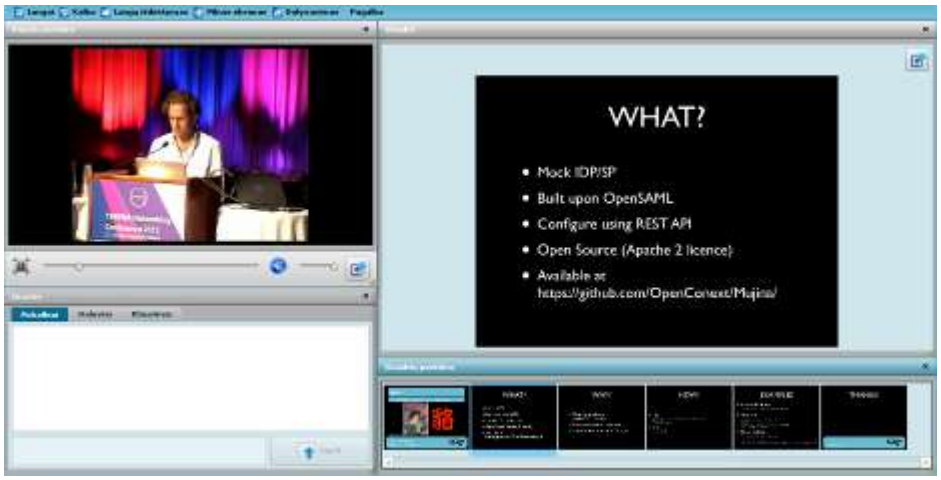

Figure 3. ViPS system user interface

Like in many other web conferencing solutions there is no need for expensive hardware and lectures can be broadcasted from any Internet connected computer with webcam and microphone. Current version of ViPS is based on Flash technology, so live streaming is working only on computers that supports Flash, but records can be converted to HTML5 version and made available on mobile devices without Flash. We are also experimenting with WebRTC technology and considering moving from Flash to WebRTC in the future.

Besides ViPS, there are several web-conferencing systems installed and used in some extent:

- Adobe Connect – used to deliver lectures and seminars, but due to licence limitations it is available to limited number of teachers only.
- BigBlueButton – installed and provided as integrated solution inside Moodle environment, but it is still in the testing phase and doesn't have big adoption yet.
- OpenMeetings – as with BigBlueButton, it is used more for the testing purposes and is not widely adopted.

The Rise of Desktop Videoconferencing

Recent advancements in video communication technologies gave another push to LieDM infrastructure. Instead of upgrading an old and expensive hardware based legacy system, desktop videoconferencing solution from Vidyo was deployed as a software appliance on the existing virtual server infrastructure at KTU data centre. This opened up possibilities for high-definition (HD) videoconferences from every desktop and mobile device. Vidyo solution is based on Scalable Video Coding that is well suitable to multi-rate users. The advantage of Scalable Video Coding is that the MCU (or other central element) does not need to transcode video anymore, as the video encoding is performed by the end users, so, it need only to redirect network packets, minimizing its processing demands and the network delay (Roesler, V., 2012). Vidyo infrastructure consist of following components:

- VidyoRouter – instead of transcoding at a centralized bottleneck (i.e., the MCU) it directs an optimized video stream to each conference participant. Much cheaper than traditional MCU, one VidyoRouter can handle up to 100 HD participants (Vidyo Lines) and can be extended by installing additional VidyoRouters.
- VidyoPortal – flexible and convenient management of videoconferences via web based interface.
- VidyoReplay – serves up to 15 parallel live webcasts of videoconferences to up to 300 participants as well as records and provides with video on demand.
- VidyoRoom ¯ Hardware based Vidyo system ment for bigger rooms and better quality, it goes with it's own VidyoLine license, so does not occupies VideoLine from the VidyoRouter.
- VidyoRoom SE – Software version of VidyoRoom system that can be installed on generic hardware and has it's own VidyoLine license.
- VidyoDesktop – Software that can be installed from VidyoPortal and can be used for participation in videoconferences.
- VidyoGateway – Gateway for interconnection with H.323 Legacy systems, it helps to resolve addresses when calling from or to H.323 clients and does transcoding of all communication.

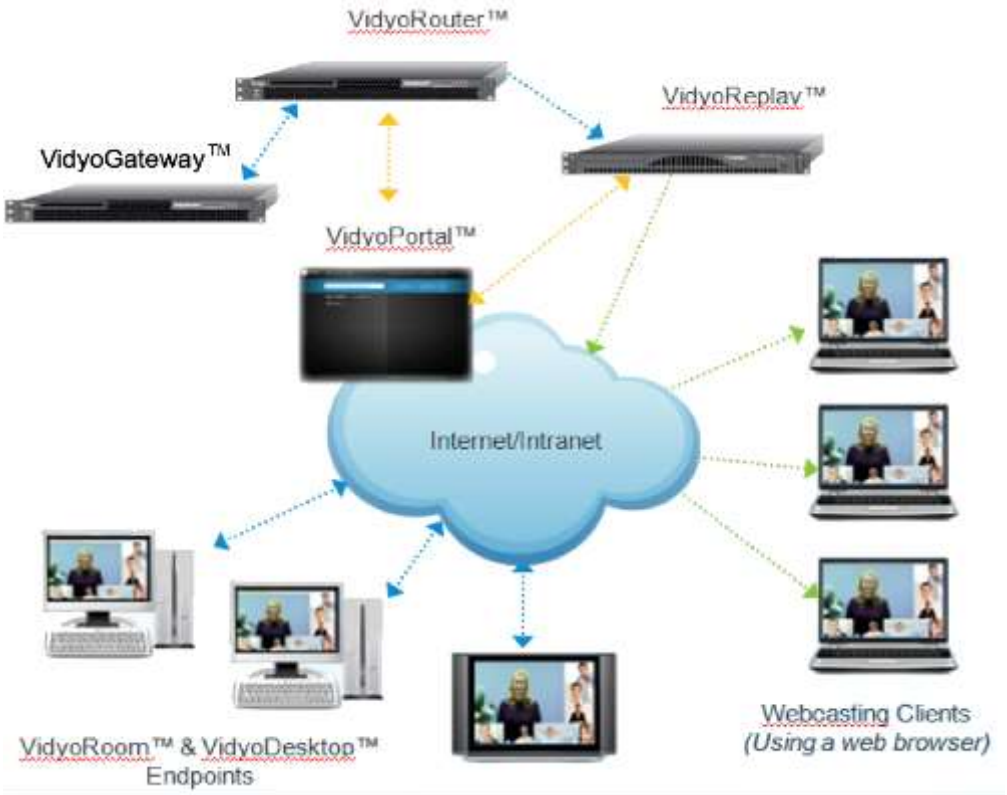

Figure 4. Vidyo infrastructure (from http://blog.vidyo.com/tag/education/)

Any Vidyo user can call directly to another user or can connect with more videoconference participants via virtual room. Each registered Vidyo user has it's own virtual room and can initiate webcast and recording of videoconferences organised in this virtual room.

Lecture recording at Kaunas University of Technology

Presented infrastructure and centrally supported services can be used for implementing different lecture recording scenarios.

We can identify three main models that significantly differ from each other:

1. Delivering lecture from specially equipped videoconference studio with technical assistance;
2. Delivering lecture from own computer;
3. Delivering lecture from any auditorium.

In the table below we summarise solutions that can be used for each of the scenario and describe preconditions needed in order to implement it in real setting.

Table 1. Implementation of defined scenarios with different technologies

	1. Delivering lecture from studio	2. Delivering lecture from own computer	3. Delivering lecture from any auditorium
Equipment	All necessary equipment is already available.	Computer connected to the reliable internet, webcam + microphone with headset or speak.	Computer connected to Internet, good quality camera on tripod, speakers and microphone.
Technology: Legacy H.323	HD codec is available and can be connected to 3 cameras via video Mixer.	There are no H.323 client software for PCs at KTU, but connection could be implemented from VidyoDesktop via Gateway.	If Legacy system is not available, then VidyoDesktop solution could be used by connecting via Gateway.
Technology: ViPS	All technologies are available and different scenarios can be implemented with the assistance of technical staff.	Teacher can deliver lecture from his computer without any assistance.	As in case of own computer teacher may deliver lecture from auditorium without technical assistance.
Technology: Vidyo	VidyoRoom system is available and can be connected to 3 cameras via video Mixer.	Teacher connects to his Virtual room and can initiate web-cast and recording of the lecture. Besides teacher can have remote students connected to his room and also record all the conversations.	Depending on complexity of the scenario teacher may need some assistance. E.g. if it is important to capture view of auditorium, additional cameras can be installed and some moderation might be needed.

The most flexible setup can be implemented with Vidyo solution. One set of equipment (Camera on tripod, computer and microphone), depending on the quality requirements, costs from 2000-5000 Eur. If there is a need to record action in the auditorium from several cameras it is possible to connect additional cameras as separate VidyoDesktop clients joining same virtual room and muting audio (Figure 5). As far as Vidyo allows high resolution screen sharing, it is also possible to use it with Smart board (Figure 6). For deploying solution based on Vidyo, additional VidyoReplay servers might be needed depending on the planned schedule of the recording sessions.

Figure 5. Vidyo record with multiple participants

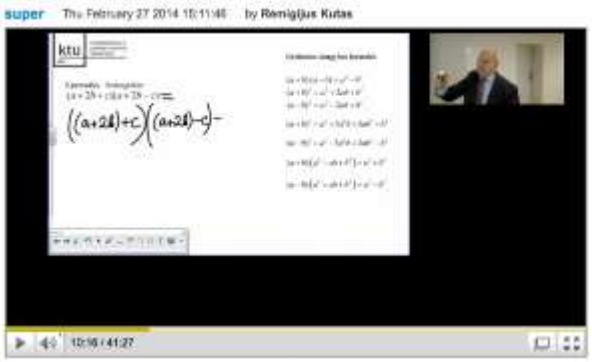

Figure 6. Vidyo record with Smart board

Summary and tasks for the Future

The availability of material at all times of the day fits well with the lifestyle of the modern undergraduate student and may have a positive impact on the value that students extract from their individual private study (Christopher J Andrews, et al., 2010). Currently implemented lecture capturing models are usually involving either specially trained teachers or assistance of technical staff. Recent advancements in video communication and capture technologies can enable automatic lecture capturing from traditional auditoriums without the need for teachers' training or technical assistance. Those cutting edge technologies enables low cost solutions based on generic hardware available for quick deployment in every lecture room, so we can finally envisage blurring the edges between on-campus and distance study programs in the near future.

Still, another important task is integration with other information systems so all the records would be automatically amended with available metadata and made searchable or even published as open educational resources. This becoming possible with ViPS as it was integrated with Moodle recently and soon teachers will be able to initiate ViPS recording straight from Moodle course by saving it to ViPS repository with metadata gathered from the Moodle. Integration of Vidyo is another challenge that involves additional costs as there are

no openly provided API and it should be purchased separately. In conclusion we can state that ViPS integrated to Moodle is a good solution to go for lecture delivery and capture from teachers' personal computer, while Vidyo seems to be a universal solutions for both live videoconferencing and lecture capturing in auditoriums that could be deployed in mass scale at relatively low costs.

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New ways of learning in higher education: the recognition of professional experience. A proposal by UNED.

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Abstract

The recognition of skills acquired through experience is a measure that is being promoted for more than a decade in higher education. Its purpose is to recognize the experience as a way of learning, encouraging professional development of all students, thus contributing to the achievement of the guidelines established in the European and Spanish legislation. Hence the interest in designing this innovative approach in our university system, because although many universities contemplate this proposal in their regulations, it has not been given experiences that support it at a distance university. With this purpose this experience has been developed with 421 students from an Education Degree at UNED, the Spanish distance university, with which we have analyzed their ability of self-assessment of competencies achieved through this learning path. As a result, we confirm the need to address three distinct phases which assess the level of achievement of specific competencies in this degree.

Keywords: higher education, recognition of work experience, validation of learning, competencies

Recognition of prior learning, evolution of a necessary demand

The culture of lifelong education implies the need to recognize the relevance of different learning methods for the personal and professional development of each individual. As a consequence of this approach, we highlight work experience as another method of learning in the educational process, which is not being given as much importance as it should. For a relatively short amount of time, from different European institutions and in different countries in the region, such as Spain, recognition of acquired professional skills acquired through professional experience has been promoted as a learning method both in professional training and higher education. The objective is to validate practical experience, regardless of where it is acquired from, as learning with the same value as learning in formal institutions, which guarantees the professional development of each student, and thus contributes to achieving the objectives of the *Lisbon Summit* (2000). One clear objective contained in this proposal is to promote the idea of lifelong learning, evaluating all training acquired regardless of context and the time it was produced.

Little by little, the process of recognizing learning obtained through non-formal methods and/or informal work at university level is being highlighted as a right of every student, in the same way that it has developed in some European countries for years, such as France that provides this for the majority of professional qualifications. For the last decade, the European Union, among other regions, has shown itself to be very interested in this method of learning (Eurydice, 2013; Werquin, 2010), as its impact can be significant for the operation of the labor market: the validation mechanisms permit greater transparency of capacities available in each professional and help to combine the capacities and work demand, to promote greater transfer of skills between companies and sectors and facilitate mobility in the European work market (COM, 2012, pp. 2-3). In a recent study promoted by Eurydice, it is shown that prior learning includes very valuable knowledge and skills that cannot be ignored nor put to waste.

“However, while higher education institutions are relatively open to recognizing prior formal learning, in particular studies at other higher education institutions, the recognition of prior non-formal and informal learning remains underexploited. In 2012, the EU institutions provided support for further developments in this field, adopting a recommendation on the validation of non-formal and informal learning (COM, 2012). This recommendation covers all sectors of education and training, including the higher education sector, and invites Member States to 'have in place, no later than 2018, in accordance with national circumstances and specificities, and as they deem appropriate, arrangements for the validation of non-formal and informal learning' (COM, 2012)” (Eurydice, 2014, p. 53)

In most European countries students can have their prior non-formal and informal learning recognized and validated towards fulfilment of higher education study requirements, but

there are still countries that they haven't develop this process and their students cannot take into account learning outside formal education settings (Eurydice, 2014). This report shows that most European countries can use prior non-formal or informal learning, but "central authorities generally do not monitor to what extent institutions recognize prior non-formal and informal learning. Therefore, most countries are unable to quantify the proportion of institutions that have implemented relevant procedures. When official statistics or estimates are available, the situation varies from country to country" (Eurydice, 2014, p. 54). In short, most of the European countries have established a legal entitlement to the recognition of prior learning, but the institutional practice in this field is not always monitored, so many students can't use this option. The reality and possibility of opting for this right for recognition of prior acquired learning continues to be a difficult gap to close in our countries.

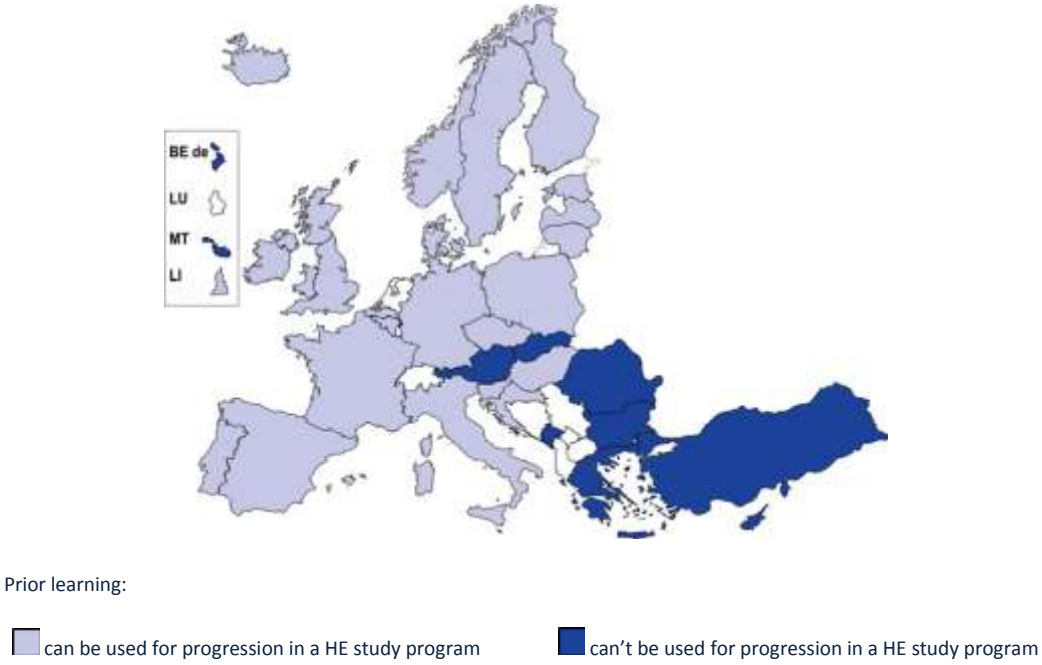


Figure 1. Recognition of prior non-formal and informal learning for progression in higher education studies 2012/13. (Eurydice, 2014, p. 54).

In this line, and in accordance with the European directives, the Spanish university in the University Law 6/2001 of December 21st, (published the 24/12/2001), in article 36 indicated the interest in regulating the conditions to validate work or professional experience for academic effects. This proposal was later developed in Royal Decree 861/2010, of July 2nd (published the 03/07/2010), in the complementary Law 4/2011 of the Sustainable Economy Law, of March 11th (published the 03/07/2010) and in RD 1791/2010, of December 30th

(published the 03/07/2010), which regulates the University Student Statute. Thanks to these standards, our university system finally received different educations options that include

(...) accepting different methods of learning as valid education scenarios with official recognition. This allowed for non formal learning methods (all education activities performed outside the education system) and work experience at the same level as formal education. In this way, the biggest novelty is in adjudicating "evaluation processes in virtue of which it is recognized and certified that a person has certain skills, independently of how, where and when they were acquired" (Medina and Sanz, 2009, 256) (Manzano, Martín-Cuadrado and Ruiz-Corbella, 2012, p. 660).

Based on this legislation, together with the experience gathered in other countries, the Faculty of Education of the UNED created a procedure framework in order to handle the ECTS recognition in the Degree courses through learning acquired in work environments.

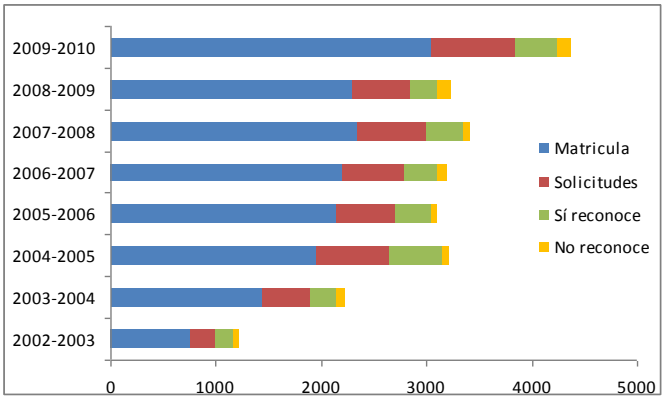
Prior experience in projects for recognition of prior learning in non-formal and informal environments

We must not forget that in the state of Spain there is no experience or solid proposals at university level that help to tackle this validation of learning obtained during experience acquired through work. At this time, we would like to repeat that the option of recognizing credits for professional experience is included in the majority of institutional websites of the various Faculties that teach Degree courses in the area of education. However, they either do not specify the process to be followed, or only specify the documentation to be provided which only requests a certificate from the company worked at.

