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Dear TOJDE Readers,

Welcome to the Volume 18, Number 1 of TOJDE,

There are 15 articles and a book review in this first issue of the year 2017. These articles are written by 37 authors from 9 different countries. These countries are Bangladesh, Brazil, Canada, Iran, Mexico, Nigeria, Sweden, Turkey and USA.

The 1st article is written by Katherine J. JANZEN, Beth PERRY and Margaret EDWARDS. The title of the article is **BUILDING BLOCKS: ENMESHING TECHNOLOGY AND CREATIVITY WITH ARTISTIC PEDAGOGICAL TECHNOLOGIES**. Three Artistic Pedagogical Technologies are used in this article. The purpose of the article is to present the results of a research study that explored how selected artistic APTs stimulated interaction, created social presence, and helped develop community in the online post-secondary classroom. Findings are discussed and implications are presented in the end.

The 2nd article is titled **ASSESSMENT OF A MULTINATIONAL ONLINE FACULTY DEVELOPMENT PROGRAMME ON ONLINE TEACHING: REFLECTIONS OF CANDIDATE E-TUTORS** and written by Muge ADNAN, Filiz KALELIOGLU and Yasemin GULBAHAR. This article provides insights into a multinational faculty development programme for teaching online, elaborating on results of expectancy and satisfaction surveys.

PROBLEMS EXPERIENCED IN EVALUATING SUCCESS AND PERFORMANCE IN DISTANCE EDUCATION: A CASE STUDY is the title of the 3rd article. Ramazan YILMAZ is the author. The purpose of this study is to examine the viewpoints of lecturers regarding the evaluation process of academic success and performance of those students who are attending to online distance education program and to compare lecturers' views on assessment and evaluation practices carried out in face-to-face classroom environment with those online assessment and evaluation practices.

Ibrahim ARPACI is the author of the 4th article. **THE ROLE OF SELF-EFFICACY IN PREDICTING USE OF DISTANCE EDUCATION TOOLS AND LEARNING MANAGEMENT SYSTEMS** is the title. This study aims to investigate the role of self-efficacy in predicting students' use of distance education tools and learning management systems (LMSs). A total of 124 undergraduate students who enrolled in a course on Distance Education and selected using convenience sampling willingly participated in the study. The results of the main analysis also suggested that self-efficacy positively affects perceived ease of use, while usefulness and ease of use perceptions positively affect attitudes toward using distance education tools and systems.

The title of the 5th article is **ICTS AND EDUCATIONAL DEVELOPMENT: THE UTILIZATION OF MOBILE PHONES IN DISTANCE EDUCATION IN NIGERIA**, written by Fatima Shehu KABIR and Abdullahi Tukur KADAGE. This article makes a case for implementing mobile learning in Nigeria by showing a number of successful Mobile Learning initiatives. It also identifies challenges that need to be addressed in order to sustain and succeed in the implementation of mobile learning in Nigeria.

The 6th article, titled **READING OPEN EDUCATION IN THE AGE OF MANKIND: REPRODUCTION OF MEANING IN THE DERRIDEAN SENSE**, is written by Gulfem GURSES and Basak KALKAN. This study is aimed identifying students' perception of open and distance education system -being the educational technology of the twenty first century-, the present study has been conducted with 69 students that were presently enrolled to the Anadolu University Faculty of Open Education and entitled to the certificate of honour. At the end of the study, it is established that the students enrolled to the Open Education System regarded open education as a means to access to information.

THE EFFECTS OF SOCIAL MEDIA USE ON COLLABORATIVE LEARNING: A CASE OF TURKEY is the 7th article and written by Aysun BOZANTA and Sona MARDIKYAN. Determining the effects of social media on collaborative learning is the aim of this article. The results of the study might be helpful to students and educational leaders in their efforts to create initiatives to support, promote, and encourage the implementation and usage of social media in blended learning classes and provide adequate training for teachers to increase social media adoption.

Rouhollah MAHDIUN, Davoud MASOUMI and Maghsoud FARASATKHAH are the authors of the 8th article. The title is **QUALITY IMPROVEMENT IN VIRTUAL HIGHER EDUCATION: A GROUNDED THEORY APPROACH**. The article aims to explore the attributes of quality and quality improvement including the process and specific actions associated with these attributes – that contribute enhancing quality in Iranian Virtual Higher Education (VHE) institutions. A total of 16 interviews are conducted with experts and key actors in Iranian virtual higher education in this study.

The 9th article's title is **STUDENTS' PREFERENCES IN ONLINE ASSESSMENT PROCESS: INFLUENCES ON ACADEMIC PERFORMANCES**. Unal CAKIROGLU, Fatih ERDOGDU, Mehmet KOKOC and Melek ATABAY are the authors. The purpose of the study is to investigate relation between students' preferences in assessment process and students' performances. The study was conducted with 67 sophomore students enrolled in Department of Computer Education and Instructional Technologies at a State University. The results indicate that, there are no prominent criteria in the relations between the preferences of students about assessment process and the academic performances.

The 10th article is written by Martin Alonso MERCADO-VARELA, Jesus BELTRAN, Marisol Villegas PEREZ, Nohemi Rivera VAZQUEZ and Maria-Soledad RAMIREZ-MONTOYA. The title is **CONNECTIVITY OF LEARNING IN MOOCs: FACILITATORS' EXPERIENCES IN TEAM TEACHING**. This article specifically discusses the role of the facilitator in Massive Open Online Courses (MOOC), which are characterized by their stimulation of learning connections. The results highlight that the collaborative construction of knowledge is the most widely used strategy to promote learning connections in MOOCs and that its design is the biggest challenge that facilitators faced while carrying out their activities.

A CONCEPTUAL FRAMEWORK OF VIRTUAL INTERACTIVE TEACHER TRAINING THROUGH OPEN AND DISTANCE LEARNING FOR THE REMOTE AREAS ENGLISH TEACHERS OF BANGLADESH is the title of 11th article and written by Irene PARVIN. The main purpose of this study is to identify a suitable technology for developing a virtual interactive teachers' training program for the disadvantaged English teachers of Bangladesh. It is hoped that the result of this study will encourage the policy makers to implement new ODL approaches for the training of disadvantaged rural English teachers.

Airton ZANCANARO, Carolina Schmitt NUNES and Maria Jose Carvalho de Souza DOMINGUES are the authors of the 12th article and titled **EVALUATION OF FREE PLATFORMS FOR DELIVERY OF MASSIVE OPEN ONLINE COURSES (MOOCs)**. This study seeks to identify platforms that make it possible to create, host and provide courses free of charges for the offeror; find in the respective literature, the basic requirements for MOOC platforms and to evaluate the platforms based on the raised requirements. As a result there is the identification of six platforms that allow the free supply of courses, the proposal for 14 requirements for reviewing them and a frame containing the evaluation of the identified platforms.

The title of the 13th article is **MULTIPLE ACCESS POINTS WITHIN THE ONLINE CLASSROOM: WHERE STUDENTS LOOK FOR INFORMATION**. John STEELE, Eric J. NORDIN, Elizabeth LARSON and Daniel MCINTOSH are the authors. The purpose of this study is to examine the impact of information placement within the confines of the online classroom architecture.

Major findings suggest that instructors teaching within the online classroom should have multiple data access points within the classroom architecture. Furthermore, instructors should use a variety of communication venues to enhance the ability for students to access and receive information pertinent to the course.

The 14th article is THE NEED FOR A MORE EFFICIENT USER NOTIFICATION SYSTEM IN USING SOCIAL NETWORKS AS UBIQUITOUS LEARNING PLATFORMS. This article is written by Can MIHCI and Nesrin OZDENER DONMEZ. While carrying out formative assessment activities over social network services (SNS), it has been noted that personalized notifications have a high chance of "the important post getting lost" in the notification feed. In order to highlight this problem, this article compares within a posttest only quasi-experiment, a total of 104 first year undergraduate students, all of which are prospective ICT teachers, in two groups. The results indicate a flaw in message design for using social networks as LMS's. Sensible use of push-messages is advised.

Onur YUMURTACI is the author of the 15th article. This article is titled A RE-EVALUATION OF MOBILE COMMUNICATION TECHNOLOGY: A THEORETICAL APPROACH FOR TECHNOLOGY EVALUATION IN CONTEMPORARY DIGITAL LEARNING. This study aims to provide a theoretical framework for the re-evaluation of the technology we utilize in connectivist learning; more specifically, how to evaluate our perception of mobile communication technology. The implications of possible outcomes of this re-evaluation are discussed with regards to connectivist learning and education as a whole.

A book is reviewed in this issue. The title of the book is RESEARCH ON E-LEARNING AND ICT IN EDUCATION. This book is an editorial book and the editors are Charalampos KARAGIANNIDIS, Panagiotis POLITIS, Ilias KARASAVVIDIS. The reviewer is Harun BOZNA.

**I wish a happy new year for all of you. Hope to meet again in the next issue of TOJDE.
Cordially,**

**Dr. T. Volkan YUZER
Editor-in-Chief**

BUILDING BLOCKS: ENMESHING TECHNOLOGY AND CREATIVITY WITH ARTISTIC PEDAGOGICAL TECHNOLOGIES

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ABSTRACT

Using the analogy of children's building blocks, the reader is guided through the results of a research study that explored the use of three Artistic Pedagogical Technologies (APTs). 'Building blocks' was the major theme that emerged from the data. Sub-themes included developing community, enhancing creativity, and risk taking. The discourse of the paper centers on how selected APTs stimulate interaction, create social presence, and help develop community in the online post-secondary classroom. Additional findings are discussed and implications are presented.

Keywords: Creativity, technology, e-learning, artistic pedagogical technologies, creative arts-based learning, social presence, social interaction.

INTRODUCTION

Artistic Pedagogical Technologies (APTs) are creative arts-based instructional strategies. Research conducted from 2006 to the present demonstrates that APTs enhance teaching and learning in the post-secondary educative environment. While it is known that APTs are effective, it is less clear why and how they are effective especially in the triad of stimulating interaction, creating social presence, and helping develop community in the online post-secondary classroom. Why APTs are effective has been, and continues to be, theoretically explored and refined through writings and research related to The Quantum Perspective of Learning (Janzen, 2013; Janzen, Perry & Edwards, 2011a; 2012a; 2012b; 2012c).

The purpose of this paper is to present the results of a research study that explored *how* selected artistic APTs stimulated interaction, created social presence, and helped develop community in the online post-secondary classroom. A brief literature review focused on creativity and the intersection of technology and creativity in the post-secondary educative environment is presented. The background of APTs is delineated. The research question and methods are presented. Results and discussion are explored. Implications for practice and further research are offered. Limitations of the research are explicated.

LITERATURE REVIEW

Creativity

The first recorded musings on creativity were addressed by Plato in Greco-Roman times and creativity was thought of as being a god-like trait (Hendriksen, Mishara & the Deep-Play-Research Group Michigan State University, 2014). Hendriksen and colleagues explain that this notion of creativity evolved over time until the Renaissance period where a creative person was thought to be unique or gifted, but still in a mystical way. This thinking was sustained until Shakespearian times. Even Shakespeare in his writings “doubted the absolute originality in creative work” (p. 16). While agreement that certain individuals are better at creativity than others has been sustained through time, creativity was thought of in the early 19th century as simply the art of “drawing from existing sources” (p. 16). In the 20th century, thinking related to creativity was thought of much the same way.

Beginning in the 1950’s creativity has now been researched for six decades (Cummins, 2013). Creativity is still thought of and defined in many ways, but essentially circumscribes the idea that creative individuals work with possible variations of ideas or themes to “produce something novel, effective, and/or esthetically pleasing” Hendriksen et al., 2014, p. 16). McCormack and d’Inverno (2014) outline, in particular, that Boden’s (2010) definition acts as a starting point in understanding creativity. Boden cites that creativity incorporates ideas which encompasses the novel, envelops the surprising, and elicits the valuable. In her seminal work, *The Creative Mind* (1990) she pioneered the construct of academic creativity.

Technology, Post-Secondary Education and Creativity

Today, we live in an era where technology is often deemed to be outdated by the time it is mass produced and reaches the user (Thong & Calvin, 2014). We have moved far from Web 1.0 technologies where the first courses were delivered via the web in 1994 (Hill, 2012; Pence, Williams & Bedford, 2015). Web 2.0 technologies have become ubiquitous and now we are beginning to utilize Web 3.0 technologies within semantic webs (Pence et al., 2015). We are considered to be existing in a Social 3.0 society (Moravec & van der Hoff, 2015). In this 3.0 society, Moravec & van der Hoff describe one in three of the United States’ workforce as “knowmads” or “nomadic knowledge workers [who] can instantly reconfigure and recontextualize their work environments” (p.3). It is estimated that knowmads will balloon to 45% of the workforce by 2020 (Disney, 2013; Moravec, 2013; Moravec & van der Hoff, 2015).

The face of online education and online learning environments are continuing to change. Rapid advances of technology provide both students and instructors with a multitude of choices not even imagined five years ago. If this frenetic pace continues it may push institutions, course designers, as well as teachers and students in even more novel directions as they try and keep pace with the technological explosion.

Gadgets, apps, smart phones, and tablets are continuing to morph (Odora & Matoti, 2015) which has ties to what the millennial learner may need technologically in terms of software and programs to remain engaged in the post-secondary learning environment in the next five to ten years (Janzen et al., 2012b). Internet technology and resultant skills taught today in all areas of post-secondary education have been purported for some time now to have become obsolete before students even finish their education (Cummins, Kunklel & Walker, 2015; Lightfoot, 2006). With the recent worldwide economic crisis and the resultant negative impact

on educational funding, how can post-secondary institutional budgets keep pace with technological advances in the face of shrinking resources? The answer may lie in enmeshing technology and creativity in the development of low cost technologies that deliver multiple benefits for students, instructors, and post-secondary institutions (Minuto, Pittarello & Nijholt, 2014).

Today, computers and creativity are creating “seismic changes” in education (McCormack & d’Inverno, 2014 p. 2). As a society, we have now generated machines that can learn (McCormack & d’Inverno, 2014) which incites exponential possibilities in education. Virtual worlds are being increasingly used as “contexts for creativity” (Alahuhta, Nordbäck, Sivunen & Surakka, 2014, p. 16). While at one time highly skilled technicians developed interactive systems (Minuto et al., 2014), the creation of content is now being produced by teachers and students in a creative context of “social software” into e-Learning 2.0 (Toming & Lamas, 2014, p. 3). This has been largely accomplished by utilizing Web 3.0 technology and tools (Janzen et al., 2012a).

The gap between technology and creativity is being narrowed as teachers and students “take control over the creative process” (Minuto et al., 2014, p. 141) ensuring that creativity still resides within the “human ability to engage in everyday creative skills” (McCormack & d’Inverno, p. 2). This, then, becomes the enmeshing of technology and creativity. This is the hallmark of Artistic Pedagogical Technologies (Perry & Edwards, 2010a; 2010b).

BACKGROUND

Artistic Pedagogical Technologies

Artistic pedagogical technologies (APTs) are creative arts-based teaching strategies and have the features of Web 3.0 technology (Janzen, Perry & Edwards, 2012a). APTs include literary, visual, musical, or drama elements and are distinguished from customary teaching strategies by their emphasis on aesthetics and their heightened connection to creativity (Perry & Edwards, 2010a). APTs were first pioneered by Perry (2006) over 10 years ago. Perry posited that technology could be melded with the creative arts to produce teaching strategies which could have benefits for both students and instructors in the post-secondary online learning environment. Starting with just a single APT, Photovoice was developed as a derivative of Wang and Burris’ (1977) action research. The research team of Perry, Edwards and Janzen have gone on to create and research new APTs.

Research has explored APTs and how APTs positively influence post-secondary online learning environments and student learning (Perry and Edwards (2006; 2010a; 2010b; 2012; Perry, Edwards, Menzies, & Janzen, 2012; Perry Mahler & Edwards, 2009). APTs help provide a real and authentic medium for instructors and students to engage with one other, with technology and with educational content (Janzen, Perry, & Edwards, 2011b; 2012a), create inviting learning environments (Perry & Edwards, 2012), initiate, sustain, and enhance interaction between students and instructors, and help develop community (Perry & Edwards, 2010b, 2012; Perry, Janzen, & Edwards, 2011). Further, the use of APTs stimulate creative thinking, capture student attention (Perry, 2006), extend the application of course content, contribute to positive learning outcomes, and help develop a sense of professional fulfillment for instructors (Perry & Edwards, 2010b).

APTs contribute to students establishing a sense of group identity (Perry et al., 2011), support course engagement, enhance the learning environment, and develop social connectedness (Perry, Dalton, & Edwards, 2009). Finally, students report a positive influence on not only course interactions, but on their sense of community, increased comfort in the educational milieu, and learners note that APTs aided them in getting to know themselves, classmates, and

instructors (Edwards, Perry, Janzen, & Menzies, 2012). Through Perry and Edwards' (2010a; 2010b; 2012) research, a collection of APTs appropriate for use in a variety of disciplines have been developed and evaluated. The collection of APTs continues to grow (Janzen, 2013; Perry, 2013).

METHODOLOGY

The purpose of this study was to increase understanding of *how* selective APTs stimulate interaction, create social presence, and help develop community in the online post-secondary classroom.

A purposive sample included students (N=60) from 2 faculties of nursing in Western Canadian universities. A convenience sample of the teachers (N=16) was also invited to participate. These teachers taught the classes in which the APTs were used. Student participants consented to complete online quantitative questionnaire and a sub-set consented to participate in online focus groups during which qualitative data were collected. Teachers consented to participate in online focus groups only. The research study was approved by the Research Ethics Boards of both universities.

The quantitative questionnaire, using a 5 point Likert scale, was adapted (with permission) from Rovai's (2002) Classroom Cohesion Scale (CSS) and Richardson and Swan's (2003) Social Presence Scale (SPS). The questionnaire was prepared using SurveyMonkey® and sent to participants electronically to an email addresses they had provided when they consented to participate. Questionnaires were sent to student participants by the research assistant and completed questionnaires were returned to that same research assistant. The research assistant complied the data so identifiers could not be associated with any particular responses. A total of 15 students completed the questionnaire for a participation rate of 25% in the quantitative element of the study.

Qualitative data were collected from students and teachers using secure, private, online focus groups. The actual number of participants in the online focus groups was teachers (N=4 for a participation rate of 25%) and students (N=7 for a participation rate of 12%). Quantitative data were analyzed using descriptive statistics and qualitative data were analyzed for themes using NVivo10 (QRS International, 2015) qualitative data analysis software.

Three APTs were used in this study: Photovoice, Parallel Poetry, and Conceptual Quilting. Photovoice consists of a photographic image with an accompanying reflective question which the students respond to. Parallel poetry involves a poem written by the teacher and then a poem written by the student which reflects or parallels the teachers's poem. Existing poems by other authors can be used by the teacher or the teacher can write a poem themselves. Conceptual quilting involves students and teachers creating electronic 'quilt squares' filled with concepts, ideas, or themes from a completed course that stood out for them. The completed quilt squares are fashioned into an electronic whole quilt electronically which is subsequently shared with the teacher and classmates in a quilt gallery. Teachers and students 'walk' through the gallery, view the quilt collection and then engage in discussion of common themes and reflections.

RESULTS

Quantitative Results

All 15 students who completed the questionnaire were completing a master's degree in nursing, health studies, or a nurse practitioner program. All participants resided in Canada with the majority (80%) living in Alberta, Ontario, or British Columbia. One study participant

had only completed one online course (the course included in the study) while the others (93.3%) had completed two or more online courses including the study course.

In response to the question that asked if APTs had a *positive influence on their learning* in the course, 16.7% marked strongly agree, 41.7% agreed, and the remainder of respondents (41.7%) neither agreed nor disagreed. The majority of the participants (58.4%) found that APTs had a positive influence on their learning.

When asked if online education is an excellent *medium for social interaction* as demonstrated by APTs, (33.3%) were neutral. The majority (67.7%) were positive. Specifically, 6/15 students agreed, and 2/15 students strongly agreed, that APTs demonstrated online education was an excellent medium for social interaction.

Students were asked if APTs enabled them to form a *sense of community* online. The majority of respondents (50%) were neutral, but this time 1/15 students (8.3%) disagreed indicating that APTs were not helpful in the formation of an online community. On the positive side, 33.3% agreed with the statement, and 8.3% strongly agreed, for a total of 5/15 students who did find that APTs helped with community formation in their online course.

A more general question that asked if students in online courses which have learning activities encouraging interaction are more likely to form a sense of community netted no neutral responses. A large majority (91.7%) agreed, or strongly agreed, with this statement. Only 1 student disagreed.

When asked if they felt comfortable interacting with other participants in APTs, again a large majority (75.0%) agreed. A further 16.7% strongly agreed that they felt comfortable for a total of 91.7% on the positive side. One participant was neutral and no respondents disagreed or strongly disagreed with this statement.

The statement that read, "My point of view was acknowledged by other participants during APTs," again elicited a strong positive response with a total of 75% (9/15) indicating that this occurred. More specifically, 1/15 strongly agreed and 8/15 agreed that their point of view was acknowledged by others during APT learning activities. The remainder of respondents 3/15 were neutral on this point with no students marking a negative response.

Participants were asked if they came to know themselves, other students, and the instructor through APTs. Several participants (5/15) were neutral while 5/15 agreed that they did get to know others through APTs. Further 2/15 (16.7%) strongly agreed that APTs helped them get to know course participants. There were no negative responses.

Another question asked students if they were able to form distinct individual impressions of some course participants by their APT participation. No respondents marked disagree or strongly disagree. Approximately twenty-seven percent (4/15) of participants were neutral on this point, and the remainder (66.7%) either marked agree, or strongly agree, indicating that they were able to form distinct impressions regarding people in the course through their APT participation.

The last question asked if the respondents felt the learning in the course was positively influenced by APTs. One person marked disagree indicating that APTs did not have a positive influence on learning. Six of 15 respondents marked neutral, while 41.6% gave a positive response. Of the positive responders 4/15 agreed, and 1/15 strongly agreed, that APTs positively influenced their learning in the course.

Qualitative Results

The major theme that emerged from the data was 'building blocks.' Sub-themes included developing community, enhancing creativity, and risk taking. This theme and sub-themes are explored in this section of the paper.

Building blocks

As children, many played with building blocks—wooden blocks featuring colorful alphabet letters and/or animals. One would build structures with these blocks with an ultimate objective of seeing how high the structure would become without toppling over. It was soon learned, through trial and error, that the blocks needed a broad foundation upon which to rest resulting in a stronger structure.

It was also learned that there could be spaces within the enlarging structure which added to the height of the structure without compromising strength. Last, the structures that were built were as individual as the creators of the structures themselves. Each structure was representative of the different aspects or imaginations of the builders. No two structures were exactly alike. Through the activity of creating structures through the use of building blocks there were benefits such as developing dexterity, furthering imagination, encouraging creativity, and fostering learning. When playing with other children, the structures built developed a sense of community between those that participated, furthered the creative natures of the individuals that were participating, and allowed the builders to engage in risk taking before either the structure toppled to the ground or the last building block was used. Using the analogy of the building blocks, the builders are the students and teachers acting as individuals and co-builders. The blocks become representative of the various APTs employed in this research. The finished structures are closely aligned with the building blocks of learning and the resultant benefits of utilizing APTs in in the online classroom. The variety of the structures created represent creativity enmeshed with technology.

To illustrate the building block metaphor, phrases "putting things together" and "building upon" emerged from the data. For example, one teacher participant remarked,

I think one of the things is that, we are kind of looking at their ways of *putting things together*. And of course they have various learning styles, but some people were very creative and I think they enjoyed the exercise because of that, and I think they were able to use their creativity and kind of integrate all the learning theories and concepts from the course. (Italics added)

Another student participant noted that APTs were "a great tool to *build upon* . . . current knowledge, rather than repeating what [had been] already learned about" by "pulling together course concepts and sharing [them thereby] creat[ing] discussion." (Italics added). As an instructor participant noted, APTs enabled participants to "grasp connections between important elements." Additionally, APTs were seen as a tool that could aid in "verifying that learning [had] taken place" (instructor).

Several other benefits were seen as a result of engaging in APTs. One student participant remarked that APTs "enabled me to learn what I wanted to or needed to learn." Another student said, "each week was kicked off with a different teaching tool, which was very useful at capturing attention and driving the desire to learn." Another learner commented involvement went "beyond having to participate in order to get a grade" and "the activities in the course invited [students] to think beyond course requirements." A teacher concluded that this encouraged 'individualized self-expression, as well as collaborative learning, and help[ed learners] to better understand and integrate training content.' Participants concluded that APTs "inspired a richer conversation," and "professionally and educationally, APTs opened

mind[s] to additional effective teaching/training, and learning strategies helping to promote online social interaction, content integration and collaborative learning.” In sum, within the use of APTs in this research study, community was developed, creativity enhanced and risk taking embraced.

Developing community

Developing community, like building participative structures with building blocks, involved a sense of being not only co-creators in the development of content but also involved engaging in an interactive nature with other students, teachers, technology, and ultimately with the learning environment. The result was a learning environment that participants commented felt “real.” One student remarked that “the active interactions elicited by APTs felt very real and meaningful” while another said, “I couldn’t say that I ever felt [the] online course did not feel ‘real.’ The work, forum contributions, assignments, and extra discipline required, are quite real.”

Participants became ‘real’ to each other though sharing their perceptions and assignments with each other. One teacher expressed, “by encouraging students to express themselves through poetry, concept quilting, or Photovoice, for example, I found that we got to learn a bit more about each other’s experiences, talents, and perspectives.” A student commented about the conceptual quilt saying, “we were actually going to share it so I could see that forming a sense of community for sure.” This sense of community was enhanced through the development of a “culture... in the class environment where [students] wanted to participate” (instructor). The result was an environment where students “took the time to interact more with [their] classmates and instructor.” This allowed, “through the use of APTs,” getting “to know classmates more” and “led to a sense of collegiality [in] the forums.”

This collegiality was perhaps best expressed in a poem a teacher shared in one of the discussion forums where parallel poetry was utilized. This was the teacher’s first attempt at sharing his/her own poetry.

I am your teacher
I answer your questions,
I reply to your emails,
I give you advice,
I inspire your learning,
I challenge you to do your part,
I am your teacher.

I have your best interest at heart,
I help you to critically think,
I guide you to knowledge fountains,
I encourage you to drink,
I grade your work with care,
I am your teacher.
I empower you through self-direction,
I lead you by example.
I give you timely feedback,
I appreciate your worries,
I try to meet your needs,
I am your teacher.

I am committed to you,
I understand your challenges,

**I praise your accomplishments,
I want you to succeed.
Let me inspire you
Like you inspire me
Let me help you grow
I am your teacher.
And you also teach me,
We are partners,
In your journey to success.
You learn from me,
I learn from you,
We will be changed forever.
I am your teacher.**

Enhancing creativity

Just as building structures with building blocks requires a sense of creativity as the structure emerges, APTs engendered and encouraged a sense of creativity in both learners and teachers. This creativity was both individual and collective in nature. One teacher expressed the individual and collective nature of APTs in saying that "APTs provide another tool to engage learners' creativity." Another teacher expressed it much the same way in that APTs "tapped into their creative ability" which was then shared and discussed with each other in further creative ways.

Within the discipline of nursing, there exists an art and a science both professionally and educationally. Creativity may have infused an essence of 'art' into traditionally 'science' based theory courses. This is illustrated by one student who remarked "the assignment encouraged creativity, blending theoretical concepts into an art form" and another commented that "it was a creative way to express a generally text-based course into something visual." One teacher expressed it this way:

"For me it was the use of creativity to be able to pull the course concepts together in a different way instead of a more-I guess you would say-a traditional way. This is just something that is different and I think they enjoyed it."

The students enjoyed these types of activities as well. One student stated, "I personally enjoyed these types of things because I've always enjoyed things that are creative." Another student put it this way:

"I think it just—it helps with the students' learning when they can tap into some of their creative abilities and pull things all together and I think that people don't realize is how much, when they are doing the activity, just how much they are having fun and enjoying it."

As well as having fun, creative processes were enacted. The teacher who wrote the poem which was previously cited, commented: "I surprised myself with the poetry exercise as I never imagined that I could create any type of poetry." This sense of accomplishment and creativity however, involved risk taking.

Risk taking

Building structures with building blocks requires an element of control and risk taking. Control involves a steady hand and the creative and purposeful placement of the building blocks. Risk taking is also evident in that the builder(s) cannot be 100% certain that with each successful block being placed whether the structure will topple to the ground. However, the builder(s)

continue to build despite that risk and the emerging structure validates and lessens that sense of risk as positive outcomes are realized.

Although APTs involved risk taking, APTs also gave a sense of “control over the learning environment” for both teachers and students. Some of that control came because of the element of choice. Participation in APTs was optional and not graded giving participants choice in terms of their involvement. This choice was encapsulated in “picking learning activities,” “develop[ing] and direct[ing one’s] own learning,” and the “choice of learning activities to meet [one’s] own learning needs.” “Aha” moments were one of the benefits of risk taking. One participant expressed his/her reactions to another student’s conceptual quilt. “It was very evident from her quilt what she was trying to say and what she learned so when the other students did see it they kind of had that aha moment.”

Students and teachers “open[ed] up (creatively) with [their] peers about [their] feelings.” This opening up was a reciprocated experience where instructors took “risks, so, [students] felt safe to do the same.” A teacher expressed the level trust students had in both their peers and their instructor:

“Like when you are doing the conceptual quilt there has to be a level of trust I believe for the student to be able to share with you their thoughts and feelings about a particular concept, I found that some of the pictures that students used really demonstrated the student’s personalities. For them to be able to use specific pictures that represented them I feel that they had to trust the instructors and probably the class as they shared this with them.”

Two students remarked on the need for mutual respect that accompanied the sharing in the conceptual quilting exercise in that the sharing could “be personal.” This was illustrated in the following comments: “respect... I think it is just providing respect for others if you are sharing with other people or commenting on [their work]” and “I found it also contributed to a neutral sharing ground for all, and a safe place to do so.” Further, one instructor commented, “On a personal level APTs helped [students] be less afraid to express [themselves] or tap into potentially hidden talents.” APTs also increased interactivity, and students were willing to express themselves in a way that at times created some vulnerability as the following instructor quote illustrates.

“Students were generally more interactive with ATPs, including those who appeared to be shy at first. They seemed more eager to ‘let their hair down’ and share their professional and personal experiences while integrating course content. I also found that students seemed to encourage and compliment each other more during ATP exercises and didn’t mind showing some vulnerability.”

DISCUSSION

To return to the analogy of building blocks, a solid foundation has been built over the past 10 years which has demonstrated the many benefits of APTs. A tower or educational teaching structure has been built block upon block, year by year, and research study upon research study. There remain spaces in the structure which have allowed the developing knowledge base of APTs to be continually explored and added to. This research represents the first study to explore *how* APTs ‘work.’