However, if we review the situation at other education levels, specifically Vocational Training, we can see that there is a recognized experience with great interest that has served as a reference point when designing this process. The Program ACREDITA, promoted by the Government of Spain, evaluates and accredits professional skills that are justified through the information and/or documentation provided by the applicant, analysis of the proof of skills, professional interview, professional skill tests, simulation of professional situations and observation in the place of work, if necessary, with the objective of evaluating skills related to the professional qualification being requested by the applicant (ACREDITA, 2014).

Returning to university level, UNED, in accordance with the existing standards, introduced this new method of recognizing credits to the design of the Degree and Masters courses, permitting the various Faculties to develop the process to be followed. With this option, the Faculty of Education of the UNED, as it already had much experience in recognizing credits acquired through professional experience, created the procedure to facilitate this right to all of our students that comply with the necessary requirements.

The Faculty of Education has the experience of 8 academic years where this option was offered to the internship students of the Diploma in Social Education. In this case, the recognition accredited the practical hours that the students had to carry out in a work center, therefore they only had to perform the theory credits of this courses that were focused on the self-assessment of their own internship work. This experience was carried out from the 2002 - 2003 until 2009 - 2010, when the EHEA studies began. The average number of requests for this partial recognition has increased and, in the last 5 years, reached 500, indicating the high number of professionals and voluntary participants that are studying the Social Educator Degree. In Graph 1 the existing registrations in the Diploma for each of these academic years is shown, as well as the requests for this type of partial recognition in the Internship subject. This experience grew until it was completely consolidated in the curricular design of this subject, which required the teaching team to specify a method of carrying out this Internship subject specially directed towards students with recognized experience.



Graph 1. Data of Experience Recognition in the Diploma of Social Education. UNED. 2002-2010.

The strength of this proposal is focused on the great acceptance that our students showed, as a large number of them came from work and/or volunteering backgrounds in the area of social and educational intervention. For their activity to be recognized meant a clear approach to their practical reality, assessing the connection with their university studies and their professional or voluntary career. This also implied, at that time, the beginning of a

process without precedents in the university environment in the state of Spain.

Among the weakness of this process, it was noted that the professional and volunteering environments could not be assessed in the same way and with the same tools. The experience permitted recognition of said areas such as actions to be considered and evaluated in a different manner, as they imply different roles and tasks in the professional and volunteering areas, as well as a level of commitment that is not comparable. On the other hand, it was clearly seen that, as demonstrated by existing experiences in universities of other countries, this evaluation cannot be carried out exclusively on a series of certificates, as these do not provide sufficient information for an objective and rigorous assessment of the level of achievement of each skill. There is an obligatory requirement for self-assessment by the candidate and a personal interview in order to compare the roles that are theoretically included in the certificates and documentation provided with the learning that is truly acquired.

This experience, together with that obtained in the ACREDITA program for accreditation of evaluators of the learning acquired through non formal and informal methods in Vocational Training (Manzano *et al*., 2012), mentioned above, and the documentation provided by other European universities are the basis of the design that we have proposed for the process of recognizing practical experience in the Social Education Degree. In addition, from the beginning of the implementation of this course, there will be an objective of

(...) opening an evaluation process in order to recognize and certify (accredit), in terms of formal learning, the skills that this worker has acquired during their life, not through initial-formal training, but rather (...) through informal education processes (...) (Medina and Sanz Fernández, 2009, p. 168).

That is to say, to design a "process of identification, evaluation and legitimization of proof of skills that have been obtained through any method of learning, through a comparison with a skill reference (ERA Project, 2004)" (Retortillo, 2011, p. 221). From this proposal, undoubtedly, a response was being made to the establishments of Spanish and European standards in relation to the recognition of this method of learning.

Objectives and design of a proposal for the recognition of professional experience of the social educators

As a starting point, we would like to clarify that we understand the protocol for evaluation and accreditation of the skills acquired through non formal and informal methods as the

entirety of actions and tools directed towards evaluating and recognizing the same based on work experience. The purpose of this protocol is to evaluate the skills that each person possesses through common procedures, methodologies and tools that guarantee the validity, reliability, objectivity and technical rigor of this evaluation. Thanks to this process, recognition was achieved of a maximum of 36 ECTS, in accordance with the establishments of the standard, for 6 subjects in this study plan (Faculty of Education, 2013).

With the purpose of validating this experience, the objective of the action were the following:

- Evaluate the possibilities of recognizing acquired experiences in higher education.
- Create the instruments necessary for evaluation of the experience acquired through work.
- Validate the process and instruments designed for the evaluation of the experience acquired through work.
- Integrate the instruments created in a coherent, objective and rigorous evaluation process.

In this new proposal, the recognition of the professional experience was exclusively focused on the evaluation of the duly justified work activity. This must accredit at least 4500 hours of professional experience carried out in an area related to the skills of this Degree and where at least 30% of the time has been dedicated to one of this professional role over the last 8 years. These basic criteria for the evaluation of the professional experience were determined in collaboration with the General Council of Schools for Social Educators, that supported the validity and objectivity of the criteria used in this analysis.

With regards to the procedure followed in this process, it was organized in 3 phases:

- Phase I, where the student provides the official certificates of their work experience and the employer provides specifications of the roles and tasks carried out.
- Phase II: the students that comply with the criteria established in the notification and that pass Phase I, will create a self-assessment where they will demonstrate, in accordance with the functions and tasks that they performed in their work post, the skills that they developed and the level of achievement of the same. At this time, the student carries out a proposal of subjects to be recognized in accordance with their professional experience and the specific skills of the course.
- Phase III: a personal interview is carried out about the professional career of these students, with the objective of evaluating and contrasting the professional experience with the specific skills developed as a social educator.

Analysis of the experience of the UNED Faculty of Education

This experience was developed during the academic years 2011 - 2012 and 2012 - 2013 in the Degree of Social Education taught by the UNED Faculty of Education. During both years, the same procedure was implemented for the recognition of professional experience and data was collected from the documents requested, the self-assessment and the personal interviews with the participating students. In order to carry out this research, we relied on the research model based on the qualitative paradigm, focused on descriptive aspects, particularly through content analysis (Basoredo, 2010). Using the data obtained, we intend to extract valid inferences in order to consolidate the procedure designed for this type of credit recognition.

First of all, we must note that in both notifications that have been carried out, participation has not reached 30% of registrations in the Degree. Although the number is low, 199 applications the first year and 176 the second, it does indicate that we are facing a group that is demanding a right on the one hand, and on the other, that meets the necessary conditions to make this way of learning possible. We must clarify that in this first experience we have exclusively focused on the recognition of learning through work experience, not including experience acquired through volunteering, as this acquisition trial requires a different process.

The study population that we worked with are all students of the Social Education Degree of 2 academic years that have requested recognition of their professional experience (table 1).

Table 1. Number of students of the Social Education Degree (UNED) and number of applications for credit recognition through professional experience.

Term	No. of students	Submitted applications
2011 – 2012	7,988	199
2012 - 2013	7,900	222
Total		421

The type of student that has requested recognition responds to a professional that has been working for an average of 6 years in a specific area of social and educational intervention, among which we can highlight the sector of care for families and minors, adolescents and young people at risk of social exclusion, both in private and public areas. They are employees that carry out roles and tasks that are characteristic of this Degree, although the title under which they were contracted is not ideal. In the majority of cases, these studies must be

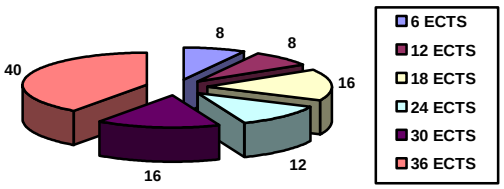
completed as a requirement to continue and/or maintain their work post, and even to change category, principally to be able to move from "caregivers" to "educators".

Logically, not all applications pass through the 3 phases of the process with the main reasons for rejection in Phase I being not achieving the minimum hours established (in this sector it is normal to see contracts per project, therefore the duration of each contract is greatly atomized), the activity performed does not correspond to the skills and functions of a social educator, or the documentation requested is simply not delivered or not delivered in full. In Phases II and III, the limited capacity of self-assessment and of the theory-practical relation are notable, which implies that they do not know how to present a proposal that is coherent between roles performed and skills of the course, nor how to relate subjects of the course with the roles developed.

In the first year of this experience, 30% of the requests obtained recognition of at least 1 subject, whereas in the second year this figure rose to 56%. This is due to the fact that on the second occasion there were much more specific details for the criteria required to opt for recognition (although they were explicitly described in both notifications), therefore the students that presented in the second year had more adequate proposals. All elements are required to show that it is not a simple administrative procedure, as in the case of validations between subjects, which requires greater involvement of the student in the entire process. This avoided the high percentage of desertion that occurred in the first edition.

With respect to the average number of credits recognized, in the majority of cases it was 36 ECTS, as shown in graph 2, mainly coinciding with the recognition of subjects in the Professional Practice area of this degree, with a weight of 30 ECTS, together with an optional subject related to the area of activity. This coincides with the professional origin of the majority of our students, which shows that the professionals linked to the sector of care for families and minors, adolescents and young people at risk of social exclusion.

We can also highlight the high percentage of subjects not recognized, despite being requested, as the students did not know how to justify the relation between the skills of the subject requested and the roles performed in a coherent manner. In the majority of cases this is due to the fact that they occasionally focus exclusively on subjects considered by the students to be difficult, such as "Statistics applied to Education", or limit themselves to the subjects they need in order to finish the Degree, independently of whether they are in accordance with the skills they have acquired during their professional experience or not. In other cases, it is derived from a deficient capacity of analyzing their own work, of relating theory and practice, of seeking connections between the knowledge and skills that they have acquired during their professional experience and the knowledge and skills given to them by the Degree studies.



Graph 2. Percentage of ECTS credits recognized

Preliminary conclusions

The experience that has been carried out in both notifications implemented has been very positive, which leads us to guarantee this procedure and propose continuity. Both the team of teachers that worked on this project and the students themselves confirm its viability, relevance and rigor in the procedure used and the results obtained. The process designed allows us to affirm that the recognition of the experience acquired through work experience, supported only with the work experience certificate and the certificate from the employee, does not at all guarantee that the specific skills of the course have been acquired. The proposal for a second and third phase that request a motivated self-assessment, a proposal for subjects justified by the roles performed and the skills acquired and the interview show that many of the students do not know how to reflect on their own work, nor identify the level of achievement of their skills, or to relate roles, tasks and skills by suggesting proposals for subject recognition that are coherent with their knowledge. Thus, although they are part of the work environment, that experience cannot be recognized due to the lack of skills that guarantee their positions as future professionals. This is, without a doubt, the learning provided to them by this course and the relevant task developed by the education in these university institutions. This provides validity to develop this proposal and to continue improving the global process and the different phases contained therein.

The fact that there is a limited number of candidates, taking into account the number of students registered in the course, leads us to continue to propose a *numerus clausus* of no more than 150 applications for each notification, in such a manner that each student can be assisted with rigor and quality over the three phases, a process that implies personalized attention for each student over a period of at least 4 months. As this is an annual notification, and can only be requested once during the studies, it implies that the student may study and analyze their situation from the beginning of the Degree and present their application at the correct time, with a greater chance of success.

Among the weaknesses highlighted, we note the vision of the administrative procedure shown by some students, as we have already mentioned, which leads to a deficient development of their proposal. On the other hand, the lack of capacity to relate theory and practice is significant, which leads us to affirm that in many cases, despite having ample experience, the study of a higher education course is the element which will bring them closer to the meaning and sense of their work, to study the different theories that support their decisions, to handle different methodologies, resources, instruments, etc. that will help them to perform their task with solid criteria, etc. That is to say, to know how to reflect on their own work, which will undoubtedly lead to professional improvements.

Another point of interest is the high number of students that do not know how to create an adequate and complete curriculum vitae. They do not know how to present themselves in a professional environment, how to show the skills that they possible, their level of achievement, the studies completed, etc., despite a long professional experience. Faced with this situation, it is necessary, apart from offering them the steps and criteria needed for its elaboration, to show them how to prepare a CV that is appropriate for a professional, particularly, the Europass, which will allow them to widen their borders and opportunities in the work market. To request the presentation of their CV in this format has helped them to discover how to gather the information that should be presented in professional contexts and to organize it in accordance with the criteria of the current work market, and to self-assess themselves knowing how to show specific and general skills that will help them to open new professional opportunities.

In order to help them surpass these difficulties, we propose the creation of a Guide for the recognition of learning acquired through professional experience so that they can fill in the various documents requested with quality criteria and can be aware of the sense and content of each phase, thus constructing their own professional portfolio. We can also count on the support of COIE (Center for Orientation, Information and Employment) at the university as a guidance center for this procedure.

Another relevant issue detected is that not all subjects can participate in this recognition, given that the skills that they involve do not have an eminently practical dimension. This had led us to analyze and evaluate the specific skills of each subject, in order to detect which ones must be excluded from this process and to specify the same in the notification and which are ideal both at a general level and in relation to each specific area of social and

educational intervention. To be able to specify this information will collaborate with the achievement of greater objectivity, rigor and transparency in the entire process and, particularly, with the identification of the key educational profile of the Degree.

As a future line of work, apart from consolidating this process, we propose considering the recognition of the experience acquired through voluntary work, given the high number of students in this course that collaborate in entities involved in social and educational intervention. For this, we will begin with the proposal of the certificates that must be provided, specifying the content to be included in the same, the process that must be followed and the evaluation criteria that must be set. Logically, the key will also be the reflexive self-assessment on their own practical experience and their relation with the specific skills of the course.

Another point that is attracting our attention is in relation to the generic skills that must be developed during the course. How to evaluate and integrate them to this process is an element that must not be ignored and implies a challenge to be included in these recognition processes.

In summary, without a doubt this proposal suggests giving visibility to that which is learned beyond the formal system, making the most of all learning ways and opportunities (COM, 2012), making their validation possible without losing the requirements and strictness, making the invisible visible, while each person is aware of the important knowledge that they possess and that they can offer to society. If we agree upon lifelong learning, we must attend to all learning scenarios because all interaction spaces provide education. To recognize this education with comparable, transferrable and reliable criteria is the great challenge and opportunity of learning generated in any environment.

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Teach.Learn.anywhere.everywhere. Exploring ubiquity and flexibility in MOOCs through ECO project[21]

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Abstract

The Massive Open Online Courses (MOOCs) offer new opportunities for distance learning. MOOCs are the real phenomenon in distance education (Berge & Muilenburg, 2013, Volkan & Eby, 2014, Losh, 2014, Huggett, 2014). The features are discussed, especially regarding massive, the open, online, and training characters. 10 hubs are designing and carrying out 16 MOOCs in 6 languages. 50,000 teachers have to be involved in this first phase. This process is based on a collaborative partnership of 22 institutions, universities, and companies, for three years. The goals of the project are focusing the design and development of MOOCs with special attention to methodology and platforms, carrying them out in three consecutive editions. The methodology will be based on didactical principles and will be inclusive. Several platforms are being tested and put into practice. In addition, 4,000 teachers have to be involved to design and present their own MOOC starting from their learning in ECO project. According with the project goals, the organisation is supported by six work packages: project management, methodology and pilots specifications, architecture and service integration, service deployment and validation, dissemination and communication, and exploitation, commercialization and marketing. The project description is complemented with a SWOT analysis to evaluate the strengths, weaknesses, opportunities, and threats involved in its development.

Keywords: MOOCs, project, research, design, SWOT analysis.

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[21] ECO Project: Elearning, Communication and Open-data: Massive Mobile, Ubiquitous and Open Learning. Project n. 621127. Competitiveness and Innovation Framework Programme (CIP). CIP-ICT-PSP.2013 Theme 2: Digital content, open data and creativity. Obj 2.3.a: Piloting and showcasing excellence in ICT for learning for all.

1. Introduction

Nowadays, one of the latest trends in educational contexts are new models of education known as Multi Massive Online Open Courses (MOOCs) that provide full access to materials and contents. Stephen Downes and George Siemens coined the term (2008) with a significantly increased spread in recent years.

This approach enables a trend towards an open instruction as alternative or supplement regarding university with the great advantage of having tens of thousands of students working at their own pace in many cases courses from prestigious institutions. This trend has been reinforced by the growth of social networks and mobile devices that promote connectivity and access to information.

From the perspective Horizon Report (Johnson, Adams Becker, Estrada, and Freeman, 2014) application of these new models of education is a challenge described in the report as Difficult Challenges: Those we understand but for which solutions are elusive".

MOOCs are present in discussions related to new trend in education, to the point that some universities recognize credits in MOOCs (Indiana University-Purdue University Indianapolis, and Colorado State University-Global Campus). These universities consider this trend as one advantage and an opportunity to improve their offer and student enrolment.

From an instructional design, there are different types of MOOC (Downes, 2012; Siemens, 2012; Department for Business, Innovation and Skills, 2013), highlighting particularly:

- xMOOC: This type of MOOC refers to university e-learning courses adapted to the structure of MOOC with essential importance of the exhibition and presentation of content. This typology is present on platforms like Coursera, Edx and Udacity.
- cMOOC: This option focus on working on knowledge together in communities from the perspective of connectionist learning (Siemens, 2007; McAuley, Stewart, Cormier, & Siemens, 2010; Downes, op. cit.). The student is the central element in this type of design, so that seems to be the most appropriate pedagogical approach.

In short, from a pedagogical perspective, cMOOCs are based on connectivism (Downes, op. cit.; Hill, 2012) while xMOOCs, which are developed by elite institutions, could be linked to behavioural approaches. The digital storytelling course at the University of Mary Washington is a good example of an effective online course that is organized around the connectionist model that has been adapted into several other contexts.

From the particular perspective of the ECO project: "Elearning, Communication and Open-data: Massive Mobile, Ubiquitous and Open Learning" we try to assess the requirements for MOOC platforms from a pedagogical point of view as well as the creation of a framework for designing and implementing MOOCs from a Design Based Research approach. Therefore, this project provides proposals and improvements in learning environments related with the mentioned trends.

This project focusses on working on the implementation and impact of the MOOC in pedagogical practice through an analysis of the available MOOC platforms, instructional design, the importance learning analytics, Web 2.0 and social media.

2. Theoretical: possibilities of MOOC

MOOCs provide a real chance to work open contents, allowing processes of communication and interaction among participants. Using the network as a tool allows interaction and it provides numerous possibilities regarding information and knowledge.

One essential element that makes MOOCs attractive is related to their ease of access for a large number of users (some could not access otherwise due to different gaps). Provision of free courses and content from prestigious institutions is what has caused an impact that is still being analysed in academic contexts.

Fenn and Raskino point out that we are in the phase of oversizing regarding MOOCs (2008). Cabero, Llorente and Vázquez (2014) emphasize that nowadays, universities want to have their MOOCs, Higher Education Institutions organize conferences on this subject and scientific journals publish special issues related to MOOCs.

In this context, higher education institutions are looking for new opportunities to improve their educational quality. However, the main problem in these practices is that very few students' finish MOOCs, some educators are concerned about the low completion rates of MOOCs' (between 5-16%). There is an increasing need to evaluate models and determine the best way to support collaboration, interaction and evaluation in these practices. Taking advantage of new technologies is not enough; new models need to use these tools and services to engage students on a deeper level (Johnson, Adams Becker, Estrada, & Freeman, op. cit.).

As an example, it is noteworthy that in the fall of 2012, Colorado State University-Global Campus became the first university which offered credits (payment) when they completed a MOOC. One year later, this university reported that not a single student had taken advantage of this program.

One possible answer from the perspective of The Online Education Revolution Drifts Off Course (go.nmc.org / drif) is human support, which may be essential for students to complete their courses (Johnson, Adams Becker, Estrada, & Freeman, op. cit.). Clearly, the human factor is a solution to the problems for several students; however, it remains challenging from an organizational and methodological perspective in real practice.

Moreover, evaluation in MOOC has been criticized for passive approaches and its lack of flexibility in evaluation structure. There are even disadvantages related to peer assessment, due to students prefer to be assessed by a teacher and not by other student (McAuley, Stewart, Cormier, & Siemens, op. cit.).

3. ECO Project: a proposal of solutions and alternatives

3.1 General Framework

ECO project is a European project developed since February 2014 to January 2017. ECO project seeks to document the best practices from the perspective of the types of MOOC, the aforementioned problems and circumstances to consider. From design approaches mentioned above (xMOOCs, cMOOCs) and other generalized principles, it is possible that sMOOCs (social MOOCs) will spread.

This new model will be supplemented with guidelines, materials, patterns and instructional designs that allow pedagogical practice with better development. The basic assumption of this new model for instructional design is the concept networked and ubiquitous learning (sMOOCs) with presence of mobile devices, which are more suitable for a wide range of students in Europe. Moreover, teachers will have more options to design MOOCs, taking the aforementioned innovative educational principles into account.

ECO SMOOCs differ from other MOOCs due to they focus on concepts such as equity, social inclusion, quality, diversity, autonomy and openness. They also offer the opportunity to obtain credits from educational institutions.

Courses proposed by ECO project are inclusive and accessible to the wide diversity of citizens; they allow a spectrum of approaches and contexts. This factors point out to a wide variety of languages, cultures, educational strategies and collaborative technologies. Project development and courses access can be followed in ECO website: www.ecolearning.eu

3.2 ECO Project Objectives

The main objectives of the project are (ECO Project, 2014):

- To analyse requirements for MOOC platforms from a pedagogical viewpoint (Including learning analytics, web 2.0 and other aspects).
- To set up a framework for designing and implementing MOOCs.
- To design the overall ECO platform architecture and integrate all the individual modules building the overall platform.
- To pilot with the ECO platform in the 10 hubs involving at least 50.000 students (teachers from different educational levels).
- To analyse and assess the MOOC market international scenario.
- To develop an appropriate business strategy and business plan for ECO sustainability.
- To increase awareness in Europe on the open educational resources benefits for European citizens and institutions.

Participation of educational institutions in Europe will have a positive impact on the sustainability of the project taking into account the number of new courses that will be generated as a direct result of project activities. 500 new courses are expected to be generated during the project.

Through these MOOCs, there is a step further using interactions in platforms and social media. There are advantages related to combining educational content in a platform with debate, dialogue and sharing through social networks (Facebook, Twitter, YouTube…). In this sense, one main objective is to integrate student in the process of learning by doing, generating content and improving progressively the pedagogical model. MOOCs also have an economic and social goal, due to they can be an essential tool cover gap in the digital divide between different social classes and access to education.

This project aims to attend educational needs identified by citizens. According with Dow descriptions (ECO Project, op. cit.), the identified needs are:

- Understanding the process of changing the paradigm that involves the transformation of society from analogue to digital one.
- Understanding the processes of transformation and changes within the world of education.
- Meeting new methodological approaches and their incorporation of ICT into teaching and learning processes.
- Developing digital literacy skills and a socio-technological and educommunicative perspective.
- Management and acquisition of information and knowledge.
- Connect digital technology with information and knowledge.
- Incorporating digital technologies as research objectives and creation.
- Building learning communities that facilitate the exchange of knowledge and resources.
- Collaborate and participate in the construction process of learning.
- Generate new profiles that respond labour demands.
- Promote entrepreneurship initiatives as a mechanism to adapt and respond to the workplace.

Priority areas for training in ECO are: digital literacy, art and creativity, math and computer science and MOOCs design.

3.3 Work packages (WP)

Starting from project objectives, six work packages (WPs) have been designed in order to fully reach them in an efficient way. The work packages are:

- WP1 Project management.

The objectives of this work package are the general management of the work developed in the project, the support to the leaders in coordinating tasks, and communication improvement among all partners. This implies a continuous and flexible monitoring of all activities and resources to check and evaluate the project progress, the communication with the European Commission, to anticipate risks and to provide appropriate contingency

measures. These indicators ensure the planned task quality and the excellence of deliverables.

- WP2 Methodology and pilots specifications.

The objective of this work package is to analyse the optimal guidelines to organise MOOC platforms from a pedagogical point of view. This includes analysis of the anatomy of a MOOC platform as well as the design of an instructional framework for the implementation of MOOCs. This approach does not require the design of a new MOOC platform but specifications for improvements or new features. It is one of the main objectives of the ECO project. The research methodology will take in account as reference interest groups, language, culture, methodological strategies, and technological specifications reaching an active, autonomous role of learners in the process.

- WP3 Architecture and Service Integration.

This work package will deal with the technical integration of the different modules provided by ECO partners. It will also provide technical support to hubs during the implementation phase, including fine-tuning the platform according to the feedback received. The main WP5 objectives are (ECO Project, op. cit.):

- ✓ To specify individual modules that will constitute the ECO platform.
- ✓ To design the overall ECO platform architecture.
- ✓ To integrate all the individual modules by building the overall platform.
- ✓ To test the overall platform implementation in each pilot/hub.
- ✓ To provide technical support to all the pilots, including fine-tuning the platform according to end users' feedback.
- ✓ To integrate ECO platform with existing social networking technologies

- WP4 Service deployment and validation.

The deployment of services and validation is central to the project. The core of the project is the planning, implementation and support to support the pilot courses at each institution (Hub). Planning includes process design, organization strategies, didactical principles, methodological approaches, and the means to develop the action, engaging users and improving courses to carry out in three editions. The means implementation will be based on teaching teachers and learning for students. The support will involve controlling the process

to ensure resolution of problems and implement improvements. The evaluation of the pilot prototypes will provide the final results. The main objectives of this work package are (ECO Project, op. cit.):

- ✓ Implement 10 large scale pilots in the different hubs involved in the project.
- ✓ Analyse each pilot intermediate results and improve the pilot implementation in the subsequent editions (3 editions during the project duration)
- ✓ Evaluation assessment of the final results of the pilots' implementation.

- WP5 Dissemination and communication.

The main objective of this work package is to increase the impact of the ECO project activities, with particular emphasis on promoting the MOOC use in the European academic community. This work package includes a specific set of activities to ensure the widest dissemination of the project results and greater external visibility and dissemination of the project with special attention to the target groups. The first step towards this aim is the development of a Dissemination Plan with the following activities:

- ✓ Definition of project visual identity and production of project collaterals;
- ✓ Development and maintenance of project website;
- ✓ Project's presence on social networks and relevant online forums, blogger communities;
- ✓ Production and release of project e-newsletters;
- ✓ Contribution to external events and publications;
- ✓ Organisation of project events.

- WP6 Exploitation, commercialization and marketing.

This work package will try to develop marketing strategies, contacting and signing agreements with companies, universities, training services, and educational institutions:

On the one hand, departing from the MOOCs developments outcomes that take place in WP4, to address the iterative work of writing/organizing Business Plans, according the requirements of different investors both from the private and the public sector.

On the other hand, ensuring the sustainability of the services once that the project itself has ended.

The final goal is to make the project solutions (MOOCs platform) are market-ready, being easily transformed in commercial products by the ECO partners.

3.4 Courses

Sixteen courses will be organized throughout the project length:

- ✓ Basics of MOOC design: transversal course, for all publics by all partners
- ✓ E-learning project management
- ✓ Reliability and maintainability
- ✓ Flipped classroom
- ✓ Communication and mobile learning
- ✓ E-learning, open data and mobile technologies
- ✓ MOOC and ubiquitous learning
- ✓ Digital Literacy for socially excluded people
- ✓ Digital Skills and ICT enabling approaches for a successful MOOC
- ✓ Digital literacy (uses of Web 2.0)
- ✓ e-skills for teachers
- ✓ Design, Artistic and Creative skills
- ✓ Geographic Information Systems (GIS)
- ✓ Experimentation with Mathematics
- ✓ Geomatics
- ✓ New environments for learning to learn

3.5 Partners

The project is leaded by the Universidad Nacional de Educación a Distancia and the partners are:

- ✓ Editrain SL
- ✓ Fundação para o Estudo e Desenvolvimento da Região de Aveiro (Fedrave)
- ✓ Fundación Universidad Loyola Andalucía
- ✓ Humance AG
- ✓ Montiel Molina Vicente
- ✓ Open Universiteit Nederland
- ✓ Politecnico di Milano
- ✓ Prisma Vista Digital SL
- ✓ Reimer It Solutions Bv
- ✓ Sunne Hanna Eichler

- ✓ Telefónica Learning Services SL
- ✓ The University of Manchester
- ✓ Universidad de Cantabria
- ✓ Universidad de Oviedo
- ✓ Universidad de Valladolid
- ✓ Universidad de Zaragoza
- ✓ Universidad Manuela Beltrán Fundación
- ✓ Universidad Nacional de Quilmes
- ✓ Universidade Aberta
- ✓ Université Paris III Sorbonne Nouvelle
- ✓ Vereniging Van European Distance Teaching Universities

3.6 Timing

The timing is described in a Gantt chart. The work packages have different lengths according with their tasks and requirements. WP1 (management) and WP5 (communication) last for the whole project. WP2 (didactics) and WP3 (technology) are placed at the beginning, before WP4 (courses), while WP6 (marketing) will be carried out later in the timeline.

- ✓ WP1 Project management.

It will extend its activities during the whole project. Really it has begun before the project, preparing documents and protocols to ask for funds and it will continue after it for the same reasons.

- ✓ WP2 Methodology and pilots specifications.

The didactical methodology and pedagogical pilot specifications are very important in the first phase to support the course design. There are a lot of ways to design a MOOC and the project will be involved in 16 courses. A strong framework is required to assure a good development.

- ✓ WP3 Architecture and Service Integration.

As for the WP4, the architecture and service integration are required to base on them the technical decisions. These decisions will determine the pedagogical possibilities of course designs.

- ✓ WP4 Service deployment and validation.

This part is the project core. The course deployment will allow their validation. Means to monitor and evaluate the experience of the three editions of the MOOCs will be required.

- ✓ WP5 Dissemination and communication.

Dissemination and communication are also permanent activities during the project. Usually, European project promote and disseminate their results and actions. In this case, this work package will be important to enrol learners in the courses.

- ✓ WP6 Exploitation, commercialization and marketing.

Finally, this project will require exploitation, commercialization and marketing to assure the longest continuity of the achievements and results to reach a strong European net of MOOCs.

4. SWOT analysis

The SWOT analysis could help understanding the actual possibilities of ECO Project. Then strengths, weaknesses, opportunities, and threats are going to be analysed.

4.1 Strengths

- ✓ The number of partners offers strong opportunities to join experiences, abilities, and knowledge from different approaches.
- ✓ European projects design is very well evaluated and its development is based on strong monitoring of results.
- ✓ The quality approach designed to assure good results using internal peer review and online strategies to coordinate.
- ✓ The project organization in work packages makes easier management and specialization in tasks.
- ✓ The partners' expertise in MOOC development in previous designs and experiences.

4.2 Weaknesses

- ✓ The number of partners is also a management problem to assure an effective management.
- ✓ Their different sources, as technical / pedagogical perspectives, as universities / companies, could complicate the management.
- ✓ The withdrawal is specially high in distance education and much more in MOOCs.

4.3 Opportunities

- ✓ General context is favourable for MOOC development.
- ✓ Institutions and companies are interested on MOOC design as training strategy.
- ✓ Citizens are asking for curation and support to take advantage in OER.
- ✓ Europeans institutions are developing a general strategy to promote own research and developments, with several projects about MOOCs.
- ✓ Social media offer strong, innovative opportunities to promote and involve learners.
- ✓ The early deadlines to design, promote and organize MOOCs could complicate learners' enrolment.

4.4 Threats

- ✓ The large number of MOOCs offered by a lot of institutions and companies could complicate learners' enrolment.
- ✓ People and specially teachers are usually involved in a lot of tasks and could have very little available free time.

5. Conclusions

The ECO project will develop throughout three years and will involve 22 European and Latin American institutions in 6 work packages. We can establish the four main focusses: organization, communication, methodological, and technological designs. 16 MOOCs will be carried out in 3 stages. The courses will be designed by the participants themselves. The assessment and proposals for improvement will be collected and the courses improved. Real models and platforms for massive open online courses will be analysed to design and experiment a new one. The expected results of this experience will contribute to consolidate

and promote strongly MOOCs in Europe and articulate a culture of collaboration between institutions, universities and companies that support the development of the sector in the coming years. The SWOT analysis highlights the strengths and opportunities are much more and more relevant than weaknesses and threats. Then the project is actually a great opportunity to design a real European strategy based on innovative parameters as in technical as in didactical as in social fields.

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Bridging Math-Gaps with the Learning Environment MUMIE
The European Project S3M2 and the German Math-Bridge course OMB+ for the Enhancement of Student Mobility

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ABSTRACT:
Mobility of students and success in their studies depends critically on the effort needed to change from high-school to university, from bachelor to master, from one country to another, from one social class to another, etc. Web based education offers an opportunity that is particularly suited to bridge these gaps.

In this article we report on a European project aimed at tackling bridging problems of students in Science, Engineering, Technology, Economy and Mathematics at European universities. The main stumbling block is mathematics. For that reason the partners of S3M2 are about to finalize several open and web based math-bridge courses, including a course on mat-lab and octave using a dedicated open source platform called MUMIE.

The educational concept of these courses is highly flexible. It ranges from pure self-study over blended learning, to a situation where the course material is used as complementary to a regular course. It may be supplemented by a virtual or standard tutorial. The material invites to explorative learning. Each module focuses on basic concepts, enhanced by visualizations and refreshing facilities. It involves self-assessment tools and training facilities with automatically corrected home work problems.

The modular content can be easily arranged in various forms. MUMIE comes with a highly developed authoring system and supports the work-flow of students. It allows for statistical evaluation of learning outcome.

The S3M2 courses have been tested and evaluated. The results will be reported.

For more information about the project and the courses see www.s3m2.eu and https://www.mumie-hosting.net/s3m2.

Key Words: student mobility, bridge course, mathematics, programming, MOOC, general mathematics, probability and statistics, numerical analysis, Octave, Matlab, MUMIE

1. Introduction

The high demand for engineers and other professions with mathematical background is a serious problem for many European countries. In Germany for example, for each mechanical or electric engineer looking for a position, there are more than 3 openings. In absolute numbers there are about 60.000 openings for engineers in the monthly average (VDI-IW, 2014). So the formation of highly qualified engineers is of great importance for industrial countries like Germany, the Netherlands and Sweden just to name a few. The situation is different in countries like Spain and Greece where for engineers it is hard to find a position. So for them it is mobility which is important.

Student[22] mobility is severely obstructed by the heterogeneity of educational systems and educational achievement. This heterogeneity is not only posing a mobility problem between different European countries but even within individual countries it is considerable. In Germany for instance the educational system is still very much in the hands of local governments. The result is, that high-school curricula vary from land to land, making it hard for students to move from one place to another and for teachers to teach first year courses. This situation makes the choice of the most appropriate and most promising institution of learning difficult and contributes to a large drop out quota of students in their first year of study for a bachelor or a master. So enhancement of student mobility is a major aspect in the quest of improving education.

At engineering studies deficiencies in mathematical competence are the main obstacle at the transition from bachelor to master and from high-school to university. Most importantly the knowledge of basic facts, the understanding of elementary concepts, and a good command of the toolbox of the basic methods are in many cases not good enough for a

[22] In this article we focus on student mobility albeit the projects we present will facilitate mobility for engineers too.

successful study.

There are many projects trying to alleviate or even overcome these problems based on e-learning and web-based technology. Most of them are only short-lived because of two main reasons: Firstly the setup of sustainable courses of high quality is difficult and expensive. Secondly the infrastructure for sustainability is missing, because - even though running such a course is comparatively cheap - it still needs stable management and support. This is not that easy to achieve in a university environment.

Both projects discussed in this report address the quest for more student mobility in two ways. Firstly by bridging the gap between high-school and university as well as between bachelor and master. Secondly they set a benchmark of what is needed in terms of mathematical competence for a successful study in Economy, Mathematics, Engineering, Natural-Science and Technology STEM (bachelor or master).

The first project *Support for Successful Student Mobility with MUMIE* (S3M2, 2013) is funded by the European Commission in the frame-work of *Lifelong Learning.* It is about three online bridge courses in preparation to master studies and one bridge course in preparation to a bachelor STEM-study. Their main objective is to improve the mathematical core competence of students and thereby reducing the dropout quotas at the transition from bachelor to master as well as from high-school to university on a European level.

The second project is the *Online Mathematical Bridge Course+* (OMB+ 2014). This is a mathematics bridge course specially designed as a preparation to STEM studies (including economy) at a German universities. It has the form of a blended learning remedial course with interactive learning material and a virtual tutorium. Following a widely accepted syllabus (Cosh 2014) it sets a benchmark for what is expected by German universities in terms of mathematical competence.

Web-based education provides a special opportunity for tackling the problems which are at the root of the lack of student mobility since it is available at anytime, anywhere and can be constantly improved and adapted to the special and individual needs of the students. If done well, it invites to explorative learning and thereby invites the learner to do mathematics actively by himself. This is of great importance for successful learning since - paraphrasing Hans Freudenthal (1972) - "Mathematics is not a set of knowledge, it is an activity; you learn it by solving problems, alone or in groups".

The learning management system MUMIE has been specially designed for this kind of learning and teaching. It allows for many different pedagogical learning and teaching scenarios, in particular for the type of virtual blended learning as is used in the S3M2 and OMB+ projects.

2. The European project S3M2: Support for Successful Student Mobility with MUMIE

In the project S3M2, four European engineering universities combine their effort to improve student mobility and freshmen teaching through bridge courses. The lead of the project is in the hands of Delft University of Technology (TUD). Partners are the KTH Royal Institute of Technology (Stockholm), the Aalto University Helsinki (Aalto), the Berlin University of Technology (TUB) and the company integral-learning GmbH, Berlin (il).The project has started in fall 2012 and is about to end in fall of this year.

In the project four bridge courses were designed, put in place and are now in the testing phase. Delft University is responsible for a course on Numerical Analysis, KTH for a course on Scientific Computing with Matlab/Octave[23], TUB for a course on Statistics and Probability and finally Aalto for a course on High-School Mathematics.