APTs could be seen and understood much like building a structure through the use of building blocks. Instead of envisioning how high the APTs (the structure) can become, APTs can be seen as a multitude of learning technologies that enhance or broaden the learning experience

for students and teachers alike. The spaces between the building blocks or APTs represent fluidity instead of stasis—therefore allowing APTs to continue to develop in breadth and depth. As well, research involving APTs continues to evolve and exploration is recurrent as new questions arise.

Thus, the APTs are not cemented together but represent a plasticity as a medium to enmesh the APTs, students, teachers, and the learning environment together with technology. This is supported by the tenets of the SITE Model which espouses that for learning environments to be successful, all elements (students, instructors, technology and environment) must be present and intersect resulting in Quantum Learning Environments that grow evolve and are living environments (Janzen et al, 2012a). This then, can create learning environments that are 'real' (Janzen et al., 2010) and invitational (Janzen et al., 2011c; Perry, 2013) despite the online nature of the course delivery. From the findings of this study, students *want* to participate and their participation can invite both teachers and students to share not only their thoughts and feelings but also their experiences. APTs provide a venue for members of the class community to reveal elements of their personalities, attitudes and values in an appropriate way. Doing so helps students and instructors to get to know one another in a more human to human way even through the mechanisms of the online course.

The plasticity which exists can allow each student and teacher to see and utilize APTs in unique ways, furthering learning and enhancing creativity. It is posited that no two people see APTs exactly alike, which allows and encourages creativity. For example, in the APT, Photovoice, each individual sees something different within the images that are presented. Each Photovoice then, becomes as unique as the individual that works with the images and results in a multitude of different expressions through words and images. Diversity becomes evident and valued by the class community.

Additionally, on occasion sometimes similarities and commonalities are revealed as learners participate in APTs. For example, if two students create conceptual quilts that highlight similar elements of the course, this gives fodder for the formation of alliances and even friendships furthering the sense of connectedness and community in the class. When two students see the same thing in a Photovoice image and share this in the public forum of the online course they are often pleased to discover a kindred spirit in the course. This finding of someone who shares something in common with them often results in the two working together on a course project or interacting activity in a discussion forum. Learners become engaged and discussions achieve depth in part of what appears at first to be a simple APT.

APTs can create community through the sharing of multiple mediums that APTs represent. The building blocks, then, become those of sharing, shared experience, trust, and respect. This, as in the building blocks, helps to create and further develop a strong foundation upon which to build community. Essentially community seems to be created within a virtual world which is 'real' to those that frequent it, populated by 'real' people and filled with 'real' experiences through the use of 'real' APTs.

The sense of community is referred to as "co-presence" in the virtual world (Alahunta et al., 2014, p. 7). This co-presence is mediated by the shared experiences of teachers and learners and is "embraced by immersion" (p. 7). APT assignments can immerse students and teachers into a virtual world that can become a virtual community. This community, although not long-term as it does not extend past the confines of the course work, can be very 'real' to all participants for the time they are part of that community.

Additionally, APTs can create virtual worlds by utilizing familiar learning objects such as photographic images, quilts, and poems. Through mutual or dual-learning—or as Brooks,

Borum and Rosenørn (2014) term it, "joint-learning" (p. 37), learning seems to arise from the use of familiar objects and participants' encounters with each other's sharing. In essence, this dual-learning can be conceptualized as building a community together just as in building a structure out of building blocks as a collective activity. It has been said in a traditional African proverb, that it takes a whole village to raise a child (Healy and Salaam, 1998). Likewise, it is posited that it takes all learners and each teacher to build a virtual community. The class community building becomes a communal effort (1998) and the collective efforts of all are needed help create virtual communities that are strong and healthy. Thus, the building blocks do not topple and builders (teachers and learners) can go on to greater heights, insights and learning.

For example, through the use of Conceptual Quilting, each student or teacher creates a different quilt and when the quilts are shared with one another, the opportunity to further enhance the learning of others in the online classroom can occur in a rich and deep way. In poetry, the prior and current personal wisdom and knowledge of both the writer and the reader can intersect as thoughts and feelings are shared in an atmosphere of vulnerability and acceptance. This depth of such sharing involves risk taking which was seen by students and teachers alike to be an affirming experience in this study which lends itself to further developing community.

Emmeshing Creativity and Technology in the Post-Secondary Learning Environment

As one participant remarked, "technology and creativity were two of the components that were embraced." We suggest that technology and creativity become enmeshed in the use of APTs. Etymologically speaking, the word enmeshed is derived from the 1530's meaning to become entangled or involved (*Online Etymology Dictionary* 2015a, para 1). More recently in 1944 enmeshment constituted to "put in" or "to involve" (para 1). Further, the word entangle from the early 15th century Latin, has ties to "interweaving" (*Online Etymology Dictionary*, 2015b, para 5).

When creativity and technology, such that is enveloped in APTs, becomes enmeshed then positive results can be seen. Creativity enhances high level meta-cognitive processes (Liu, Lin, Jian & Liou, (2012) while technology diversifies the experiences of learners and is thought to "enhance cognitive flexibility and creative thinking" (Kuo, Chan & Hwang, 2014, p. 221). APTs could be considered as "creative tools" just as computers are seen as creative tools (McCormack & d'Inverno, 2014, p. 2). Further, the intertwining of computers and creativity are felt to enrich the social and the cognitive (p. 8). When the virtual combines with creativity, sustained cognitive engagement occurs (Mason, 2014).

APTs can enable the inherent art of a discipline to emerge rather than focusing solely on the traditional science of that discipline. Frei, Alverez and Alexander (2010) echo this in saying that involving the creative arts in education, "provides a memorable educational experience that provides new ways of thinking about educational concepts and complements the dominant scientific pedagogy" (p. 672). Thus teaching is encountered in the affective domain which effectively creates an "intersection of science and art" (Frei et al, 2010, p. 676; Henriksen et al., 2014). Artistic practices such as APTs are closely interwoven with human creativity at a "raw and visceral" level (McCormack & d'Inverno, 2014, p. 3) often at a level of the very 'being' of students and teachers alike as they take risks and succeed. APTs as the technology can allow an intertwining of creativity to emerge to enhance that sense of truly 'being-in-the-virtual-world' (Heidegger, 1962).

IMPLICATIONS

Software development is a lucrative business in today's world of technology. In addition, the procurement of innovative, creative software can be an expensive venture for post-secondary institutions. Thus, technology can be considered to be a "double edged sword" (Thong & Calvin, 2014, p. 50). The response to the high costs of technology in online post-secondary education has been to continue to primarily use traditional forms of teaching and technology such as reading, discussion boards (Brooks et al., 2014) and online forums. Providing low-cost technologies which enmesh with creativity may be one solution that has been overlooked for far too long. APTs can provide both cost effectiveness and harness creativity. Ultimately APTs can have substantial prospective in building invitational virtual structures or virtual environments, creating social presence, and developing virtual communities. We posit that these are of great value.

This value can be both communicated and transferred to the generations that follow. This can be envisioned in building even better online educational institutions than exist in today's millennial world—a future online educative world in which technology is unequivocally enmeshed with creativity. In the precise combination of benefits that APTs allow, virtual worlds have the potential to merge in today's society as effective, cost-worthy technological and creative tools for educational institutions, teachers, and students alike.

LIMITATIONS

There are several limitations in this research. First, the results are not generalizable due to the small sample. In quantitative research the aim is generalizability while the purpose of qualitative research is not directed to generalizability (Cresswell, 2013). A mixed methods approach however, strengthened this research. A mixed methods approach combines the strengths of both quantitative and qualitative research while lessening the inherent weaknesses of either one by itself (Onwuegbuzie & Johnson, 2006).

While a small sample in quantitative research lends less generalizability to the research results, a small sample of six to eight in focus groups is considered to be adequate and results in richer data (Kreuger and Casey, 2009). Further, restricting focus group size counters the limitations of focus groups due to the use of more than one focus group, the development of reflective questions to promote thinking and sharing, and inviting all group members to provide a voice. The constraints of the focus group were also mediated by the number of accesses on the secure, online focus group blog page (n = 111). Participants appeared to be highly engaged in the focus group. Kreuger and Casey also outline criticisms of focus groups, namely, possible intellectualization, focus group members lacking emotion, participants creating fictitious data, and dominant individuals influencing results.

CONCLUSION

In this paper research pertaining to a collection of four selected APTs, was explored. This exploration pertained to *how* APTs stimulate interaction, create social presence, and help develop community in the online post-secondary classroom. The theme of 'building blocks' was identified along with three subthemes: developing community, enhancing creativity, and risk taking. Methodology and results were presented. An examination of the dominant theme and sub-themes followed. A discussion was undertaken related to the themes. Potential implications as well as limitations of the research summed up the paper.

This research has presented several conclusions regarding *how* selected APTs can enhance the online classroom in very specific ways. Using the analogy of children's building blocks helps

the reader to understand APTs in new ways by utilizing these familiar objects. The building blocks presented generate not only a foundation for helping to understand how APTs work, but also a springboard to envision how creativity and technology can merge in the online educative environment more meaningful, purposeful, and thoughtful ways. It is hoped that through additional research these processes will become better understood.

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ASSESSMENT OF A MULTINATIONAL ONLINE FACULTY DEVELOPMENT PROGRAM ON ONLINE TEACHING: REFLECTIONS OF CANDIDATE E-TUTORS

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ABSTRACT

Teaching online requires different skills, roles and competencies for online instructors compared to teaching in traditional learning environments. Universities should offer ongoing support in various forms to help academic staff through their online journey. This paper provides insights into a multinational faculty development program for teaching online, elaborating on results of expectancy and satisfaction surveys. From a local program to a subproject within the Swiss National Science Foundation Project Scopes, e-Tutor aimed at expanding competencies in online lecturing and providing OER material for training colleagues. Designed in the form of a descriptive case study, this research was conducted with 34 attendees of e-Tutor. Data was collected using an e-learning readiness and expectancy questionnaire, and open-ended questions after the program to measure satisfaction. Descriptive statistics were used to analyze the survey data and content analysis for open-ended data. Participants considered e-Tutor a well-planned and targeted program with good theoretical and practical balance. Duration of such courses, opportunities for adaptation to real-life situations, and localization of the content are areas to be explored further. For future studies, it would also be interesting to see whether participants can apply their newly acquired knowledge and skills to create efficient online learning environments.

Keywords: Professional development, faculty development, e-tutor, e-learning, online teaching and learning.

INTRODUCTION

Momentous step changes are taking place in higher education with information, Internet and communication technologies developing at an unprecedented pace. Technology continues to influence and change the way higher education is delivered, resulting in the emergence of fully online courses, degree and certificate programs, as well as technology-supported on-campus courses (Arinto, 2013; Bates, 2008; Lepori, Cantoni, & Succi, 2003; Stein, Shephard, & Harris, 2011). Distance learning is also changing from conventional

print-based to online in this digital era, requiring new 'organizational and pedagogical models' (Tait, 2010, ix).

Being central to any teaching-learning process, faculty members profoundly need new knowledge, skills, and qualifications about how to effectively integrate and adapt online learning into teaching. A major hindrance to the uptake of e-learning is argued to be the people (Anderson, Brown, Murray, Simpson, & Mentis, 2006; Stein et al., 2011), and a lack of appropriate professional development (Rosenberg, 2007). Human and circumstantial factors are also emphasized by several researchers, replacing computers as the central focus for online teaching (Salmon, 2005). Human factor is key since instructors work in professional communities, not in isolation; hence, issues of management and organization, design, collaboration and other organizational issues are also valid for e-learning as an institutional change. Organizationally, change indicates a process to perform in a more efficient manner; often a difficult and painful process. Change is easier to manage when parallel to employees' goals, so faculty participation and engagement is critical in embracing online learning technologies, particularly in conventional teaching situations. Professional development programs are vital to integrate lecturers into this change process; advising about the change nature and background, as well as training on the basics of online learning, tools and techniques required to adapt conventional classroom environments to online.

Stein et al. (2011) indicated that faculty development leads to higher levels of adoption and continued use. Shea, Pickett, and Li (2005) also claim that it is possible to achieve higher levels of faculty satisfaction through effective faculty development programs. High quality online teaching and learning must be supported through systematic, well-organized, proper faculty development initiatives, so that high quality online teaching and learning is supported, and instructors have *au courant* views of e-learning required to engage online students (Shea et al., 2005; Stein et al., 2011).

Faculty Members' Changing Roles in Online Learning

Use of online technology to support teaching and learning fundamentally changes the instructor's role, who are now expected to use technology effectively, adapting pedagogical knowledge to virtual environments and digitized content (Hu & Potter, 2012). Teaching online is very different from face-to-face in classrooms, where instructors observe learners' reactions real time, offer immediate clarification on complex topics, personally get to know learners and communicate face-to-face. This is completely different online, where instructors have to manage the environment and guide learners, in addition to delivering content. Transformation from information provider to facilitator, guide or moderator has been discussed by several researchers (Bailey & Card, 2009; Berge 2001; Laurillard, 2002; Mehrotta, Hollister, & McGahey, 2001; Moore & Kearsley, 2005; Palloff & Pratt, 2001; Pundak & Dvir, 2014; Smith, 2005; Williams, 2003). Tait (2010, x) describes this as a new mediating and supportive teaching role "to support the capacity of learners to make sense of the wealth of resources which they can, with guidance, find themselves". Alternatively, Arends (2008) examines e-instructors' roles under five groups: (1) an effective learning environment; (2) instruction as science and art, (3) quality of instruction, (4) quantity of instruction, and (5) active teaching and learning. Bawane and Spector's (2009) study on the prioritization of online instructor roles concludes that, among an identified set of roles, the pedagogical role has highest priority, followed by professional, evaluator, social, and technologist roles.

Competencies Needed for New Roles: e-Competencies

Online instructors (known as e-instructors or e-tutors), require certain competencies in order to perform using technology-enhanced tools. Williams (2003) classifies e-competencies as communication and interaction, instruction and learning, management and administration, and use of technology. In addition to Smith's description of 51 e-competencies for teachers (2005), Guasch, Alvarez, and Espasa (2010) specify e-competencies based on literature including design/planning function, social function,

instructive function, technological domain, and management domain. Accordingly, instructors are to plan instructional design from objectives to lesson evaluation, improve their relationship and communication with students, instruct and facilitate learning in a deep, complex and critical manner, use the necessary technology, and organize and modify the online process. Varvel (2006), on the other hand, summarizes e-competencies from seven aspects: administrative (education system, ethical concerns, and legal issues); individual (qualifications, characteristics); technological (knowledge, technology skills); instructional design (teaching-learning process components and design); pedagogical (learning process stages, learning styles, student characteristics); evaluation (learning, achievement); and social aspect (social issues of process management). Having defined ICT competencies for instructors, UNESCO's ICT Competency Framework for Teachers (2011) also emphasizes the concept of teacher as "an exemplar" where teachers acquire necessary knowledge, skills and experience and serve as role model to students in virtual learning environments.

Professional Development to Acquire e-Competencies

Preparing teachers for online education means preparing for diverse roles and relevant competencies, achieved through proper, authentic, coordinated, to-the-point professional development activities. Arinto (2013) states that professional development in open and distance e-learning is a "complex process that requires continuous engagement..., critical reflection, and membership in a community of practice". Conducted at a small Philippines distance education university, her study (2013) about course design practices of faculty members concludes that professional faculty development programs on distance learning should target wide-ranging competencies in a methodical and articulate manner. Wilson (2012) emphasized the importance of professional development with opportunities for skills acquisition and collaboration as most effective in his New Zealand study on e-learning managers' views.

Yar, Asmuni, and Silong's (2008) study to determine distance education tutors' roles and competencies at Malaysian universities, stated they "serve as useful guides to effective professional development". Based on comprehensive literature review, current practices and outcomes of an institutional workshop, an online faculty development program was created to train e-tutors how to conduct high quality online teaching-learning activities.

Many universities offer skills acquisition opportunities to potential online faculty, including informal learning, mentoring, in-service training or structured certificate programs. Structured training programs are the foremost support universities can offer online instructors to improve online instruction quality, since they cannot be expected to design, develop and deliver online courses innately (Rovai, Ponton, Derrick, & Davis, 2006). Worldwide examples include Germany (Technical University in Berlin, Freie University of Berlin, or University of Frankfurt run specific programs), Austria (joint initiative by 14 universities offering a national "e-Learning Certificate"), North America (ASTD, Sloan-C, Bay Path College's 3-tiered faculty development program, Virginia Tech Institute's Online and Masters Online Certificate Programs, or North Carolina State University's Comprehensive Online Instructor Certificate Program), India (Tech-MODE), Australia (Monash University), and United Kingdom (Open University's special training program).

About e-Tutor Certificate Program

Based on concepts of Pedagogical Content Knowledge (PCK) (Shulman, 1986) and Technological Pedagogical Content Knowledge (TPCK) (Mishra & Koehler, 2006), the e-Tutor Certificate Program was designed to provide potential online instructors with essential pedagogical and technological knowledge and skills for effective online tutoring. The program instils e-learning concepts and processes, together with useful tools for management, organization and e-Learning content creation. Participants are expected to gain the following e-Learning skills:

- knowledge of e-learning basic concepts and online learning theories;
- ability to determine what online learning theories are required to learn via e-learning;

- understand the differences of and use learning and content management systems, and virtual classrooms;
- to define the concepts of online instructional design and methods;
- learn concepts of copyright, intellectual rights, digital rights management, creative commons, academic ethics and plagiarism;
- learn about various assessment types;
- realize the principles of graphical design;
- to create effective visuals, graphics and multimedia materials;
- integrate and use social media tools;
- to be knowledgeable about quality assurance in e-learning.

The program consists of 14 topics, carried out on a learning management system (LMS) supported by one-hour live, interactive virtual classes for each topic. The LMS features used for communication, interaction and activities are survey, choice, assignment, lesson, forum, quiz activity, chat, and wiki. Various materials provided to students include electronic handouts, narrated presentations, videos, audio, interactive activities, e-portfolio artefacts, and Web resource links. Participants are assessed based on performance of activities and e-portfolio content. Success requires completing >70% of assessment activities, including creating an online course (main outline, course plan, and some learning materials).

From a local faculty development program, it became a subproject within the Swiss National Science Foundation Project Scopes in cooperation with Ankara University, Turkey. e-Tutor aimed at expanding competencies in online lecturing and providing material OER for training colleagues. Training materials were translated into English by the tutors, then edited and proofread by a native speaker. e-Tutor was ran as an intensive 7-week professional development program in October-November, 2014, with 51 professionals attending from Canada, UK, Georgia, Ukraine, Switzerland, Germany, Norway, Russia, Belarus, Romania, and Lithuania.

This paper aims to assess this multinational online teaching faculty development program on the basis of the participants' expectations and reflections through the following research questions:

1. What were the expectations of participants?
2. What is the e-readiness level of the participants for e-learning?
3. What are the participants' reflections for the course in general?
4. Are the participants satisfied with the program in general?

METHOD

Participants

This study was conducted with 34 e-Tutor program attendees, 80% of whom were actively teaching in various disciplines at higher education level. Table 1 provides additional information about respondents' profession and service duration.

Experience (years)	Profession	#	%
1-20	Instructor	27	79.41
4-10	Researcher	3	8.82
10-26	Software Developer	2	5.88
12	Lawyer	1	2.94
24	Physicist	1	2.94

Research Design

This descriptive case study assesses a multinational online teaching faculty development program, based on participant expectations and reflections. According to Yin (2003),

descriptive case studies describe a phenomenon or intervention in the context it occurs. Creswell also defines case study as 'an in-depth exploration of a bounded system (e.g. activity, event, process, or individuals) based on extensive data collection' (2007), and states that a "case" may be a single individual, several individuals separately or in a group, a program[me], events, or activities (e.g. a teacher, several teachers, or the implementation of a new math program[me])' (2012). For the purposes of this study, the case is the implementation of e-Tutor program.

Data Collection Tools

Researchers collected data using an e-learning readiness and expectancy questionnaire, followed by 12 open-ended questions to measure levels of satisfaction. Both data collection tools were created by one of the researchers. The e-Learning Readiness and Expectation Questionnaire for e-Tutors (Gulbahar, 2012) was completed by 34 participants of the e-Tutor program. The questionnaire was structured on Gulbahar's study (2012), with expert opinions taken from the field of educational technology. The questionnaire included 26 items classified under five factors. Reliability coefficient for e-readiness scale ranged between .77 and .80 (Gulbahar, 2012). The e-Learning Readiness and Expectation Questionnaire for e-Tutors has 24 Likert-type questions valued between '1-Strongly disagree' and '5-Strongly agree' under two dimensions: e-Readiness and e-Competency. It includes two open-ended questions on how participants plan to implement knowledge and skills gained from e-Tutor, as well as their expectations as well as their principal reasons for preferring e-Tutor.

Upon completion of the program, participants were requested to answer the following 12 open-ended questions. A total of 29 e-Tutor participants responded to the questions:

1. Has the e-Tutor Program met your expectations? Please explain.
2. What were the main benefits of the e-Tutor Program for you?
3. What do you think about the content delivered in terms of quality, intensity, and readability?
4. What do you think about the evaluation process (interactive assignments, e-portfolio artefacts, forum discussions etc.)?
5. What do you think about the teaching methods, techniques and activities used to deliver the content in terms of experiencing an online environment?
6. What do you think about the Learning Management System (Moodle) used?
7. To what extent did you benefit from the learning materials provided (videos, presentations, articles, etc.)? Did you find them useful and informative?
8. When adapting this course for your university, is there any aspect/topic you would change or amend? If yes, please explain which aspects and why.
9. What do you think about the Virtual Classroom Management Tool, Adobe Connect?
10. What do you think about the interaction level during the course?
11. Do you consider that you actively participated in the course during the seven weeks? Please explain your online experience in detail.
12. Is there anything else you would like to share with us?

Both data collection tools were shared with participants, and responses collected via the Learning Management System.

Data Analysis

Descriptive statistics were used to analyze the data obtained from the e-Learning Readiness and Expectation Questionnaire for e-Tutors. Content analysis was used to analyze the data gathered from open-ended questions where participants' responses were manually coded by the researchers separately, then reviewed and paralleled. A frequency table created, emerging themes identified, and codes and themes rearranged and classified.

The following section presents the findings of the data analysis. Significant ideas and statements by some of the participants are included as quotations as a way to illustrate the findings.

FINDINGS

Expectations from the e-Tutor Program

According to responses to the open ended questions prior to e-Tutor, the participants' expectations mainly focused on acquiring or advancing their knowledge of e-learning technologies. They also wanted to have first-hand experience in an online course, and also to receive practical information about organizing and conducting an e-course. Figure 1 shows the emerging themes from participants' primary expectations:

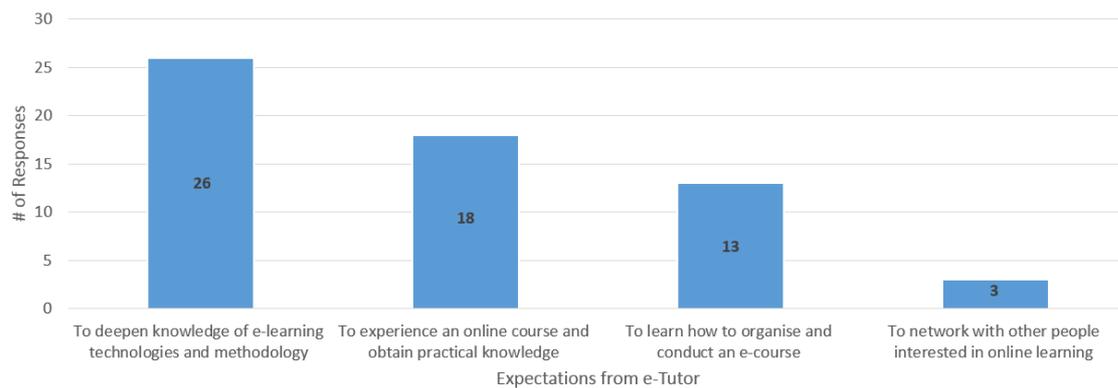


Figure 1. Expectations from e-tutor

Participants' future plans to use the knowledge and skills gained from e-Tutor concentrated on practice and teaching online (Figure 2). In addition, being able to develop an online or blended course, and helping colleagues prepare e-learning courses were also among their future plans.

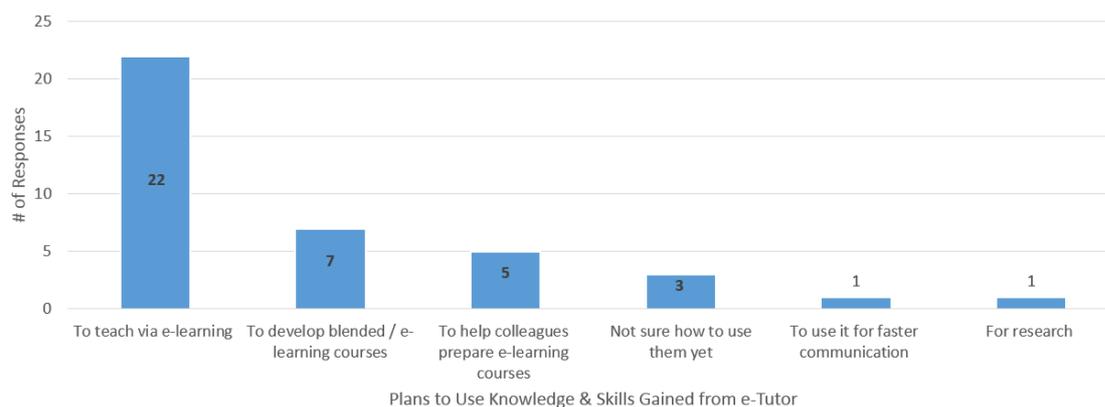
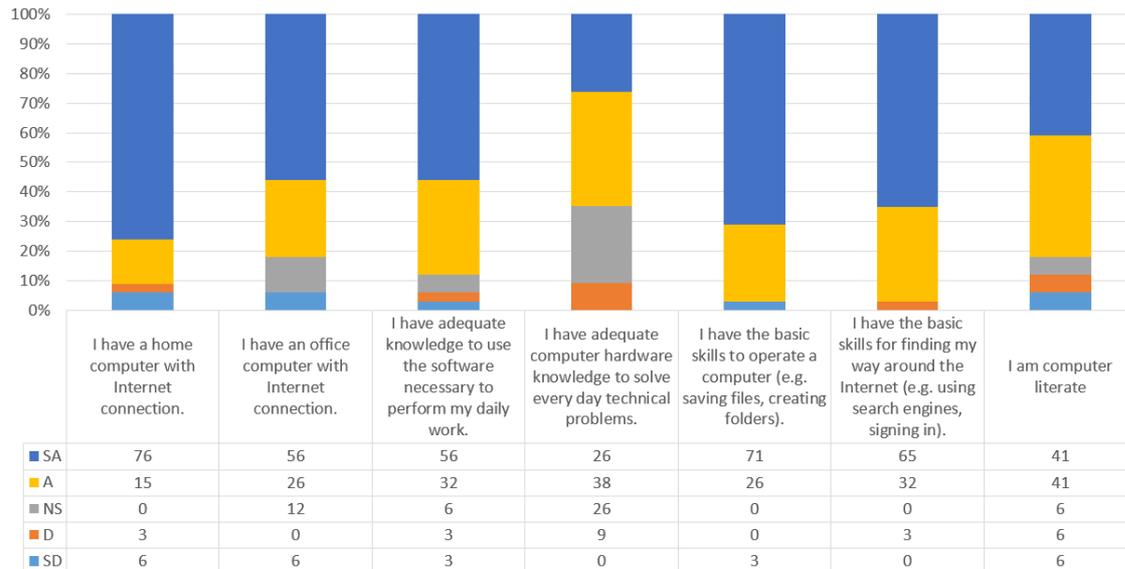


Figure 2. Plans to use knowledge and skills gained from e-tutor

Level of Readiness for e-Learning

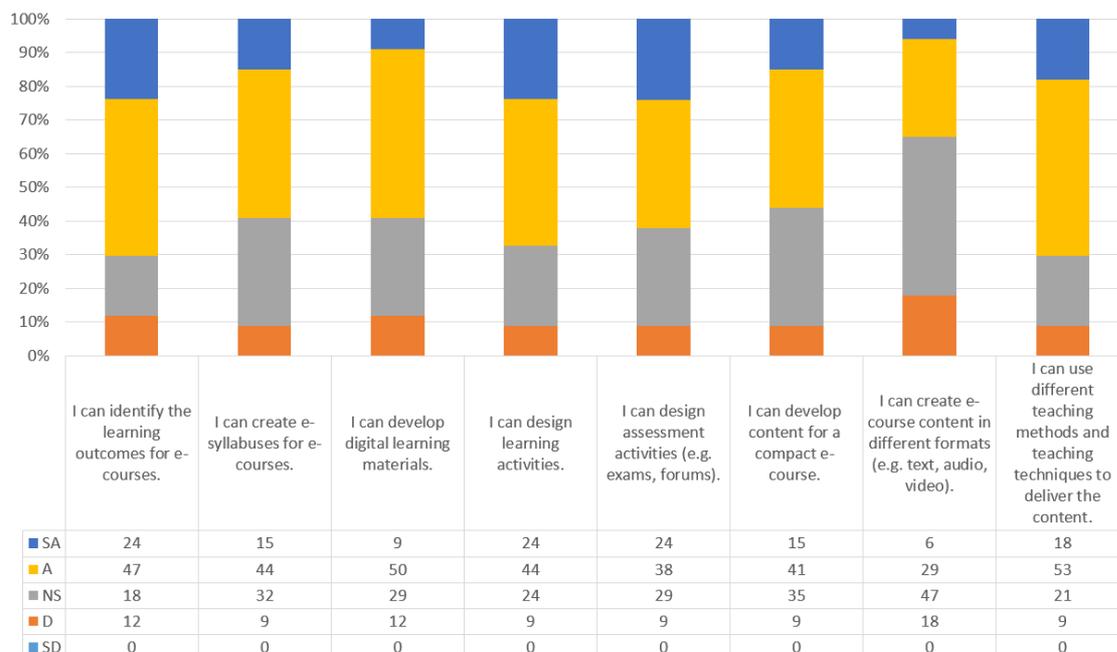
Participants' technological readiness, measured by the e-Learning Readiness and Expectation Questionnaire for e-Tutors, revealed a reasonably high level of readiness in terms of having an Internet-connected home or office computer, having basic computer operating and Internet usage skills as well as adequate software knowledge to perform their daily work (Figure 3). Overall, 82% considered themselves as computer literate.