The courses are flexible and can be used in different manners: Self-study would be the natural form of learning for a student from abroad. This could be complemented by a virtual tutorium where students get help through Skype, telephone, email or other systems of communication. Due to their modularity all the courses can also be used as remedial courses and for learning specific parts of a mathematical field. This scenario is most effective if combined with self-assessment tests giving recommendations to students what part they should focus special attention to. Furthermore the S3M2 courses are well suited as a compliment to traditional courses.

The target group of the bridge courses are students from abroad and students from local universities, as well as people having already worked for a number of years and now are looking for further education in Science, Technology, Economics or Mathematics.

To find the appropriate content for the four bridging courses an overview and collection of content material, training exercises, tests and exam and other educational material like visualizations, problems and videos was put together. Based on these results and our own teaching experience the necessary syllabus was formulated and the courses designed. All content is standard material at university level.

All courses are modular and start with a diagnostic entrance test. This test allows the learner to get insight on the modules he needs to improve upon. Using the authoring tool MIAU, authors can easily rearrange the modules and the content blocks of the course and adapt it to their personal perception.

Pedagogically the focus of the S3M2 bridge courses is on visualizing important concepts through interactive diagrams and corresponding interactive formulas, thereby exploiting

[23] Matlab is a registred trademark of The MathWorks, Inc. For octave, cf http://www.gnu.org/software/octave/.

the power of multimedia. This provides an optimal setting for explorative learning where students are taking on an active role.

The Numerical Analysis course from TUD is designed as a bridging course to master studies in applied mathematics. It assumes some elementary knowledge in Numerical Analysis. It provides refreshing knowledge and skills in numerical methods, especially for solving differential equations. As all four courses it starts with a diagnostic test followed by ten sections on the most relevant definitions, theorems and algorithms of the field. For every section there are a number of exercises with full answers and explanations, and a number of problems for training.

In the course on Scientific Computing with Matlab/Octave developed by KTH students learn how to solve numerical problems using Mat-lab and its open source variant Octave. Both programs are well known systems for numerical simulations and very popular among engineers and applied mathematicians. They provide built-in support for numerically solving rather complex problems as well as an advanced programming language.

The course builds on skills typically taught in a basic course on Numerical and Mathematical Analysis, Linear Algebra and general knowledge in programming. It is based on lots of homework problems. Students program the Octave-Code in the learning environment MUMIE after which the code is corrected automatically by the system (see Fig1).

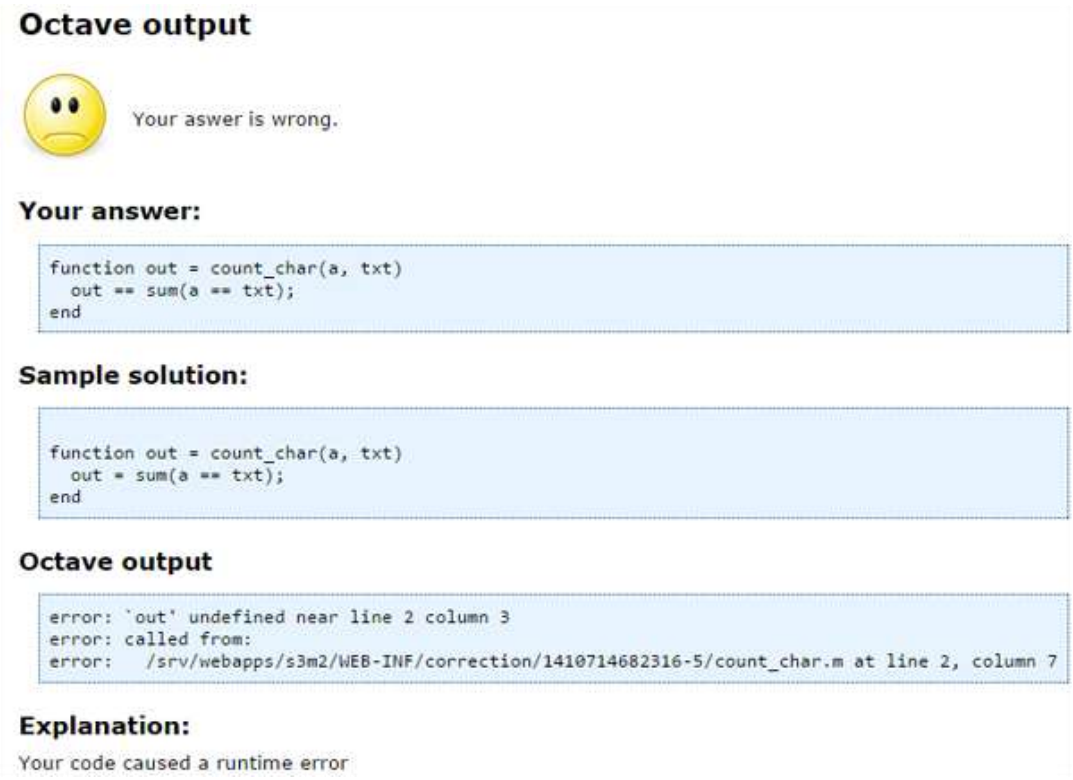

Fig. 1: Correction output by the system

The course on Statistics and Probability provided by the TUB, consists of 9 lectures, sub-divided into smaller articles presenting the theory and include plenty of examples. Attached to every lecture there are a number of exercises with full solutions, and a number of problems to solve. The course material covers the basics of probability and statistics. It includes interactive visualization of basic concepts like the one shown in fig. 2. below.

The course by Aalto on High-School Mathematics covers the basic mathematics that a student starting a bachelor study at Aalto should already be familiar with. Each section contains a brief description, which is followed by examples and exercises. Additional exercises are provided in the learning management system STACK. For more details and an evaluation of a pilot based on this course see Rasila at al. (2014).

The work-plan for the bridge courses in the S3M2 project followed the following steps.

1. For each of the bridge courses the most important mathematical problems where defined. This was done in view of the local, the European and the international students applying to a master course at one of the universities of the consortium. Student experiences were collected and evaluated.

2. For each of the courses a diagnostic entrance tests was developed. Because of its important role, special attention was given to that task by the educational staff members of the participating universities. Diagnostic tests are based on deficiencies experienced by students when entering the university and as observed by teachers. They locate loopholes in knowledge and mathematical competences of each student individually and directs them to the corresponding course material.

3. To exploit the features available in the LMS MUMIE it is important that authors have some proficiency in the authoring tool MIAU. To that end we organized several workshops and a summer school run by integral-learning, where students learned to produce visualizations for S3M2 courses (fig. 3). For more information about the project and the courses see www.s3m2.eu and https://www.mumie-hosting.net/s3m2.

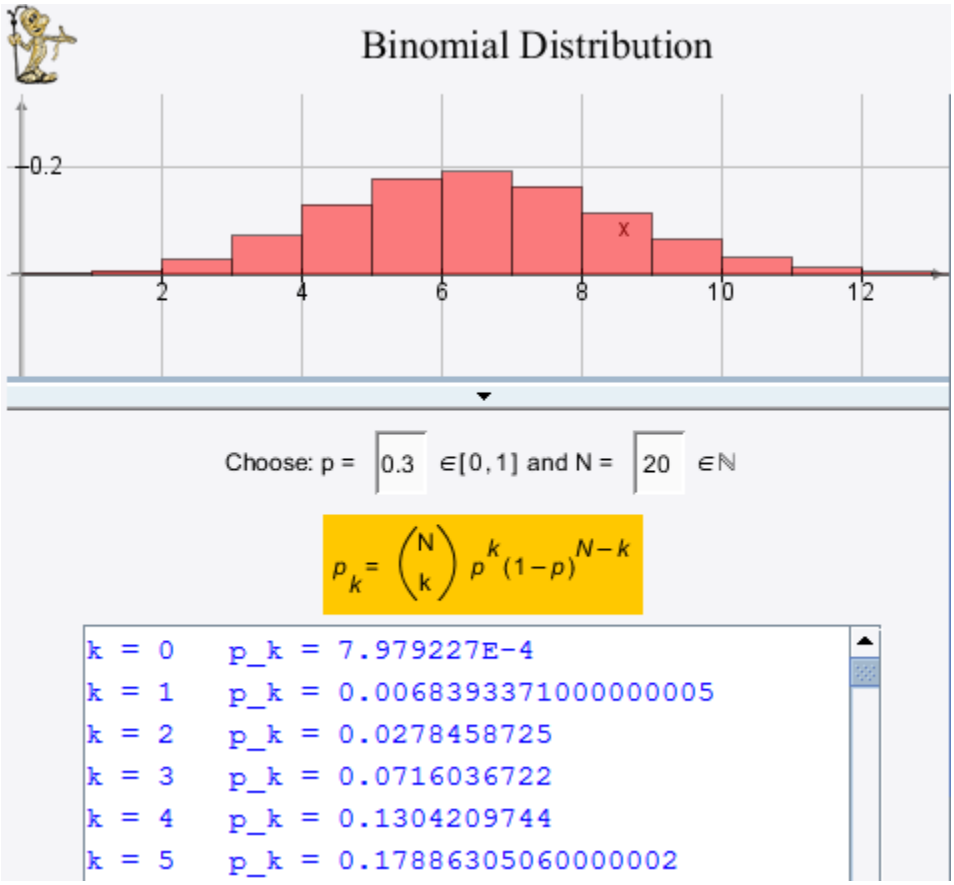

Fig.2: Students can explore important concepts e.g. the Binomial Distribution.

3. The Online Mathematical Bridge Course OMB+

The Online Mathematical Bridge Course OMB+ is a course for students entering a bachelor study in the field of Engineering, Natural Sciences, Technology or Economics at a German University. Its aim is to give these students the necessary competence and self-confidence to work with the mathematical tools of high-school mathematics.

The selection of content follows the recommendation of the COSH group (Cosh 2014). It contains roughly the following topics:

- Numbers and Fractions
- Linear and Quadratic Equations and Inequalities
- Elementary Functions (Powers, Exponential and Logarithm, Trigonometric Functions) and
- Differential- as well as Integral Calculus.

The OMB+ course will go online this fall. More than twenty universities in Germany will recommend this course to their students as a preparation to their studies.

The OMB+ is a follow up of the Online Mathematical Bridge Course OMB (Krumke et al. 2012), used over several years in Germany. This later course is an adaptation of a very

successful online bridge course offered in Sweden by KTH for more than 10 years, with about ten thousand registered users every year.

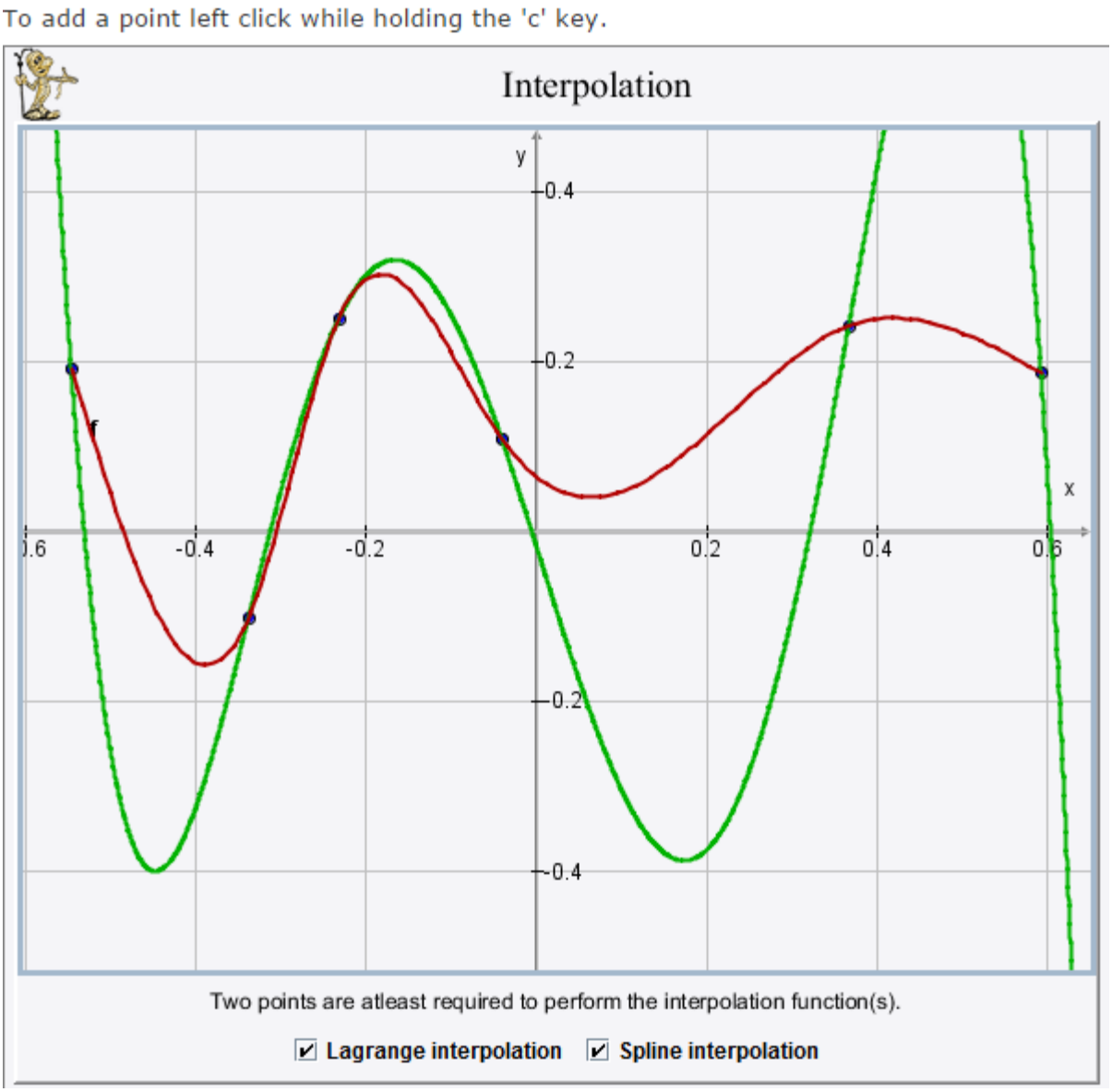

Fig. 3: A MUMIE-applet for the course Numerical Analysis.

The newly build course OMB+ differs from the Swedish course in content and in as far as it uses interactive visualizations, more interactive problems and examples and more advanced technology. In its pedagogical concept, it is however very much the same.

Here are a few remarks about the general framework of the OMB+ course.

1. Since the course targets students having already passed high-school and preparing themselves for studying towards an engineering degree at a German university, it can and should not try to be a substitute for a full mathematics course typically taught in high-school. It should have a remedial character and must have a volume which can be accomplished in a few weeks. On the basis of our experience with the Swedish OMB, we aimed at a volume which requires about 60 hours for an average student to accomplish. This corresponds to 2 ECTS points.

2. To work on the course, students need a standard desktop computer, a laptop or a mobile device. The course will be available in German and English (the English version is planned for spring 2015).

3. Of particular importance in the course are the training and homework problems. Typically they come in many variants and are automatically corrected. The correction provides feedback in the case the problem has not been solved correctly.

The pedagogical framework and the structure of the course is based on the long standing experience with the online mathematical bridge course OMB in Sweden and in Germany. Similar to the OMB, the OMB+ provides the student with a sheltered learning environment in which he can find everything necessary to master and finish the course successfully. The course consists of a diagnostic entry test, ten chapters with the basics of high-school mathematics each one with a forum, a virtual tutorium and a mathematical call center.

The diagnostic entry test[24] helps the student finding his own learning path through the course material. This is particularly useful in the case of bridge courses of this type. After all most students have already learned the material of the course and need to learn and practice only these parts in which they are deficient.

By registering, he becomes a member of the virtual tutorium which is part of the course. This means that he can participate in the forum and get assistance from tutors in the call-center. In the forum he can post his questions, search for already existing answers to his question and can communicate with his fellow students. For each of the chapters there is a separate forum. This makes it easier to find useful answers. Via Skype, e-mail and telephone he can contact the call-center and get personal help from tutors in case he is stuck with a problem.

Each chapter is subdivided into several sections each one with an e-text including many examples, images and interactive visualizations. After having worked through the e-text of a section - which should not take more than a quarter of an hour - the students is expected to work through a set of exercises, a quiz and a training section with homework problems. For

[24] The diagnostic entry test will be available in spring 2015

each of the problems in the exercise pool, the student can ask MUMIE to give him part of the solution or even the full solution. The quiz lets the learner know whether he has understood the content of the section. If he still needs to practice, he can work on homework problems in the training section. Here the student can ask MUMIE to give him as many variants of the problem as he likes until he feels poised and confident enough to proceed to the next section. At the end of each chapter there is a final test.

The style of the language is short, concise and pragmatic. Arguments use a minimally necessary level of abstraction. Particularly important and demanding concepts as for instance differentiation, integration and limits must be introduced heuristically in order to prepare the grounds for a deep understanding at the university. Whenever it is useful for a better understanding concepts are underpinned with graphics, images and interactive multimedia visualizations.

Different models for working with the course are possible. Looking back at the OMB course we experienced that some students like to work quite independently, others like to exchange ideas about how to solve problems in the forum, others make use of the call center where they can get help from tutors by Skype, telephone or e-mail. Some students like to take a slow pace, others want to go fast. Students can choose the speed upon registration. If they do not live up to the model they had chosen themselves, they get a reminder by e-mail.

Let us conclude this section with a remark about the relevance of the call center. Since the time of the dialog between Socrates and Meno on a problem in geometry, dialogue is known to be one of the most effective elements of learning and teaching. About two thousand years after Socrates, George Polya elaborated on this method in his book "How to solve it" (Polya 1945). He describes in great detail a heuristic of problem solving based on Socratic dialogue. Based on that and our personal experience we think that the call center is an important pedagogical component in spite of the fact, that some learners work on the course without ever using it. It is this kind of flexibility which makes the courses attractive to students of different learning styles.

4. The learning management system MUMIE

MUMIE is an open-source e-learning platform for learning and teaching mathematics and computer science. It grew out of the needs of practical teaching at the interface between high-school and university. MUMIE is highly flexible. Its courses and course material are easily adjusted to any kind of pedagogical scenario. It has built in learning and training environments with wiki-like dedicated social networks for virtual tutorials and self-organized learning. The powerful authoring tool MIAU supports the production of new content. The

MUMIE platform and content is the result of a cooperative effort by leading universities in Europe. It is supported by the company integral-learning which grew out of a project funded by the German Ministry for Education and Research BMBF.

Content in MUMIE has the character of a Lego-Land. Examples, definitions, theorems, applications, articles are like Lego-blocks. They may contain images, interactive visualizations and other types of multimedia components and are highly reusable i.e. they can be put into different courses, lectures, articles, worksheets or they can be used stand alone.

Problems can be personalized by randomized parameters, or randomly chosen from a set of problems. Thus each student gets his own problem to solve or can use a problem in training mode where many variants of a problem can be done repetitively . Typical input of students are numbers and formulas. There is a sophisticated correction tool which is able to understand and correct complicated student input.

Furthermore MUMIE courses scale easily: They can be used for small groups of students as well as very large ones.

Of course one of the most important parts of a system like MUMIE is its authoring concept and authoring tool. Since authoring of mathematical content is done by mathematicians, the concept must take into consideration their working habits and must be simple to use for mathematicians with no or very limited knowledge in programming. For that reason the authoring tool MIAU - which is in fact based on the well know developing system eclipse[25] - allows the author to write most of the content in Latex in a single text file. To produce problems and visualizations (both 2d and 3d) a special script language is available (Fig.4).

[25] http://eclipse.org

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\begin{variables}
        \point[editable]{P}{real}{1,0}
        \function{f}{real}{sin(x-var(P)[x])}
\end{variables}

\color{f}{BLUE}

\label{f}{$\sin(x-\phi)$}
\label{P}{P}

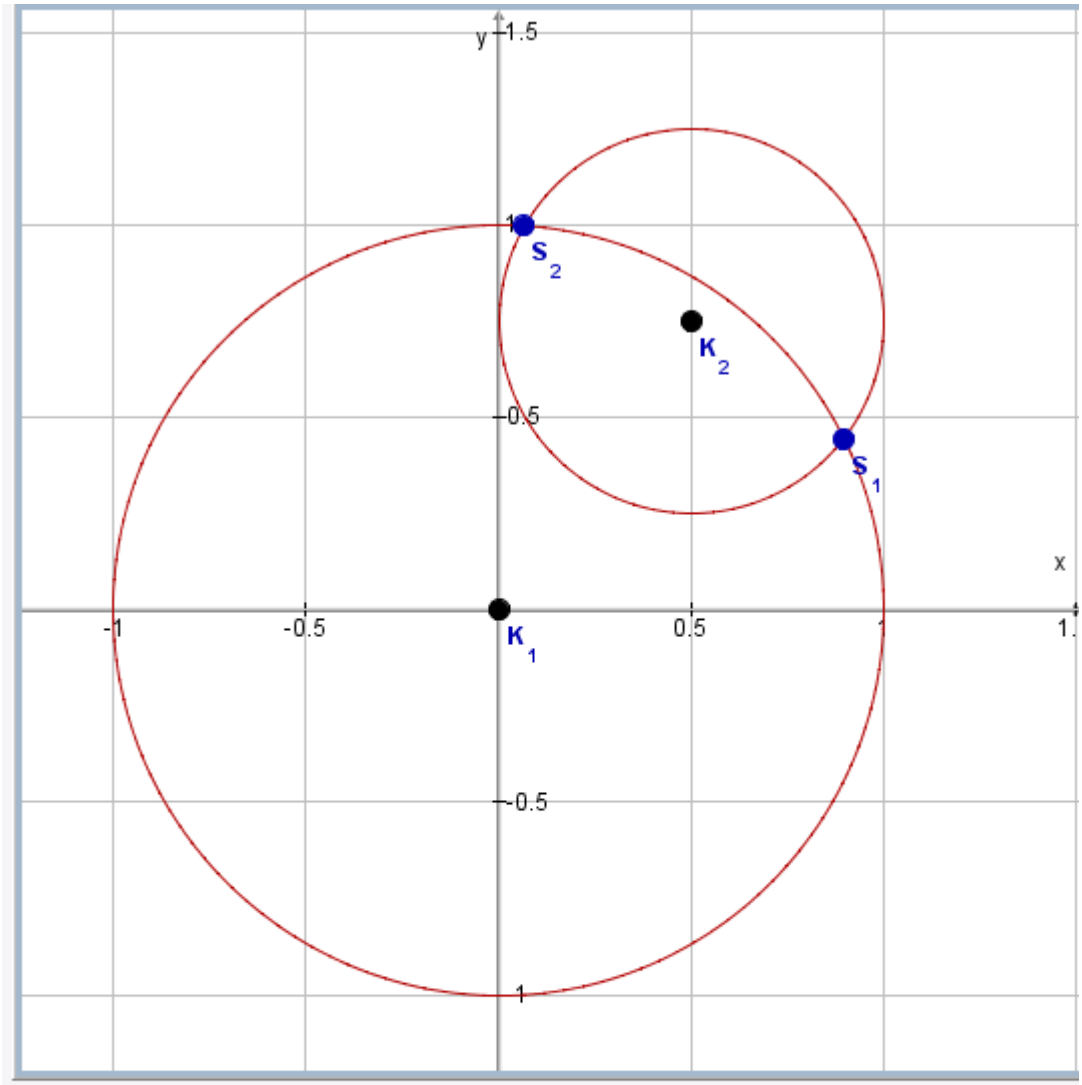
\begin{canvas}
        \plotSize{550}
        \plotLeft{-10}
        \plotRight{10}
        \plot[coordinateSystem]{f,P}
\end{canvas}

\lang{de}{\text{Phase $\phi = \var{P}[x]$}
\text{Sie k"onnen den Punkt P entlang der horizontalen Achse verschieben.}
\text{(Vertikale Bewegungen werden ignoriert.)}}