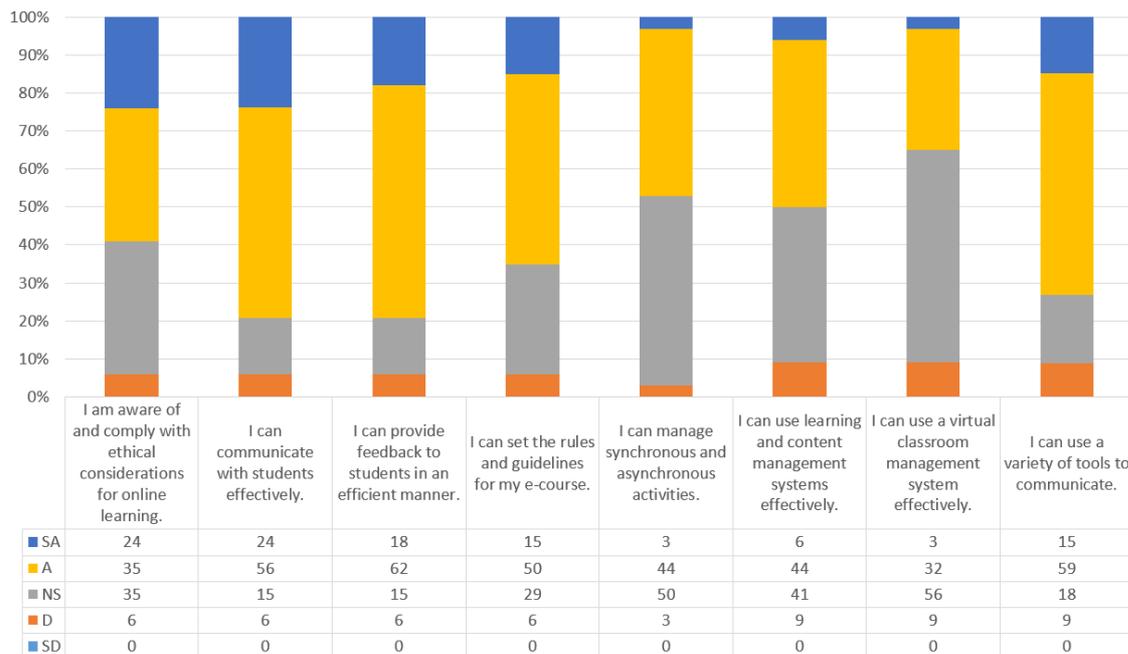


SA – Strongly Agree / A – Agree / NS – Not Sure – D – Disagree / SD - Strongly Disagree

Figure 3. Technological readiness for e-learning

Participants’ pedagogical readiness and perceived competencies (Figures 4.1, 4.2) were measured on specific instructor activities. Data shows that participants are less confident in terms of their pedagogical readiness particularly for the design, development and use of digital materials and systems. They seem to be self-reliant on traditional instructor competencies, including communicating effectively with students, providing feedback to students, designing learning activities or assessment activities. Yet, they are not so self-assured where digital learning environments are concerned, and half of them are unsure about how to use learning management and virtual classroom management systems.





SA – Strongly Agree / A – Agree / NS – Not Sure – D – Disagree / SD - Strongly Disagree

Figures 4.1 / 4.2. Pedagogical readiness for e-learning

Participants' Opinions about E-Tutor

Quality of content

All participants were satisfied with the quality of content, which they defined as appropriate, well-organized, interesting, modern, and comprehensive, with and a good theoretical and practical balance.

The choice of topics was excellent, and that's why I wanted to join the course in the first place. Starting with theoretical background and moving on to various methods, followed by relevant software and websites was perfect, and so was the weight given to each section during the course.

It was intensive; yet I think it was doable, largely due to the perfect organization of the topics and materials, and the adequacy of tasks. Short assignments were good, could be more, but less time consuming as the readability of the material was good – 'easy to understand' and overlapping with the synchronous session was helpful.

Four participants stated they would be happier if they tackled one topic per week; covering two topics every week was a majority administrative decision taken to complete the whole program before the year end. Finally, one participant underlined the qualifications of the program tutors:

Their class presence was responsive, professional, friendly, supportive, and flexible. They seemed to have a lot of experience, were very knowledgeable about the subject; also they were very willing to help and accommodate any learner needs that emerged. Their attitude was kind, but firm --the best mix really. They are highly useful role models for us as potential future teachers of e-learning.

Assessment

Electronic portfolios were used for evaluation purposes throughout e-Tutor, where participants had to complete more than 70% of the activities. In general, participants seemed satisfied with this process, since it reflects the flexible nature of e-learning with a

variety of tools that are appropriately organized and managed. The participants were also quite content with interactive discussions and hands-on activities. One participant stated: 'e-portfolios help to collect all the material together, and are always available from anywhere. Forum discussions are also necessary and useful, where you can discuss topics that interest you'. Another participant considered this assessment method as 'fitting perfectly with the expected outcomes of the course'. One participant said the overall program 'managed to make it varied and interesting for learners. It was a real asset'. Nonetheless, almost half the participants criticized not having enough time to efficiently handle the tasks. One participant said: 'They were useful, but there were many assignments, and not enough time to complete them'.

Teaching methods, techniques and activities

According to most participants, teaching methods, techniques and activities used to deliver the information were used effectively.

I admired the combination of techniques, suggested activities and social atmosphere of the course, created mainly by the tutors' friendliness and openness.

The way the course was set up (e.g. Moodle, videoconferencing) worked very well, giving us accurate e-learning experience, as did the homework assignments.

All the methods, techniques and activities perfectly fit the expected course outcomes. We experienced things we expect from our students, which will help in designing our own courses.

Good, interactive, well-explained, with different communication modes.

Participants also favored the level of interactivity and synchronous class sessions.

Synchronous teaching sessions were important - even more than I expected at the beginning. It kept us feeling part of the class. I liked [those] because of the feeling of involvement.

Then again, several participants expressed a need for more interactivity during online meetings, and also to complete collaborative projects with more colleague interaction.

Learning management system and virtual classroom management tool

The e-Tutor program used the Moodle open-source learning platform, with which some participants already had prior experience. Participants with previous Moodle experience were comfortable with it, whereas others found it complicated at first, yet quite convenient and easy-to-use after grasping the "logic" behind it.

This learning platform can be explored forever. I mean, the more you learn, the more you find something new in it.

Moodle learning management system is very good for timely communication with students, giving them useful and necessary information. It has all the tools needed for delivering and collecting materials.

Participants were also content with the virtual classroom software used; finding it convenient and useful. They experienced no technical problems; which was considered a positive feature of the tool. One participant mentioned difficulties with one specific browser.

It was convenient, because we could see the presentation, ask questions and interact with others.

It's a good replacement for live dialogue.

I didn't have any technical problems. Nice. Interactive. Sufficient for our program.

Learning materials

Participants valued the effort spent preparing varied multimedia materials, course notes and relevant website links. The learning materials were considered to be informative and useful.

*They are useful and informative, still, we need more practice to develop skills to better use them.
...it was sometimes the papers, the links you provided, and the course materials ... a good mix.
Yes, very interesting materials [were] provided to us. I often watch videos of lectures and presentations.*

The participants were asked about the perceived main benefits of e-Tutor. Participants' responses focused on using innovative software for creating learning materials, tools and applications as well as applying new pedagogical techniques into teaching. Figure 5 gives a graphical illustration of the emerging themes, followed by direct quotations from the participants.

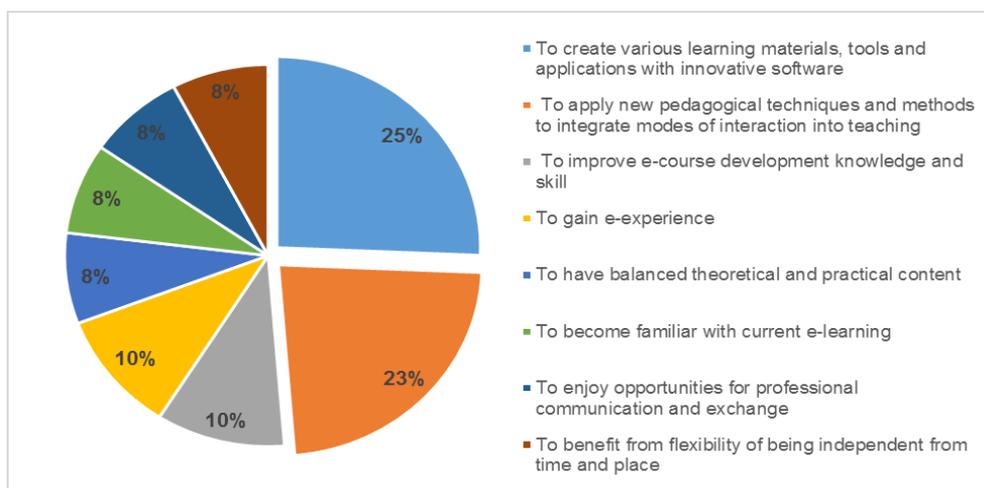


Figure 5. Perceived benefits from e-tutor

This was the first time I'd participated in such a program with highly motivated adult "students" and even more motivated "teachers". I actively experienced the process, and now I understand my students better.

The main benefit for me was having access to materials which I can use at my university. Thank you very much for this.

I studied many new approaches for teaching, and also learned how to make teaching process more effective.

Satisfaction with the program

Of the 29 respondents to the questions on satisfaction with the e-Tutor program, 75% stated they actively participated in the course, with 25% not actively and regularly joining the instructional activities.

I found the environment and activities motivating, so I had no trouble engaging with them. I'm also very short on time, so it was important for me to do assignments as they were given. In some cases, where I felt I had more to learn from a certain activity, I may have put in more than was required; I generally invested more in the activities that I felt would be more directly useful to me.

From the obligatory class time, I benefited most from the direct interaction approach --it felt like being in a real class with the teacher present. That was what most contributed to my sense of being part of an actual class group.

The majority of respondents (97%) stated that e-Tutor met their expectations. Three respondents considered it as a high level course that exceeded their expectations:

Yes, it did [exceed]. I expected a "masters' level class" --concentrated, easy to understand and follow with many real life tips and examples, a result-oriented course. And it really was like that!

Some emphasized the balance of theory and practice in the content:

In my view, the program successfully achieved its pre-set goals and the audience was exposed to a variety of theoretical and practical sessions and assignments. I enjoyed the training process.

Absolutely. It had just the right balance of theory and practice.

When I first looked at the content, I thought it was too much and I would not be able to manage that. But the content is well-balanced and practice-oriented!

Interaction throughout the course was another theme, reflected by participants as mostly high.

I truly enjoyed the chat opportunity during class and that people could ask/answer questions as they came up. The teachers were very friendly and encouraging, stimulating that interaction.

Tutors managed to maintain it on a high level. Everyone was involved; tutors responded quickly and were in tune with the audience. Thank you! It was a great job!

The course was very interactive. It was almost [like] a face-to-face course; we were able to ask questions anytime during the seminars. It's a very good format for 30-40 listeners (adults).

Only one participant was dissatisfied with the interaction level between participants:

If we are talking about participants, it wasn't really good. Few people participated in discussion forums, and even less were replying to somebody else's messages. It would be good to have a look at what others did with their e-learning courses and assignments, see what our mistakes were etc.

One objective of the e-Tutor program was to put the participants in learners' shoes in order for them to have first-hand experience with online learning environment:

It was important to experience a whole e-learning course as a student. The number of techniques used would help me to decide on my own options in terms of e-learning - what principles I adhered to, what I would like to keep doing, and what I would like to change. Being in a multinational class was also very interesting.

Being a subproject under the Swiss National Science Foundation Project Scopes, e-Tutor aimed at expanding competencies in online lecturing and providing material OER that can be used for training colleagues. Thus, it served as a model for its international participants, who would have like to adapt it for local practices. More than half the participants (58%)

stated they would adapt the course content without any change to its content or format. Others suggested adapting it with very slight changes like extended course duration, presenting/reducing graphic and social tools, administering more teaching methods, and providing more practical applications. Several participants mentioned concerns about colleague computer literacy levels and suggested some add-ons to include more features about LMS or changing the difficulty level of technical content.

DISCUSSION AND CONCLUSION

Al-Salman (2011) says "unlike what has been traditionally required from faculty in academia, distance learning necessitates that online faculty master a number of roles and acquire a specific set of competencies". Teaching online requires different skills, roles and competencies for online instructors compared to teaching in traditional learning environments. Universities should offer ongoing support in the form of professional development programs in order to help academic staff through their online journey. This paper provides insights into a multinational online teaching faculty development program, e-Tutor, elaborating on its assessment through the results of expectancy and satisfaction surveys.

The findings indicated that, from the perspective of technological familiarity, the majority of the participants were ready to attend e-Tutor. However, in terms of pedagogical readiness, participants felt less qualified conducting e-course activities, whereas they were able to use a variety of communication tools, teaching methods or techniques in general. They were particularly not qualified in using learning and virtual classroom management systems, managing discussions tools or creating digital materials effectively. What participants expected from e-Tutor was to learn basic e-tutoring skills, to deepen their knowledge of e-learning technologies and methodology, experience an online course, obtain practical knowledge, and learn how to organize and conduct an e-course.

These expectations perfectly matched the e-Tutor program objectives, which aims at equipping participants with contemporary knowledge and skills on technology use and its integration into instructional processes to improve the quality and efficiency of e-learning practices. Over 75% of the e-Tutor participants stated that they would use the acquired knowledge and skills to teach via e-learning, develop blended or e-courses. Many participants stressed the benefits of e-Tutor as acquiring the ability to create various learning materials, tools and applications with innovative software, as well as applying new pedagogical techniques and methods, and possibly integrate modes of interaction into their teaching.

Balanced theory and practice shaped participants' reflections on the quality and variety of e-Tutor content. In e-learning, it is essential to provide learners with a rich variety of well-organized materials that best serve their interests and respond to individual needs. In the case of e-Tutor, participants' responses to open-ended questions showed that some benefitted from videos and visual materials, whereas others used written materials and took notes for studying and future use. Therefore, it is possible to say that e-Tutor achieved its aim of reaching out and responding to all participants.

The practice-oriented nature of e-Tutor and active participation in the process was well received by most participants. Many emphasized the importance of experiencing as an e-learner before teaching online. Providing first-hand online learning experience is paramount to ensure faculty fully appreciate the online learning experience in the environment their students will use. This has been claimed to have a positive influence. Referencing to Knowles, Holton, and Swanson (1998), Stein et al. (2011) underlined the principle that puts learner engagement at the center of appropriate and effective professional training.

Practical and hands-on activities were fundamental to assessment, as well as electronic portfolios, which were well-reflected by participants. One drawback emphasized was the limited time allocated for completing the portfolios, since the overall program was completed in seven weeks. Deciding on the duration of online professional development programs is problematic because participants may need more time to complete activities; yet longer durations may lead to increased dropout or demotivation due to their routine business. On the other hand, shorter durations, as in the case of e-Tutor, may create pressure on participants to complete materials or activities more efficiently.

Synchronous class sessions were mostly discussed in terms of interactivity. Participants highly favored the opportunities for real-time interactivity through synchronous classes, with less interaction through asynchronous activities such as forum discussions. Synchronous sessions were said to instill a sense of involvement and communal belonging. Then again, participants wanted more interactivity during online meetings, as well as inclusion of a collaborative project to increase interaction with their colleagues. Collaboration and the value of collaborative effort have been underlined in other studies, and the concept of embedding professional development into everyday work life pointed out in addition to conventional courses, certification programs or workshops aiming at skills acquisition (Wilson 2007, as quoted in Stein et al., 2011).

Familiarity with learning and virtual classroom management systems was one concern expressed by participants in the readiness survey. Describing the course management system review process at the University of Florida, Means, Johnson, and Graff (2013) also determined during focus group interviews that many faculty members did not feel confident using such technologies, mostly due to their workload making learning of such technologies difficult.

One very important goal of e-Tutor, under the Swiss National Science Foundation Project Scopes, was to ensure adaptability of e-Tutor to different languages and cultures via its participants. Participants suggested adapting it either without change or with very slight changes like duration, social tools, teaching methods, and more practical applications. However, adaptation of e-Tutor for different cultures would definitely require certain changes to content, scope, and method of delivering content.

People are claimed to be a major limitation to the acceptance of e-learning (Stein et al., 2011; Anderson et al., 2006). Instructors play a crucial role in creating successful online learning environments, and amongst others, Stein et al. (2011) indicate that faculty development leads to higher levels of adoption and continued use. A recent study by Adnan and Boz (2015) considered if mathematicians and mathematics educators at a Turkish university with prior online experience as instructors or learners affect faculty members perspectives to teach online, and concluded that they were significantly positive about teaching mathematics online where they had participated in a professional online learning development program, and even more so if they practiced it. This was also emphasized by Chang, Shen, and Liu's study (2014) exploring the role perceptions of e-instructors in higher education where they concluded that 'e-instructors with sufficient training support rated [online instructional practices] higher than did those with little or only some training support'.

Online learning faculty development programs should reflect new roles, skills and competencies required from all instructors in any new online learning and teaching environment. This parallels with several accounts that professional development programs should address redesigning and rethinking multidimensional roles of faculty members (Arinto, 2013; Bawane and Spector, 2009; Chang et al., 2014; Guasch et al., 2010).

With the participants' help, the assessment of e-Tutor has led to certain issues being considered for similar programs: (1) well-balanced, well-organized programs with theoretical and practical dimensions; (2) longer duration to enable more time for hands-on

activities, yet keeping the program compact; (3) inclusion of collaborative projects to encourage additional interaction among participants; (4) motivation to participate in asynchronous discussion forum activities; and (5) experienced, responsive and dynamic tutors to keep participants engaged throughout the process.

For future studies, it would be interesting to see whether or not participants of faculty online teaching development programs can actively and efficiently apply their newly acquired knowledge and skills to create online learning environments and to teach online.

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PROBLEMS EXPERIENCED IN EVALUATING SUCCESS AND PERFORMANCE IN DISTANCE EDUCATION: A CASE STUDY

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ABSTRACT

The need for distance education is increasing due to such reasons as keeping up with the changing social conditions, meeting the learning needs of the individuals and enabling them to be lifelong learners. In addition to many advantages distance education provides, it also has certain restrictions. One of these restrictions is the problems encountered in evaluating students' success and performance. The purpose of this study is to examine the viewpoints of lecturers regarding the evaluation process of academic success and performance of those students who are attending to online distance education program and to compare lecturers' views on assessment and evaluation practices carried out in face-to-face classroom environment with those online assessment and evaluation practices. The study was a case study and the data of the study were collected from the lecturers who lectured in a distant education program of a state university. Based on the findings of the study, the problems that lecturers have in evaluating the success and performance of the students in online distance education and possible solution suggestions for these problems are presented.

Key words: Distance education, assessment and evaluation, success, performance.

INTRODUCTION

It is seen that both in formal education and in distance education, the behaviorist understanding, practices and evaluation methods have been used until recently (Benson & Brack, 2010). Such materials as the books, CDs, DVDs, videos or even educational software prepared by the teachers in distance education practices are materials prepared with a behaviorist approach. In the preparation process of these materials, teachers prepare the learning content and the materials based on the behaviors that students will be equipped with and deliver these materials and content to the students. Students are expected to study the content in the given materials and be successful.

However, as a result of the reflection of constructivist approach on distance education practices recently, there is a movement from pure transformation of information in education towards social construction of information (Benson & Brack, 2010; Lucas, Gunawardena, & Moreira, 2014; Tenenbaum, Naidu, Jegede, & Austin, 2001; Wen, Tsai, & Chuang, 2004; Zhang et al., 2015). Developments in ICT and their reflections on education also contributed to the progress of this process. Accordingly, the use of such interactions tools and environments as forum, blogs, social networks, web conferences in distance education improved the interaction between teacher, student and content (Hernandez, Montaner, Sese, & Urquizu, 2011; Thoms & Eryilmaz, 2014; Uzunboylu, Bicen, & Cavus, 2011) and decreased the perception of transactional distance among these elements (Ekwunife-Orakwue & Teng, 2014). By discussing on the subject in these medium and through these tools, teachers and students contribute to the development of the learning content and thus, ensure that the information is constructed socially (Benson & Brack, 2010; Mbatı, 2013; Thormann, Gable, Fidalgo, & Blakeslee, 2013). The most

important responsibility in implementing constructivist approach in online distance education programs is on the teachers who deliver online distance education courses.

Although there are significant changes and developments in ICT and although the reflections of these changes and developments are seen on education, one of the most important problems in online distance education practices is the issue of evaluating student success and performance. When the literature is reviewed, it is seen that mostly the assessment and evaluation practices used in traditional face-to-face classroom environments are used for evaluating student success and performance in online distance education programs. For example, in Turkish Higher Education System, the success and performance evaluation process in distance education programs is subject to a regulation.

According to this regulation; "Distance education programs and assessment and evaluation activities relating to the courses provided through distance education could be carried out face-to-face or in electronic medium, either attended or unattended, using the assessment and evaluation methods (assignments, project studies, written exams or oral exams etc.) approved by the senates of higher education institutions in line with the curriculum or in the form of a central examination. Mid-term exams could be carried out unattended in electronic medium if required; whilst final exams and make-up exams shall be carried out attended either in face-to-face or electronic medium. Where and how these exams will be carried out as well as which assessment and evaluation methods such as oral exams, performance exams, project, thesis and portfolios, will be used is determined by the senate upon the request of the relevant department. The rate of unattended assessment and evaluation activities on overall success cannot be more than 20% in distance education" (YOK, 2013).

It is seen that there is not a standardization of the assessment and evaluation activities of higher education institutions of today. Each university individually determines which evaluation methods they will use as well as according to which parameters they will score or the type of assessment and evaluation practices. Therefore, a lot of problems are encountered. According to the aforementioned regulation, whilst the rate of mid-term exams on overall evaluation cannot be more than 20%, the rate of final exams cannot be less than 80%. And this is in fact, something that is against the philosophy behind distance education. Ensuring the reliability dimensions of examinations could be determining factors in the fact that final examinations have higher effect on overall evaluation compared to mid-term exams and that final exams are carried out in traditional classroom environment (Benson & Brack, 2010; Williams, Howell, & Hricko, 2006; Mardanian & Mozelius, 2011). However, online practices based on constructivist approach using traditional assessment and evaluation methods in measuring students' success and performance could be a contradiction. What is wondered here is what kind of a path should be followed in evaluating success and performance in distance education.

When the literature is reviewed, it is seen that in addition to traditional examinations various alternative practices are used in evaluating student performance and success in online distance education. In online examinations, which is one of those practices, students are asked to log into the examination in online medium and to answer the questions given in this medium at a given period of time. In online examinations, mostly multiple choice, true-false, fill-in-the-blank and open-ended questions are used (Costa, Mullan, Kothe, & Butow, 2010; Gikandi, Morrow, & Davis, 2011; Jordan, 2011; Marriott, 2009; Terzis & Economides, 2011; Wang, 2007, 2008, 2010). According to the literature, both traditional and online examination practices are mostly used to assess result-oriented success rather than student performance in the process and whether this assessments measure students' success truly is open to discussion. Recently, it is seen that such alternative assessment and evaluation practices as e-portfolio, concept maps, projects, collaborative studies, assignments, self-assessment, peer assessment, online discussions, learning analytics have started to be used in online distance education as

alternatives to exam practices (Chang, Tseng, Chou, & Chen, 2011; Gikandi, Morrow, & Davis, 2011; Gress, Fior, Hadwin, & Winne, 2010; Wang, 2008, 2011; Yang & Tsai, 2010). Such interaction tools and media as e-mails, blogs, forums, e-portfolio systems used in online distance education enable teachers to make alternative assessment and evaluation and makes it easier (Gray et al., 2012; Kear, Donelan, & Williams, 2012; Kecik et al., 2012; Terzis, Moridis, & Economides, 2012). In addition, the reflections of constructivist philosophy in education support alternative assessment and evaluation. However, the most important factor in implementing all these is the teachers lecturing in online distance education programs. Teachers' technology and pedagogy knowledge, their knowledge and experience on alternative assessment and evaluation techniques, their attitudes and beliefs towards these techniques are factors effecting the acceptance and use of alternative assessment and evaluation techniques.

It is important to see the advantages and restrictions of this approach that aforementioned university use in evaluating success and performance in distance education. Thus, according to the results of this model, it will be possible to develop a model with better quality in evaluating success and performance in distance education. When the literature is reviewed, no study looking into the practices, in which online and traditional assessment and evaluation techniques are used together in evaluating student performance and success in distance education, and relevant lecturers' opinions. Therefore, it is believed that this study will fill an important gap in the literature. So, this case study compares online and traditional assessment and evaluation practices from the viewpoint of lecturers who are attending to online distance education program with the problems encountered in assessing student success and performance; and based on the opinions of the lecturers suggestions for solutions were made. In line with this overall objective, answers to the following research questions were looked into:

- Which assessment and evaluation methods and practices do lecturers use in assessing students' success and performance online?
- To what extent do lecturers follow and chose to use the latest developments on assessment and evaluation methods?
- What are lecturers' opinions on using alternative assessment and evaluation techniques in online assessment and evaluation processes?
- What are the difficulties lecturers face in assessing student performance and success in distance education and what are their solution suggestions?

METHOD

This section includes information on the research model, study group, data collection tool and analysis of data in the study.

Research Model

The study is designed according to case study which is a qualitative research design. The main feature of qualitative case study is in-depth investigation of one or more cases (Yin, 2013). Both qualitative and quantitative research methods are used together in the study. Whilst the quantitative data was collected using a questionnaire developed by the researcher, the qualitative data was collected through semi-structured interview forms which was also developed by the researcher.

Study Group

The study was conducted on 46 lecturers who work at online distance education programs of a state university. The demographic information on the lecturers is given in Table 1 below.

Table 1. Demographic information of the lecturers

Variable	Group	N	%
Gender	Female	12	27
	Male	34	73
Total		46	100
Professional Experience	0-5 Years	17	37
	6-10 Years	11	24
	11-15 Years	14	30.4
	16-20 Years	2	4.3
	21 Years and more	2	4.3
Total		46	100
Total Number of Courses They Deliver in Distance Education	1 Course	19	41.4
	2 Courses	11	24
	3 Courses	6	13
	4 Courses	5	10.8
	5 Courses and more	5	10.8
Total		46	100

Whilst mid-term exams in the distance education programs in which the study was conducted were carried out through online assessment and evaluation practices, final exams were conducted in the form of traditional examinations carried out in traditional face-to-face classroom environments. Following the exams, lecturers, who worked in online distance education programs for one year, were asked to complete the data collection forms developed by the researcher.

Learning management system through which online distance education practices would be conducted and alternative assessment and evaluation tools integrated into this system were introduced to the lecturers, who would deliver courses in online distance education programs, before the beginning of the academic year and they were informed about how these can be used in assessment and evaluation processes. There are synchronous discussion (web conference), asynchronous discussion (forum), forming questionnaire, creating e-portfolio, assignment preparation instruments, blogs, social network tools, online examination practices (true-false, multiple choice, classical, short answer etc.) on Moodle which is the online learning management system through which lecturers deliver their course. Lecturers were introduced on how to use these tools in assessing student success and performance before the beginning of the academic year. In addition, lecturers were informed about creating digital concept maps and puzzles, collaborative project studies, assignment practices, self-assessment, peer-assessment and online discussion techniques.

Data Collection Tools

The data in the study were collected through a questionnaire and a semi-structured interview form developed by the researcher. The questionnaire comprises of two parts. The first part includes questions on demographic information of the participants. The second part includes questions on the assessment and evaluation techniques that lecturers use in distance education as well as questions on whether they follow and chose to use the latest developments on assessment and evaluation.

In semi-structured interview forms, lecturers were asked questions towards determining the reasons they prefer alternative assessment and evaluation methods in distance education, the restrictions before using alternative assessment and evaluation methods in distance education, the problems encountered in evaluating student success and performance in distance education and solutions towards solving these problems.

Data Analysis

Content analysis method was used in analyzing the qualitative data. The data emerged from the research was examined in detail by the researchers and, themes and codes were identified. The data were coded by two researchers with the coding reliability percentage found at 86%. For the remaining 14%, the researchers came together to discuss and reconciled.

FINDINGS

Descriptive statistics showing which assessment and evaluation methods and practices do lecturers use in assessing students' success and performance online are given in Table 2 below.

Table 2. Assessment and evaluation techniques that lecturers prefer to use

Assessment and evaluation techniques lecturers use in online learning	Always		Generally		Sometimes		Rarely		Never	
	f	%	f	%	f	%	f	%	f	%
Online oral examinations	1	2.2	6	13.0	7	15.2	4	8.7	28	60.9
Online written (open-ended) examinations	13	28.3	16	34.8	8	17.4	3	6.5	6	13.0
Online multiple choice examinations	12	26.1	18	39.1	8	17.4	-	-	8	17.4
Online true-false examinations	7	15.2	11	23.9	9	19.6	5	10.9	14	30.4
Online short-answer examinations	5	10.9	16	34.8	7	15.2	3	6.5	15	32.6
E-portfolio	4	8.7	7	15.2	7	15.2	8	17.4	20	43.5
Digital concept maps	2	4.3	5	10.9	4	8.7	4	8.7	31	67.4
Assignments	5	10.9	14	30.4	7	15.2	4	8.7	16	34.8
Check list	-	-	2	4.3	10	21.7	3	6.5	31	67.4
Rubric	2	4.3	2	4.3	7	15.2	3	6.5	32	69.6
Making students prepare and present e-presentation	4	8.7	9	19.6	8	17.4	1	2.2	24	52.2
Self-assessment	3	6.5	5	10.9	8	17.4	2	4.3	28	60.9
Peer-assessment	2	4.3	3	6.5	5	10.9	2	4.3	34	73.9
Group assessment	1	2.2	2	4.3	10	21.7	2	4.3	31	67.4

The assessment and evaluation techniques lecturer prefer to use in mid-term exams are given in Table 2. When "Always" and "Generally" options in the questionnaire are examined, it is seen that lecturers mostly prefer "*online multiple choice exams*" ($f= 30$) and "*online written (classical) exams*" ($f=29$) for online assessment and evaluation. These two options were followed by "*online short-answer exams*" ($f=21$) and "*assignments*" ($f=19$) and "*online true-false exams*" ($f=18$). When above given assessment and evaluation choices are examined, it is seen that all of them except assignments are the electronic versions of traditional exams. In other words, it is seen that lecturers do not prefer alternative assessment and evaluation techniques in assessing success and performance.

In line with the second research question in the study, descriptive statistics showing to what extent lecturers follow and chose to use the latest developments on assessment and evaluation methods are given in Table 3.