\lang{en}{\text{phase $\phi = \var{P}[x]$}
\text{you may move the point P along the horizontal axes.}
\text{(vertical motions are ignored.)}}
```

Fig.4: Bilingual code for the visualization of the concept "phase"; included in a LateX document

Interactive visualizations can be complemented by explanatory text which adapt itself to the situation at hand (Fig.5).



Betrachten Sie den Kreis K_1 mit Mittelpunkt (0,0) und Radius r_1 = 1 > 0

$K_1 := \{(x,y) \in \mathbb{R}^2 \mid x^2+y^2=(\ 1\ )^2\}$

und einen zweiten Kreis K_2 mit Mittelpunkt (1/2 , 3/4) und Radius r_2 = 1/2 > 0

$K_2 := \{(x,y) \in \mathbb{R}^2 \mid (x-(\ 1/2\ ))^2+(y-(\ 3/4\ ))^2=(\ 1/2\ )^2\}$.

Fig.5: Interactive visualization with adaptive explanatory text (from the course OMB+).

There is a build in Latex editor with an online support. The corrections of the problems are written in the same way and are part of the same text file.

Some visualizations and problems are quite demanding, so they need a dedicated applet. To make this as simple as possible, the Learning Management System MUMIE provides a large library with all the necessary classes. Of course the programming of such applets still needs programming skills (Fig. 3).

To have MUMIE courses available on mobile devices, Java is replaced by JavaScript and HTML5. So large parts of MUMIE content come in two variants, a Java variant and JavaScript/HTML5 variant. In particular this is the case for content in the course OMB+.

5. Conclusion and Outlook

There is a great and clear cut need for bridging courses at European institutes of higher education because more and more students choose to be mobile and want to move to the university of their choice for their bachelor and master studies. The differences in prerequisite skills between students mean that they need attractive and effective bridging courses to repair their deficiencies.

In this article we presented two projects supporting this drive to mobility. The first one, called *Support for Successful Student Mobility with MUMIE,* is a European project under the priority “Mobility strategies and removal of barriers in mobility in Higher Education”. It runs under the lead of the TU Delft with participation of three major other European universities and the company integral-learning GmbH. The second project, called the OMB+, is primarily German. It is a cooperative effort of a large group of German universities.

Anticipating the impact of these projects we expect the following three major changes.

1. They will set a benchmark of mathematical knowledge and competence for successful bachelor and master studies at major European technical universities.
2. They will make learning and teaching more efficient, since the huge difference in mathematical knowledge and competence due to different curricula and learning cultures will largely be levelled.
3. Students, not yet resident at the location of the university of their choice or students still occupied with professional or family obligations, will be able to prepare themself to their studies much earlier than before.

The courses in the two projects we have described have quite a different Ansatz to the presently very fashionable video courses (MOOCs). In the bridge courses we presented here, students can find a sheltered learning environment, where they can study actively by exploring the mathematics they need, solving problems as much as they need and getting support by other students or by tutors from the mathematical call-center. In contrast to that, most video courses of the MOOC type are from a pedagogical point of view a modern form of ex cathedra teaching - of course in many cases by first class scientists. Students get, however, little support. The future only will tell in which way higher learning will go. It is quite possible that it will be a kind of combination of the two schemes.

6. Acknowledgements

With the support of the Lifelong Learning Programme of the European Union.

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Open Education Consortium – Student Mobility Handbook

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Abstract 1: Student Mobility Handbook

In 2012 five European universities and three third party organizations started a European Lifelong Learning Programme project with the main goals to (1) create the preconditions for a strong European OpenCourseWare framework and (2) to create guidelines and informative handbooks to support other universities who want to use OpenCourseWare. The particular context of this project is clear in its full title: “OpenCourseWare in the European Higher Education Context: how to make use of its full potential for virtual mobility”. The deliverables of the project thus seek to enhance quality and increase the usage of online courses and therefore facilitate virtual mobility. One of the deliverables is a Student Mobility Handbook. With this handbook, our aim is to show how students and universities throughout Europe, can get the most out of OpenCourseware to become part of new learning communities and facilitate virtual exchange across borders. The main part of the handbook is the presentation of the Student Mobility Cycle that was developed within the project and that defines five phases in the process of a student participating in Student Mobility: study selection, preparation, actual study, sustainability actions, capitalization. For each of these phases, Virtual Mobility can be an alternative.

Keywords

OER, OpenCourseWare, Open Education, Mobility

Intro

After participating in projects such as OER-HE (http://www.eadtu.eu/oer-projects/93-oer-he.html), NET-CU (http://www.eadtu.eu/netcu.html) and EU-VIP (http://www.euvip.eu/), partners involved in OCW-EU (http://www.opencourseware.eu/) were well prepared to address the issue of Mobility from the viewpoint of Open Educational Resources, in this case Open Courseware. This project was part of an effort to establish a consortium for OpenCourseware in Europe, now launched as part of the global movement under the new name Open Education Consortium (http://www.oeconsortium.org/).

The handbook has 3 parts, an intro on the usefulness of Open Courseware for Mobility, the core section on the scenarios of use of OpenCourseware in (virtual) mobility and a discussion on recent and future trends in open education.

This handbook aims at internal offices of universities, who could use it to inform students on how to become self-supporting in a mobility context such as an Erasmus exchange. And of course, students themselves will likely find this a valuable instrument to gauge their skills in open education mobility.

Preparation

The basic scenario's for the handbook were derived from targeted workshops at Open education conferences, compiled in a report "Promoting virtual mobility scenarios through OCW in the EU context" (Tovar 2014). This led to the definition of 10 scenarios.

To learn whether OpenCourseWare and these possible scenarios were familiar both with students and learning professionals, we ran a survey (https://websurvey.kuleuven.be/index.php/5596/lang-en) from September to December 2013 to which 176 people responded, of which 135 answered all questions.

Survey Results

We show some results of the survey, based on the respondents who answered all questions, so N=135.

Profile

Of the 135 respondents who completed the whole survey, 88 were full-time students (65,19%), 4 were part-time students (2,96%), 20 were full-time employed (14,81%), 20 were both student and employed (14,81%) , 3 were unemployed non-students (2,22%).

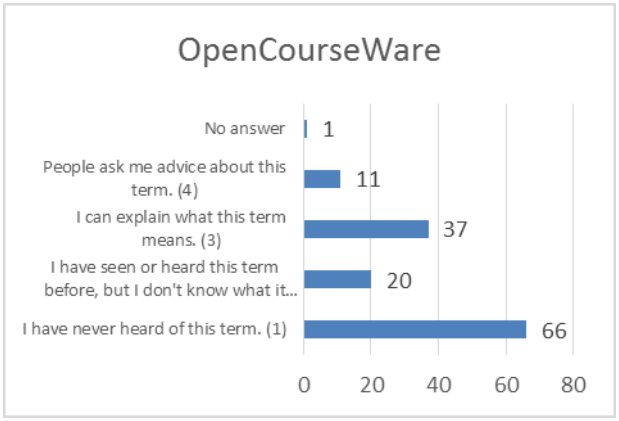
One was under 18, 86 between 18 and 25 (63,70%), 21 between 26 and 35 (15,56%), and 27 between 36 and 65 (20%).

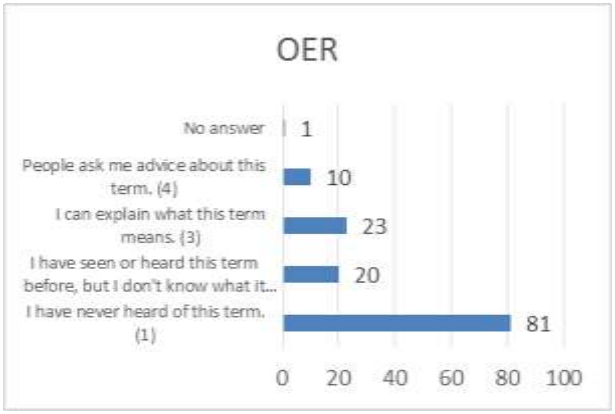
79 are female (58,52%) and 56 are male (41,48%).

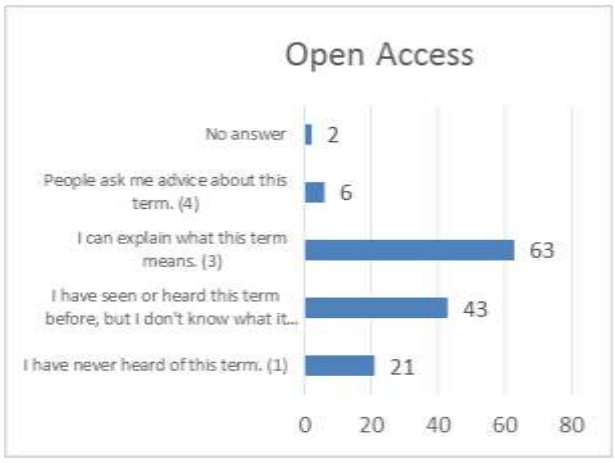
60 only completed secondary education (44,44%), 39 have a bachelor degree (28,89%), 33 have a master (24,44%) and 3 obtained a PhD (2,22%).

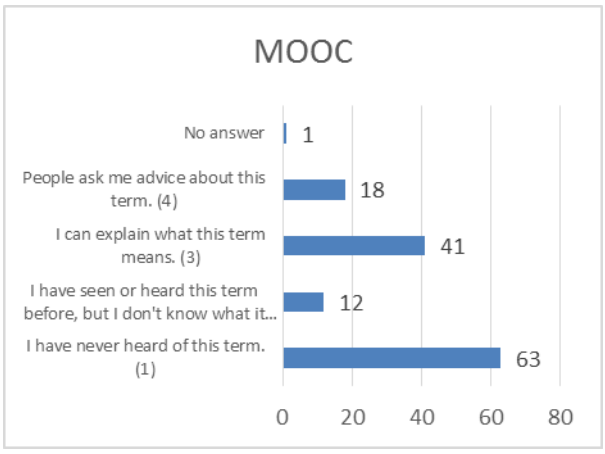
Knowledge of Open

We asked respondents to indicate their level of knowledge of certain Open Education terminology.

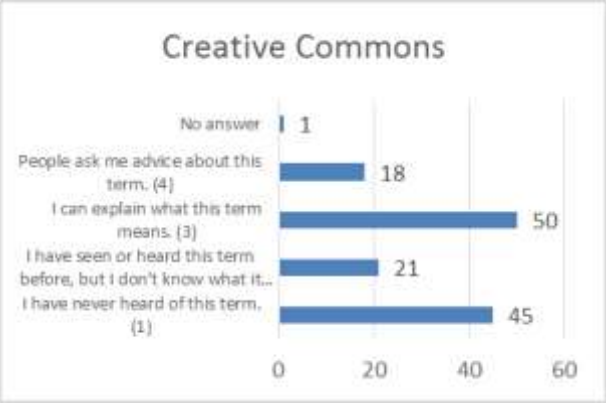


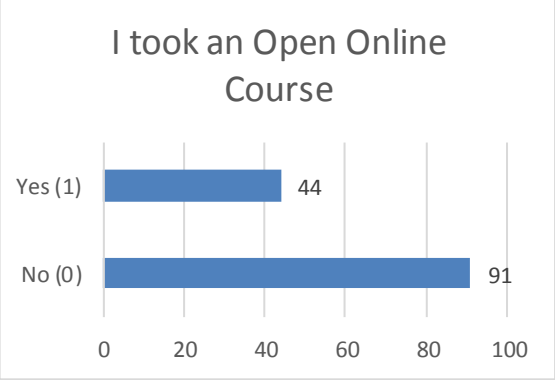






A first striking difference is in the knowledge of "older" notions like OpenCourseWare and OER, when compared to current debate terms like MOOC and Open Access. In the latter we see a clearer dichotomy between those who know about it and the others, while the older terminology just doesn't seem to ring a bell. Creative Commons seems relatively well known however, it is a notion steadily gaining ground.





A quite surprising fact is that a sizable number of respondents already took an Open Course, of which 33 actually took a MOOC. Respondents indicated different motives for this.

We asked for motives in 4 different clusters: study related motives, work related motives, social motives and personal motives.

The study related motives held the most appeal, with Widening interest (88,64% applicable), Deepening expertise (86,36% applicable) Curiosity (84,09% applicable) resounding very strongly with the respondents, more than being able to compare learning materials (45,45% applicable).

In the work related motives, following an Open Course as a “knowledge refresher” had quite some appeal (68,18%), followed by “career boost” with 56,82%. Trailing motive is reuse in class (22,73%). 5 respondents indicated that they mandatory took an open course for their work!

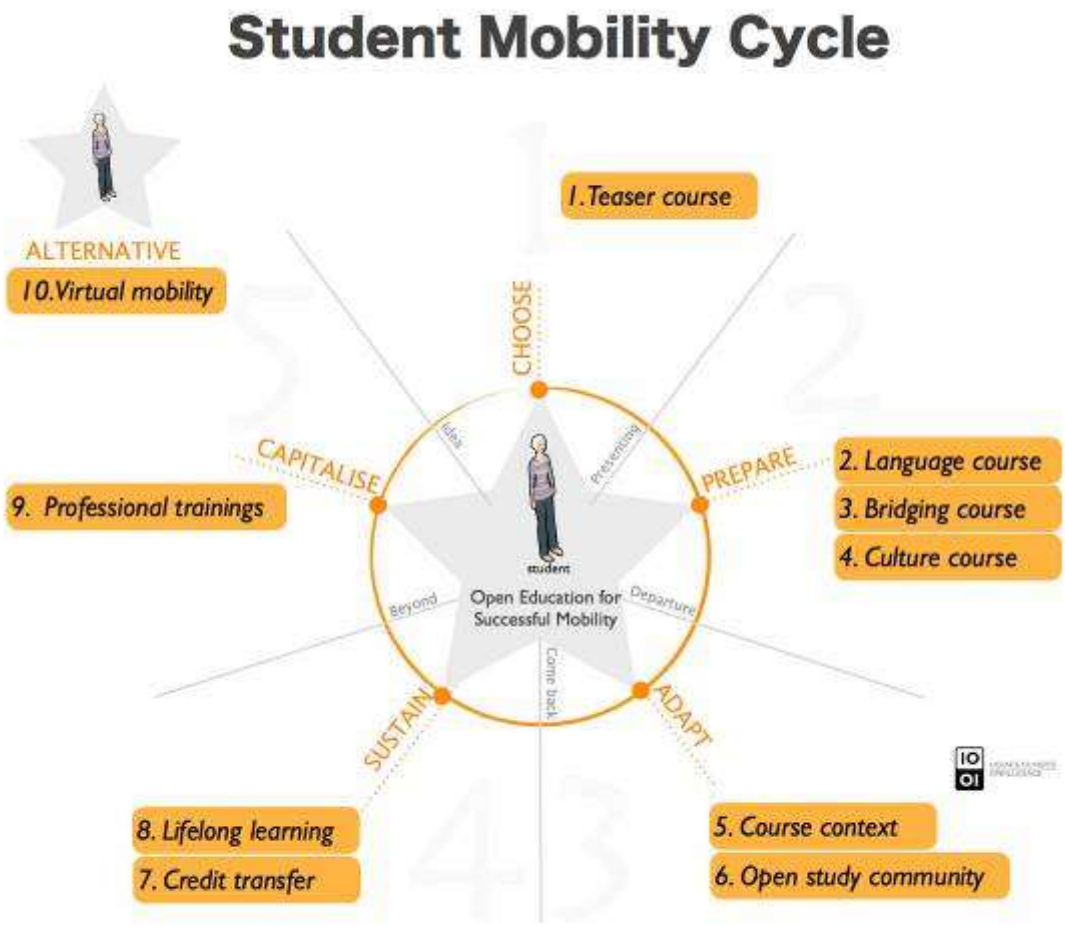
Social motives are less perceived as relevant, with minorities indicating “community feeling” as a motive (34,09%) and “helping out” (36,36%). Contrast this with personal motives such as Interest (95,45%) and Self-development (95,45%).

Handbook

We opted to describe the scenarios in the context of Student Mobility in the form of a Student Mobility Cycle: the process of being mobile as a student can be divided into five different phases.

First there is the phase of the study selection. In this phase, candidate students are gathering information about their potential future studies in order to choose a study. Taking an Open Course from different universities as teaser courses, can be a valuable idea to have a look

inside the particular institutions. Once a student has chosen the study he wants to commence, he can start preparing himself for this course, e.g. by taking Open Courses to learn a foreign language, to gain insights in the culture of the institution, or he can use an Open Course to fill what we call his 'knowledge gap'. Certain prior knowledge that he hasn't achieved yet, can be learnt in an Open Course. In the next phase, the phase of the actual study, OpenCourseWare can be used as an extra learning resource: learning materials provided by the teachers of the courses one takes can be complemented by Open Educational Resources and OpenCourseWare derived from other Higher Education institutions. The fourth phase is the phase where a student wants his learning efforts to be validated, e.g. under the form of credits and where a student wants to keep updating the acquired knowledge and/or skills from that particular study. We called this fourth phase the 'extending' phase. The final phase is not necessarily to be put after the fourth when it comes to chronology. In the fifth phase we namely describe a number of alternatives for students who, for several reasons, cannot travel abroad. Virtual student mobility is a well-known alternative for actual student mobility, meaning that students can take (open) online courses as part of their curriculum, but without travelling physically to another institution. It goes without saying that in this case too, OpenCourseWare can be a valuable alternative. Also when it comes to Lifelong Learning, OpenCourseWare's importance has increased over the last couple of years.



infographic: Sophie Touzé 2013

In what follows we summarize the different phases as described in more detail in the Handbook (see Truyen, Verbeken e.a. 2014b). The handbook can be downloaded from http://www.opencourseware.eu/deliverables/d3-1-empowering-student-mobility-with-opencourseware. We encourage international offices from universities and HE institutions to promote this handbook with their students.

The first phase involves **study selection**. In this phase, prospective students gather information about their potential future studies in order to choose a study programme. Taking an Open Course from different universities as a teaser course can be invaluable to form a better perspective/understanding of what particular institutions are offering. Once a student has chosen his course of study, he can start **preparing** for this course, e.g. by taking

Open Courses to learn a foreign language, to gain insight into the learning culture of the institution (certain conventions particular to the institution), or he can use an Open Course to fill what we call his 'knowledge gap'. A lack of knowledge in specific areas can be bridged through Open Courses. In the next stage, **the actual study phase**, OpenCourseWare can be used as an extra learning resource: learning materials provided by the teachers of the courses students are taking can be complemented with Open Educational Resources and OpenCourseWare from other Higher Education institutions. This helps the student to adapt to the context he finds himself in. The fourth phase is the phase in which students want their learning efforts to be validated, e.g. in the form of credits. A student wants to keep updating the knowledge and/or skills he acquired in a particular study programme using OpenCourseWare, whether from a university where he took the course or not. We call this fourth phase the **sustaining phase**. This Lifelong Learning scenario, in our opinion, is to be distinguished from professional trainings in the **capitalising** phase. Lifelong Learning happens when one perceives a learning need and is based on intrinsic motivation. Professional training however is typically requested by the company someone works for. A separate phase, which does not chronologically follow on the five previously described phases, is a possible alternative for students who cannot travel abroad for different reasons. **Virtual student mobility** is a well-known alternative for actual student mobility, meaning that students can take (open) online courses as part of their curriculum without physically travelling to another institution. It goes without saying that in this case too OpenCourseWare can be a valuable alternative.

Phase 1: Choose

Before going to university, a decision has to be made on the appropriate course of study. In this decision process several questions might arise, such as "What is it like to take classes at a university?"; "What is it like to follow a class with 300 rather than 20 other students?"; "What do scientific articles and reading assignments look like, and will I be able to understand them?" Using OCW and its educational materials could be useful to provide prospective students with information about a new study programme they might be uncertain about. Such materials can help prospective students understand the real complexity level of the content or the way a course is organised before they officially enrol.

Phase 2: Prepare

Once a student has chosen the university he wants to attend and the study programme he wants to commence, he has to start preparing for that particular course of study. Several problems can arise, such as the need to learn the language of the destination, or experience of a knowledge gap. Both scenarios are described below.

OCW can fill a 'knowledge gap'. There might be a difference between the curriculums of the home university and the destination university. When a student is not allowed to take a certain course in the programme that he should have completed to be able to take an advanced course at the university abroad, he can independently take the open course to fill the knowledge gap.

An Open Course of the destination university can be used to assess the language requirements to study at a particular institution. Using the openly available resources might provide answers to questions such as: "Will my language level be sufficient to understand the lecturers?"; "Will I be able to study a scientific text in a foreign language?" If it becomes evident that the student's language skills are indeed insufficient, he can take an open language course to improve his knowledge skills.

Phase 3: Adapt

In taking courses at the destination university, a student may often stumble on references to other locally taught courses that local students might have taken but that are not directly accessible to him. These are contextual elements that are important for correct understanding of the course contents and that need to be clarified. Good OCW is designed so that it makes explicit when an open course builds on other materials and ideally refers to other open content to resolve these requirements for understanding. More broadly speaking, courses are also always embedded in cultural practices and unspoken local conventions part of the local learning community. A university might consider offering courses specifically designed to explain and make explicit these kinds of cultural assumptions that often prove a frequent hurdle for foreign students. An 'introduction to our campus life' open course makes just as much sense as a course on local educational terminology.

By joining open online learning communities, the student can organise interactions with local students in direct relation to the course content, e.g. by getting information from local senior students. This partly compensates for the disadvantage of not having a real social network in place from the start. But, conversely, the student can remain active in the social network of his own home university by taking part in open online communities of his home university's online education offer. In general, a true open course should also be a course in which students have the possibility of adding content to the course and sharing this among each other. The main message is that study of an open course reaches its full potential when the student actually becomes part of a social learning network or open study community related to that course. Such a learning community can go beyond students and teachers to also include external stakeholders who might have a relation with the field of study.

Phase 4: Sustain

Open educational resources, open courses and open information about course metadata in the form of completion certificates, badges, credits and credit transfers, can help facilitate course certification for the student. Exemption for Accredited Prior Learning (APL) can more easily be accorded when study materials and student activities are publicly available as OERs online.

When a student graduates and becomes active on the labour market, his knowledge will need to stay up to date. When the course(s) he took are Openly available, an opportunity exists to have access to new and relevant content related to the courses, and to read and learn about state-of-the-art research results in their field.

Moreover, he can in turn complement the course with practical knowledge and insights gained working in the field of the Open Course. A real Open Community can be constructed.

Phase 5: Capitalise

Professional trainings are in a certain respect also a form of Lifelong Learning. We opted to distinguish between both in the sense that Lifelong Learning springs from an individual's personal motivation. One continues to learn because they want to, because they feel a certain learning need, and because they truly want to gain certain knowledge or skills. Professional trainings, on the other hand, are often required by but also provided by the company someone works for. Companies often organise internal trainings for certain groups of employees to teach them new skills, or to update them on the procedures common in the organisation. These professional trainings are usually closed to anyone outside the organisation. Moreover, they are often not accessible to employees in that particular company who do not belong to the specific target group the training was developed for. We believe that when these trainings are made accessible to all employees in a company, and even to outsiders, an extra target group might be served, namely the unemployed who can use the content of these trainings to increase their job opportunities on the labour market.

Virtual Mobility as an alternative for physical Student Mobility

Since not everyone has the possibility or wish to travel abroad, students can opt to be virtually mobile. Virtual Mobility is defined by the European Commission as "a complement or as a substitute to physical mobility (Erasmus or similar) in addition to a type of independent mobility which builds on the specific potentials of on-line learning and network communication. It may prepare and extend physical mobility, and/or offer new opportunities for students/academic staff who are unwilling or unable to take advantage of

physical mobility. (…) Full academic recognition is given to the students for studies and courses based on agreements for the evaluation, validation and recognition of acquired competences via Virtual Mobility. In this context, cooperation agreements are key to ensuring sustainable mobility schemes."

In the light of this definition, it becomes clear that a virtual equivalent exists for several of the above-described scenarios. It all boils down to students taking (open and online) courses from universities other than their own institutions, with the goal of an international study experience and with the intention of including that course in their study programme at their home universities.

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Master in the mix: transition from a regular on-campus master of statistics into a blended and a distance program

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Abstract

The aim of this paper is to outline our preliminary experiences in and our future plans for the conversion of a regular on-campus Master of Statistics into a Blended and a Distance Program, each of them having their own target groups. The goal is to offer two more or less parallel programs: one on-campus and one off-campus. With this transition we are aiming at optimizing and broadening the in- and outflow of the Master of Statistics both in a qualitative and a quantitative way.

The paper presented describes the current and the future Master Programs, and the motivation that underlies the decision to innovate it, as well as the strategy we will apply to implement it. Given that we will reshape the whole Master program, it is clear that the innovation needs to be developed at both the level of the curriculum (i.e., meso level), and at the level of the courses (i.e., micro level).

As stated, the result of the innovation will be twofold: one Blended and one Distance program. The first is to be differentiated from the latter in that sense that it is to be done on-campus. Students will regularly (e.g., several times a month) come to the university campus in order to perform a whole range of learning activities: classes, exercise sessions, group work, a variety of assessment, etc. Contrary to the Blended program, the Distance program will consist of almost no face-to-face contact. The majority of the learning activities will be executed off-campus. At the time of writing, the idea is to bring students to university campus in case of assessment. Due to practical issues, we will not be ready to organize off-campus exams in 2014-2015 but in the future exams will take place in universities or institutes abroad who are organizing the exams from a practical point of view.

Apart from the on- and off-campus part, there is another important difference between the Blended and the Distance Program. Where students will follow a group pace in the first, they will define their own in the latter. There will be certain points in time where they will be able to do exams and other forms of assessment will have certain deadlines, but apart from that they can structure their own learning path the way they want to.

Keywords: Innovation, technology, research projects.

Introduction

The aim of this paper is to outline the preliminary experiences in and our future plans for the conversion of a regular on-campus Master of Statistics (offered at Hasselt University, Belgium) into a Blended and a Distance Program, each of them having their own target groups. The goal is to offer two more or less parallel programs: one on-campus and one off-campus. With this transition, we are aiming at optimizing and broadening the in- and outflow of the Master of Statistics both in a qualitative and a quantitative way.

The paper presented first describes the current Master of Statistics in its context, i.e., the so-called Belgian/Flemish Higher Education Area. The second part focuses merely on the motivation that underlies the decision to innovate the Master program. The third part of this paper contextualizes the pedagogical innovation of the Master of Statistics within the university's educational policy framework. Given the fact that we will reshape the whole Master program, it is clear that the innovation needs to be developed at both the level of the curriculum (i.e., at meso level), and at the level of the courses (i.e., at micro level). Each of these levels will be addressed in the fourth and fifth part of this paper, respectively. We describe the principles underlying the innovation processes at each of the named levels. Before drawing conclusions, we briefly mention the considerations we are making for the near future, including some potential questions we might ask ourselves when conducting applied educational research on the topic of the Master's program.

Description of the current Master of Statistics

Education in Belgium is a community matter, which means that it is the community-level government that is responsible for education and hence for Higher Education. The university that is at stake in this paper, is located in Flanders, the Dutch speaking northern part of Belgium. Therefore, the context of our Higher Education is the Flemish Community.

Hasselt University is one of the smaller universities in Flanders, located in the province of Limburg, in the north-east of the country. UHasselt encompasses six faculties. The Center for Statistics (CenStat) is a research unit within the faculty of Science. The scientific research conducted within CenStat, a division of the Interuniversity Institute for Biostatistics and statistical Bioinformatics (I-BioStat), is internationally renowned for its theoretical as well as for its applied component. Further, its education and consultancy records are excellent.

I-BioStat offers a Master of Statistics, a so-called initial Master, which means that it is accessible to students holding a Bachelor's degree based on a program with a sufficiently strong background in mathematics and statistics (mathematics, computer science, physics, biology, life sciences, medicine, etc). In practice, many students already hold a Master degree, often in the field of mathematics, biology, or physics, which is a logical consequence of the four Trajectories that are offered within the Master of Statistics:

- Biostatistics: In the specialization Biostatistics/Biostatistics ICP, sound training in modern statistical methodology, necessary for the design and analysis of biomedical and epidemiological studies, is provided. Core biostatistics courses are Longitudinal Data Analysis, Survival Analysis, and Clinical Trials. The specialization in Biostatistics has a strong research orientation. The option Biostatistics also has a sub-option "Biostatistics/ICP" where ICP stands for Intercultural Program. This program of students from developing countries, with a scholarship sponsored by the University Development Cooperation Section of the Flemish Interuniversity Council (VLIR-UOS), is adapted to their specific needs and interests in the Biostatistics ICP specialization.
- Epidemiology & Public Health: The specialization Epidemiology & Public Health Methodology offers a professionally-oriented program with emphasis on epidemiology, modeling of infectious diseases and microbial risk assessment.