Table 3. Descriptive statistics on to what extent lecturers follow and chose to use the latest developments on assessment and evaluation methods

Following the latest techniques on assessment and evaluation	f	%
I do not follow	12	26
I partially follow	14	30.4
I follow	20	43.6
Total	46	100
Choosing evaluation techniques which take students to the center during the evaluation process	f	%
I do not prefer	4	8.7
I rarely prefer	12	26.1
I sometimes prefer	23	50.0
I always prefer	7	15.2
Total	46	100

When Table 3 was analyzed, it was seen that 12 lecturers giving courses in distance education stated that they did not follow the developments on the latest techniques on assessment and evaluation whilst 14 of them indicated that they partially follow these developments and 20 of them indicated that they followed these developments. In addition, when their choice of evaluation techniques which take students to the center during the evaluation process was examined, 4 of the lecturers indicated that they did not prefer these techniques, whilst 12 of them indicated that they rarely preferred, 23 of them indicated that they sometimes preferred and 7 of them indicated that they always preferred these techniques. When the results from Table 2 and Table 3 are examined in general, although almost half of the lecturers indicated that they followed the developments in assessment and evaluation, it is seen that they rarely prefer student-centered alternative assessment and evaluation practices in success and performance evaluation. The data collected through semi-structured interview forms in order to find out the reason of this case was analyzed using content analysis. In line with the third research question, lecturers were asked why they chose such alternative assessment and evaluation techniques as e-portfolio, digital concept maps, self-assessment, peer assessment in distance education. The views of the lecturers are given in Table 4.

Table 4. The Reasons behind lecturers' choice of alternative assessment and evaluation techniques in distance education

Sub-themes	f
Because it makes students active and eager in the learning process	32
Because it gives clues about whether learning has been achieved or about the quality of learning	26
Because it contributes to the development of the student	22
Because it gives students the opportunity to show their competencies and performance	18
Because it enables assessing students' knowledge and skills throughout the process of education	15
Because it gives students the opportunity to communicate with each other and to cooperate	12
Because it gives the opportunity to assess student development from different views	8
Because it gives the opportunity to follow student development systematically	8
Because it improves students scientific research skills	4
Because it makes it easier to know about the students	3
Because it gets students adopt the habit of studying	2
Because it enables students to access more resources in the process of learning	1
Because it enables peer assessment	1
Because it encourages students to prepare for the course	1
Because it ensures consistency in assessment and evaluation	1

When the content analysis findings given in Table 4 are examined, it is seen that the reason behind lecturers' choice of alternative assessment and evaluation techniques are seen as "*Because it makes students active and eager in the learning process*" ($f=32$), "*Because it gives clues about whether learning has been achieved or about the quality of learning*" ($f=26$) and "*Because it contributes to the development of the student*" ($f=22$). Table 5, on the other hand, includes the content analysis of the data collected from semi-

structured interviews in order to determine the restrictions caused by using alternative assessment and evaluation techniques in online distance education.

Table 5. Restrictions of utility of alternative evaluation techniques in distance education

Sub-themes	f
Because using alternative assessment and evaluation techniques alone is considered insufficient	12
Because the evaluation takes a long time, and requires a lot of time and effort	10
Because it is difficult to determine whether the assignment was made by the student or not	8
Because it does not provide same opportunities that face-to-face communication and interaction with students does	3
Because it can not prevent cheating	3
Because it might not be convenient for cases in which instant feedback is necessary	2
Because it is not possible to determine to what extent students understand the subject	2
Because the information found on internet sources is put into assignments by copying and pasting it without checking whether it is correct or not and presented to the lecturer	2

When the content analysis findings in Table 5 is analyzed, it is seen that what lecturers see as restrictions of alternative assessment and evaluation techniques are "*Because using alternative assessment and evaluation techniques alone is considered insufficient*" ($f=12$) "*Because the evaluation takes a long time, and requires a lot of time and effort*" ($f=10$) and "*Because it is difficult to determine whether the assignment was made by the student or not*" ($f=8$). In line with the fourth research question of the study, the results of the content analysis collected from the semi-structured interview forms conducted to determine the problems that lecturers delivering courses in online distance education face in evaluating students' success and performance are shown in Table 6.

Table 6. The problems lecturers face in evaluating student performance and success in distance education

Sub-themes	f
Because it is not possible to prevent cheating in online exams as in traditional face-to-face exams	30
Because in assignments and project studies, students use the same assignments by copying from each other and/or they copy/paste things they found on internet	22
Because traditional exams do not give the opportunity to evaluate student performance in a limited period of time	20
Because in distance education, it is difficult to control the practices students carry out	19
Because the process of preparing and evaluating online exams and assignments requires a lot of time and effort	18
Because only a limited period of time is spent with the students, it is not possible to completely assess the knowledge and skills they have and to get to know them well.	16
Because students do not actively participate in online practices	15
Because significant success differences emerge between mid-term and final exams.	12
The inadequacy of online exam systems	10
The inadequacy of online exam and evaluation techniques	10
Because students and lecturers do not actively use the online system	8
Because online oral exams are difficult to conduct and time consuming	8
Because students lack motivation	6
Because carrying out and scoring final exams in the form of traditional exams requires long time and effort.	5

The results of content analysis given in Table 6 shows the problems encountered in implementing mid-term exams and final exams. Accordingly, it is seen that one of the most frequently experienced problems of the lecturers is *"not being able to prevent cheating during the exams"* (f=30). And this problem is followed by *"in assignments and project studies, students use the same assignments by copying from each other and/or they copy/paste things they found on internet"* (f=22). And *because traditional exams are conducted in a limited period of time* (f=20) lecturers consider that inadequate to evaluate student success and performance. Besides, the fact that *it is difficult to control the assignments and projects students carry out in distance education* (f=19) is considered as an important deficiency. Also, lecturers state that *the process of preparing and evaluating online exams and assignments requires a lot of time and effort* (f=18).

The opinions of the lecturers that they stated as possible solutions to the aforementioned problems relating to evaluating student success and performance in distance education were analyzed via content analysis and the results are given in Table 7 below.

Table 7. Suggestions of lecturers relating to the problems experienced in evaluating student success and performance in distance education

Sub-themes	f
Giving students assignments and practices that will not require memorizing but will enable them to use high-order thinking skills and will prevent them from cheating	15
Students and lecturers should be provided with trainings on assessment and evaluation from time to time.	10
Online exam systems should be made more practical and interactive	7
More project assignments should be given instead of online exams	6
Security practices should be developed in online exam system	5
Students should also make a presentation of the assignments they prepared and this should be a criteria considered in the process of evaluation	5
Attending online classes should be compulsory and thus, evaluating student performance should be made possible	5
Assignment directions should be well-prepared and students should be given guidance during the process	2
Practices that will increase satisfaction and motivation of the lecturers should be provided	2
Self-assessment and group assessment should be made throughout the project	1
Enabling students to make inter-group assessment throughout the project	1

When the result of content analysis given in Table 7 is examined, it is seen that the most often indicated solution relating to evaluating student success and performance in distance education is giving students assignments and practices that will not require memorizing but will enable them to use high-order thinking skills and will prevent them from cheating (f=15). Another solution offered is providing students and lecturers with trainings on online assessment and evaluation practices (f=10). In addition, increasing interaction possibilities in online exam practices (f=7) is another solution offered. Also, increasing the encouragement and motivation of lecturers on developing online assessment and evaluation practices and using alternative evaluation techniques are outstanding solution suggestions.

DISCUSSION, CONCLUSION AND SUGGESTIONS

When the difficulties faced in evaluating student success and performance in distance education were examined, it was seen that the main problem faced in online exams, compared to traditional exams, was the cheating problem. Lecturers indicated that they faced similar problems also in assignment and project studies and that students copied

and pasted things they found on internet or copied one another's assignment in assignment and project studies. The studies in the literature support this finding (Harmon & Lambrinos, 2008; King, Guyette, & Piotrowski, 2009; Olt, 2002; Watson & Sottile, 2010). Mardanian and Mozeliuss (2011) indicate that they experience similar problems in online environment and that it is difficult to prevent this. Lecturers expressed that it was not possible to control students in online environment and this prevented them from getting to know and observing students in all aspects. From another point of view, lecturers indicated that it was not possible to evaluate success and performance in a limited period of time during final exams. These findings indicate that lecturers do not find online exams reliable and that they find traditional exams inadequate in evaluating success and performance.

When online assessment and evaluation choices of the lecturers are examined, it is seen that most often used techniques were online exams (open-ended questions, multiple choice questions, true-false questions, short-answer questions etc.). It is seen that online exams are followed by assignments. When lecturers' opinions and evaluations on alternative assessment and evaluation techniques are examined, it is seen that most of the lecturers indicate that they follow the latest developments in assessment and evaluation and that they prefer to use student-centered evaluation techniques. In addition, lecturers express that alternative assessment and evaluation techniques will make students active and eager during the learning process, will make it easier to follow the learning process of the student, will make it easier for students to show their performance and will improve cooperation and communication among students. Considered from this point of view, it is seen that lecturers are aware of the possible benefits of alternative assessment and evaluation practices. And when the reason behind not using these alternative assessment and evaluation practices despite having the awareness is examined, it is seen that lecturers indicate that preparing and evaluating these alternative assessment and evaluation practices take a lot of time and effort. Also, it is understood that lecturers need to have knowledge and experience on how they can use alternative assessment and evaluation techniques in distance education. Because of all aforementioned, it is seen that lecturers prefer online exam practices. Similar findings were obtained in a study carried out by Tomei (2006) and it is indicated that while the workload that traditional evaluation bring on lecturers is stable, online evaluation has a fluctuated nature.

When the possible solution suggestions of the lecturers regarding the problems in evaluating success and performance in distance education is examined, it is seen that the most often suggested solution is including alternative assessment and evaluation practices in mid-term exams and that these practices should not include memorizing information but rather, enable students to use high-order thinking skills and prevent them from cheating. Also, it is seen that lecturers state that both lecturers and students should be provided with trainings on online assessment and evaluation practices. Another solution suggested is that the instructions of online assessment and evaluation practices should be well-prepared and should be easy-to-understand for students and should guide them.

Taking all these realities into account, utilizing alternative assessment and evaluation practices to solve aforementioned problems in the process of evaluating success and performance in distance education will be more convenient, and these practices will enable social construction of knowledge by creating social constructivist learning environments and also will improve communication interaction in distance education (Gaytan & McEwen, 2007; McLoughlin & Luca, 2001; Robles & Braathen, 2002; Vonderwell, Liang, & Alderman, 2007). Preparing seminars for lecturers and students on how to use alternative assessment and evaluation practices in evaluation process and introducing the weaknesses and strengths of each alternative techniques; and providing them with guidebooks and materials will be useful. The support of the management is of great importance in encouraging lecturers to use alternative assessment and evaluation techniques. Distance education managers should support lecturers on this issue and

provide incentives for them. Using the same teaching and evaluation activities used in traditional environments will cause to quality and satisfaction problems in distance education (Benson & Brack, 2010; Dunn, Morgan, O'Reilly, & Parry, 2003). Therefore, it is believed that providing lecturers who deliver/will deliver distance education courses with regular technological and pedagogical trainings regarding teaching and evaluation dimensions will be useful.

In future studies, the acceptance and utilization of alternative assessment and evaluation techniques shown to lecturers during such events as seminars can be examined within the scope of technology acceptance model and the acceptance and utilization of each technique can be evaluated and thus, a model suggestion can be made within the framework of accepted evaluation techniques. In addition, the impact of using formative and summative evaluation techniques together in the process of evaluating success and performance could be looked into. Here formative assessment could be provided to students online and they could be made to assess themselves and see what they could not learn.

It is thought that in formative evaluation process, there will not be any problems if students show cheating behaviors. Because student will look for resources in this process and interact with his/her peers. And at this point, formative evaluation will serve its objective and contribute to the learning process of the student. However, the impact of formative evaluation in overall evaluation should be smaller. In summative evaluation, on the other hand, such activities as e-portfolio preparing, project studies can be included. Taking acceptance and belief status of lecturers into consideration, summative evaluation process can be supported with traditional assessment and evaluation activities. The efficiency of such an evaluation model blended this way can be examined.

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THE ROLE OF SELF-EFFICACY IN PREDICTING USE OF DISTANCE EDUCATION TOOLS AND LEARNING MANAGEMENT SYSTEMS

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ABSTRACT

This study aims to investigate the role of self-efficacy in predicting students' use of distance education tools and learning management systems (LMSs). A total of 124 undergraduate students who enrolled in a course on Distance Education and selected using convenience sampling willingly participated in the study. The participants had little prior knowledge about distance education tools and LMSs. Therefore, they received instructions from the researcher over the course of a semester. The study proposed a research model based on the Technology Acceptance Model that has been widely used to predict user acceptance and use. Structural equation modelling was used to test the research model against the data collected through questionnaire surveys. Pretest-posttest results suggested that the students had significant learning by participating in the instruction. The results of the main analysis also suggested that self-efficacy positively affects perceived ease of use, while usefulness and ease of use perceptions positively affect attitudes toward using distance education tools and systems. Implications are provided along with limitations of the study discussed.

Keywords: Distance education, self-efficacy, authoring tools, learning management systems

INTRODUCTION

Distance education is "a planned learning that normally occurs in a different place from teaching and requires special instructional techniques, special techniques of course design, special methods of communication via technology, and special organizational and administrative arrangements" (Moore & Kearsley, 1996). Schlosser and Simonson (2002) emphasized on the technologies used and defined distance education as "an institution-based formal education, where the learning group is separate and interactive telecommunication systems are used to connect learners, resources, and instructors."

Instructional designers in distance education must provide the required course structure to satisfy student needs and ensure students attain the required standards in learning excellence (Saba, 2000). Students are more likely to drop courses when they receive no feedback about their progress, they may become frustrated with completing the course, they think the course is too difficult and the content is irrelevant, or they become isolated since they have limited interaction with their instructors and peers (Moore & Kearsley, 1996). Thus, interaction is critically important for student motivation and satisfaction as well as maintaining their persistence in distance learning (Berge, 1999).

Interactive tools and systems may provide instructional designers to modify a course structure and set an appropriate level of interactivity to meet learner needs (Flottemesch,

2000). The success of distance education therefore depends on the ability of instructional designers to provide student satisfaction and retention (Saba, 1999). Accordingly, instructional designers in distance education should have a broad background in instructional design and distance learning theory, have both technical and soft skills, and have a willingness to learn emerging information and communication technologies (Ritzhaupt & Kumar, 2015).

Self-efficacy is a key concept in socio-cognitive theory and refers to "a person's self-evaluation of his ability to execute the courses of action required for the successful attainment of a certain goal" (Bandura, 1977, 1997). Self-efficacy is a useful lens for researchers in predicting persistence, emotional reaction and effort (Zimmerman, 2000). The role of self-efficacy in successful experiences of distance education has been a frequent theme of recent research. For example, Kozar, Lum, and Benson (2015) investigated the relationship between self-efficacy and vicarious learning in PhD studies at a distance. Their results suggested the more opportunities to engage in meaningful contact, the stronger the students' self-efficacy in completing their degree, and the more satisfying will be their experience. Similarly, Cho and Shen (2013) investigated the role of self-efficacy and goal orientation in student achievement in an online course. Their results indicated the importance of individuals' self-efficacy and intrinsic goal orientation in academic achievement. In another study, Dunn, Rakes, and Rakes (2014) investigated the impact of critical thinking, self-regulation, and age on online students' help-seeking. The results suggested a positive correlation between self-regulation and critical thinking with help-seeking, and a negative correlation between age and help-seeking.

Wang, Shannon, and Ross (2013) investigated the relationships among technology self-efficacy, self-regulated learning, and course outcomes in an online learning. Their results suggested that the higher the levels of motivation in online courses, the higher the levels of technology self-efficacy and course satisfaction. Recently, Lee (2015) investigated whether self-efficacy and task value change over the course of a semester. The results suggest that self-efficacy in course content and online technologies fluctuated, while task value remained unaffected over the course of the semester.

Review of the literature emphasizes the importance of the individual characteristics such as self-efficacy, self-regulation, and autonomy in distance education. However, there is a limited number of studies that investigated the effect of individual characteristics on use of distance education tools and systems. Thereby, the present study contributes to the literature by investigating the role of self-efficacy in predicting the use of distance education tools and systems.

TOOLS AND SYSTEMS USED IN DISTANCE EDUCATION

Screen Capturing Tools

Screen capturing tools are used to capture the computer screen by recording the mouse movements, clicks, and keystrokes along with narration. Captivate is a typical example of sophisticated screen capturing tool used to create distance learning materials with audio, visual, and interactivity. This tool can be used to create demonstrations, simulations, scenarios, and quizzes in different file formats. Furthermore, it can be used to create screencasts, and thereby, enables digitally created contents to be followed for later views. Similarly, Camtasia is a screen capturing tool used to create digital contents appropriate for distance learning. Recording screen movements and actions, importing high quality videos from different sources such as camera, customizing and editing the digital content from different platforms, and sharing the contents across multiple devices are the main functionalities of this tool.

Authoring Tools

An authoring tool is a collection of software that allows authors to create or modify web content. Authoring tools are an essential element in achieving a universal and accessible web. I-Spring is an example of authoring tool that is built for providing an environment to create e-learning courses. The tool has the capability of converting the PowerPoint slides into a Flash or HTML5 by preserving the effects of transitions, complex animations, and triggers. Thereby, PowerPoint-based courses make slides can be turned into professional training courses with interactive quizzes, audio and video narrations, and screencasts. Similarly, Articulate Studio is an authoring tool that allows authors to narrate, create, and annotate e-learning content in PowerPoint, add surveys, quizzes, media-rich interactions to online courses, and create training videos by recording screencasts.

Learning Management Systems

LMS is an integrated set of software that allows the administration, tracking, reporting, documentation, and delivery of e-learning courses or distance education programs. There are several LMSs with standard features that can be used for distance education, blended learning, and e-learning. For example, Moodle "Modular Object-Oriented Dynamic Learning Environment" is an open source LMS enabling educators to create online learning environments filled with dynamic courses. Based on a constructivist and social constructionist approach, Moodle aims to provide a virtual learning environment with several plugins, integrations, and collaborative tools to address specific learner needs. Similarly, Sakai is an open source LMS that aims to provide a flexible and feature-rich environment for learning, teaching, research, and collaboration. Edmodo also provides a free blended learning classroom for teachers and students by fostering communication and social learning.

Docebo is a cloud platform for e-learning, which includes authoring tools, real-time collaboration, curriculum management, and reporting capabilities. With the cloud-based nature of this LMS, there is no software to install, and more importantly, it automatically updates itself whenever there is a new update available. However, Docebo is free of charge for groups up to five users. ALMS is also a licensed LMS used by more than 30 universities in Turkey. ALMS is distinguished from others by allowing users to connect on social media.

Virtual Classroom Systems

Virtual classroom systems are online environments that allow users to interact with learning resources, view presentations, communicate, and work in groups. Virtual classrooms provide a synchronous learning environment by allowing LMS integrations. BigBlueButton is an open source virtual classroom system that enables users to share documents, webcams, chat, audio, and desktop. Lectures can be recorded for later playback by students and whiteboard controls let users annotate and call out key parts of the presentation for viewers. Similarly, Adobe Connect offers online meeting experiences for large scale webinars, group collaboration, lecturing, or office hours. Lastly, Perculus is one of the virtual classroom systems that enable users to join online courses.

THEORETICAL BACKGROUND AND HYPOTHESES

This study used the Technology Acceptance Model (TAM) developed by Davis (1989) as an initial theoretical framework. The research model shown in Figure 1 suggests that actual use of distance education tools and systems is predicted by behavioral intentions, which are predicted by attitudes. While, the attitudes are predicted by perceived usefulness and perceived ease of use that is predicted by self-efficacy.

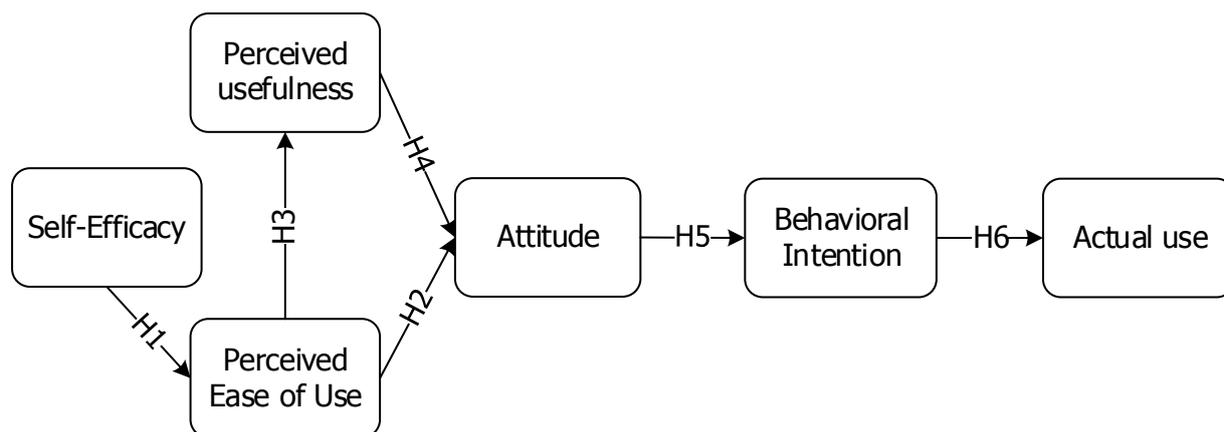


Figure 1. Research model

Self-Efficacy

Self-efficacy can be defined as a judgment of students' ability to use a system (Bandura, 1997). Students with a "high computer self-efficacy are more likely to choose and participate in computer-related activities, expect success in these activities, persist and employ effective coping behaviors when encountering difficulty, and exhibit higher levels of performance" than the students with a low computer self-efficacy (Compeau & Higgins, 1995). Accordingly, students' competence and confidence in distance education tools and systems may play a significant role in the ease of use of these tools and systems. Therefore, self-efficacy would positively affect perceived ease of use of distance education tools and systems (H1).

Perceived Ease of Use

Perceived ease of use can be defined as the degree to which a student believes that using distance education tools and systems is free from effort (Davis, 1989). The complexity of distance education tools and systems depends on how easy it is to use these tools and systems such as screen capturing tools, authoring tools, LMSs, and virtual classroom systems. The easier it is to use these tools and systems, the more positive attitudes toward using these tools and systems (H2) and the easier and quicker perception of the advantages provided by them (H3).

Perceived Usefulness

Perceived usefulness can be defined as the degree to which an individual believes that using distance education tools and systems would enhance his or her success and performance (Davis, 1989). The main functionalities of distance education tools and systems enable users effectively develop interactive content and manage web-based courses. Therefore, perceived usefulness would positively affect students' attitudes toward using distance education tools and systems (H4).

Attitudes, Behavioral Intentions, and Actual Use

Attitudes toward using a new system is defined as a student's overall affective reaction to use the system (Davis, 1989). However, intention to use can be defined as the degree of an individual's belief that he or she will use distance education tools and systems (Venkatesh, Morris, Davis, & Davis, 2003). Ajzen's Theory of Planned Behavior (TPB) (Ajzen, 1991) implies that the more favorable the students' attitudes toward distance education tools and systems, the greater will be their intention to use these tools and systems. Therefore, it is hypothesized that attitudes toward distance education tools and systems would positively affect behavioral intentions (H5), which would have a significant positive effect on actual use (H6).

METHOD

Research Design

To make the study ecologically valid, the study was conducted in students' classrooms during their regularly scheduled Distance Education classes. At the start of the study, the students were given 30 minutes to complete a paper based pretest (conceptual knowledge measure). The students received instructions from the researcher about distance education theory for seven weeks (four hours per week). Then they received instructions from the researcher about tools and systems used in distance education for another seven weeks. At the end of the intervention, the students were given 30 minutes to individually complete the posttest, which was identical to the pretest. Finally, an online survey was administered to the students using an Internet based surveying system.

Sample

The target population of this research is undergraduate students majoring in Computer Education and Instructional Technology in Turkey. From this population, a total of 124 students who were selected using convenience sampling willingly participated in the study. The participants' ages ranged from 18 to 29 years (mean = 20.98, SD = 1.63). In terms of college status, majority of the participant (97.6%) were juniors. Meanwhile, 72 (58%) of the participants were women. The participants had little knowledge about distance education tools and systems prior to participating. This limited prior knowledge was verified through the analysis of the students' pretest scores.

Instrument

The conceptual knowledge measure used for the pretest and posttest consisted of ten multiple choice questions regarding distance education tools and systems, including screen capturing tools (Captivate and Camtasia), authoring tools (i-Spring and Articulate), LMSs (Moodle, Edmodo, Canvas, ALMS, and Docebo), and virtual classroom systems (Adobe Connect, Perculus, and Big Blue Button).

A scale developed Davis (1989) was used to measure perceived ease of use and perceived usefulness. In addition, items measuring attitude and behavioral intention were adapted from the TPB (Ajzen, 1991). The items measuring self-efficacy were adapted from the relevant literature (Compeau & Higgins, 1995). Thus, the instrument has a total of 23 items, including 4 items for self-efficacy, 5 items for perceived usefulness, 3 items for perceived ease of use, 4 items for attitude, 3 items for behavioral intention, and 4 items for actual use. Participants were asked to indicate their level of agreement using a five-point Likert scale ranging from "strongly disagree" to "strongly agree."

RESULTS

Pretest-posttest Results

A paired-samples t-test using SPSS version 22.0 (SPSS, Chicago, IL, USA) was conducted to compare students' learning before and after the intervention. The mean posttest score (M= 8.2, SD= 1.3) was higher than the mean pretest score (M= 1.6, SD= 1.8), and the difference was statistically significant ($t = -21.64, p < .001$). This implies that students had significant learning by participating in the instruction.

Instrument Validity and Reliability

Prior to conducting the main analyses, the data set was checked for the adequacy of factor analysis through with Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity (Bartlett, 1951; Kaiser, 1970). Table 1 shows the suitability of the data set for factor analysis. In addition to KMO, the results of Bartlett's test of sphericity verified the sampling adequacy of the data set for factorability.

Table 1. The suitability of the data for factor analysis

	KMO	Chi-Square	Sig.
Self-efficacy	.81	273.79	.001
Perceived usefulness	.89	672.62	.001
Perceived ease of use	.73	202.15	.001
Attitude	.81	401.03	.001
Behavioral Intention	.76	393.93	.001
Actual Use	.83	314.00	.001

Exploratory factor analysis (EFA) was employed using principal components extraction to assess the construct validity of the scales. The Bartlett's test of sphericity demonstrated the measures for the constructs are interdependent and the KMO measure of sampling adequacy is well above the minimally accepted level of .50 (Leech, Barrett, & Morgan, 2005). The percentage of total variance explained ranged from 71.86 to 91.35, which are higher than the acceptable value of .40 for measures with one factor (Scherer, Wiebe, Luther, & Adams, 1988). Furthermore, each measurement item has a factor loading above .81 and a communality value above .66; both are higher than the acceptable value of .40 (Field, 2005). The corrected item-total correlation coefficients ranged from .47 to .89, suggesting moderate to high homogeneity of the items.

Average variance extracted (AVE) values equal or exceed .50 (Hair, Anderson, Tatham, & Black, 2006), indicating the convergent validity for the constructs of the measurement model is adequate. Finally, reliability analysis indicated the instrument has a strong internal consistency in that Cronbach's alpha values ranged from .88 to .95, suggesting good to very good internal consistency (Creswell, 2005). The results of principal component analysis (factor loadings, total variance explained, and communality values), internal consistency reliability measures (corrected item-total correlations and Cronbach's α values) and convergent validity measures (composite reliability (CR) and AVE values) were shown in Table 2.

Table 2. Reliability and validity evidence

Construct	Item	Internal reliability				Total variance explained	Convergent validity	
		Cronbach's alpha	Item-total correlation	Factor loading	Comm unality		CR	AVE
Self-efficacy	Se1	.88	.78	.88	.78	74.18	.79	.50
	Se2		.81	.90	.81			
	Se3		.73	.85	.72			
	Se4		.68	.81	.66			
Perceived ease of use	PEU1	.88	.81	.92	.85	81.05	.77	.50
	PEU2		.77	.90	.81			
	PEU3		.74	.88	.77			
Perceived usefulness	PU1	.95	.93	.96	.91	83.65	.76	.51
	PU2		.91	.95	.90			
	PU3		.86	.92	.84			
	PU4		.82	.89	.78			
	PU5		.80	.87	.75			
Attitude	AT1	.93	.80	.89	.79	82.27	.89	.63
	AT2		.86	.92	.85			
	AT3		.83	.91	.82			
	AT4		.84	.91	.83			
Behavioral Intention	BI1	.95	.86	.94	.88	91.35	.92	.74
	BI2		.92	.97	.94			
	BI3		.92	.96	.93			
Actual use	AU1	.90	.79	.89	.78	71.86	.87	.62
	AU2		.80	.89	.80			
	AU3		.80	.89	.79			
	AU4		.76	.87	.75			

Common Method Bias

Harman's one-factor test was used to assess common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). All the dependent and independent variables were subjected to an EFA using unrotated principal components factor analysis, principal component analysis with varimax rotation, and principal axis analysis with varimax rotation. The results suggested the presence of six factors with eigenvalues higher than one. The six factors together accounted for 76.43% of the total variance, while the first factor explained 28.81% of the total variance. Further, confirmatory factor analysis (CFA) showed that the one-factor model did not fit the data [$\chi^2/df= 3.94$, GFI= .60, AGFI= .51, NFI= .74, NNFI= .77, IFI= .79, SRMR= .50, RMR= .36, CFI= .79, RMSEA= .155]. These results suggested that common method bias is not of a concern in the data set.

The Structural Model

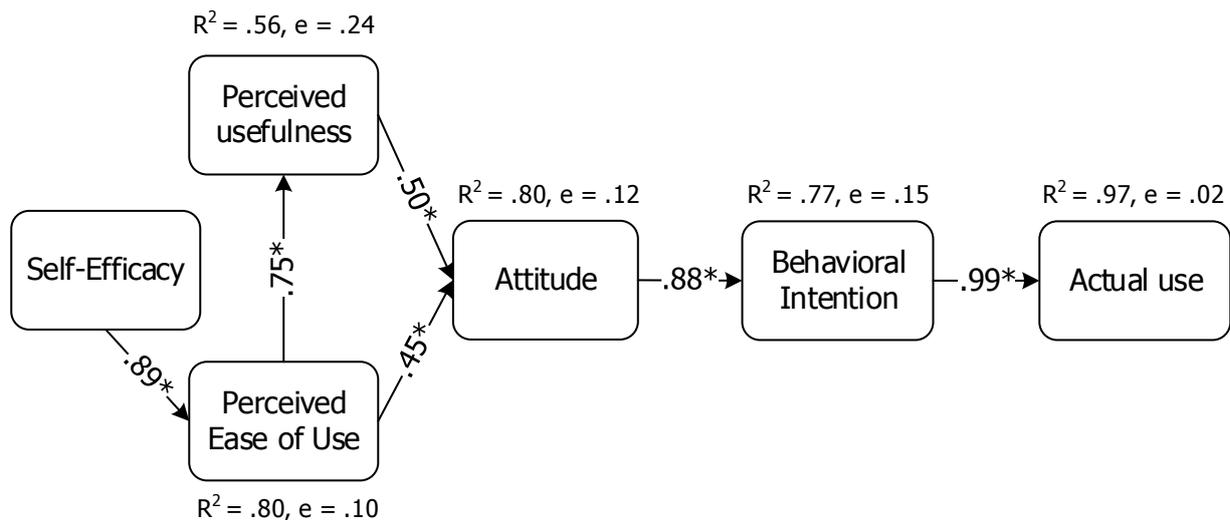
Structural equation modeling (SEM) was conducted via maximum likelihood using SPSS AMOS (version 22.0) to test the research model. SEM is one of the most effective and reliable multivariate analysis methods for examining the factor structure of the measures and testing the hypothesized relationships among observed and latent variables (Byrne, 2010). The model produced good fit indices as shown in Table 3. The value of Chi-square/df is 1.11; according to Kline (2005); a ratio of less than three is acceptable, whereas a ratio of less than two is good. The results of the CFA demonstrated all scales used in this study form adequate measurement models, and therefore, provide evidences for the construct validity of the measures.

Table 3. Model fit indices

	Model	Acceptable Fit Values
χ^2	107.734	
p value	.214	.05 \leq p \leq 1.00 (Hoyle, 1995)
χ^2/df	1.11	< 3 (Kline, 2005)
GFI	.91	\geq .90 (Hair et al., 2006)
AGFI	.87	\geq .80 (Marsh, Balla, & McDonald, 1988)
SRMR	.033	\leq .10 (Kline, 2005)
RMR	.024	< .05 (McDonald & Moon-Ho, 2002)
RMSEA	.030	< .08 (Hair et al., 2006)
NFI	.95	\geq .90 (Hair et al., 2006)
NNFI	.99	\geq .90 (Bentler & Bonett, 1980)
CFI	.99	\geq .90 (Bentler, 1990)
IFI	.99	\geq .90 (Bollen, 1989)
PNFI	.77	

Hypothesis Testing

Hypothesized relationships were tested through a structural model which was developed based on the TAM. The results indicated all proposed path coefficients among the observed and latent variables are significant ($p < .001$). Figure 2 shows the results of the SEM analysis, including the path coefficients with significance levels along with R-squared values and respected error terms. The paths specified in the model account for 97% of the variance in actual use.



Chi-Square = 107.734, df = 97, Chi-Square/df = 1.11, *p*-value = .21, GFI = .91, RMSEA = .030, **p* < .001.

Figure 2. Causal model of the students' use of distance education tools and systems

A summary of the hypothesis testing results is given below:

- H1. Self-efficacy would positively affect perceived ease of use ($\beta = .89$; $t = 8.99$; $p < .001$).**
- H2. Perceived ease of use would positively affect students' attitudes toward using distance education tools and systems ($\beta = .45$; $t = 5.09$; $p < .001$).**
- H3. Perceived ease of use would positively affect perceived usefulness ($\beta = .75$; $t = 9.29$; $p < .001$).**
- H4. Perceived usefulness would positively affect students' attitudes toward using distance education tools and systems ($\beta = .50$; $t = 5.93$; $p < .001$).**
- H5. Attitudes would positively affect students' intentions to use distance education tools and systems ($\beta = .88$; $t = 11.36$; $p < .001$).**
- H6. Behavioral intentions would positively affect actual use ($\beta = .99$; $t = 14.67$; $p < .001$).**

DISCUSSION AND CONCLUSION

This study proposed a research model based on the TAM to investigate key factors affecting attitudes and behavioral intentions toward using distance education tools and systems. The proposed model suggested that perceptions of perceived ease of use is anchored to self-efficacy. Additionally, consistent with the TAM, it suggested both perceived usefulness and perceived ease of use are significant in explaining the attitudes toward using distance education tools and systems.

The CFA results showed that the proposed model indicates a reasonable fit to the data with the following fit indices; [$\chi^2/DF = 1.11$, GFI = .91, AGFI = .87, NNFI = .99, NFI = .95, CFI = .99, IFI = .99, and RMSEA = .030]. The research model, which explains 97% of the variance in actual use, has a strong predictive power. The high proportion of the variance explained suggested that the model includes a significant portion of factors that might affect actual use.

Consistent with the hypotheses, the results showed that self-efficacy is directly related with perceived ease of use and indirectly related with attitudes and behavioral intentions.

The results also showed the usefulness and ease of use perceptions have significant effects on the attitudes. However, the perceived usefulness to have a greater correlation with system use than those of perceived ease of use. Moreover, the attitudes have a significant and positive effect on behavioral intentions, which have a significant and positive effect on actual use.

The fact that perceived usefulness has a significant effect on attitudes suggests the participants believe that distance education tools and systems would be a useful to do their work. Furthermore, they think that using these tools and systems would increase their productivity, enhance their effectiveness, improve their performance, and ease their job. The results also indicated that perceived ease of use has a significant effect on the attitudes. This suggests that the participants find it easy to become skillful at using distance education tools and systems and they believe that their interaction with these tools and systems would be clear and understandable.

The present study has important research implications. First, the results indicated the research model explains the variance of the dependent variable better than the TAM, which does not explicitly include any individual characteristics. However, self-efficacy in the proposed model may capture unique variance in attitudes and intentions. Second, the traditional TAM constructs provide very general information on students' opinions about distance education tools and systems. Whereas, the research model delivers more specific information by including the self-efficacy. Therefore, the proposed model is more likely to capture situation-specific factors.

The findings have several practical implications for instructional designers, instructors, and policy makers. First, the tools and systems investigated in this study provide great platforms for managing online learning environment where instructors can enrich teaching materials, and support new pedagogies that focus on interactive tools for inquiry based pedagogies and collaborative workspaces. This implies that not only instructional designers but also instructors need to be equipped with the acquired literacy and skills regarding these tools and systems. Finally, it is important to note that policy makers should develop new pedagogies and update the related curriculum that support these new skills. Otherwise, integrating these emerging tools and systems to traditional teaching practices may hinder the design of effective online learning environments as they require intensive teacher-student interactions.

The present study investigated factors affecting use of tools and systems used in distance education focusing only on the self-efficacy. Future research should therefore focus on the impact of other individual characteristics such as self-regulation and autonomy on users' attitudes toward adoption of distance education systems. Finally, it may be useful to employ a mixed method approach that incorporates both qualitative and quantitative methods for a deeper investigation of the key factors affecting use of such systems.

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ICTS AND EDUCATIONAL DEVELOPMENT: THE UTILIZATION OF MOBILE PHONES IN DISTANCE EDUCATION IN NIGERIA

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ABSTRACT

The demand for education in Africa has been on the increase. Thus, there is the need to identify more affordable ways of improving access to learning. For many decades, Open and Distance Education mediated by ICTs has been used to improve access to education. But in developing countries ICTS have been full of challenges of cost, and lack of appropriate infrastructure creating the notion of "digital divide". At the same time, we are now witnessing an unprecedented explosion in the number of mobile telephones globally, and in Nigeria. This technology, which is arguably the commonest means of communication, could play a pivotal role in extending the possibilities for teaching, learning, and research in distance educational institutions. Numerous studies have shown success stories of mobile learning in the developed world. This paper makes a case for implementing mobile learning in Nigeria by showing a number of successful Mobile Learning initiatives. The study also identified challenges that need to be addressed in order to sustain and succeed in the implementation of mobile learning in Nigeria.

Keywords: Mobile devices, distance education, open and distance learning (ODL), mobile learning, learning technologies.

INTRODUCTION

Distance Education has become one of the most rapidly growing fields of education and training. According to UNESCO (2002), it is fast becoming an accepted and indispensable part of the mainstream of educational systems in both developed and developing countries. The goals of distance education, as an alternative to conventional education, have been to offer degree granting programs, to battle illiteracy in developing countries, to provide training opportunities for economic growth, and to offer curriculum enrichment in non-traditional educational settings (Al-Fahad, 2009).

Distance Education is synonymous to technology: from print (correspondence systems), to Educational Radio and Television systems, to multimedia systems and then Internet based systems. Al-Fahad (2009) added that Distance Education relies heavily on technologies that include: Print, broadcast radio, broadcast television, computer conferencing, electronic mail, interactive video, satellite telecommunication and multimedia computer technology in order

to promote student-teacher interaction and provide necessary feedback to the learner at a distance. Literature has however pointed to the persistent challenge of lack of infrastructural development in sub Saharan Africa (Yusuf, 2005; Olulobe, 2007; Kwache, 2007; Olakulehin, 2010; Ofulue, 2011), which impedes the use of appropriate technology to advance Distance Education.

According to (Osang, Ngole, & Tsuma, 2013) the availability of new technologies which has opened up developing economies to the world market, has done little to help deprived groups gain access to educational opportunities. The infrastructural deficit associated with the region as well as the level of illiteracy poses great danger to the educational and general development of the continent. (Perraton, 2007; Osang, 2012) suggests the integration and use of information and communications technology (ICT) and open and distance learning (ODL) as a panacea. Surely, the integration of e-learning strategies into ODL is a step in the right direction. However, these strategies have not sufficiently broadened access to education especially to the rural dwellers in Nigeria. Kadage (2013) aptly stated that Educators and Planners are now discovering that anticipated benefits of the use of technology in distance learning instruction are not automatic or assured and this has often led to frustration and waste. He added that this reinforces the continued reliance of distance learning system on print material and broadcast technologies in developing countries and thus creates an IT access gap which is contributing to the widening 'digital divide' between haves and have not in these countries.

Valk, Rashid & Elder (2010) however posited that of the many different forms of ICTs, mobile phones are thought, for several reasons, to be a particularly suitable tool for advancing education in developing regions. Keegan (2005) stated that because of the lack of infrastructure for ICT (cabling for Internet and telecom) in certain areas in Africa, the growth of wireless infrastructure is enormous - even more rapid than in many first world countries. For Keegan (2005), using the mobile phone for learning is particularly suited to Distance Education because, "if serving the mobile learners is the focus of M Learning, then D.E institutions have always been doing this---serving learners anytime, anywhere". Mobile technologies, which include hand held computers, Personal Digital Assistants, mobile phones, lap tops, and i-Phones, are all part of the emerging information revolution taking place worldwide. People need not work with large computers on desk tops, or made to carry laptops searching for wired internet connection. According to Bradford (2010), knowledge and learning is now literally at a person's fingertips via the mobile phone, and that several decades ago, when the nontraditional student began impacting higher education, distance education, asynchronous education and open or virtual learning emerged as a way to continually educate students. Keegan (2005) stated that: "*one and a half billion people, all over the world, are walking around with powerful computers in their pockets and purses but they often don't realize it, because they call it something else.... today's high-end cell phones have the computing power of the mid-1990's PC, while consuming only one one-hundredth of its energy*". Statistics, as indicated below, have established the exponential growth of mobile phones in sub Saharan Africa, even surpassing the figures in some developed countries. This is indeed a pointer to the important role mobile phones are expected to play in educational delivery in Nigeria. For example,

- Nigeria and South Africa, are Africa's leading mobile telephony powerhouses, accounting for 45% of the continent's GSM industry (Nwaugwu & Odetumibi, 2010).
- "Nigeria, has overtaken South Africa to become the continent's largest mobile market with now close to 100 million subscribers, with market penetration at around 60% in early 2012 (*World Bank, 2013*).

- Nigeria is the largest mobile market in Africa and tenth largest in the world, though with low PC and fixed line penetration (Daily Trust, 17th Nov 2014).
- Total GSM subscribers in Nigeria stands at a total of 121,271,218 as at September 2013 (www.ncc.org).
- Nigerians watch video on YouTube 4 billion hours every month (Daily Trust, 17th Nov 2014).

“Today wherever one looks, evidence of mobile penetration is irrefutable: cell phones, PDAs, MP3 players, portable game devices, handhelds, tablets, and laptops abound. No demographic is immune from this phenomenon. From toddlers to seniors, people are increasingly connected and are digitally communicating with each other in ways that would have been impossible only a few years ago” (Osang, Ngole, & Tsuma, 2013)

The Concept of Distance Education

According to UNESCO (2002), the concept of distance education as a way of “opening” up education can be directly traced to an American visionary, Charles Wedemeyer. Wedemeyer realized that conventional face-to-face instruction would not be able to attain the vision of providing access to education for all, unless the barriers of time and space associated with face-to-face teaching are removed. Thus he popularized the concept “distance education”, earlier called “independent study,” and defined it as *“a form of study that encompasses several teaching-learning arrangements in which teachers and learners carry out their essential tasks and responsibilities apart from one another, communicating in a variety of ways”*(p. 2114).

Distance Education has traditionally been defined as instruction through print or electronic communication media to persons engaged in planned learning in a place or time different from that of the instructor or instructors. Yusuf (2006) echoes Holmberg’s definition of distance education as:

“The various forms of teaching and learning at all levels which are not under the continuous, immediate supervision of tutors present with their students in lecture rooms or in the same premises but which nevertheless benefit from the planning, guidance and tuition of the staff of the tutorial organization” (p.1).

The traditional definition of distance education is slowly being eroded as new technological developments challenge educators to re-conceptualize the idea of schooling and lifelong learning. At the same time, interest in the unlimited possibilities of individualized distance learning is growing with the development of each new communication technology. Distance education has experienced dramatic growth both nationally and internationally since the early 1980's (Al-Fahad, 2009). Al-Fahad (2009) added that D.E has evolved from early correspondence education using primarily print based materials into a worldwide movement using various technologies. The goals of distance education, as an alternative to traditional education, have been to offer degree granting programs, to battle illiteracy in developing countries, to provide training opportunities for economic growth, and to offer curriculum enrichment in non-traditional educational settings. But in Nigeria there is still lack of these technologies.

On the global scene however, recent developments in interactive multimedia technologies offer a lot of promise to facilitate "individualized" and "collaborative" learning, and are blurring the distinctions between distance and traditional education. These technologies also have the capability of creating new environment for learning such as "virtual communities".

THE SIGNIFICANCE OF MOBILE LEARNING

Multi mobile services have the potential to improve the educational environment in substantial ways. That we've ignored this potential for 10 years, and continue to ignore it today, is a blind spot we simply must correct. A billion mobile phones will be sold this year. A billion. This isn't a case of handwriting on the wall — this is a case of a revolution having occurred while we weren't looking. The information appliance of the future isn't in the future anymore; it's here today, in astonishing numbers. All of your students, and all of your prospective students, own one of these appliances. (Bradford, 2010)

Mobile technologies include portable and personal handheld devices, such as laptops, personal digital assistants (PDA), smart phones and mobile phones. Trifonova et al (2006) referred to mobile device as any device that is small, autonomous, and unobtrusive enough to accompany people in their life. For UNESCOIITE (2010), mobile learning is a form of learning that takes advantage of learning opportunities offered by mobile technologies, and that this happens when learners are not at a fixed, predetermined location. UNESCOIITE (2010) further stated that Mobile learning enables learners connect to learning from different locations and further emphasizes the integration of learning with life and work, so that education is no longer seen as a separate activity that has to take place in a school, university or other establishment.

Bradford (2010) cited a comprehensive definition of m-Learning as “Learning that might take place independent of location and made possible through the use of mobile devices”. She stated the characteristics of Mobile learning as:

- ubiquitous—anywhere, anytime access;
- bite sized—components are relatively short in duration;
- on-demand—always on` to deliver content at the point of need;
- blended with other technologies—mobile technology is not the primary delivery platform;
- can be collaborative—most mobile devices facilitate communication;
- can be location dependent but does not have to be.

Peters (2007) stated that, mobile technologies can significantly reduce people’s dependence on fixed locations, and thus have the potential to revolutionize the way people work and learn. According to Suki and Suki (2009), mobile devices are educationally interesting because they offer several communications channels on one device, cheaper, have comparable functionality with desktops or laptops, and also provide wireless access to educational materials. The ubiquitous feature of mobile devices which distinguish them from other learning tools has made mobile learning to be increasingly recognized in educational institutions.

Traxler (2007) made his categorization of mobile learning in to: *Technology-driven mobile learning; Miniature but portable e-learning; Connected classroom learning; Informal, personalized, situated mobile learning; Mobile training or performance support; Remote, rural or development mobile learning.* According to Traxler (2007), Mobile Learning in Africa is based on the last category only. The last category, remote or rural mobile learning means that technologies are used to overcome environmental and infrastructural challenges to deliver and support education where “conventional” e-learning technologies would fail (Traxler, 2007).

According to UNESCOIITE (2010), Mobile learning has the following attributes:

- ***Classroom dynamics:*** Mobile learning provides new means of communication and collaboration, and a way to connect classroom learning with learning elsewhere, the journey home and learning between lessons.
- ***Connecting remote learners:*** Providing distributed learners with opportunities to exchange information, ask questions, and practice new skills in situ.
- ***Learners as knowledge producers:*** When learners are commenting, discussing, or creating and sharing digital resources, the teacher's traditional authority function shifts towards a more collaborative or mentoring role. Learner-generated content represents a significant pedagogical resource and a shift towards authentic learning.
- ***Experience capture:*** In work settings, recording and note-taking is facilitated, as part of collecting evidence of learning, or as a way to combine formal and informal learning.
- ***Lifelong learning:*** Over time, students become more able to take responsibility and the habits of lifelong learning can take root. This is facilitated by mobile access to social networks that can support a person's learning goals and career development over a lifetime (UNESCOIITE, 2010).

THE UTILISATION OF MOBILE PHONE IN DISTANCE EDUCATION IN NIGERIA

"Estimates put mobile subscriptions at more than 6 billion globally, with at least 75% of these being in developing countries. Nearly 2.5 billion of the world's population can now access the Internet, a third doing so through mobile devices alone". (Ally and Tsinakos, 2014)

Indeed today, mobile phones are the most prevalent ICT in the developing world, and the penetration rate is rising rapidly. For example, in Asia, mobile penetration has doubled within a short span of time; in 2001, average penetration was 19.7 per 100 inhabitants while in 2005 the penetration rate rose to 40.9. Adedoja *et al* (2013) stated that mobile phone penetration in Africa is high, and mobile devices such as phones and PDAs (personal digital assistants) are available at much lower prices than desktop computers and therefore offer a less expensive means of communication. In South Africa there are 8 times more cell phones than computers, while in Nigeria 58.5 per cent of Nigerians in the rural population now have access to mobile phones (Nigerian Bureau of statistics, 2011), and pervasive evidence of mobile penetration and adoption is irrefutable as cell phones, PDAs, MP3 players, portable game devices and lap tops are increasingly being used in ways that would have been impossible to imagine only a few years ago (Adedoja, Adelere, Egbokhare, & Oluleye, 2013).

The Mobile phone has been proposed by several researchers as the most suitable device to promote mobile learning (Muckos, Dawson, Edel-Malizia, Shaffer-Swaggerty, 2011; Makoe, 2012; Suki and Suki, 2010; Osang, F.B, Tsuma C., Ngole J., 2013). According to Suki and Suki (2010), the mobility and ubiquity of mobile phone makes it a very suitable medium for learning. Also Makoe *et al* (2012) stated that in distance education, lack of contact and limited feedback from lecturers is of great concern for distance learners. This leads to lack of confidence to learn independently and as a result distance learners have trouble in self-evaluation. Hence the mobile phone can thus be used as for communication between the instructors and distance learners, thus facilitating interaction through synchronous and asynchronous learning (Makoe *et al*, 2012). Distance learners could access library catalogues from home or on the road and they download course materials from anywhere beyond the campus. With the mobile phone, students could be encouraged to use social networks such as MXit, WhatsApp, BBM to form study groups and work collaboratively on projects. E-books accessed via mobile phone, could also facilitate a more social form of study, with group of

students collaborating to read, explain and compare one or more texts on the same topic, each working from their individual mobile device (Conejar *et al*, 2014).

Makoe *et al* (2012) added that Mobile phones can also be used to enhance learning interaction through weekly self-assessment quizzes, also mobile phone downloadable audio files could also be used to add voice and provide narrative to learning content. They further asserted that the combination of printed study material, mobile phone based self-assessment quizzes and audio will guide a student through a web of learning material while assisting them to pace themselves.

Recent innovations in mobile technologies include access to digital textbooks accessed via e-readers, and the development of mobile applications (apps) and software platforms for accessing educational resources via mobile devices (Conejar *et al*, 2014). For example, instead of investing in the same textbook set or software solution for an entire classroom, educators could choose from a variety of apps that are tailored to each individual learner, promoting personalized learning, which is expected to characterize formal education in the future. For them, emails and announcements from their lecturers arrive instantaneously 24/7 to their devices. Rather than meeting somewhere at the university campus with their peers to discuss a project, students use chat, SMS, emails and free video telephony software. Communication takes place outside class hours through social media and resources are shared likewise using mobile technology available at their fingertips. This is a technology that allows them to freely record lectures and play them at their own time and location

MOBILE LEARNING PROJECTS

There are indeed hundreds of mobile phone projects across the globe. Mobile learning is emerging as a new way to reach and connect with students, with different areas of the world adopting this method of teaching and learning at different paces, and for different reasons. (Muckos *et al*, 2011). Indeed, several mobile phone projects in education and distance education in particular, across the globe starting from the days of Ericsson Education MLearning project, in Dublin Ireland in 2005 (Keegan, 2005), have been implemented according to the specific needs of each country, or the specific problem which the mobile phone projects seek to address: Some few examples of these projects among numerous others cited in literature include: the U.K mobile project for unemployed youths who had urgent need for additional training but refused to attend a training center or college (Keegan, 2005); Blended classroom project in China which pursues anytime, anywhere learning that aims to increase Chinese students' class interactivity using mobile phone (Ally and Tsinakos, 2014); Mobile phone projects that address lack of access to education by disadvantaged groups such as women and girls, scheduled castes and tribes in India (Valk *et al*, 2010); A mobile phone project that afforded medical students in India access to Tufts University School of Medicine knowledge repository for their clinical training (Ally and Avgustos, 2014); 'Pocket Eijiro' English learning system for mobile phone users which assumes that learners could not make time to learn hence provided learning in their spare-time (Morita, 2010); Mobile phone projects offered to learners who live in deep rural areas with little or no fixed line telecom infrastructure in South Africa; The Nokia MoMath project in South Africa which uses the SMS features on standard mobile phones to provide students with access to mathematics content and support (Ismail *et al*, 2010); and the use of SMS in Niger to teach functional literacy using local languages (Tsinakos, 2013).

The growth of mobile learning in developing nations has been a direct response to a need for distance education that serves dispersed populations, often characterized by low incomes and the inability to afford expensive PCs and/or Internet access. In contrast, the growth of

mobile learning in the western world is to complement an already robust use of online distance education. (Muckos et al, 2011).

In Nigeria, mobile learning is still at its infancy more especially with respect to distance education. However a number of studies have demonstrated the potential of mobile learning at higher education in Nigeria. Some of these mobile learning projects include the following:

UNESCO/NOKIA Life+ Project

In 2013 UNESCO launched a mobile phone project that aims to help teachers improve the English language literacy skills of primary school students in central Nigeria. Teachers selected to participate in the project sign up for a service which sends them richly formatted messages containing education content and pedagogical advice via a platform called NokiaLife+ daily. According to UNESCO website (www.unesco.org), the service, named "English Teacher," is freely accessed on inexpensive handsets common in Nigeria. The project represented one of the first attempts to employ mobile technology to improve the capacity of primary school teachers in West Africa.

UNESCO website further stated that the Project, was a collaboration between UNESCO, Nokia and British Council, with its content developed by the British Council, and tailored specifically for use on mobile devices and for teachers working with large classes in resource-poor schools. The learning content was organized according to themes in sequential modules, and broken across one or two week periods, to teach primary school teachers strategies to encourage learner independence, cultivate different learning preferences, and reflect on their personal teaching practices. The modules also provided links to other relevant educational resources.

Mobile Learning Platform for Tutorials in Distance Education in the University of Ibadan, Nigeria

A Learning Platform was created in University of Ibadan for delivering tutorials on mobile devices. The mobile learning platform was officially opened to students on the February 21, 2012 (Utulu & Alonge, 2012) .The project team collected information and data of students from the Management Information Systems (MIS) unit of the Distance Learning Centre, which were required for purposes of identification, registration and communication. At the beginning of the project, group email accounts were created for the different courses. These email accounts were used to communicate with students such as sending information about their orientation date, lecture commencement dates, etc. In addition, a bulk SMS account was opened in order to reach students, because the SMS is considered one of the fastest, cheapest and most reliable ways to reach the students immediately.

Utulu and Alonge (2012) further reported that at the beginning of the semester, students received a formal orientation on the use of the new instructional delivery formats. Students were divided into groups and were connected to online support referred to as "online tutors." In the first week, students were exposed to the first three modules of each course. A module on the platform is made up of frames, which comprises of a small piece of information a student is exposed to at a particular time. Each frame comes with some practice questions designed to evaluate student's understanding of that unit of instruction, which were either multiple choice type or those requiring writing short answers. The modules also contained chat sessions and forums. Students were encouraged to log on to chat forums with their mobile phones and make comments on a discussion topic started by the online tutor or by another student. After the learners had successfully gone through the three modules, they were exposed to their first quiz on the mobile platform.

Educational Advancement Center and Exact Learning Solutions Mobile Learning Initiative at University of Ibadan, Nigeria

Reed (2010) reported an ambitious mobile learning initiative being experimented by tutors and experts through partnerships between the University of Ibadan, Educational Advancement Centre, and a leading Learning Content Management System (LCMS) and Digital Repository (DR) solution provider, eXact Learning Solutions. They developed a system that delivers the required learning materials via mobile phones seamlessly from its LCMS infrastructure.

Reed (2010) further stated that provision of such learning materials via mobile phones will produce a number of benefits for students, teachers and administrators. These benefits include: easy distribution and collation of tests, quizzes and surveys; interaction in real time between the teacher and student, as well as among students, via the forum and chat room; ease with which notifications of events, dead-lines, and timetables are sent to each student; and accessing e-books via mobile phone at some ten to fifteen per cent of the cost of supplying hard copies. The aim of eXact learning solutions was to transform 'standard computerized learning material' into materials that were adapted to be delivered via mobile phone.

KNOWLEDGETAB: A multimedia E-Learning Tablet for Nigerian Senior Secondary Schools

KNOWLEDGETAB, one of many recent mobile learning initiatives in Nigeria (which are on the increase especially within the last three years), was first launched as revolutionary interactive learning tool in 2013 in senior secondary schools across the State of Osun. It was termed '*Opon Imo*'. KNOWLEDGETAB is an Android 4.2 tablet computer specially designed initially for Senior Secondary School students but can also be used by tertiary institution students, in Nigeria. The tablet has an e-Library comprising 56 sets of textbooks, a Virtual Classroom containing 51 high quality video tutorials and 15 hours of audio voiceovers, covering 823 textbook chapters and an Assessment Zone, containing over 29,000 simulated past questions covering a period of ten years (HabariNetwork, 2014). According to the website, the Tablet also offers a collection of extra-curricular material, which includes moral instruction, educational games, language lessons and health information. The low-cost, high-value KNOWLEDGETAB is currently being used by 20,000 students in the State's public education system. Indeed this mobile learning tablet has led to significant savings on the cost of buying textbooks and tutorial question and also allows simplifies the process of updating teaching content by schools and governments without imposing the burden of regular replacement of printed books by students.

KNOWLEDGETAB was also advertised in the Daily Trust (Monday March 10th 2014, p.13) as being produced by Softcom Ltd, a Nigerian-based IT solutions firm in collaboration with Phillips Consulting. Advantages of the KNOWLEDGETAB include: its affordability, ruggedness, long-lasting battery and most importantly, all of its content is available in the absence of an Internet connection. (HabariNetwork, 2014).

University of Ibadan/PHEA-TI Project

A mobile project funded by Partnership for Higher Education in Africa-Educational Technology Initiative (PHEA-ETI), is currently being carried out in the University of Ibadan, Nigeria. According to Adedoja *et al* (2012), the project was developed and designed via the collaborative efforts of various research experts with the aim of providing distance learners access to instructional contents to enable learning at any time and in any place. In the first phase, four pilot courses have been designed on the mobile platform and can be accessed from any mobile device anywhere in the world. This means that distance learners do not have to be physically present in the classroom to access information or submit assignments. The Mobile platform also provides learning activities such as lessons, wikis, quizzes, chats,

and news forum. The platform also allows Students to have access to course tutors and other students at anytime and anywhere. The courses have been built to fit most of the commonly used internet-enabled mobile phones in Nigeria (Nokia, Samsung, Blackberry, I-phones, HTC, including the less expensive phones, termed China phones (e.g Techno T9). The mobile platform could also be used with tablets such as Samsung Galaxy Tab or I-PAD. Opera mini is the preferred browser for mobile view. The project has now reached implementation stage and is currently being test run in some faculties selected to pilot the project.

Dr Maths on MXit

MXit is a cell phone instant messaging application which is proprietary software of MXit Lifestyle (Pty) Ltd. based in South Africa. It enables people to easily communicate with each other with textually typed messages which are similar to SMS on mobile phones. One of the primary differences, however, between SMS and MXit is the cost factor. Messages sent via MXit cost approximately one or two cents whereas SMSs could cost upwards to fifty cents depending on contract type. This means that MXit is the South African equivalent of Whats App mobile app. It is extremely quick and easy to get connected with MXit on phones. Just as with Whats App, MXit software is downloaded and registered with via WAP which runs on most modern mobile phones, and then instant communication starts between friends, colleagues and family members (Butgereit, 2014).

According to Butgereit (2014), *Math on MXit* leverages the fact that teenagers are already using MXit as a medium for communication. For today's teenagers, SMSs are too expensive, and phone calls are too loud. The MXit software can communicate with other instant messaging systems. According to the developers of the system, the Tutorial system called *dr.math.help.me* was set up as an account at *jabber.org*. Learners who wanted to take part could merely invite Dr. Math to be one of their contacts and they start asking questions instantly. There are no registration forms to complete, no waiting period, and no costs. Learners use the MXit platform on their mobile phones to ask questions which are routed to a tutor who is online during specified hours to help provide guidance in working out mathematical problems. With this system, the tutors do not do their learners' homework but instead, guide the learners into working out the problems themselves.