- Bioinformatics: The rapid evolution in scientific research in genomics and proteomics continuously requires new knowledge and skills. Besides a working knowledge of molecular biology, there is the need for a specialized knowledge of, and applied skills in database management, computer programming, statistical techniques and knowledge discovery & integration. The Master of Statistics: Bioinformatics prepares graduates in such a way that they are able to design and analyze experiments aimed at obtaining genomic and proteomic data; that they possess the necessary knowledge and skills to develop, understand and create bioinformatics software tools and databases; that they become self-assured, independent and assertive professionals for whom analyzing an issue, structuring information, working in international and multidisciplinary teams, conducting and chairing discussions and presenting ideas have become second nature.

The Master of Statistics has been selected by the VLIR-UOS (http://www.vliruos.be/en) to be supported with scholarships for students from economically developing countries. VLIR-UOS supports partnerships between universities and university colleges, in Flanders and in the South, looking for innovative responses to global and local challenges. It is founded by the Flemish Interuniversity Council (VLIR) to fund cooperation projects between professors, researchers and lecturers. VLIR-UOS also awards scholarships to students and professionals in Flanders and the South. Lastly, VLIR-UOS helps to strengthen higher education in the South and the globalization of higher education in Flanders. More specifically, students in the South can apply for scholarships for studying in Flanders. As a consequence, a majority of the students in the Master of Statistics come from Africa.

The program of the Master of Statistics can be found on http://www.uhasselt.be/Master-of-Statistics. The Master consists of 120 ECTS credits which conventionally means a study of two years. The master includes a Master's thesis which students combine mostly with an internship in Flanders.

Motivation for the transition into a Blended and Distance program

Although the current program runs smoothly as it is at the time of writing, there is still the perceived need for a transition to a Blended and to a Distance program. The motivation for this transition was drawn from a SWOT-analysis we did about the program in 2013:

Table 1: SWOT analysis of the Master of Statistics (2013)

Positive	Negative	
Strengths 1. Strong reputation Master of Statistics 2. Strong international embedding 3. Strong involvement in VLIR-UOS South programmes 4. Involvement in the *Master in de Epidemiologie* at Antwerp University 5. Collaboration with KU Leuven within the context of the formal cooperation on the Master of Statistics 6. Experienced, resourceful, dedicated workforce 7. Proactive management team	**Weaknesses** 1. Not enough measures and facilities geared to working and part-time students 2. Little or no teaching methods or facilities geared to off-campus students	Internal factors
Opportunities 1. Growing need for bioinformatics in biopharma and biotech industry 2. Inflow to the master from UK and US 3. Blended learning initiatives 4. Revision of Bachelor of Mathematics at Hasselt University 5. Integration of academic college course programmes	**Threats** 1. Limited influx from Europe and Asia in master and PhD programmes 2. Growing competition in Flanders and outside 3. Increased number of responsibilities on staff 4. Growing administration	External factors

As can be seen in the table above, the weaknesses of the statistics program have to do with target groups and facilities for on the one hand part time students, and on the other hand with students who do not have the means to study on-campus in Hasselt, Belgium. Offering the on-campus program in a Blended version (in which online and offline teaching methods are combined) and in a Distance version (where students can take the program not coming to Hasselt), are obvious solutions to the questions we are facing.

In general, with both transitions, we have one overarching aim: we want to make it feasible for more students to obtain a Master's diploma in Statistics. Both the Blended and the Distance program will offer courses with an increased flexibility as guiding principle which will make it possible to serve more target groups than only the ones who are able to visit the campus for two years.

A more general motivation, not to be defined within one particular target group, is the fact that globally Lifelong Learning is a growing paradigm. Again, maximal flexibility is an important prerequisite when we want to attract Lifelong Learners.

A motivation lies also in the fact that we want to realize an innovative educational project, which makes the program stronger from a competitive point of view. We cannot ignore that this will be a strength that will probably be valorized when the Master of Statistics will be assessed by the external evaluation panel. Moreover, from a European and more broadly from a global perspective, offering a Distance program will allow us to increase the collaboration with other universities around the world. Networked curricula, joint degrees, or e.g. Erasmus Mundus programs will be organized more easily and better prepared when all courses can be taken without having to travel to Hasselt.

Last motive in general, but not least: when we will be able to organize the Distance and/or Blended program in a modular way, we will be able to offer certain modules to the industry, e.g., to the professional field where people need to be trained in Statistics, or where professionals need to update their competences in Statistics.

Although the transition to both the Blended and to the Distance program is being developed at the same time, there are still a number of motives that are different for both programs. First and foremost because the designing and implementation processes of the transition vary but also because the target groups that underlie the decision for both transitions is different.

Motivation Specifically for the Blended Learning Program

As stated above, we want to change the on-campus program from a regular program into a Blended Learning program. We use the term Blended Learning in the definition of Annetta et al. (2010), who state that Blended Learning combines different learning approaches and that it encompasses both classroom sessions and technology resources. Hence, Blended Education makes use of the combination of both on-campus and off-campus teaching methods.

With this transition we are aiming at (1) so-called working students who want to combine their (often full-time) job with a part-time study and (2) a higher flexibility for all on-campus students. For the first target group, it is important to be able to do certain learning activities at home because of their daytime jobs. Yet, this target group still wants to make use of the on-campus facilities such as the ICT-environment (statistical software in PC-labs at the campus) and social activities, whether they are linked to the courses (e.g., face to face group work or exercise sessions) or not (e.g., student's social activities). Blended learning offers an increase in flexibility, both in time and space.

Another target group we will be able to serve, are the students from other Master Programs at Hasselt University who, given the high degree of flexibility in the Blended and/or Distance Program, will be able to choose optional courses from the Master in Statistics, again without any practical restrictions.

Motivation Specifically for the Distance Learning Program

As stated, in general we want to make it feasible for more students to obtain a Master's degree in Statistics. On the one hand, it concerns students from developing countries for whom this Master's program, and specifically living in Hasselt for two years is (too) expensive. Yearly, the VLIR-UOS offers scholarships to students from poor regions but as is the case for all scholarship application possibilities: the demand is always higher than the supply. If we offer an alternative to the students not receiving a scholarship, i.e., for them to take the Master from a distance, they are still able to participate in the Master but off-campus.

The second group we are targeting with the Distance program is, like in the Blended program, the so-called working students. Given the fact that the time they can spend on their study is not only limited, but also largely outside the regular office hours, it is important to offer a program that maximizes flexibility. Working students living near campus can enroll in the Blended program: off-campus and on-campus learning activities are mixed so these students do not have to be on-campus every day. Working students from abroad will be able to enroll for the Distance Program of the Master. Both target groups will thus be able to

study, e.g., during the weekends without practical restrictions.

The institutional level: Educational Policy at Hasselt University

Obviously the Master of Statistics offered at Hasselt University fits in with the organization's educational policy. In this section, we offer a selection of topics from the education policy document (UHasselt, 2013) that is applicable to the Master of Statistics and to both the Blended and Distance Learning program under development.

The central educational concept at UHasselt is "monitored self-study," where lecturers are considered coaching devices along the student's path towards reaching the learning outcomes. These learning outcomes are on the one hand domain-specific, i.e., relative to the topic of statistics, but on the other hand also of an employability skills nature, more generically formulated to ensure that within the study programs there is also room for students to evolve towards employable professionals, able to work in a team and ready to become lifelong learners (UHasselt, 2013).

According to the educational policy, every study program should embrace international experience, which is obviously the case in both the Distance and Blended Program: indeed, both consist of an international student group. Students will be able to learn how to communicate interculturally and internationally.

As stated before, the role of the lecturer shifts from a source of knowledge, like it is in traditional higher education, towards a coach according to the educational policy. Especially in the Distance and Blended Programs, this will be the case. In both programs, content delivery will (nearly) not be done in face-to-face contact moments. Rather, students will meet their lecturers (whether online or on-campus) in a coaching setting: lecturers will truly guide students through the matter of statistical topics, whether that is in helping them with exercises, or guiding them in their (group) homework or projects. The lecturer becoming a coach is not only the case on the matter of the content (or product), but is also applicable on the process: the coach guides the student in their growth to independent learner. It is obvious that the extent to which students indeed are independent learners varies between the on-campus program (with more interaction between students and lecturers) and the off-campus program.

The policy text states that "the educational concept is operationalized in a variety of teaching and assessment forms" (UHasselt, 2013). In the near future the CLIA model (De Corte, Verschaffel & Masui, 2004) is an inspiring model for us to align competences (learning outcome), learning, interventions (teaching methods) and assessment in the Master of Statistics.

Transition on the level of the curriculum

Principles Underlying Both Transition Processes

At the level of the curriculum, we defined a number of principles underlying the way we will conceive both programs in the future.

First and foremost, the programs will be identical concerning learning goals and competences to be obtained. Although the learning process in both programs will differ considerably, their final objectives will be essentially equal, namely as defined in the Program-specific Learning Outcomes. At the time of writing, these Learning Outcomes are to be finalized.

Secondly, both program versions will be offered in parallel, at least partly. The courses that will be offered in the first semester of the first year in the Distance Learning program, will also be offered on-campus during the first semester and the same holds for the courses of the second semester of the first year. This is, in our opinion, a more efficient way for lecturers to offer their courses. A second argument why we want to adopt a certain accordance between the on- and off-campus programs, is to make it feasible for students to switch between both programs: a student who, for instance, chooses to start the Master Program on-campus, and who considers to step into the Distance Program, should be able to make that switch. If both programs would be offered too asynchronously, we would inhibit the transfers from one program to the other.

Thirdly, we are planning to create a one-year version of both programs. This means that students with a particular profile, such as certain degrees or certificates and students with certain prior knowledge and education, will be able to enroll for a Master program of one year instead.

Finally, we want to continue the existing collaboration with the Leuven Statistics Research Centre (LStat), the Leuven University equivalent of CenStat. This means that the development and the implementation of both the Blended and the Distance Program will be in close cooperation with the colleagues at Leuven, and that in Leuven too there will be a Blended and/or Distance Program in the future, with respect for each other's unique features and areas of specialization.

Main Principles for the Blended Learning Program

The Blended Program first and foremost is to be differentiated from the Distance program in the sense that it is to be taken on-campus. Students will regularly (e.g., a few times a week) come to the campus of Hasselt University to perform a whole range of learning activities:

classes, exercise sessions, group work, all kinds of assignments and assessments,… Although a maximal flexibility will be pursued, students still will be limited to certain moments in time where they are required to come to university campus.

Main Principles for the Distance Learning Program

Contrary to the Blended program, the Distance program will contain almost no face-to-face contact. Almost all the learning activities will be executed off-campus. At the time of writing, the idea is to bring students to Hasselt in case of summative assessment (exams). Due to practical issues, we will not be ready to organize off-campus exams in 2014-2015, so students will have to come to Hasselt twice that year. We are considering organizing the exams in the future in so-called satellite assessment centers: universities or institutes abroad who then organize the exams from a practical point of view, but the content of the exams will still be determined at Hasselt.

Besides the assessment, there are also a number of competences that are hard to train from a distance. Therefore, students will come to Hasselt in the final semester of their Master's program for their internships and in order to guide them in their Master's thesis.

Apart from the on- and off-campus part, there are two other important differences between the Blended and the Distance Program. First, where students will have to follow more or less a group pace in the first, they will define their own (individual) pace in the latter. There will be certain points in time where they will be required to take exams and also other forms of assessment will have certain deadlines, but apart from that they can structure their own learning path the way they want to.

Second, the Distance Learning program to be prepared for 2014-2015 is a program of 30 ECTS (a full-time on-campus study program consists of 60 ECTS per year). An important argument is the fact that the market segment for a full-time Distance program may be insufficiently large. In practice, Distance learners are usually working students. A second argument is that a limited number of courses at the outset renders to thoroughly monitor and evaluate the implementation process. We can more deeply monitor the courses in terms of the learning process of the students, in terms of both practical and technical issues, etc.

Timing

As is clear from the above, the implementation of both programs will be effectuated step by step. This academic year (2013-2014) will be dedicated to outlining the Educational concept of the programs: studying literature, meeting colleagues, absorbing information from a plethora of sources, etc. There is, evidently, limited time for exploring the field since on

October 1, 2014 we start with a full-time Blended operational first master (1MA, 60ECTS/year) and a part-time Distance curriculum (1MA, 15ECTS/semester or 30ECTS/year).

Depending on how well the Distance program goes in 2014-2015, we will decide next year to either implement more than 30ECTS after next year, or either implement at the same pace as we are doing at this point: 30 ECTS every year.

Transition on micro-level: course innovation

Guiding Principles in the Transition to Blended Learning

As stated above, the on-campus program will be offered as a Blended program in order to maximize the flexibility for students, whether working students or not. In general the Blended Learning will be operationalized using a Flipped Classroom teaching method. 'Flipped Classroom' is commonly used as the term for the teaching method where videos replace the knowledge transfer happening traditionally in classrooms in such a way that in-class learning activities shift from knowledge transfer to deep level learning activities, usually socially oriented. It is called the 'Flipped' Classroom because what used to be classwork (the "lecture") is done at home via teacher-created videos and what used to be homework (assigned problems) has flipped (Bergmann, Overmyer & Wilie, 2013).

The following principles are guiding in the transition from the current to the Blended program:

Off-campus learning activities focus on knowledge transfer

Because the efficiency of web lectures is generally comparable to the efficiency of live lectures attended by students when it comes to retention (Russell, 1999) we will in many cases replace in-class teaching by web lectures. In order to maximize the students' flexibility, we opted to develop web lectures for the on-campus courses. Students are expected to watch them at home or together with peer students in the on-campus computer rooms that can be booked to watch web lectures. The time that becomes available because of the deletion of lectures in the student's schedule can thus be used for other learning activities.

On-campus learning activities focus on social and constructivist learning

Since students are no longer expected to attend in-class lectures, they will acquire the knowledge outside the class. This makes it possible to learn in a social and constructivist way during in-class teaching hours. Students will bring their prior knowledge, acquired through the web lectures, to the class where they will be expected to work together in multiple sorts of activities. First of all, these learning activities will be mostly social. Students will be able to

work in pairs or groups on a range of assignments. Also in the regular program we put a strong emphasis on teamwork, in synchrony with the university's policy. This group work will be easier to organize in the future, given that there are less lectures during daytime. Secondly, students will be able to interact more profoundly with the lecturers. Whereas in the regular program lecturers are less accessible because they are supposed to teach big groups in a rather one-directional teaching method, there will be more time for discussion with the lecturers in the working sessions and seminars that will be part of Blended-program courses. Thirdly, peer-to-peer support will increase strongly as on the one hand the seminars that will be organized on-campus are interactive moments and on the other hand, students will be forced to use the discussion forum of Blackboard (the Virtual Learning Environment used at Hasselt University) to ask questions, rather that emailing directly to the lecturers. The latter will of course monitor the forums and intervene if there are no clear (or even incorrect) responses to certain questions, but the forum is too an important way for the lecturer to know the topics of the web lecture that appear to be unclear for students. Topics that receive much attention in the forum can thus be discussed thoroughly in the interactive seminars and Q&A sessions.

If possible, lecturers are referred to available (Open) Educational Resources that can be reused

As we know from experiences and from interaction with the lecturers, creating learning materials takes considerable time and effort from lecturers. Especially in the field of Statistics many OpenCourseWare and Open Educational Resources are available and can be used freely and for free without any problem. It is the educational support's job to refer lecturers to these available materials when possible.

Guiding Principles in the Transition to Distance Learning

Blackboard as Virtual Learning Environment

Blackboard Learn is the university's Virtual Learning Environment (VLE). We decided not to change this for the Distance Learning students because of a number of reasons. First of all the VLE is integrated with the administrative services of the university, so it would be rather complex to use another VLE within the same administrative environment. Secondly, lecturers are used to work with Blackboard: choosing another VLE would increase their work load (and decrease their motivation probably). Thirdly there is no particular reason not to use Blackboard so in this pilot phase of the transition, we opted not to change it. If we would encounter serious shortcomings of the VLE over the coming months, we will probably reconsider this decision.

Peer to peer support is encouraged over tutoring by lecturers

On the one hand we want to avoid a too high increase in work load for the lecturers in the Master of Statistics, which makes it logical to emphasize peer-to-peer support. But on the other hand we also want to activate students and make them independent learners who are aware of the presence and value of their peer students. Not only can they provide each other with useful information: in a Master's program we can suppose that students already have sufficient background in the discipline to explain their point of view. Peer support can also increase the sense of belonging to the study they are taking (especially in Distance Learning where there is no face-to-face social contact) and it can make the experience of learning less burdensome and more enjoyable (Boud, Cohen & Sampson, 2001).

Lecturers choose their own course design for their Distance Learning course

For the transition of the regular courses into the Distance Program courses, we opted to describe a number of course designs from which lecturers can make a choice for their own course(s). By suggesting a number of designs we give on the one hand the teacher the choice and thus a sense of ownership to his/her own course (Ogborn, 2002). By offering them a range of designs, they can decide for themselves how much time and effort they can spend in innovating their courses to ready them for Distance Learning. A minimum innovation and student support is required top-down, but still they can decide to what extent they create new courses.

Below we describe these designs.

(Web) Lecture centered design

In this design, the lectures are the central leading course component. As is the case in regular on-campus courses, the design of the course is determined by the structure of the lectures, which in a distance learning situation are replaced by web lectures. Learning activities for students in this course design are mainly watching web lectures and, if available, annotate presentation slides.

Handbook centered design

The leading course component in this design is the handbook. Several handbooks used in the courses of the Master of Statistics can be used for self-study. Lecturers who prefer to use this design usually complement the handbook with other resources such as knowledge clips (short videos that explain a concept or a procedure), exercises, practical examples, etc… The

consequence of adding other resources to the handbook is that the content can be contextualized and concretized.

Content centered design

In this design the students are provided with the learning outcomes of the course and with a variety of resources that all can be useful in the learning process towards the learning goals. They have to acquire the knowledge and/or skills through independent learning, whether this is social or not. This design is particularly suitable for experienced students and assumes a coaching lecturer who monitors the learning process. This rather liberal design is well suited for students who are able to design their own learning process, hereby choosing the kind of resources that are compatible with their learning styles: some choose to watch videos, others prefer scientific readings, etc.

Project based learning design

The project based learning design is well suited for courses where students have to acquire skills and develop social competences such as 'being able to work in a team.' In the beginning of the course the students are provided with a problem which they will have to solve during the time the course is running. The extent to which the lecturer interferes with the problem solving can vary, but in general it is the student who, together with their project team, selects the procedure to solve the problem. To make problem solving a learning process, reflection on the process is required, whether it is formal (e.g., in assignments or project reports) or informal (e.g., in reflection sessions). It is not only the lecturers' task to facilitate this reflection, but also to point the importance of the reflection phase.

Future considerations and research

At the time of writing, each of the lecturers involved in the transition to Distance Learning (n=7) are figuring out which of the described designs is the most appropriate for the content of their course and with which of the designs he feels most comfortable with.

The next steps will be to start developing the course materials, for instance writing course texts, recording web lectures and compose online tests and quizzes, especially for the distance students in order for them to track their learning process.

An important aspect of educational innovations is the evaluation of both the implementation process and the implementation product, i.e. the innovated Master of Statistics. At this point the idea is to conduct applied educational research but the research questions are not defined yet. There are however some options. We could research the learning styles that students adopt when studying as a distance learner. At the same time, it

might be an interesting quest to examine the teaching styles that lecturers adopt once they are asked to teach in a distance learning course, and compare that to their styles in regular on-campus education.

Conclusion

In this paper, we have tried to describe our first steps in Blended and Distance Learning. Although the final goal we are working towards is still somewhat uncertain and although we are now gathering experiences in the transition from regular on-campus education to Blended and Distance Learning, we are trying to figure out the right way to go and we feel confident that in several months we will have two stable study programs up and running. To establish this, we can rely on a whole team of experienced lecturers, complemented with a smaller team of educational support.

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Abstract

Advances in learning technologies along with changing demands of students and stakeholders have become some of the driving forces for open universities to explore new ways of modernising themselves to ensure sustainability. The Universitas Terbuka (UT) in Indonesia has been running for 30 years as an open university to meet the needs of its client for distance learning courses that are accessible in terms of mode and delivery, affordable in terms of cost, and accountable in terms of quality. The concept of open university has evolved to enter a new era. Open universities are to accommodate the integration of open and distance learning into the mainstream educational system and to explore new roles in the changing scenario. Increasing access and enhancing quality are conflicting issues to be reconciled through continuous improvement and modernisation. This paper discusses issues in modernising an open university in terms of what it means and what it takes, which aspects to modernise within the user context, and how it is done. Further discussions focus on actions taken by UT in modernising itself through effective design and improvement of services that meet students' needs, facilitate learning, and eventually build trust and confidence in the institution. Continuous enhancement of quality are conducted based on the belief that quality services can be improved to benefit students and stakeholders, as well as build institutional effectiveness and reputation.