Mobile Applications for Education

Mobile apps are applications developed for small handheld devices, such as mobile phones, smartphones, PDAs and so on. Mobile apps can come preloaded on the handheld device as well as can be downloaded by users from app stores or the Internet. Mobile apps are available on both feature phones and smartphones. The most popular smartphone platforms that support mobile apps are Windows Mobile, Android, Symbian, Java ME and Palm (www.about.com/mobile-devices). Mobile apps enable a phone or tablet to do almost anything that the programmers can imagine, within the technical limitations of the device. A number of educational mobile apps can be designed and included on mobile phones. Thus today's rapidly advancing mobile computing technologies together with abundant mobile software applications ("mobile apps") make ubiquitous mobile learning possible with the right educational app developed.

CHALLENGES OF USING MOBILE PHONES IN DISTANCE EDUCATION IN NIGERIA

The use of mobile phones in learning has a number of drawbacks. UNESCOIITE (2010) described the challenges as: challenge of persuading educators to accept mobile technology as a serious option for education not just a gimmick; small screen size which limits activities on the device; cost of connectivity and cost of device; constant need to keep a mobile device charged; constraints on mobile learning in rural areas due to lack of appropriate technologies; lack of competences required to develop mobile learning opportunities for

students; human relationships becoming compromised; and increase in stress levels, or feelings of overload by both learners and facilitators. Some other disadvantages of using mobile devices in distance education include the following:

1. The amount of information to be shown on the small screens of mobile devices is limited due to their physical dimensions.
2. It is necessary to charge the batteries of mobile devices regularly. In addition, their batteries have a specific life span.
3. The small keypads of these devices make data input difficult for users.
4. Software developed for computers cannot be directly used in these devices.
5. Opening videos and high-resolution images via the Internet by using mobile devices is sometimes very slow, though this depends on the speed of the wireless Internet connection.

It is noteworthy that with developments in technology, the above constraints will sooner than later be resolved.

CONCLUSION

The viability of mobile learning in different parts of the world, specifically the developed countries is evident. This evidence, according to Valk et al. (2010) has resulted in the transformation of learning systems from paper-based distance learning to E learning, and then to Mobile learning with emerging learning technologies such as location-aware, context-aware and ubiquitous learning. Thus, the need to explore the possibility of tailoring this learning to the local environment in Nigeria (Traxler, 2011) remains pertinent.

In Nigeria, there is a pervasive evidence of mobile penetration and adoption, as people are increasingly communicating in ways that would have been impossible to imagine only a few years ago. Mobile learning (M-learning) makes learning possible anywhere, anytime, and by various means. Indeed Mobile learning creates new ways of accessing and sharing knowledge and more importantly, results in more flexibility in distance education. But distance education practice in Nigeria has always been dominated by the use of traditional print media, and in some few instances radio. Even the use of television as practiced in other countries such as the China Central Radio and Television University (Perraton, 2007), the Open University United Kingdom (Olugbemi, 2008) among many others, has not taken a firm root in Nigeria. Human beings are by nature very much averse to change especially with respect to adoption of new technology. Nigerians are no exception. When for example, the Federal Minister of Agriculture, Dr. Akinwunmi Adesina, proposed the use of mobile phones to distribute fertilizer, Nigerians were very skeptical and in fact many called the initiative a scam, until it was implemented successfully. According to Agro Nigeria Online (AgroNigeria, 2013), The minister stated that the Electronic Wallet System was introduced to allow small scale farmers receive subsidized electronic vouchers for seeds and fertilizers directly on their mobile phones, in order to cut out rent-seeking middlemen who usually shortchanged farmers.

Mobile phone, as the fastest penetrating technology in human history, has become central to student information activities, playing very important roles in e-learning and e-health (Nwaugwu, 2010; Brown, 2003), and playing a critical role of using bulk SMS by students and facilitating their exchange of information and communication with staff, for example, in the University of South Africa (Nwaugwu, 2010). In Nigeria, mobile technology is fast becoming an educational communication tool as shown by the numerous Mobile learning initiatives cited earlier. According to Wright, Dhanarajan & Reju (2009), mobile phones are used to teach literacy to some of the 9.3 million nomads who wander over Nigeria's terrain and along her shoreline.

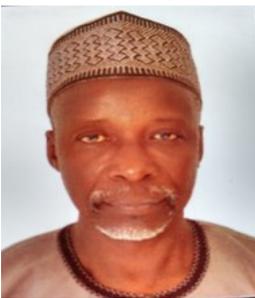
However in spite of all the above potentials of mobile devices, in Nigeria, there is general lack of awareness that mobile devices could be used in education and in fact, could move teaching from the classroom to other locations like homes, offices, shops, market place, farmlands, and even on transit, which offers great potential for Distance Education and also the new concept of Flexible and Lifelong Learning (Cook, 2006). However, the above discourse is a pointer to the fact that in the Nigerian context, the use of mobile phones in distance education offers a lot of promise. It could be used to meet the educational needs of: teachers who need further training but could not afford to leave their duties due to dearth of qualified teachers; the nomadic group, such as the Fulani Herdsmen (Aderinoye, 2004); fishermen in the Southern riverine areas (Aderinoye, 2004); women in Purdah in the Northern part of the country; market women in their stalls and shops; girls who drop out of school for economic reasons (Ofoegbu, 2009); unemployed youth who work as apprentices in various trades; itinerant workers and hawkers; our large rural population; and with falling prices it could be extended to the Almajiri group who roam the streets and form a nuisance to the society. All the above mentioned groups need education and training but will not be able to leave their occupations and attend a conventional school. Thus it is apt to state that, mobile learning will afford these deprived group educational opportunity, personal development and enhancement as they manage the challenges of learning, living and working in a diverse, global society.

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READING OPEN EDUCATION IN THE AGE OF MANKIND: REPRODUCTION OF MEANING IN THE DERRIDEAN SENSE

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ABSTRACT

The rapid change in the communication technologies plays a significant role in the transformation processes of societies. The studies studying the industrial revolution in two phases inform us that the first phase of the revolution involved a revolution in machinery while the second phase saw a revolution in technology. Fast forwarding to the twentieth century, however, one of the areas that has been affected greatly from the said technological revolution is education. The structural changes in education are essential for a new educational process that is consistent with a heterogeneous student population and independent of time and space. In this respect, the new education system in information age has been come to be called open and distance education. In the 21st century, when the information age gave way to the human age, we see learner oriented education system. Putting the learner at the center of the educational process, this particular system puts an end to binary opposition between the subject and object. Having aimed at identifying students' perception of open and distance education system - being the educational technology of the twenty first century-, the present study has been conducted with 69 students that were presently enrolled to the Anadolu University Faculty of Open Education and entitled to the certificate of honor. A metaphor analysis method was employed within the scope of this study. In order to evaluate the students' perception of open education system, this study adopted a "phenomenological method" as its qualitative research method as it seemed to be more suited to its purpose. In order to identify the students' perception of open education system, they were given a semi structured questionnaire form that contained the following statement "Open Education is like Because it is" and asked to convey their thoughts by focusing exclusively on a single metaphor. The answers from the participants were recorded by a camera, transcribed and analyzed through the spreadsheets created on an excel table. The participants of the study came up with 69 valid and 45 different metaphors regarding the concept of open education. Such metaphors were aggregated under 7 different conceptual categories. At the end of the study, it was established that the students enrolled to the Open Education System regarded open education as a means to access to information.

Keywords: Open education, distance education, metaphor analysis, Derrida, students' perceptions.

INTRODUCTION

Distance education left its mark in the educational systems of the developed and developing countries in the 20th century. The most significant reason for such influence was the rapid development and expansion of the communication technologies. Today, technology, globalization and competitive dynamics influence all sectors of life. For this

reason, the universities world over currently undergo a brand new transformation. In such transformation, however, popularization and information society assume a critical role. Rapid changes in the satellite, fiber optic, television, radio, computer, internet and various other information technologies affect the ways in which the education is conducted and force educators to implement new ways of teaching and learning. (Isman, 2011)

The 21st century is associated with the society that produces and manages the technology rather than merely keeping up with it. All such developments are acknowledged as the name of the transformation observed in the 21st century university. The name of this transformation is pronounced as the distance education system.

According to the United States Distance Learning Association (USDLA), distance learning is made available to the students living in remote areas by way of electronic devices that include satellites, computers, video and audio graphic multimedia technologies. Owing to the fact that the teacher and students are separated from one another geographically in the distance learning sessions, the educational programs in this form of education have to be conducted through the use of electronic devices and/or written materials. Distance education consists of two fundamental parts that involve teachers on the one hand and the students on the other hand (Ozbay, 2015).

As its definition indicates, distance education focuses on the interaction between the learner and teacher in the education process independently of time and space. The studies on distance education have gained a momentum due to the increasing importance of the distance learning practices and the increasing number of Open Universities and Open Education Faculties in the 21st century. The studies thus far conducted seem to have mostly focused on the educational contents and process of distance learning. However, the learners constitute the most important pillar of the open/distance education system. In this respect, the learner's perception is deemed important in building the learning processes. This study, aiming to evaluate the students' perception of distance learning through a metaphor analysis, has studied the signs brought about by the distance learning sign and the reproduction of meaning in the word 'distance learning' on a conceptual level.

READING DISTANCE LEARNING

Known to both the contemporary teacher and learner as the name of a new system, distance learning conjures up different concepts in the mindsets of both the learner and the teacher. The concepts such as distance education, open education, web based education, computer aided education and e-education are used as the synonyms of cyber education system. Albeit it is mostly based on practical reasons, such conceptual differentiation constitutes a significant debate for academic studies. While the concept of open signifies flexibility and choice in learning processes, the concept of distance signifies a mentality of education that is independent of time and space (Aydin, 2011).

The most important reason behind such conceptual differentiation is the presence of concepts that are peculiar to the fields of open and distance learning and the theories that attempt to account for the relationships between such concepts (Aydin, 2011).

In terms of system of words and signs, however, the concept of open education conjures up different definitions in the minds of the students and prospective students. Before moving on the discussion of the open education students' definitions of the subject, we believe it is important to address the views that interpret the 21st century Open Education System through interaction and communication theories and as such theoretically contributed to the design of the education processes.

Hillary Perraton's theory on open learning is influenced by the philosophy of education, communication and diffusion theory. Claiming that open learning will help eliminate the

limitations observed in the teacher and learners when they are all present at the same time and place, Perraton mostly focuses on the concept of distance rather than the concept of open. That being said, however, some of the other points made by Perraton – such as the costs of the learning processes, size of the target audience in learning, changing nature of costs with the choice of technology, opportunity to reach out to those who can otherwise never be reached through the traditional education system, building an educational system that will include dialogue, transforming teacher into a person that makes learning easier, multiple learning environments and the processes that support various different student activities- draw parallels to the flexibility and choice aspects of the concept of open (Aydin, 2011).

The equivalence theory, put forward by Michael Simonson, maintains that it is a structured education system in which the learners are separate from one another as well as the teacher and educational resources and where communication between all elements is maintained through communication technologies (Aydin, 2011). By this approach, Simonson draws emphasis to the co-learning processes of the concept of distance that is independent of time and space and underscores the fact that the structured learning experience should not be different. However, the concept of learning experience, being the most significant component of the Equivalence Theory, includes the observations, emotions or activities that facilitate learning. The students that have been educated in different times and places may require mixed learning processes that offer different learning experiences. In this respect, the educational designs should be able to cater for different student groups who demand different experiences (Aydin, 2011). When considered in terms of the concepts of open and distance, it is seen that the system is built on the concept of open.

Assessing the theories of Simonson and Perraton, we note that the concepts of open and distance are employed together in shaping up the learning processes. However, what these two theories have in common is that they draw a particular attention to the flexible and optional learning experiences in designing the educational process. While the interaction and communication theories rely on the interaction between the teacher and learner, they transform the teacher into the agent that facilitates learning.

Due to the fact that open and distance learning is a new system; there are issues in identifying and explaining the concepts. An explanation intended for making people understand their life experiences in a certain area calls for a more in-depth explanation that is beyond the standard explanations ascribed to such experiences. In this respect, metaphors serve as systematic tools that contribute additional explanations to a concept and extend its application range. The metaphors developed freely by the study participants that allow to express their opinions and the analyses thereof enable us to achieve results in the open and distance learning related studies where the individuals are put at the center stage (Gunes & Firat, 2016).

We believe that using metaphors will be more effective than other methods in getting through the thoughts of the study participants while conducting open and distance learning studies that involve different places, different socio-economic levels and a more heterogeneous target group, based on equivalence theory, as opposed to the traditional education system. Difficulty in reaching out to a greater audience, failure of the sample to represent the general population at all times and the superficial results found by the questionnaires may compromise the data collection process.

Identifying the meaning of the open and distance learning for the open education system students independently of the concepts of open and distance is considered important in terms of measuring the students' perceptions regarding this particular education system. Moreover, it is also important to measure the perceptual differentiation on the part of the students with respect to the open/distance learning. As Derrida points out, presenting the relationship between the being and subject by point out the differentiation relationship is

considered important in terms of pointing out the fact that the internalization of the object is actually the internalization of the subject itself (Derrida, 2010).

Derrida and Metaphor

The word metaphor derives from the Ancient Greek word 'metapherein' which translates as moving forward or conveying. Latin rhetoricians converted the word metaphor into the word *translatio* or *transferentia* (Karamahmet, 2012). According to Nisanyan's dictionary of etymology, the word metaphor is used in the sense of "Transfer and transformation" in Ancient Greek, the languages into which it is adopted describe the word as "in rhetoric, the use of a word outside its naturally ascribed meaning, as in semantic shift" (Nisanyan, 2010). The both words above make noticeable reference to the sense of movement and conveyance (Karaahmet, 2012). In going from its etymological origin to its philosophical background, we see that the word metaphor actually represents a vehicle whereby the word itself actually conveys the meaning from one place to another.

Metaphors have been influential in the fields of philosophy and literature theory for the last two thousand years. Plato was the first philosopher to address the metaphors in the superficial sense, while more sophisticated studies into them are found in the works of Nietzsche and Derrida. Having associated the concept of metaphor with the claims of superiority and will to power, Nietzsche believes that the metaphor will be destroyed once it is ascribed to its original meaning (Karaahmet, 2012). Derrida differs from all other thinkers who juxtapose the metaphor with the metaphysics of presence. Rejecting an independent realm of existence, Derrida argues that there cannot be a realm of meaning that is independent of signs.

The concepts of idea, substance, spirit of the world, god etc. all constitute the basis of a system of thoughts and forms where all other signs revolve around them. Derrida believes that every transcendental meaning along these lines is nothing more than a construct. There are certain signifiers or meanings with respect to the signifiers such as Power, Freedom and Order that are given great importance in society. Sometimes such meanings are thought as if they were the origins of all other meanings. However, in order for such meanings to be valid, some other signifiers should have existed prior to such meanings. Whenever a source is thought of, there is always an immediate urge to go back to a starting point that precedes that source. However, such meanings cannot be seen by looking at the source, instead they can only be observed in line with certain purposes that spearhead the progression of all other meanings. One of the ways in which to comprehend the things in line with a purpose (*telos*) or teleology with reference to their etymology is to arrange the meanings in accordance with a certain hierarchy of meanings. Derrida suggests that every system of thought falling into the category of "metaphysics" is based on a pillar, foundation or an original principle. The original principles are, more often than not, described through "opposition" in relation to other concepts that are excluded by such principles. Such principles and the "oppositions" informed by such principles can always be subject to deconstruction (Sarup, 2004).

According to Derrida's language theory, signifier is not directly linked to the signified. There is no immediate reciprocal relationship between the signifier and the signified as espoused by the Saussurean philosophy. For Derrida, a word can never be one and the same with a thought. The signifiers and signifieds either disintegrate from one another or come together due to their being constantly involved in new combinations (Direk, 2004). Derrida argues that the meaning is not immediately crystal clear whenever a sign is read out. Signs point to absence and the meaning is in constant motion throughout a chain of signs. Also known as 'non-location', this suggests that the meaning is never dependent on a single sign (Sarup, 2004).

In his article titled 'Difference', which he published in 1968, (Derrida, 1968), Derrida -in reference to the irreducible doubleness of the Latin word "differe"- talks about a law of temporal and spatial differentiation that never reveals its true identity despite enabling

signs to fulfill their functions. In talking about the 'difference' Derrida makes references to Nietzsche, Saussure, Freud, Levinas and Heidegger.

Defined as 'metaphorical' by Madan Sarup, difference holds that the meaning constantly revolves around the vicinity. Here, 'difference' is the description that is given to the process of 'meaning revolving around the vicinity'. In this respect, the biggest fear of the regular language is the reproduction of meaning. In summary, Derrida's philosophy of 'difference' is a structural principle that holds that a description is about the negative and positive references that it makes to other texts rather than the thing for which the description is given. Meaning changes over time, and, in the final analysis, the attribution of meaning is infinitely deferred. No text can be put aside, thinking that is already decrypted (Rosenau, 1998).

According to Derrida's philosophy and the chain of signs, while metaphor links the subject up to the object, it also remains present in the relationship between the being and the subject. For this reason, metaphor is the most interesting field of study in the social sciences today. In order to eliminate miscommunication, comprehension of deep metaphors regarded as essential today. Having been recognized by theoretical communication studies in terms of its efficiency, metaphor studies are now also employed by the educational communication studies. In this respect, an analysis of the age of mankind and the intellectual processes thereof are considered important in organizing the contents and patterns of the 21st Century educational processes that currently undergo a significant transformation.

METHOD

Purpose of the Study

Acknowledged as the most significant signs that reveal the subconscious, metaphors enable us to get through one's subconscious. One can tell straightaway that a person likening academic life to a rescue boat has a different value judgment than a person that likens it to the sun. For this reason, metaphor analysis is considered important from designing educational processes to the marketing of educational services. This study aims to present the open and distance education students' perceptions on the open education system –which makes the biggest contribution to the expansion ratio of universities across Turkey- on a statistical level.

Research Model

This study is a phenomenological research conducted with a view to analyzing the metaphors expressed by the open education students with respect to their perception of the open education system. As a qualitative research method, the "phenomenological method" focuses on explaining the phenomena that we are aware of but yet have no detailed and in-depth knowledge of. Phenomena are presented to us in various ways such as in the form of events, experiences, perceptions, orientations, concepts and circumstances in the everyday life. However, this does not necessarily mean that such phenomena are fully understood. Phenomenology provides an appropriate research environment for the studies that aim to study the phenomena that we have some notion of but at the same time fail to fully comprehend (Yildirim & Simsek, 2006).

The studies conducted by Gerald and Lindsay Zaltman (2008) suggest that human beings act based on more or less similar cognitive structures in every culture and society the world over. The studies of Gerald and Lindsay Zaltman show that the people living in various parts of the world express themselves by using the same "imitations" and metaphors. Zaltman and Zaltman have tried to identify common metaphors among people by developing a new technique. By conducting thousands of in-depth interviews in more than thirty countries, Zaltman and his team have come up with 7 fundamental metaphors that could establish associations with almost every sector, brand and product (Zaltman & Zaltman, 2008). Zaltmans divide metaphors into two, namely metaphor themes and surface metaphors. Various studies show that people speaking in various languages use approximately five to six metaphors in one minute. Here, the metaphor themes serve as the common pillar that constitutes the basis of the similar surface metaphors. Metaphor themes are considered as the basis on which deep metaphors are elicited (Zaltman & Zaltman, 2008).

Study Group

In this study, conducted with a view to analyzing the Open University students' perceptions of the open education system on a statistical level, 65 students, enrolled to the Anadolu University Faculty of Open Education, were interviewed. The students in question were chosen randomly out of the students that were currently enrolled in the 3 faculties and associate degree programs of the Anadolu University Faculty of Open Education during the Academic Year 2015-2016. The number of students currently enrolled in the Anadolu University Faculty of Open Education during the Academic Year 2015-2016 was 1.435.754. (Open Education System, 2015) In determining the sample group for the study, the criteria developed by Pawson, Boaz, Grayson, Long and Barnes's (2003) with respect to the reliability and validity of qualitative researches were taken into account. Abbreviated as TAPUPAS, the model in question consists of the following criteria: transparency, accuracy, purposefulness, benefit, accessibility and genuineness. In this respect, the study was conducted with 69 students –of different age and professional groups that were currently enrolled in the various different departments/programs of the Anadolu University Faculty of Open Education- who were entitled to receive a certificate of honor.

Data Collection and Analysis

An interview form was prepared to elicit the metaphors that the students might have regarding the concept of Internet. While preparing the form, the studies where "metaphors were used as a tool" were reviewed as well. (Korkut & Keskin, 2016; Korucu & Yavuzaslan & Usta, 2016; Demirpolat, Turpcu & Koroglu, 2015; Yilmaz & Guven, 2015; Franz & Feld, 2015; Saban, 2009; Coulter, Zaltman & Coulter, 2001) It was established that all of the studies thus reviewed asked the participants to complete the open ended sentences. Before collecting the data, the students were informed as to the metaphors without attempting to influence them in any way. The students were asked to complete the following sentence: "The open education system is like/similar to, because it is"". The answers given by the students were recorded by a camera and all the recorded interviews were later transcribed. The transcribed texts were then converted to excel spreadsheets. It was found that there were 45 valid metaphors. As a result of this study, and after having identified the conceptual categories based on Zaltman's metaphor themes and the characteristics pertaining to such categories, each metaphor was linked to the relevant category. At the end, 7 different conceptual category was identified. A coherency review was conducted to ensure the reliability of the study. During the data analysis stage, the researchers separated the metaphors into conceptual categories. And then an expert opinion was sought on the matter of qualitative research. The expert was provided with a list of metaphors in alphabetical order and the names of the determined conceptual categories. The expert was asked to match the metaphors with such conceptual categories. After having established the areas of agreement and disagreement with the expert, the Miles and Huberman formula (1994) ($\text{Reliability} = \frac{\text{Agreement}}{[\text{Agreement} + \text{Disagreement}] * 100}$) was calculated. It was found that the coherence between the assessments of the expert and that of the researchers was around 92.75%. Since the result of the calculation was found to be over 90 percent, the desired reliability for the present study was deemed to have been achieved.

FINDINGS AND REMARKS

The metaphors developed by the Open Education students regarding the concept of "Open Education" and the 7 different conceptual categories developed by Gerald Zaltman and L. H. Zaltman (2008) based on "Marketing Metaphors" and the characteristics pertaining to each category were identified with the support of the sample metaphors created by the participants.

According to the findings of this study, the participants of came up with 46 valid metaphors regarding the concept of open education. (Table 1) 36 metaphors out of 45 (magic wand, beehive, treasure-fountain of knowledge, river-brook, running water, heart, plane tree, life, energy, magician, universe-space shuttle, exterior house door, umbrella-roof, rescue boat, light, magic power, tool, hatchling, the old aunt that dispenses advice in the neighborhood, sportsperson, sky, live computer, Wikipedia, relay race, home, air, the place where dreams come true, ladder, flour mill, an invisible giant, my source of happiness, Venus, miracle, added value, smart friend, mate, love) were created by one participant only. The remaining metaphors, on the other hand, were created by 2 to 9 participants. These include the following metaphors: sun (f=9), mother (f=6), friend (f=3), teacher (f=4), family (f=3), sea (f=2), tree

(f=2), internet (f=2), library (f=2). The metaphors developed by the open education students regarding the concept of open education and the number of students representing such metaphors (f) and their respective proportional distribution (5) are provided in the Table 1 below.

Table 1. Metaphors created by the open education students regarding open education

Metaphors	Frequency (f)	Percentage (%)
Library	2	2.8%
Mother	6	8.6%
Magic Wand	1	1.4%
Beehive	1	1.4%
Library, fountain of knowledge	1	1.4%
Sun	9	13.04%
Internet	2	2.8%
River, brook	1	1.4%
Heart	1	1.4%
Plane Tree	1	1.4%
Tree	2	2.8%
Life	1	1.4%
Energy	1	1.4%
Friend (smart friend, mate)	3	4.3%
Smart friend	1	1.4%
Mate	1	1.4%
Magician	1	1.4%
Teacher	4	5.7%
University, space shuttle	1	1.4%
Sea	2	2.8%
Exterior house door	1	1.4%
Umbrella, roof	1	1.4%
Rescue boat	1	1.4%
Light	1	1.4%
Magic power	1	1.4%
Tool	1	1.4%
Hatchling	1	1.4%
Old aunt-uncle that dispenses advice in the neighborhood	1	1.4%
Sportsperson	1	1.4%
Sky	1	1.4%
Live computer	1	1.4%
Relay race	1	1.4%
Home	1	1.4%
Air	1	1.4%
The place where dreams come true	1	1.4%
Ladder	1	1.4%
Family	3	4.3%
Flour mill	1	1.4%
An invisible giant	1	1.4%
My source of happiness	1	1.4%
Venus	1	1.4%
Miracle	1	1.4%
Added value	1	1.4%
Wikipedia	1	1.4%
Love	1	1.4%
TOTAL: 45	69	100%

The characteristics of deep metaphor categories were identified by reviewing the deep metaphor categories developed by Gerald Zaltman and L. H. Zaltman (2008) -which include balance, transformation, journey, container, connection, source and control- and the subjects, sources and the relationship between the subjects and sources of the metaphors created by the participants. The deep metaphor patterns and their respective characteristics are provided in the Table 2 below.

Table 2. Seven Conceptual categories regarding open education system and the characteristics that represent them

Categories	Characteristics of Open Education System
Balance	<p>Open Education is dynamic.</p> <p>Open Education maintains the balance.</p> <p>Open Education addresses the question of balance.</p>
Transformation	<p>Open Education serves to fulfill some important requirements such as self-realization and attainment of social superiority.</p> <p>Open Education facilitate the transformation for those coming from different value systems.</p> <p>Open Education ensures a reliable transformation.</p> <p>Open Education brings about natural transformations.</p> <p>Open Education brings about magical transformations.</p>
Journey	<p>Open Education is a journey to a known destination.</p> <p>Open Education is a journey to the unknown.</p> <p>Open Education helps me overcome barriers.</p> <p>Open Education shows me the path to success.</p>
Container	<p>Open Education is a physical, psychological and social environment.</p> <p>Open Education reads my mind.</p> <p>Open Education is culture.</p> <p>Open Education is protective.</p>
Connection	<p>Open Education helps me strengthen my social ties</p> <p>I am at ease within the Open Education system.</p>
Source	<p>Open Education shows me how to accumulate the things happening around me.</p> <p>Open Education shows me how to distribute the things that I've accumulated around me.</p> <p>Open Education shows me how to share the things that I've accumulated.</p>
Control	<p>Open Education does not limit my freedom.</p> <p>Open Education is balanced.</p> <p>Open Education is the source.</p>

(Prepared based on the work "Marketing Metaphoria" by Gerald Zaltman, L. H. Zaltman, 2008)

The list of metaphors created by the participants in accordance with the 7 conceptual category regarding the concept of open education and the characteristics thereof is provided in the Table 3 below.

Table 3. Distribution of the Metaphors According to Categories

Categories	Metaphors
Balance	Added value to life, life, family (n=3), friend (n=3), river-brook-running water
Transformation	Internet (n=2), tool, magic wand, live computer, flour mill, the place where dreams come true, smart friend, hatchling
Journey	Ladder, umbrella, roof, rescue boat, magician, life, space shuttle, friend (n=3), love, relay race, sportsperson, sea
Container	Wikipedia, internet (n=2), library, big library, family, space shuttle, universe
Connection	Mother (n=6), exterior house door, a friend living in a faraway place but who I can reach anytime I want, heart
Source	Sun (n=9), air, source of happiness, old aunt in the neighborhood, teacher (n=4), teacher reflected on the mirror, smart friend, tree, Venus, mother (n=6), plane tree, energy, treasure, fountain of knowledge, beehive, light, internet
Control	Sky, exterior house door, an invisible giant, sea

The participants created seven metaphors for the balance metaphor. Such metaphors include value added to life (f=1), life (f=1), family (f=3), friend (f=3), river-brook-running water (f=1). The examples of the metaphors created within this category are given below.

"Added value to life"

"Everything learned in life is an added value to the life." And the thing that provides that added value is the Open Education faculty. It is a great added value for those with limited time and resources. It helps you improve your quality of life."

"Life, life itself, one gets to know oneself through education."

"A person realizes their potential as they educate themselves. People discover the purpose of life through education. As you get educated, you think to yourself whether I can do more for other people's lives."

"Family"

"Renews its services every day. I think they are doing everything they can to make us successful."

"Family"

"I pick up the knowledge that I'm missing. I like doing research. I think of it as a big family. It's always with us"

"Friend"

"As I'm currently enrolled in a distance learning course right at home it's like a family member in our household, I always have the open education textbooks open... I'm doing tests in the workbook; it's like a friend under my hand."

"A Friend"

"I see it as a friend to whom I can talk freely and blow off some steam."

"Friend"

"As I'm currently enrolled in a distance learning course right at home it's like a family member in our household, I always have the open education textbooks open... I'm doing tests in the workbook; it's like a friend under my hand."

"River, brook, running water"

"By reaching the unreachable areas, education fulfills its duty of teaching. Considering the places it goes, I'd say it's like water that runs cleanly, clearly, uninterruptedly and rapidly, meeting the requirements. Considering that knowledge is of vital importance, it can reach everywhere, bringing life to everybody."

Balance is considered to be one of the earliest metaphors developed by people. Having started life with fundamental biological, mental, moral and social balance oriented capabilities, individuals build a mentality of social and moral balance on top of their physical balance (Zaltman & Zaltman, 2008). For this reason, individuals are in search of various different sources of balance that will meet their requirements. Since the biological, mental, moral and social balance is, more often than not, intricately intertwined, the search of balance within any of these four areas of balance has an effect on other remaining areas of balance. The participants that came up with the friend metaphor show that the open education has answered for their search of social balance. The dynamic nature of the search of balance finds its expression in the metaphors of river and running water. Having been defined as an entity that constantly renews itself, the open education system addresses to the dynamic mankind's search of balance.

With respect to the transformation metaphor, the participants created 8 metaphors. These include the internet, tool, magic wand, live computer, flour mill, the place where dreams come true, a smart friend and hatchling. The examples of the metaphors created within this category are given below.

"Internet"

"With open education it is possible for you to continue with learning without having to be confined within a particular place, boundary or timeframe."

"It is a system that tests my success, motivates and supports me and at the same time makes me see myself as my rival. Anadolu University Faculty of Open Education means my personal success."

"A tool"

"It is a means and a tool that enables people to reach their goals, objectives and dreams."

"Magic Wand"

"In order to make dreams come true"

"Live computer"

"It enables us to continue our activities in life and better ourselves."

"A Flour Mill"

"It reminds me of a process that requires hard work, like a flour mill. For me. It brings forth a product gradually through hard work."

"The place-environment where dreams come true"

"I see it as an environment where every means is made available for those of us who are enrolled in a distance learning program."

"Hatchling"

"It gets to know the air and water and then it develops and learns to fly freely. It ensures improvement in its field."

"I can liken it to a smart friend."

"This friend is an immense source of information; you can learn things from him. You can obtain information from him as long as you want; he is your friend and he is always there for you."

Presence or absence of transformation functions as a strong, automatic and subconscious way of evaluating one's experiences (Zaltman & Zaltman, 2008). Transformation is considered to be the most influential parameter in people's lives. Most of the literary works, from Holy Scriptures to tales, in essence, tell the story of the transformation of the universe. As in the case of the metaphor of balance, in the metaphor of transformation, too, physical transformation influences social transformation as well. When the concept of open education is evaluated within the framework of the characteristics of the transformation metaphor, the participants point out through the metaphors they have created that the open education has guided their transformation processes.

With respect to the metaphor of journey, the participants created 11 metaphors. These include ladder, umbrella, roof, rescue boat, magician, life, space shuttle, friend (f=3), love, relay race, sportsperson and sea.

The examples of the metaphors created within this category are given below.

"Relay race"

"I endeavor to carry the flag I've received to the highest level possible."

"Ladder"

"It made me achieve the success I'd desired step by step. It gave me the opportunities that had been previously denied to me."

"Umbrella, Roof"

"You both study and be with your family at the same time. It makes you move up in the world."

"Rescue boat"

"After having graduated from high school, I could not get further education due to political reasons, as I was wearing headscarf at the time, but this provided me an opportunity."

"Love"

It is like love. It makes us look ahead with hope. "

"Magician"

It is a great opportunity for those who missed out on education in the past, thinking they could make up for it in the future, or those who lament about not having studied when they had the chance"

"Sportsperson"

"Just like a sportsperson who cannot run a racetrack in his first attempt. But he gets better and better in time. He gets the experience. Open Education provides us with that experience."

"Sea"

"Everybody can access the information easily from everywhere and depending on their own capacity; it is like those who swim well go further away in the sea but those who can't stay behind the shore."

"Friend"

"I spend time with him, he keeps me company."

"As I'm currently enrolled in a distance learning course right at home it's like a family member in our household, I always have the open education textbooks open, I'm doing tests in the workbook; it's like a friend under my hand."

Journey is one of the topics that piques people's interest the most. The journey themes are important in terms of underscoring the thoughts that people have in mind. The meaning emphasized in the proposition "I'm rapidly coming close to my graduation day" is different from the meaning emphasized in the proposition "my graduation day is rapidly coming close" (Zaltman & Zaltman, 2008). According to Zaltman and Zaltman, the first proposition has an intermediary element. A person moves towards a certain timeframe and event. In the second proposition, however, the event moves towards a person. The important thing to consider here is the accurate analysis of the trajectory between the subject and agent and the object and agent. The answers given by the participants for the metaphors they created indicate the destination of the movement. However, it should be noted that in the deeply intertwined metaphors, the binary opposition between the subject and object will be eradicated. When the metaphor of journey is evaluated in terms of the characteristics determined for the purposes of this study, we see that the students identify the open education as a known journey. However, with the metaphor of "love", we see that they identify a journey to the unknown. The common ground for all of the participants is that the open education is a means of overcoming obstacles and a path to success. Another deep meaning associated with the metaphor of journey is that we can embark on a journey with others just like we can do on our own and do it for the good of others or ourselves. Those who create the metaphor of friend are the proof that they

regard the open education system as a journey by identifying the concept of open education with the metaphor of friend.

With respect to the metaphor of container, the participants created 7 metaphors. These include Wikipedia, internet (f=2), library, big library, family, space shuttle and universe. The examples of the metaphors created within this category are given below.

"I liken it to the internet"

"With open education it is possible for you to continue with learning without having to be confined within a particular place, boundary or timeframe."

"It is a system that tests my success, motivates and supports me and at the same time makes me see myself as my rival. Anadolu University Faculty of Open Education means my personal success."

"Universe-space shuttle"

"It is an unlimited universe of learning. It is a universe of learning, the boundaries of which we can imagine for ourselves; it is a potent device. It is like a space shuttle that takes us to the place we wish to go, a strong vehicle."

"Wikipedia"

"I think it is beneficial to us like bedside books."

"Family"

"Family is always very important for me, for me the school is like family"

"I liken it to a library"

"I can find every information I need there."

"I can liken it to a big library"

"I pick up the information I'm missing through there. I love doing research very much. I think of it as a big family. It's always with us."

With the metaphor of container, life is seen as a container. Individuals see themselves and the objects and events around them in the form of containers. The requirements that individuals have managed to meet or failed to meet are each a container. Since an individual's life is a container, their memories, emotions and thoughts are considered as containers as well (Zaltman & Zaltman, 2008). In this respect, Zaltman and Zaltman defines university as a container that has a biosphere of its own and in which the students wish to plunge into both socially and academically. When the qualities of open education are viewed within the framework of the metaphor of container, we come across the following propositions: open education is a physical, psychological and social environment, open education reads my mind, open education is culture, open education is protective. The students defining open education in the form of a container liken the open education system to a container into which they wish to go in and which supports their betterment. Those associate it with the metaphor of family regard the open education system as a protective container. However, we should note that the participants who created the metaphor of family appear to be at odds with the deep meaning of freedom. The metaphor of family also seems to give the impression of being stuck in the inner container, as opposed to the metaphors such the internet which describes, rather, an outer container.

With respect to the metaphor of connection, the participants created 4 different metaphors. These include mother (f=6), exterior house door, a friend living in a faraway place but who I can reach anytime I want and heart. The examples of the metaphors created within this category are given below.

"I liken it to a good mother, a caring mother."

"She provides me with everything, thinks of everything else. She reaches out to anyone anytime."

"Mother"

"It is as caring, trustworthy, happy and altruistic as mother, a university that has the scent of a mother."

"A mother"

"It embraces me like a mother, provides me opportunities like a mother."

"Mother"

"I've learned everything I know from my mother. Likewise, I can say that I've learned everything I know academically from the Open University."

"Exterior House Door"

"It is like the exterior house door, intertwined with the garden outside, it's as if I can find every information and everything that I'm looking for there. I'm at peace there, it doesn't upset me, I'm on my own and plan the way I'd like to go about my education."

"Like a friend that lives in a faraway place but you can reach anytime you want"

"I can call up my faculty directly and talk to them and make our complaints matter. I feel that we are not left to our own devices, despite the fact that we study physically away from the classroom we got to see our deans and chancellors."

"It is the heart of the higher education mechanism."

"It is the lifeline of education in every aspect."

Individuals possess a basic urge or requirement which is defined by the sense of being connected and sometimes being disconnected (Zaltman & Zaltman, 2008). The origins of this urge are traced back to the history of evolution and found in the process of sustaining the existence. For this reason, the sense of belonging is firmly entrenched in the behavioral patterns as a permanent urge. Ever since the conception, the sense of connection that is originally started with the umbilical cord guides our interaction with the social and physical environment. For this reason, when the deep meanings of the metaphors created herein are viewed, we see that they hint at a sense of connecting with the self and also with the outside world. Those defining the concept of open education with the metaphor of mother betray the urge of connection that originally started in their mother's womb. Through the connection conveyed by the metaphor of balcony between the inner world and outer world, the participants seem to regard open education as a safe connection between the comfort of the interior and distrust of the exterior. When we study the influence of the metaphor of connection on individuals, we see that individuals make connections between the events taking place around them. The participant that defines open education as the heart of the higher education system uses a strong metaphor to make connection between the Open Education System and other higher education programs and establishes the connection between himself and the open education system through a vital organ, namely the heart.

With respect to the metaphor of source, the participants created 17 different metaphors. These include sun (f=9), air, source of happiness, old aunt in the neighborhood, teacher (f=4), teacher reflected in the mirror, smart friend, tree, Venus, mother (f=6), plane tree, energy, treasure, fountain of knowledge, beehive, light and internet. The examples of the metaphors created within this category are given below.

"Sun"

"It is like the sun that warms and enlightens me and makes me feel alive as it has given me the opportunity to resume my career without delay and supported me and helped me out at every turn."

"Sun"

"It never lets you lose hope. Like you know there is light at the end of the tunnel, you know it will rise up like the sun."

"Sun"

"It holds light to my career, I study and work at the same time. When I finish school, it will help me immensely in getting promoted at work"

"Sun"

"It lightens up the area and enlightens the people in that area without realizing them."

"Air"

"I think of it like the air for those who do not have the chance to study at school but compelled to do so at home. Just like you won't be able to live without breathing you cannot survive without education."

"My source of happiness"

"I'm one of those people that love studying so much. Open education is right up my alley. I love doing homework. I feel content when I'm studying."

"I liken it to the old uncles or aunts that tell tales or dispense advice in the neighborhood."

"It guides our way."

"A very valuable instructor/teacher... he is not there with you but you feel as though its reflection was in the mirror or projected through the mirror"

"... It gives us very valuable information, and therefore enlightens our world like the rays of the sun. It gives us life. Because life without science and knowledge is possibly the biggest dark abyss that one can find himself in. It is unique in that it takes us out of that bottomless hole."

"I can liken it to a smart friend."

"This friend is an immense source of information; you can learn things from him. You can obtain information from him as long as you want; he is your friend and he is always there for you."

"Tree"

"We can be the fruits or branches of that tree. We, too, become useful to others by dropping into soil from that tree and becoming a tree ourselves."

"Light"

"I'd say it is enlightenment. It enlightens everyone through education, puts people one step ahead in their career, help them overcome the obstacles in their path."

"It is like a venerable, deep rooted and centuries old plane tree, under the shade of which you can lie down."

"It embraces people with the knowledge it provides, you can keep the knowledge you acquired for decades."

"I can liken it to a beehive or a mother or a house."

"It's broadened my horizon, teaching me everything. "

"It's like treasure, a fountain of knowledge"

"It gives us opportunities to better ourselves without going to school. It is a significant opportunity, a treasure."

"Venus"

For me, Open Education is the light of hope; it is the path to achieving my goals or, rather, the goals that I have changed for the future."

Zaltman and Zaltman (2008) define sources in the form of capabilities and skills that are used in achieving certain goals. In this respect, the concept of open education is regarded as more than a mere educational institute. The participants go so far as to describe it as a guide, life changer, a torch that casts light. As for the accumulation, reproduction and distribution of knowledge, the participants describe the open education with the metaphors of sun, mother, teacher and light, which involve dissemination and augmentation. By using the metaphors of beehive, treasure and fountain of knowledge, we get the impression that they associate the concept of open education with the accumulation of knowledge.

With respect to the metaphor of control, the participants created 4 different metaphors. These include sky, exterior house door, an invisible giant and sea. The examples of the metaphors created within this category are given below.

"Sky"

"Education is endless. It can contain anything that you put in it. I believe it is endless and knows no bounds."

"An invisible giant"

"It is a brilliant system for working people in terms of equality of opportunity. We can call it an invisible giant. A big family and a very nice system."

"Sea"

"I add every piece of knowledge I gather from it into my chest of knowledge, and believe that I improve myself that way. I'll try to obtain as much as I possibly can."

The deep metaphor of control is triggered by the subconscious urge to control ourselves and the events around us (Zaltman & Zaltman, 2008). This subconscious urge to control things causes anxiety when people face with the situations that they cannot control. When the metaphor of control is evaluated in terms of its qualities associated with the concept of open education, we see that the participants describing the open education system with the metaphors of sky and sea regard the concept of open education as something that does not limit their freedom. However, in describing it in the form of an endless sky, they hint at losing their grip on control. The metaphor of invisible giant, on the other hand, suggests that they see it as a giant that protects them against the uncertainties resulting from the situations occurring out of their control. The participant that makes reference to the equality of opportunity seem to suggest that the giant will defend their rights and thereby maintain the balance in the event of an unexpected risk or inequality. In this respect, the deep metaphor of control appears to be working in tandem with the metaphors of balance and source.

The participants created 45 different metaphors for the concept of open education, which were classified in 7 different categories as per their respective characteristics. Another attention grabbing finding of this study is the availability of common areas where deep metaphors intersect with one another. As seen in the case of the deep metaphor of control working in tandem with the metaphors of balance and source, there are many metaphors that work in coordination with each other. The deep metaphors that work with each other are presented in the table 4 below.

Table 4. Intertwined Metaphors

Metaphors	Categories	(f)
Family	Balance, container	3
Internet	Transformation, container, source	2
Mother	Connection, source	7
Friend, mate	Transformation, journey, connection, source	5

When the intertwined metaphors are evaluated, the metaphor of family that describes the concept of open education appears to be working with the metaphors of both container and balance. While the metaphor of internet is working with the metaphors of transformation, container and source; the metaphor of mother works with the metaphors of connection and source; and the metaphor of friend with the metaphors of transformation, journey, connection and source.

If the fulfilled and unfulfilled requirements of an individual are described in the form of a container, the participant that describes the concept of open education with the metaphor of "family" also attributes the qualities associated with family –that is the qualities that maintains his physical and mental balance- to the concept of open education and thereby identifies open education with family, a unit that helps shape up his mental container, memories, emotions and thoughts. In this respect, while the open education corresponds to the search of balance it also works with container as well.

While the metaphor of "internet" serves as a vehicle for important requirements such as self-realization and attainment of social superiority, it also describes a physical, social and psychological environment through the metaphor of container. In addition to the metaphors of transformation and container, the metaphor of internet also defines the accumulation and distribution of knowledge through the metaphor of source.

While the metaphor of "mother", on the other hand, describes the Open Education System as a comfortable and reliable structure, it also describes it as a system that accumulates and augments knowledge through its deep metaphors.

The metaphor of "friend" works with the deep metaphors of transformation, journey, connection and source. Catalyzing transformation for those coming from different value systems, the Open Education System is also described as a journey that helps people overcome obstacles. While it makes social connections work through the metaphor of connection, the deep metaphor of source is coded by the participants through sharing the accumulation of knowledge.

CONCLUSION

According to the findings of the present study that aimed at presenting the open education students' perceptions of the open education system, the metaphors of sun, family, friend, mother and teacher have been found to be have been created by multiple participants. It has been established that the metaphors created by a single participant are mostly included in the category of source. The most frequently created metaphor has been identified as the metaphor of sun. When the deep metaphor of source is evaluated in terms of its characteristics associated with the accumulation, reproduction and distribution of knowledge, we see that the participants that are currently enrolled in the Open Education system tend to think of the system along the lines of a source of obtaining knowledge. The frequency of the use of metaphor of family, on the other hand, appears to correspond to their effort to maintain social balance or their search of social and physical balance. The fact that the metaphor of family also corresponds to the deep metaphor of container shows that the concept of open education also describes a psychological and social environment as well. However, it should be noted at this point that the deep metaphor of container also represents a sense of entrapment in the subconscious. Considering the frequency of the use of the metaphor of mother, the metaphor of mother coded within the metaphor of connection describes both a comfortable and secure structure under the supervision of the mother and also a certain structure within the vicinity of the container.

It is believed that the strength of deep metaphors in measuring perception paves the way for creating the contents of a system. However, another equally important point is the presentation as to how the individual improvement and transformation processes -as the key objectives of education- will be built. The metaphors created within the category of transformation focuses on natural and miraculous transformations. Making the deep metaphors of transformation and connection work together in the studies intended for developing the academic contents and communication strategies of the Open Education system will be important.

Although they are accounted for through their different characteristics, deep metaphors always work together. Such combination calls for congruity and integration rather than conflict. Conceptual harmonization sheds light to the emotional states of individuals that are brought forth through their subconscious. The concept of conceptual harmonization, introduced by Zaltman and Zaltman (2008), is likened to the combination of the colors of yellow and blue. Through the combination of the colors of yellow and blue comes the color green. However, we know that the origin comes from the colors yellow and blue. In this respect, the joint working of the metaphors of transformation and journey in the metaphor of friend can be given as an example. For a student that had to take a time out from their education due to family reasons, open education provides the opportunity of a brand new journey, helping him overcome obstacles; for an individual coming from a different value system it presents a chance to realize himself. For this reason, it is important that deep metaphors are read on top of one another, rather than individually, in order to elicit subconscious meanings.

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THE EFFECTS OF SOCIAL MEDIA USE ON COLLABORATIVE LEARNING: A CASE OF TURKEY

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ABSTRACT

The social media usage has penetrated to the many areas in daily lives of today's students. Therefore, social media can be effective tool to support their educational communications and collaborations with their friends and also faculty members. This study aims to determine the effects of social media on collaborative learning. For this purpose, a theoretical model is proposed based on comprehensive literature review. Using an online questionnaire, data are collected from the students of one of the largest university in Turkey. Structural equation modelling is employed as the major statistical analytic technique. The theoretical model is supported by the findings significantly. The findings indicate that perceived ease of use is a predictor of perceived usefulness and both of these have impact on social media use of students for educational purposes. Social media usage improves peer interaction and course engagement of students and also students' interaction with faculty members. Finally, peer interaction and course engagement have positive significant effect on collaborative learning. The results of the study might be helpful to students and educational leaders in their efforts to create initiatives to support, promote, and encourage the implementation and usage of social media in blended learning classes and provide adequate training for teachers to increase social media adoption.

Keywords: Social media, collaborative learning, structural equation modeling.

INTRODUCTION

Social media use is an increasing trend among people in all around the world. 2.5 billion people on earth use internet and .,8 billion of those have accounts on social media sites. In recent years, usage of social media has become widespread in Turkey as well as all over the world. The number of internet users is 55.9% of all people in Turkey in 2015 (Household Information Technology Usage Survey, 2015). 80.9% of people who have internet access in Turkey use it for social networking (Household Information Technology Usage Survey, 2015). The number of Facebook users is nearly 40 million in 2015 and Whatsapp, Facebook Messenger and Twitter follow it as the mostly used social platforms in Turkey (Global Digital Statistics, 2015). The average time that is spent by the people in Turkey for social media is 2 hours and 56 minutes per day (Global Digital Statistics, 2015).

This intensive use of social media has penetrated to each and every area of our lives in recent years. Especially, the use of social media in education has been investigated by many institutions and researchers. The most of the universities in the world use social media as a communication tool for current and prospective students and also for alumni. Moreover, social media is used as a supportive tool for learning. There are many examples in literature in which social media has been used in an educational context and enriched the communication and collaboration in the class.

This study aims to investigate the effects of social media on collaborative learning. Literature is reviewed comprehensively and findings are explained in part two. Theoretical model and hypotheses are explained in part three. The questionnaire, sample, and statistical method are explained in part four. Data are analyzed and results are discussed in part five. Finally, the study is discussed and its limitations are written in part six.

LITERATURE REVIEW

Social media is defined as “... *web-based services that allow individuals to construct a public or a semi-public profile within a bounded system, articulate a list of other users with whom they share a connection and view and traverse their list of connections and those made by others within the system*” (Boyd & Ellison, 2008). In addition, it is defined as internet-based applications and tools that provide the creation and exchange of user-generated content including videos, pictures, and written information (Kaplan & Haenlein, 2010; Li & Bernoff, 2008). Social media provides active participation, connectivity, collaboration, and sharing of knowledge and ideas among users (McLoughlin & Lee, 2007). These benefits provided by social media are very relevant and necessary for educational context. For this reason, the research of social media use in education is an increasing topic among researchers. There are both qualitative and quantitative studies in the literature which investigate the relationship of social media and education.

Different social media platforms were used to examine the effects of social media sites on education and collaborative work. Bongdanovs et al. (2012) created their social platform in order to measure the effects of self-created social media platforms for collaborative work. They observed that it is much more effective than typical social networks because it is created for a special purpose. Some of the studies handle social media sites separately and investigate the effects of specific one or specific kind of them in educational context. For instance in the study of Quincey and his colleagues (2012), the effects of social bookmarking sites were examined and it was found that they are very useful for storing, sharing and discovering resources. They are also helpful for creating learning communities (Quincey et al., 2012). Microblogs are another type that was investigated in the study of Ebner and his colleagues (2010) in which it was found that they are new type of communication that can help informal learning at outside of the classrooms. Moreover, the use of social media for educational purposes was analyzed also qualitatively by interviewing with university students and results showed that they use social media intensively for educational purposes such as exchanging practical and academic information, experiences, social support and also connecting with peers and sharing documents (Hrastinski and Aghaee, 2012).

It is stated that there is a positive significant relationship between academic uses of information technology and the occurrences of collaborative learning, and also academic uses of technology increases the interaction between students and also student and faculty members (Laird & Kuh, 2005; Junco et al., 2013). Grosseck and Holotescu (2010) also highlighted that microblogging is an effective tool for collaboration in educational context. Moreover, it was indicated that there is a correlation between the social media usage of students and the relationship between them (Rutherford, 2010; Rodriguez, 2011; Junco et al., 2013). It is appeared in the study of Hung and Yuen (2010) that students felt social connectedness more when social networking sites are used as supplementary tool for teaching.

On the other hand, the study of Wiid and his colleagues (2013) indicated that the most important factors according to the students' perceptions that affect the use of social media as an effective lecturing tool are 'Ease of use' and 'Accessibility'. Al-Rahmi and his colleagues (2014) also use two variables of technology acceptance model which are "perceived ease of use" and "perceived usefulness" and with these variables they also use "engagement", "peer interaction" and "faculty interaction" as the predictors of collaborative learning. In addition to this, they also investigate the effect of collaborative

learning and student satisfaction. Finally they examined the effects of collaborative learning and student satisfaction on student's academic performance. All relations were found as significantly effective on indicated variables.

In summary, there are researches exploring the effects of social media on collaborating learning. However in this study, main dimensions of technology acceptance model (TAM); perceived ease of use and perceived usefulness were used as the predictors of social media usage of students. It was claimed that social media usage of students is the indicator of interaction among students, also interaction among students and faculty members and course engagement. In addition, the effects of these three variables (student interaction, interaction between students and faculty members and course engagement) on collaborative learning were highlighted. All of these relationships are investigated in a single model which has not been proposed before in the literature.

THEORETICAL MODEL AND HYPOTHESES

Perceived Ease of Use

First of all, variables which affect the social media use are taken from basic Technology Acceptance Model (TAM) as "perceived usefulness" and "perceived ease of use" (Davis, 1989). Perceived ease of use has positive effect on perceived usefulness and also social media use and intention to use social media (Lim et al., 2013; Rauniar, 2013). Moreover, previous study from the literature revealed that perceived ease of use of social media has positive impact on social media use in educational concept (Wiid et al., 2013).

Perceived Usefulness

Perceived usefulness is defined as "the degree that an individual thinks that utilizing a particular system would enhance his/her performance" (Davis, 1989). Recent studies in the literature show that perceived usefulness has a positive significant impact on social media use and intention to use social media (Lim et al., 2013; Rauniar, 2013). Moreover, previous study from the literature revealed that perceived usefulness of social media for education has positive impact on social media use for education (Wiid et al., 2013).

H1: Perceived ease of use of social media has positive significant impact on perceived usefulness of social media

Social Media Usage

Social media usage variable measures students' actual usage of social media for educational purposes. Thus the discussion above leads to following hypotheses:

H2: Perceived usefulness of social media has positive significant impact on actual use of social media.

H3: Perceived ease of use of social media has positive significant impact on actual use of social media.

Student Interaction

Student interaction is created to measure the communication and information sharing between students among each other. In previous studies, it was stated that social media usage may have increasing effect on interaction between students (McLoughlin & Lee, 2007; Laird & Kuh, 2005; Junco et al., 2013). In this study, it is claimed that social media usage increases student interaction:

H4: Actual use of social media has positive significant impact on student interaction.

Interaction between Students and Faculty Members

Interaction between students and faculty members is created to measure the communication and information sharing between students and faculty members especially with instructors. In the literature, it was mentioned that the social media usage of students may have increasing effect on the interaction between students and faculty members (Laird & Kuh, 2005; Junco et al., 2013; Al-Rahmi, 2014). Based on the previous literature, following hypothesis was constructed:

H5: Actual use of social media has positive significant impact on interaction of students with faculty members.

Course Engagement

Engagement means “the intensity and emotional quality of children’s involvement in initiating and carrying out learning activities” (Connell & Welborn, 1991; Skinner, 1991 cited by Skinner & Belmont, 1993). In many studies in the literature, it was found that there is a correlation between use of social networking sites and students’ engagement (Heiberger & Harper, 2008; Rutherford, 2010; Rodriguez, 2011; Junco et al., 2012, 2013). Therefore, the arguments above leads to the following hypothesis:

H6: Actual use of social media has positive significant impact on students’ engagement.

Collaborative Learning

Collaborative learning is defined as following “it is a situation in which two or more people learn or attempt to learn something together” (Dillenbourg, 1999). In the study of Al-Rahmi (2014), it is found that perceived ease of use and perceived usefulness of social media student engagement, Student Interaction and interaction between students and faculty members are the predictors of collaborative learning. Grosseck and Holotescu (2010) also highlighted that social media is an effective tool for collaboration with students. Thus the argument above leads the following hypotheses:

H7: Student interaction has positive significant impact on collaborative learning.

H8: Interaction of students with faculty members has positive significant impact on collaborative learning.

H9: Students’ engagement has positive significant impact on collaborative learning.

In order to measure the effects of social media on collaborative learning, the theoretical model (Figure 1) was proposed by depending on the literature review. As a result of literature review, there is no such a complete theoretical model investigating the effects of social media usage of students on collaborative learning. Although, relationships between constructs in the model are investigated partially in different studies, this model is novel from various perspectives. For instance, the model is not only includes all related variables in a complete theoretical model, but also indirect and direct effects of independent variables were also measured in this model.

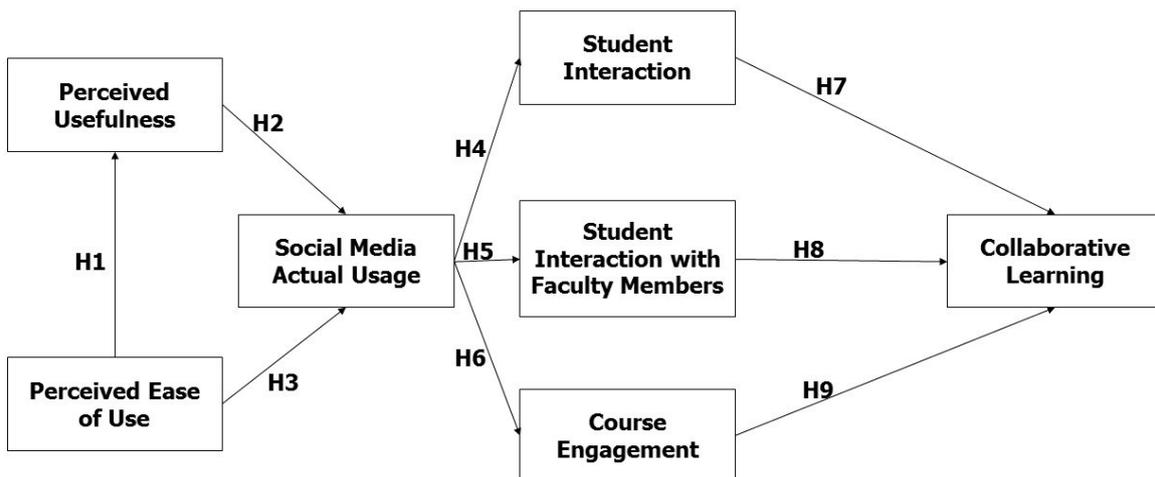


Figure 1. Theoretical Model

METHOD

Data

In line with the research objectives of this study, an online survey was developed and applied to a convenience sample of students of one of the largest university in Turkey. To be able to reach students from different levels (undergrad and grad) and departments, the survey was e-mailed to the students registered in that specific semester by institutional communication office. Out of 231 respondents, 166 complete surveys were used in structural equation modeling (SEM) by handling missing values with the complete case analysis. Hair et al. (2010) indicate that it requires minimum 150 sample size with a research model including seven or less constructs, modest communalities, and no unidentified constructs for SEM.

Measures

The questions from previous studies were adopted or directly retrieved from the existing scales for this study. The survey consists of 8 sections.

The first section of the survey includes 3 demographic questions which ask for gender, age and educational level of the respondents. 7-point Likert scale questions were used in the remaining parts of the survey. Perceived ease of use and perceived usefulness which are the basic variables of TAM were asked in second and third parts of the survey respectively. The fourth part of the survey which has a question with 3 items is about actual use of social media. This scale was adopted from the study of McGowan and his colleagues (2012). The fifth, sixth and seventh sections of the survey includes questions about student interaction, faculty member interaction of students and course engagement level of students, having 4, 4 and 3 items respectively. Question about collaborative learning was asked as the eighth part of the survey having 4 items. The scales except from fourth one were adopted from the study of Al-Rahmi (2014) (Appendix A).

Although all questions were adopted or directly retrieved from the existing scales, validity and reliability analyses were applied in the confirmatory factor analysis part.

FINDINGS

Descriptive Statistics

The demographic profile of the respondents is presented in Table 1. 65% of the respondents were female and 35% were male. The age range varies from 18 to 45, mean value of age is 23.14 and the standard deviation is 3.54. 72% of the respondents are at the bachelor's level, 19% of the respondents are at the master level and 9% of the respondents at the PhD level.

Table 1. Demographic Profile of Respondents

Age	Min	Max	Mean	Standard Deviation
	18	45	23.14	3.54
Gender	Female	Male		
	108	58		
	65%	35%		
Education	Bachelor's Level	Master	PhD	
	119	32	15	
	72%	19%	9%	

Structural Equation Modeling

Structural equation modeling (SEM) which examines a set of relationships between one or more observed independent variables, either continuous or discrete, and one or more dependent variables, either continuous or discrete; both of which can either be factors or measured variables (Ullman, 2000) by combining factor analysis and path analysis (Kaplan, 2000), was applied in this study. Analysis of Moment Structure (AMOS version 22) software was benefitted in the analyzing the data that was gathered from the students of one of the largest university in Turkey.

Confirmatory factor analysis

The skewness and kurtosis values of each indicator and also standardized residual covariance matrix were examined for multivariate normality. For each variable, skewness and kurtosis values were in the range between -2 and +2. In addition, the standardized residual covariance matrix and largest standardized residuals were analyzed for evidence of normality. With the use of covariance matrices, small residual values (<0.05) are indications of normality (Bentler, 1995). Large values of covariance residuals tend to be influential in lack of model fit and are another measure of normality when using covariance matrices (Bentler, 1995). A review of the largest standardized residuals revealed no large values. All absolute values were less than 2 for all indicators. Therefore, it can be stated that each variable satisfies the normality requirement. Thus, maximum likelihood model was chosen as estimation technique.