Key words: open university modernisation, student services, quality improvement

Evolving concept of open university

Open and distance learning (ODL) takes many forms and evolves dynamically, as described by Moore and Kearsley (2012, p. xv) in the Preface of the 2012 3rd edition of their book.

> "The past five years have witnessed a transformation in the availability of educational opportunity at all levels, from the university graduate school to the kindergarten classroom, from the corporate training network to the professional development of doctors and nurses, and the training of military personnel. Technology continues to advace at breakneck speed, taking with it transformation of thinking about how we learn, and forcing revision of thinking about how teach. These changes in turn offer opportunity to forward-thinking educational administrators, and they compel others to reconsider how their institutions are organized and their budget allocated. In other words, the revolution represented by distance education continues apace."

These direct introductory quotations provide us with clear description of changes in ODL and the speed of technological development that have made teaching and learning more challenging for higher ODL institutions, making it more accessible and affordable to students. At the same time, these changes have also continuously directed ODL system to adapt itself more rapidly to respond to emerging needs of the students.

ODL should always develop in ways that are able to meet the needs of students and stakeholders (Simonson et al, 2012). Since the time the terms open university (OU) and ODL are introduced, people have gained better understanding of terms and their applications. ODL and OU have been widely applied in different programs of education across different countries and cultures and at different levels of provision. Both OU and ODL systems have also adapted themselves to respond to the needs for lifelong learning and continuous professional development. The introduction of new technologies for teaching and learning, particularly online learning, have paved news ways for OU and ODL system in the way they offer programs and courses. OU and ODL system have the capacity to reach different groups of students using different modes of interaction and communication.

Trindade, Carmo & Bidarra (2000) have observed the development of ODL and the evolution of universities, in which universities have transformed themselves from serving limited number of students to meeting access by a large number of audience. The campus-based universities have maintained their major functions of teaching, research, and community services. Limits to access have encouraged the developments of open universities throughout the decades of the 1970s and 1980s, and more recently the foundation of virtual universities (Trindade, Carmo & Bidarra, 2000). Higher ODL institutions and OUs share common functions as those campus-based intitutions, although they use different methods of teaching and learning and reach diverse groups of students.

The development of OU and ODL system in new formats continue until today, as indicated by the growing number of virtual universities or e-learning universities, the provision of the massive open online courses (MOOCs), and the application of online and blended learning. MOOCs are a recent trend that have been added to ODL involving a range of online learning

options (Liyanagunawardena, Adams & Williams, 2013). Universities have now been more confident and are willing to embark on new ventures in online and blended learning, which enrich student learning experience through a combination of both campus-based and online learning. ODL seems to have entered into another phase of development in line with the advancement of technology and changing needs of the society for new modes of learning.

A recent study by Tait (2013) on distance and e-Learning, social justice, and development examines the relevance of capability approaches to the mission of distance teaching and open universities. Tait (2013) has reviewed the discourse of mission in large open universities, and further analysed the theories of development and social justice in relation to their institutional missions. OU system has adapted itself to meet new needs of learning styles of its diverse groups of students.

ODL and OU have been developed in response to the needs for mass higher education and meet the challenges of the knowledge societies (Trindade, Carmo & Bidarra, (2000). They evolve and need to be continuously evaluated and improved in terms of quality. A later study by Tait (2013, p. 13) offer a wise conclusion: “At a time of increasing commercialization and commoditization of higher education there is a need to protect the development character of higher education institutions and in particular open and distance teaching universities”.

Another important theoretical challenge for distance education is a shift from structural to transactional issues, in which theoretical concerns on distance education need to shift from “the standardization of a product outweighed issues related to the adaptability of the educational transaction” (Garrison, 2000). ODL has been responsive to these changing scenarios of teaching and learning.

The review of literature has indicated that OU and ODL as an educational innovation have consistently integrated themselves into the mainstream educational system. Students and stakeholders have the choice of taking higher education courses on campus or through ODL. Students who lack the time to attend campus-based instituions may decide to take courses through an OU they can do those courses using ODL system. When students opt to enrol courses on a campus-based university, they will have to attend classroom courses.

Changes are currently taking place that enable many students to have wider options and greater flexibilities to take the courses via ODL system or online and blended learning, or to take the courses conventionally on campus. People also have easier access to a wide range of online courses through MOOCs as well as other kinds of online learning provision, which they can take with or without charges. Learning has gradually become an individual obligation and right at the same time.

Although changing are taking place in terms of the integration of ODL and OU system in the mainstream educational system, there are remaining issues of inequality of access and quality to be addressed. Nowadays, a wide range of online courses are available to those with proper device. Many of these online courses are of high quality, but there are also

courses that are still doubtful in terms of quality. Country capacities in terms of provision of internet infrastrcture vary, and this may lead to inequality of internet access. Economic capacities and social opportunities among different segments of the society within each country also vary that may lead to further inequalities in terms of access to knowledge. These issues are to be gradually resolved, as countries generally attempt to improve the quality of ICT infrastructure and at the same time individual citizens have increasing economic capacities amd literacies to use new technologies.

Open learning and the concept of open university has entered a new era. The constantly increasing needs of adults for continuous professional development and lifelong learning have shifted higher education instituions to open up new avenues to meet these specific needs. Supported with developments and uses of new technology for learning, higher education institutions can now offer educational services that are more easily accessible by students.

Open learning has become the interests of stakeholders and driving force of expansion for many higher education institutions to reach wider groups of clients. The open university is no longer the dominant player of ODL. Many higher education institutions have transformed themselves to become providers for ODL courses.

The wide use of internet and its ease of access by students have encouraged higher education institutions to offer regular online courses. Many MOOCs are offered by higher education institutions jointly in collobaration with each other. These developments have made learning become rich experience for learners who have access to the internet. Learners with proper devices and support have easier access to a variety of knowledge and courses that suit their specific needs for professional development and further learning needs.

ODL has become more integrated into the maintream educational system, although there are historical origins that may have previously made them different from each other. Integration should provide stakeholders and students with greater flexibilities and wider choices in pursuing higher education studies. For integration to be effective and have added values to stakeholders and students, legislators and governments should have educational laws, regulations, and policies that clearly incorporate the roles of ODL as part of the maintream education.

The OU is now confronted with the challenge to find and redefine its roles in the new higher education scenarios, in which societal demands are increasing, mobility of services worldwide are taking place, and vast amount of knowledge are accessible by the community. The new roles of the OU system in a changing scenario have strengthened its missions to provide access to quality higher education and knowledge to the wider community. The OU system no longer has geopolitical nor geographical boundaries, as OU courses can be taken by anyone with access and competency in the language of instruction used for the courses.

Ensuring access and quality simultaneously

Along with the rapid changes as earlier described, ODL has also been constantly confronted with the paradox of ensuring access and quality simultaneously. Quality ODL is a major concern for students, governments, and other stakeholders. As students and employers needs quality higher education to meet job competencies, governments are obligated to wisely allocate the necessary resources for ODL. At the same time, ODL institutions have to make themselves accountable in terms of quality.

Managing quality ODL has been a worldwide challenge, and effort to improve access and quality has been a major interest of ODL system (Inglis, 2005). In South Africa, for example, effort has been made to design ODL system that promotes access, quality, and student support in an Advanced Certificate Programme for South African rural teachers, as reported by Fresen & Hendrikz (2009). A similar concern to improve quality and student support in ODL is also taking place in Asian ODL (Kawachi & Sharma, 2011). Such effort to increase education access through critical review of approaches and practices is also made in East Africa (Komba, 2009). With the introduction of online learning, effort in quality assurance in online learning has also been developed and implemented (Frydenberg, 2002).

The conflicting issues of access and quality have remained important considerations, although new technologies have made them become less relevant. New ODL approaches have made teaching and learning services easier to access. ODL institutions also constantly make effort to provide programs and courses with quality standards acceptable by stakeholders and employers. Quality ODL has been further challenged with the more recent ODL approaches that use new technologies involving online learning to enrich student learning experiences.

The OU has been designed as a higher education institution that is able to meet the need for accessible quality higher education by the society using ODL system. The OU system has adopted the use of new and appropriate technology in accordance to the needs of the society it serves. The ODL system has been developed with the capability to accommodate a large number of students with the same standards of quality. This is one unique capacity of the ODL system.

The OU should ensure continuous improvement and convince the public and stakeholders that ODL is of the same or even higher quality than the other modes of teaching ang learning. QA system has been developed by OU and ODL system as it is a worldwide concern. ODL system and stakeholders have colaborated in joint effort for continuous improvement that includes developing common criteria and tools for implementing QA system, benchmarking, and raising awareness of the public about QA. Internally, ODL institutions have developed their QA system and ensure effective QA implementation so that they can meet the expectations of students and stakeholders.

ODL and OU systems have made consistent attempt to improve quality continuously because of the natural character of opennes of the system. As the needs for learning arise,

so do the need for quality and accessible ODL. OUs have mostly been established by governments as public institutions. Many virtual universities have been initiated by private enterprise. New ODL initiatives through MOOCs have been pioneered not only by OUs but also by campus-based institutions with the general purpose to ease access to higher learning.

Modernising an open university

The open university has an enormous task of modernising its learning and teaching approaches and management styles because of the changing scenarios of higher education needs and increasing demands for continuing professional development and lifelong learning. The OU system has been initiated as an innovation, introducing new methods in learning and teaching and educational services. The OUs should find themselves capable of changing its paradigms and reforming its approaches to these changing scenarios. Modernising OU and ODL should be a concerted effort that involve good understanding of what should be modernised, which aspects to modernise, and the purpose of modernisation to benefit distance learners.

Modernisation may be defined in several ways. One pragmatic definition of “modernity” can be found in Wikipedia, stating that “modernity” may involve the following aspects:

- ✓ increased movement of goods, capital, people, and information among formerly discrete populations, and consequent influence beyond the local area
- ✓ increased formal social organization of mobile populaces, development of "circuits" on which they and their influence travel, and societal standardization conducive to socio-economic **mobility**
- ✓ increased specialization of the segments of society, i.e., division of labour, and area inter-dependency (Direct quotes from Wikipedia, 2014).

The challenge for OU is then to decide what kind of modernisation to take, what it means to improve services and satisfaction of students, and to make an OU a truly modern institution capable of meeting the needs of students and stakeholders effectively.

Higher education institutions, including OUs, have to adjust to changing environments and modernise themselves in order to be sustainable. Modernising an OU covers all aspects of its operations, including academic services, management, operational system, administrative as well as other services. OUs have to make consistent effort to continuous improvement. There is no doubt that OUs may take different paths and adopt different approaches in modernising themselves. The OU spirit of modernisisation shoud be built into its institutional culture as a learning organisation. The OU system has to consistently adapt itself to the needs of modernisation in terms of technology used for teaching and learning, management and support systems that help students learn more effectively, and the way the system improves access and quality to serve its students. Modernising an OU should lead to improvement of services that support and facilitate distance learning. At the centre of the improvement effort is to ensure that students can learn more effectively through

various means that make learning at a distance a pleasant and encouraging experience.

Modernising UT through improvement of student services

Universitas Terbuka (UT) has responded to the changing higher education scenarios by modernising itself throgh improvement of student services. UT modernisation addresses the needs of students and stakeholders, through effective policy formulation and implementation, and planning of actions within the specific context of Indonesia. Information and data used in this particular section are taken from the UT website (www.ut.ac.id) and the most recent Annual Report of the Rector of Universitas Terbuka (UT, 2014).

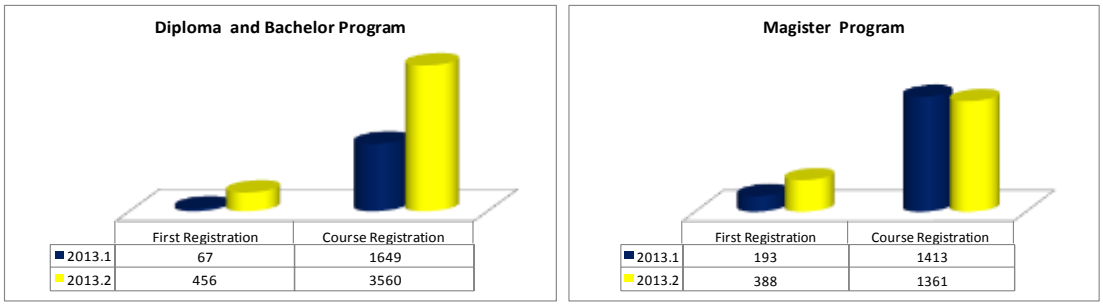
Student services are of importance to students, and they have significant effect on ensuring effective learning process. Student services in ODL include those administrative services (registration, information and administrative processing), logistic services (learning, examination and other support materials), and academic services (tutorials and other learning support services). Student services are critical to provide the necessary support through their distance learning process. The learning process for distance students have improved with the advancement of technology. Success in learning has also been imrpoved through effective design and development of the learning support system for distance students. New technologies in the ODL system have enabled greater interaction and communication among students and with instructors. Additionally, student services are also provided in order to build trust that the open and distance education system is one of ways of achieving their educational needs.

Modernising student services can take many forms, and it includes academic as well as administrative and support services for distance students. In terms of increasing access to student services, UT continuously enhances the quality of student services in a variety of modes, such as in face-to-face and online tutorial services, online self-excercise, online-based enrichment materials, digital library, Online Tutorial Kit, and Dry Lab. UT has also implemented online registration and payment, digital printing for examination manuscripts and answer sheets, as well as administer online examination. Access to OER (open educational resources) has alaso been made available to enrich student learning.

UT implements online registration system as part of the effort to improve academic administration services. Online registration with electronic payment has been implemented since 2012 for master students (starting in the first semester of 2012), and then for diploma and bachelor students (starting in the second semester of 2012) for both registration for new students and course registration. By implementing electronic payment system, the validation process of course registration can be conducted faster because students can pay the fees at the partner bank in a matter of minute, and the payment transaction can be recoded and synchronised with UT student record system. In addition, the implementation of electronic payment system ensure accuracy of course registration and its payment.

Figure 1 shows the number of students at diploma, bachelor, and magister programs who registered online.

Figure 1
The Number of Students Using Online Registration



Source: UT, 2014

The printed learning materials is the main source for student learning at UT students. UT has made improvement of the quality of the learning materials in a variety of ways in terms of size, format, integration of mutimedia materials, and design for independent learning of the materials. Multimedia learning materials have been developed as integrated part or as supplement to the printed materials for some courses depending on the characteristics of courses. This improvement has made learning easier for distance students, as the learning materials are easy to use and carry, and available to meet the different learning styles of the students.

Online access to learning materials has also been imrpved through the introduction of Virtual Reading Rooms as part of the UT digital library. The Virtual Reading Room is one form of student services designed to facilitate student learning process. Full text online electronic version of UT printed learning materials are made available to UT students through the Virtual reading Room, making it possible for students to studey the materials anywhere anytime. In the early 2014, up to 91% nearly 1,000 of the learning materilas are available online in full text learning through the Virtual Reading Room. The Virtual Reading Room can also accessed by UT online tutors through online tutorial services. Furthermore, online self-directed exercises are available online to assist student learning. For students needing practicum, online Dry Lab is available, making it possible for students to work amd experiment independently with minimal supervision of tutors.

UT OER provides knowledge that can be freely accessed by public. It consists of quality learning resources developed by individual lecturers or teams, adopting creative commons license. Up to mid of 2014, there are 310 topics of online learning resources at the UT website that can be accessed by public at. One of the UT OER is ITV-UT that can be accessible via online streaming. Up to the end of January 2014, there are 1,341 I-TV programs at the UT website accessed by 11,222 visitors. *Guru Pintar Online* (GPO) – literally means "Online Smart Teacher" – is another OER at UT dedicated to teachers so that they can have free access to quality learning resources. GPO consists of examples and discussion about (1)

Instructional Laboratory, (2) Enrichment Learning Materials, and Video Programs of Enrichment Instruction, as well as an online forum for discussion among teachers. Teachers can benefit from the UT GPO as the learning resource for continuous professional improvement.

Student learning support services are provided in order to facilitate successful student learning process. The availability of tutorials are intended to assist students in understanding the learning materials and solving their learning problems. Since students are encouraged to interact with other students, tutorials can help increase student motivation and encourage independent learning.

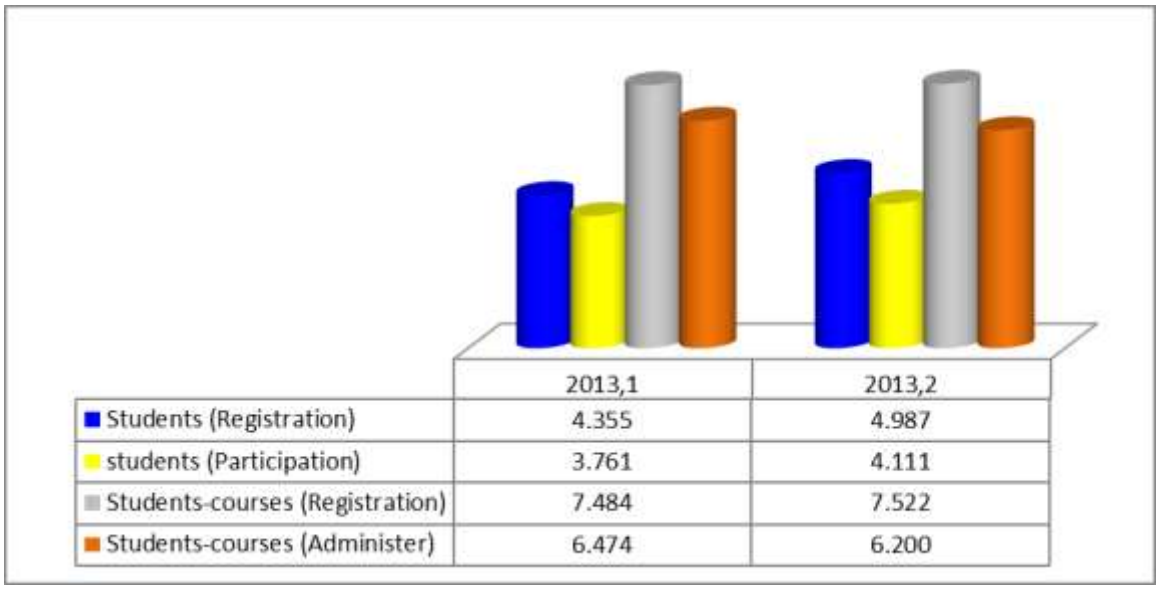
UT provides online tutorials, aside from face-to-face, radio, and television tutorials. Online tutorials also provide students with experiences in using technology in their learning process, and exploring new knowledge. Literacy in the use of technology will prepare students with the necessary skills as professionals in the digital world. Most online tutors are UT academic staff. At the first semester of 2013, there were 930 online courses attended by 108,942 students. At the second semester of 2013, there were 843 online courses which offered online tutorials, and 123,960 students participated in online tutorials. This data shows increasing number of students participating in online tutorials. UT has developed web-based tutorials (*Tuweb – Tutorial Web*) using the web seminar mode., especially for UT students residing outside Indonesia.

Improvement of examination system is important to ensure quality, accuracy and security of student evaluation process. Examination process is conducted to measure student achievement of a course in a study program. Areas of improvement includes grading system, and administration of the examination. UT administers four cycles of semester examination a year, two for the non-primary teacher education Program and the other two for the primary teacher education Program. The Primary Teacher Program is intended for elementary school and early childhood teachers offered by the Faculty of Teacher Training and Educational Sciences. Meanwhile, the Non-Primary Teacher Programs are offered by the Faculties of Economics, Mathematics and Natural Sciences, Social and Political Sciences, Postgraduate Program, and the study program for secondary and high school teachers at the Faculty of Teaching and Educational Sciences.

As illustration of the logistics in the administration of examnination is as follows. At the first semester of 2013, UT administered semester examination in 667 locations with 350,473 students, including 12 locations overseas with 1,181 students. Meanwhile at the second semester, examination was administered in 678 locations with 336,405 students, including 15 locations overseas with 1,319 students. In the first semester, the Examination Center processed 1,792,294 examination papers, and 1,654,735 examination papers in the second semester. In order to speed up the processing of examination papers, UT has implemented digital printing in producing the examination manuscripts and answer sheets since 2011.

To offer flexibility, UT has administered online examinations for 634 courses (66%) during

the first semester of 2013 and 634 courses (67%) during the second semester of 2013. The number of students taking the online examination in 2013.1 were 3,761 students and in 2013.2 were 4,111 students. Online examinations are proctored at the Regional Offices (RO)s. Until now, UT administers online examination for objectives tests. The online essay examination is still being developed and tried out in some ROs. The online essay examination will be administered starting in the second semester of 2014. Figure 2 shows the number of students taking online examination and the number of student-course of the online examination in the 2013.



	2013,1	2013,2
Students (Registration)	4.355	4.987
students (Participation)	3.761	4.111
Students-courses (Registration)	7.484	7.522
Students-courses (Administer)	6.474	6.200

Source: UT, 2014

Figure 2
The Number of Students in Online Examination

UT has taken modernisation seriously through continuous improvement of students services ir order to meet the requirements of the students and stakeholders they serve. Modernising UT has taken into considerations the cultural aspects of the students and the accessibility of the technology available to students. UT is well aware that when new technologies for learning and teaching are introduced, it would take some time to orient and familiarise students with these technologies. Therefore, UT has introduced these new technologies gradually to students, tutors, and educators through a cycle of continuous improvement.

Conclusion

There is no doubt that modernising OU is a must to be achieved for an OU to be sustainable and accessible by students. The OU needs to continuously improve the quality of its services to meet the expectations of students and stakeholders. People working in an OU should share the same belief that quality of student services should be continuously improved, and that quality assurance and improvement is a shared responsibility of all staff and management. Improved quality of services should benefit students and stakeholders, and eventually build institutional image and reputation for the sustainability of the OU.

Sometimes innnovation and modernising an OU has to be enforced with care and effectiveness. Lots of work need to be done as well to convince stakholders and partners to go hand in hand with the OU in introducing and fostering uses of new technologies that benefit student learning.

Openness has been a strong character of ODL and OU. Openness has also become a stronger feature of higher education since the introduction of the OU system. New technologies have also confronted higher education and ODL system to a higher level of openness. Higher education systems have been encouraged to open new frontiers of learning provision through making their open educational resources available to the public through. To quote Lane (2009), openness should have constructive impact on bridging educational digital divides. As the term “open” suggests, ODL and OU should be able to bring about opportunities and learning experience to a wider audience.

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