Confirmatory factor analysis that is the first step of SEM was applied and factor loadings, factor loading squared, measurement errors and p-values were calculated (Table 2). Measurement model and its standardized regression weights can be examined in Appendix B.

Table 2. Confirmatory factor analysis results

Latent Variable	Indicator	Factor Loading	Factor Loading Squared	p- Value
Perceived Usefulness	PU1	0.81	0.66	-*
	PU2	0.90	0.81	0.001
	PU3	0.91	0.83	0.001
	PU4	0.90	0.81	0.001
Perceived Ease of Use	PE1	0.55	0.30	-*
	PE2	0.84	0.71	0.001
	PE3	0.84	0.71	0.001
Social Media Actual Usage	SM1	0.85	0.72	-*
	SM2	0.76	0.58	0.001
Student Interaction	PI1	0.89	0.79	-*
	PI2	0.92	0.85	0.001
	PI3	0.90	0.81	0.001
	PI4	0.87	0.76	0.001
Interaction between Students and Faculty Members	FI1	0.93	0.87	-*
	FI2	0.96	0.92	0.001
	FI3	0.97	0.94	0.001
	FI4	0.91	0.83	0.001
Engagement	EN1	0.80	0.64	-*
	EN2	0.88	0.77	0.001
	EN3	0.89	0.79	0.001
Collaborative Learning	CL1	0.93	0.87	-*
	CL2	0.88	0.77	0.001
	CL3	0.80	0.64	0.001
	CL4	0.55	0.30	0.001

*not estimated when loading set to fixed value of 1.0

According to Hair (2009) factor loadings should be at least 0.50 and ideally 0.70 or greater. Furthermore, squared of factor loadings should explain half of the variable even if at least 0.50 factor loadings are significant. Indicators PE1 and CL4 have both 0.55 factor loadings which is not ideal but more than acceptable level. They do not violate the construct integrity. Moreover, all values are significant with p value 0.001.

Table 3 shows the goodness of fit indices for the measurement model and acceptable fit intervals. Chi-square and the root mean square error of approximation were chosen as absolute fit indices and normed fit index (NFI) and comparative fit index (CFI) were determined as incremental fit indices, and parsimonious comparative fit index (PCFI) were determined as parsimony fit indices for this study. Chi-square value of measurement model is 427.892 and degree of freedom is 231. The ratio of chi-square over degrees of freedom is 1.85, (≤ 3.00). RMSEA was found as 0.072 which satisfies the acceptable fit value (≤ 0.08). Moreover, NFI and CFI were found as 0.90 and 0.95 respectively. These two incremental indices also satisfied the acceptable fit values (≥ 0.90). All values of goodness of fit indices and their acceptable values can be seen in Table 4 under the model fit section. Overall, it can be said that the measurement model provided a good fit to the data.

Table 3. Goodness of fit indices for the measurement model

Goodness of Fit Indices	Values	Acceptable Fits
Chi-Square	427.892	
Degrees of Freedom	231	
Absolute Fit Measures		
RMSEA	0.072	.05\leqRMSEA\leq.08
Normed Chi-Square	1.85	X²/df\leq3
Incremental Fit Indices		
NFI	0.90	.90\leqNFI\leq.95
CFI	0.95	.90\leqCFI\leq.95
Parsimony Fit Indices		
PCFI	0.80	.80\leqPCFI\leq.90

Construct validity consists of convergent validity, discriminant validity and face validity. In order to ensure convergent validity of the constructs, factor loadings, average variance extracted and reliability of the constructs were calculated. It is observable at the standard loading column and their p-values that all indicators ensure adequate standard loading value (≥ 0.5) at the alpha level 0.1% (Table 2). Table 4 shows reliability values (Cronbach's Alpha values), average variance extracted and composite reliability values. For each latent variable Cronbach's Alpha values are greater than 0.70 that supports instrument's reliability. Moreover, each AVE met the recommended minimum threshold of 0.50. All composite reliability values exceeded the recommended level of .70. Convergent validity was assessed using factor loading, construct reliability, and average variance extracted (Hair, Black, Babin, Anderson, & Tatham, 2006). Therefore, all factors in the measurement model had adequate convergent validity.

Table 4. Convergent Validity Values

Latent Variable	Reliability (Cronbach's Alpha)	Average Variance Extracted	Composite Reliability
Perceived Usefulness	0.93	0.78	0.94
Perceived Ease of Use	0.79	0.57	0.75
Social Media Actual Usage	0.79	0.65	0.84
Student Interaction	0.94	0.80	0.95
Faculty Interaction	0.97	0.89	0.99
Engagement	0.89	0.74	0.91
Collaborative Learning	0.87	0.65	0.83

Then discriminant validity of the model was examined. Each correlation between constructs and their AVE values can be seen in Table 5. Most of the AVE values of constructs are greater than the square of correlation between constructs except perceived usefulness and collaborative learning pair. However, these two constructs are totally different constructs and there isn't any similarity between their indicators so it can be said that nearly all constructs satisfy discriminant validity requirement.

Table 5. Discriminant Validity

Construct 1		Construct 2	Correlation	Square of Correlation	AVE of Const 1	AVE of Const 2
PerceivedUsefulness	<->	StudentInteraction	0,76	0,58	0,78	0,80
PerceivedUsefulness	<->	SocialMediaUse	0,65	0,42	0,78	0,65
PerceivedUsefulness	<->	FacultyInteraction	0,51	0,26	0,78	0,74
PerceivedUsefulness	<->	CollaborativeLearning	0,90	0,81	0,78	0,64
PerceivedUsefulness	<->	PerceivedEaseOfUse	0,81	0,65	0,78	0,57
PerceivedUsefulness	<->	Engagement	0,77	0,59	0,78	0,74
SocialMediaUse	<->	StudentInteraction	0,66	0,43	0,65	0,80
StudentInteraction	<->	FacultyInteraction	0,50	0,25	0,80	0,89
StudentInteraction	<->	CollaborativeLearning	0,71	0,50	0,80	0,64
PerceivedEaseOfUse	<->	StudentInteraction	0,75	0,56	0,57	0,80
StudentInteraction	<->	Engagement	0,63	0,40	0,80	0,74
PerceivedEaseOfUse	<->	SocialMediaUse	0,66	0,43	0,57	0,65
SocialMediaUse	<->	FacultyInteraction	0,46	0,21	0,65	0,89
SocialMediaUse	<->	CollaborativeLearning	0,67	0,45	0,65	0,64
SocialMediaUse	<->	Engagement	0,66	0,43	0,65	0,74
PerceivedEaseOfUse	<->	FacultyInteraction	0,36	0,13	0,57	0,89
FacultyInteraction	<->	CollaborativeLearning	0,55	0,30	0,89	0,64
Engagement	<->	FacultyInteraction	0,63	0,39	0,74	0,89
Engagement	<->	CollaborativeLearning	0,84	0,71	0,74	0,64
PerceivedEaseOfUse	<->	CollaborativeLearning	0,79	0,63	0,57	0,64
PerceivedEaseOfUse	<->	Engagement	0,69	0,48	0,57	0,74

"The term 'face validity' implies that a test which is to be used in a practical situation should, in addition to having pragmatic or statistical validity, appear practical, pertinent and related to the purpose of the test" (Nevo, 1985). In order to express each construct correctly, it is important to understand its meaning and content. Therefore, at the very beginning of the study, each construct should be investigated from the literature comprehensively. In addition, their relationship should be constructed correctly based on

a literature. In this study, all constructs were taken from the literature directly or adopted from the literature.

Structural model validity

The structural model was tested for structural model validity which includes hypotheses testing and model fit. Chi-square was found as 545, 211 and degrees of freedom is 244 which implies that Chi-square in the acceptable range since it should be less than 3 degrees of freedom ($\leq 3d.f.$).

Chi-square over degrees of freedom was chosen as absolute fit index and comparative fit index was determined as incremental fit index for structural model. It can be observed in Table 6 that, both indices are in the acceptable range. Therefore, it can be said that structural model also satisfies model fit requirements.

Table 6. Goodness of fit indices for the structural model

Goodness of Fit Indices	Values	Acceptable Fits
Chi-Square	545.211	
Degrees of Freedom	244	
Absolute Fit Measures		
Normed Chi-Square	2.23	$\chi^2/df \leq 3$
Incremental Fit Indices		
CFI	0.92	$.90 \leq CFI \leq .95$

Afterwards, regression weights and their p-values that can be seen in Table 7 were calculated. It can be seen that, all regression weights are significant at the alpha level 0,05 except the hypothesis 8 which shows the effect of interaction between students and faculty members on collaborative learning. Therefore, this relation was deleted from the model. The structural model's regression weights were calculated again for the updated version of the model and the regression weights were found as same with the previous model. The updated version of structural model and its standardized regression weights can be examined in Appendix C.

Table 7. Regression Weights

Relationships of Constructs	Regression Weight	p-value
H1: Perceived Usefulness <-- Perceived Ease Of Use	0.807	.000
H2: Social Media Use <-- Perceived Usefulness	0.639	.000
H3: Social Media Use <-- Perceived Ease Of Use	0.319	.004
H4: Student Interaction <-- Social Media Use	0.82	.000
H5: Interaction between students and faculty members <-- Social Media Use	0.599	.000
H6: Course Engagement <-- Social Media Use	0.88	.000
H7: Collaborative Learning <-- Student Interaction	0.22	.006
H8: Collaborative Learning <-- Interaction between students and faculty members	-0.001	.992
H9: Collaborative Learning <-- Course Engagement	0.73	.000

Modification indices were examined to determine whether there is a relationship that was unnoticed and can improve structural model. It is recommended that "Modification indices of approximately 4.0 or greater suggest that the fit could be improved significantly by freeing the corresponding path to be estimated" (Hair et al., 2009). However, any modification index that causes a change in our model haven't been appeared in the analysis.

DISCUSSIONS and CONCLUSION

This study proposes a model that investigates the effects of social media usage of students for educational purposes on collaborative learning. This model was constructed by depending on the findings of previous literature and tested by structural equation modeling. The basic technology acceptance model was applied on social media usage of students for educational purposes. Then, the effects of social media usage of students for educational purposes on student interaction, faculty member interaction with students and course engagement of students were examined. Finally, the overall effects of student interaction, faculty member interaction with students and course engagement of students on collaborative learning were determined.

The main research results are summarized as follows. Perceived ease of use has positive significant effect on perceived usefulness; they both affect social media usage of students for educational purposes positively. Social media usage of students improves student interaction and course engagement of students and also interaction between students and faculty members. Student interaction and course engagement have positive significant impact on collaborative learning. However, interaction of students with faculty members doesn't have significant effect on collaborative learning.

Results of this study are consistent but not limited to results in previous studies. Both direct and indirect effects of perceived ease of use on actual usage of social media are measured in this study. As it was indicated in the literature, active technology use for educational purposes increases the interaction between students and also students and faculty members (Laird & Kuh, 2005; Junco et al., 2013). Moreover, it was also supported that the use of social media has significant impact on student engagement (Rutherford, 2010; Rodriguez, 2011; Junco et al., 2013). In the study of Al-Rahmi (2014), it was found that perceived ease of use and perceived usefulness, engagement, student interaction and interaction between students and faculty members as the predictors of collaborative learning. However, in this study, the effects of perceived ease of use and perceived usefulness on social media usage. The effects of social media usage on student interaction, interaction between students and faculty members and course engagement were measured and positive significant impact was determined. Student interaction and engagement have direct impacts on collaborative learning. In addition, social media usage, perceived usefulness and perceived ease of use have indirect effects on collaborative learning. All these relationships were analyzed in a single model.

Some limitations should be noted in this study, and the following suggestions for further research will be worth future efforts in this field. First, the sample of this study is limited to students of a large university in Turkey. Therefore, this study can be applied to other university students in the same country and also in other countries for generalizability.

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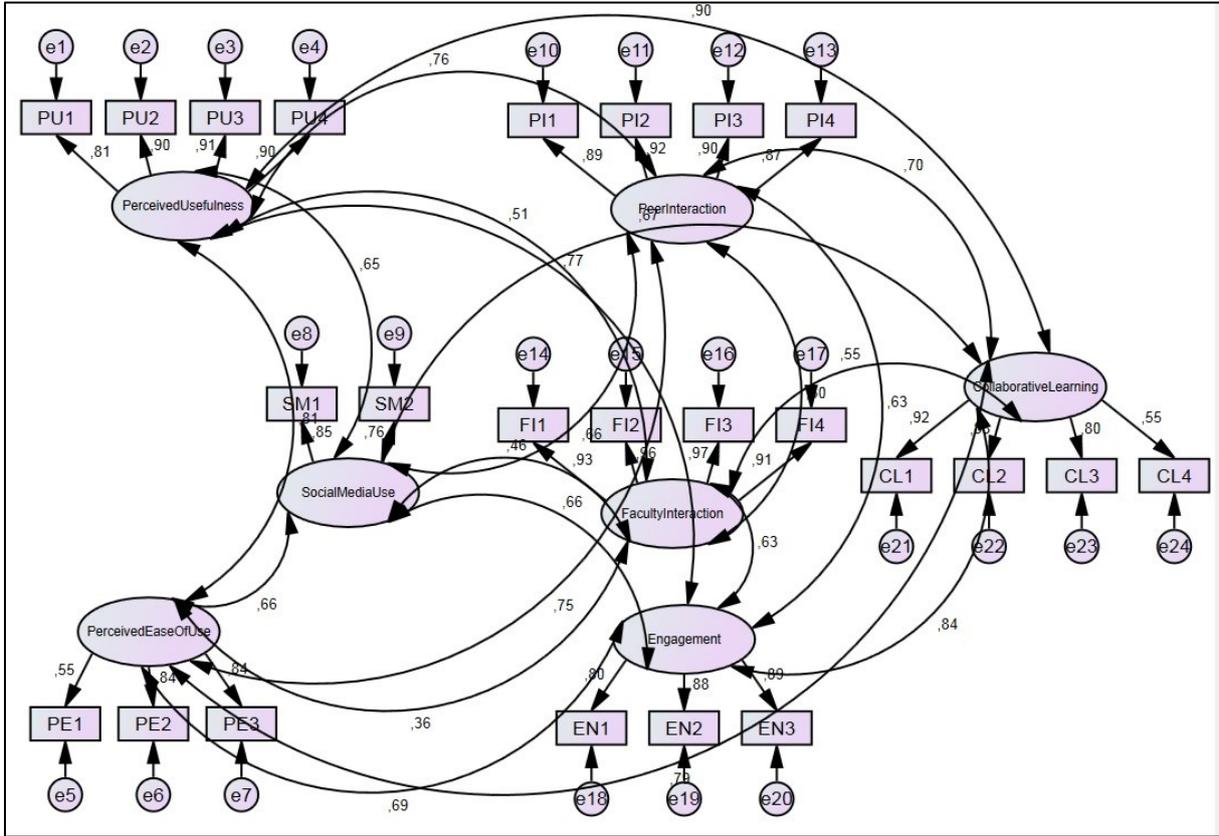
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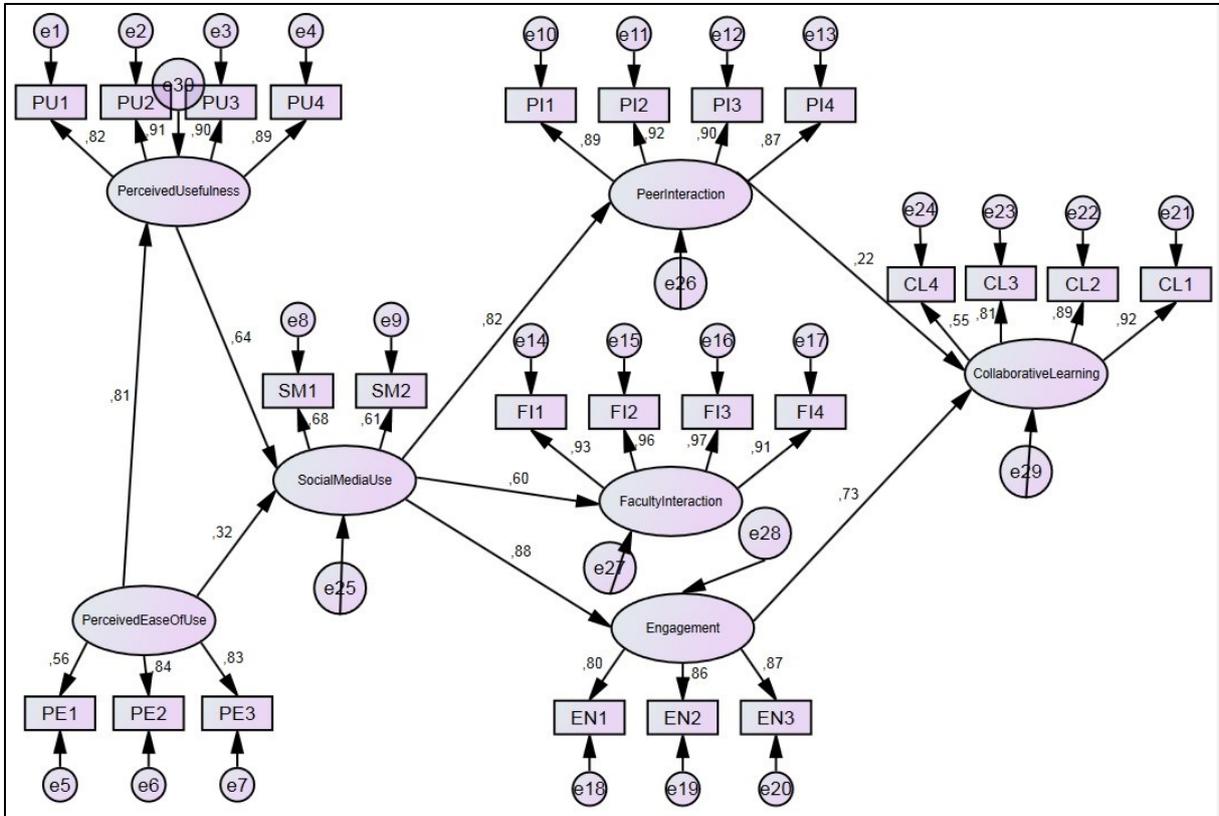
APPENDIX A

Scale Name	References
2. Perceived Ease of Use	Adopted from Al-Rahmi, Othman, (2013).
a. I feel that using of social media is easy.	
b. I feel that using social media is easy to incorporate in my classroom.	
c. I feel that using social media makes it easy to reach peers.	
d. I feel that using social media makes it easy to reach teachers.	
3. Perceived Usefulness	Adopted from Al-Rahmi, Othman, (2013).
a. I believe that using social media is a useful learning tool.	
b. I feel that using social media will help me to learn more about my class.	
c. I believe that using social media enhance my effectiveness.	
d. I believe that using social media will improve students' satisfaction with collaborative learning.	
4. Actual Usage	Adopted from McGowan, B. S., Wasko, M., Vartabedian, B. S., Miller, R. S., Freiherr, D. D., & Abdolrasulnia, M. (2012).
a. What is your overall frequency of using social media for educational purposes?	
b. What is your overall frequency of using social media for sharing educational information with your friends?	
c. What is your overall frequency of using social media to communicate with your faculty member for educational purposes?	
5. Student Interaction	Adopted from Al-Rahmi, Othman, (2013).
a. Using the social media for educational purposes facilitates interaction with peers.	
b. Using the social media for educational purposes gives me the opportunity to discuss with peers.	
c. Using the social media for educational purposes facilitates dialog with peers.	
d. Using the social media for educational purposes allows the exchange of information with peers.	
6. Faculty Interaction	Adopted from Al-Rahmi, Othman, (2013).
a. Using the social media for educational purposes facilitates interaction with faculty members.	
b. Using the social media for educational purposes gives me the opportunity to discuss with faculty members.	
c. Using the social media for educational purposes facilitates dialog with faculty members.	
d. Using the social media for educational purposes allows the exchange of information with faculty members.	
7. Engagement	Adopted from Al-Rahmi, Othman, (2013).
a. Using the social media for educational purposes has favored my personal relationships with my peers and teachers.	
b. By using the social media for educational purposes, my peer and faculty interactions made me feel valuable.	
c. By using the social media for educational purposes, I felt that my opinions have been taken into account in the class.	
8. Collaborative Learning	Adopted from Al-Rahmi, Othman, (2013).
a. I felt that using social media for collaborative learning in the class was effective.	
b. I was able to develop research skills through peer collaboration with using social media.	
c. I was able to develop new skills and knowledge from other members of the class.	
d. Collaborative learning experience in the social media environment is better than in a face-to-face learning environment.	

APPENDIX B



APPENDIX C



QUALITY IMPROVEMENT IN VIRTUAL HIGHER EDUCATION: A GROUNDED THEORY APPROACH

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ABSTRACT

The article aims to explore the attributes of quality and quality improvement including the process and specific actions associated with these attributes – that contribute enhancing quality in Iranian Virtual Higher Education (VHE) institutions. A total of 16 interviews were conducted with experts and key actors in Iranian virtual higher education. A constant comparative analysis was adopted to construct a grounded theory model. Drawing on the experiences and perspectives of key actors and experts closely associated with quality in e-learning, a paradigm model for quality improvement in virtual higher education institutions was developed. The model articulates causal conditions, action/interaction strategies, consequences, contextual factors and intervening environments. Interestingly, quality of learning, i.e. deep learning was the core phenomenon in quality of virtual higher education institutions.

Keywords: Quality improvement, e-learning, learning quality, grounded theory and virtual higher education.

INTRODUCTION

Information and communications technologies (ICT) increasingly impact and shape all aspects of our life, including the ways we learn and teach. The emergence of ICT-based initiatives in education as a driving force in the Knowledge Society is part of a wider context of change in higher education and society at large (Bhuasiri, Xaymoungkhoun, Zo, Rho and Ciganek, 2012).

In alignment with the growing demands for higher education, most of the higher education institutions across the world have adopted ICT as a way to response the increasing demands and enhance quality of teaching and learning process (Thurab-Nkhosi & Marshall, 2009; Tucker & Gentry, 2009). A large number of virtual institutions and e-universities have been established. In some of these institutions, all of the teaching, learning, communication and administration activities are conducted virtually -online or offline- as in University of Phoenix and in Open University of London.

Similarly, higher education institutions in developing countries have significantly informed by Information Technology (IT). For instance, the number of virtual institutions (in this study virtual higher education institution assumed type of e- learning that included all of the universities and institutions that they attempt to take students virtually, at least in one or more undergraduate or graduate degree in education), programs and courses have considerably increased in developing countries (Allen, & Seaman, 2013; Bhuasiri, Xaymoungkhoun, Zo, Rho and Ciganek, 2012; Liu, Liao, & Pratt, 2009; Masoumi, 2010b; Sloan Consortium, 2010). The number of students enrolled in online (virtual) programs in Iran, as an instance, has enormously boosted in last six years from 4918 in 2007 to 19 000 in 2011 (Iranian Higher Education Research and Planning Institute, 2012).

In an era of increased accountability and booming Virtual Higher Education Institutions, it is critical for authorities to be able to demonstrate that their approaches to e-learning as a mode of delivery for their institutions are sound and effective (Hosie, Schibeci, & Backhaus, 2005; Oliver, 2005). In line with accountability movement in higher education (Oliver, 2005; Abdous, 2009; Masoumi & Lindstrom, 2012), failures of a number of higher education institutions, such as UK e-University (Garrett, 2004) and the US Open University (Meyer, 2006), lack of appropriate tools and methods of quality control in e-learning (Ehlers, Hildebrandt, Gortz, and Pawlowski, 2005; Pawlowski, 2007), budget constraints (Abdous, 2009) and growing number of academic fraud cases, are pressuring higher education institutions to bring in and implement quality issues and measures in order to enhance educational practices and services.

However, quality is a value-laden and actor-relative (Harvey and Green, 1993; Dondi, Moretti, & Nascimbeni, 2006; Jung and Latchem 2007), multi-dimensional (Giertz, 2001) and elusive (Green, 1994) concept. The quality in higher education have been patented with various concepts including Quality Assurance (QA), quality assessment, quality control, quality audit, quality management, and quality enhancement/improvement. Tacking each one of those concepts divers' interests and expectations of various internal and external actors in higher education institutions (Abdous, 2009). The different actors' interest and expectations can challenge not only the ways that quality can be taken into account but even the meaning of the quality. However, quality in higher education institutions are mostly characterized in terms of students' satisfactions, cost-effectiveness, and graduation rates (Jung, 2011).

Furthermore, quality in Iranian higher education has been faced with institutional and structural complications. For instance, there is no independent and non-governmental institutions to audit and assure quality in higher education as well as valid indicators, and standards which address the main actors' interests and expectations. On the other hand, imposing bureaucratic centralism in Iranian higher education have simplified the assessing and compering quality in Iranian higher education institutions, but it seems such approach have not made any significant contribution to quality of teaching and learning.

The growing concern with quality in e-learning has led higher education institutions to look for frameworks and approaches for managing quality (Inglis, 2005). Addressing these concerns, a large number of models, frameworks and guidelines have been developed for enhancing and assuring quality in e-learning (see Oliver, 2005; Reglin, 2006; Pawlowski, 2007; Abdous, 2009; Chen, 2009; Ireland and et al, 2009; Jung 2011; Masoumi & Lindström, 2012; Ossiannilsson & Landgren, 2012, Barat Dastjerdi, 2016). Adopting a positivistic approach, a number of these studies, models and frameworks have tried to extract factors that are shaping quality of e-learning. Applying such positivistic approach, however, may not meet the needs and expectations of Iranian virtual higher education institutions. Due to higher education institutions in Iran need to determine which process and specific actions

can significantly contribute to quality enhancement regarding Iran's specific cultural contexts.

This study, thus, aims to develop a paradigm model to enhance quality in virtual institutions through examining key actors' perceptions about dimensions and consequences of quality in the context of the Iranian virtual higher education institutions. A systematic understanding of the quality from key actors' perspective i.e. scholars in the e-learning arena and virtual institutions' decision makers can contribute to create a framework for enhancing and assuring quality in VHE in the contexts of the developing counties.

REVIEW OF E-QUALITY MODELS AND FRAMEWORKS

Several models and frameworks have been developed for assuring and enhancing quality of e-learning (see Swedish National Agency for Higher Education, 2008; University of West Indies Distance Education Centre model, 2006; Australasian Council on Open, Distance and E-Learning, 2007; Council for Higher Education Accreditation, 2002; E-xcellence benchmarking model, 2006; Distance Education and Training Council, 2012; The SEEQUEL core quality framework, 2004). These models aimed to explore key factors in assuring and enhancing quality of e-learning. Key factors indicated in these studies and frameworks can be outlined in the following themes and/or factors: Technology, Pedagogy, Institution, Student support, Faculty support, Course development, Evaluation and Learning context. A brief picture of these factors is outlined in table 1.

Table 1. VHE quality dimensions based on literature

Dimensions	References
Technology	McKinnon, Walker & Davis, 2000; Australasian Council on Open, Distance and E-Learning, 2007; Chen, 2009; Masoumi, 2010; Wu & Lin, 2012; khan, 2005; Meier, Seufert & Euler, 2012; Ossiannilsson & Landgren, 2012; Fresen, 2007.
Pedagogy	University of West Indies Distance Education Centre model, 2006; McKinnon, Walker & Davis, 2000; Australasian Council on Open, Distance and E-Learning, 2007; Chen, 2009; The SEEQUEL core quality framework, 2004; Jung, 2011; Masoumi, 2010; Distance Education and Training Council, 2012; Wu & Lin, 2012; khan, 2005; Jara & Mellar, 2009; Meier, Seufert & Euler, 2012; institute for higher education policy, 2000; Fresen, 2007.
Institution	University of West Indies Distance Education Centre model, 2006; McKinnon, Walker & Davis, 2000; Australasian Council on Open, Distance and E-Learning, 2007; Council for Higher Education Accreditation (CHEA), 2002; Chen, 2009; E-learning quality of Swedish National Agency for Higher Education, 2008; E-xcellence benchmarking model, 2006; Jung, 2011; Masoumi, 2010; Distance Education and Training Council, 2012; Wu & Lin, 2012; khan, 2005; Meier, Seufert & Euler, 2012; Ossiannilsson & Landgren, 2012; institute for higher education policy, 2000; Fresen, 2007.
Student support	University of West Indies Distance Education Centre model, 2006; McKinnon, Walker & Davis, (2000); Australasian Council on Open, Distance and E-Learning, 2007; Council for Higher Education Accreditation (CHEA), 2002; Chen, 2009; E-learning quality of Swedish National Agency for Higher Education, 2008; E-xcellence benchmarking model, 2006; Jung, 2011; Masoumi, 2010; Distance Education and Training Council, 2012; Jara & Mellar, 2009; institute for higher education policy, 2000; Fresen, 2007.

Faculty support	University of West Indies Distance Education Centre model, 2006; Australasian Council on Open, Distance and E-Learning, 2007; Council for Higher Education Accreditation (CHEA), 2002; Chen, 2009; E-learning quality of Swedish National Agency for Higher Education, 2008; E-xcellence benchmarking model, 2006; The SEEQUEL core quality framework, 2004; Jung, 2011; Masoumi, 2010; institute for higher education policy, 2000; Fresen, 2007.
Course development	University of West Indies Distance Education Centre model, 2006; Council for Higher Education Accreditation (CHEA), 2002; Chen, 2009; E-learning quality of Swedish National Agency for Higher Education, 2008; E-xcellence benchmarking model, 2006; The SEEQUEL core quality framework, 2004; Jung, 2011; Masoumi, 2010; Distance Education and Training Council, 2012; Wu & Lin, 2012; khan, 2005; Jara & Mellar, 2009; institute for higher education policy, 2000; Fresen, 2007.
Evaluation	University of West Indies Distance Education Centre model, 2006; E-learning quality of Swedish National Agency for Higher Education (2008); The SEEQUEL core quality framework, 2004; Jung, 2011; Masoumi, 2010; khan, 2005; Ossiannilsson & Landgren, 2012; institute for higher education policy, 2000.
Learning context	The SEEQUEL core quality framework, 2004; Masoumi, 2010; khan, 2005; Meier, Seufert & Euler, 2012.

A number of these studies and frameworks approached quality of e-learning to provide a comprehensive model based on strategies, contextual and environmental factors (Masoumi, 2010). Lacking a comprehensive approach to quality in e-learning, the focus of a large number of the e-quality models and frameworks is, however, centered on a dimensional approach (Sultan & Wong, 2013).

METHODOLOGY

Method

This study is focused on exploring the process of quality improvement among Iranian virtual higher education institutions. The research approach has been adopted from Strauss and Corbin's (1998) representation of Grounded Theory (GT). GT has been established as an appropriate and robust approach for carrying out qualitative research in which the purpose is to inductively generate theory in research (Brady & Loonam, 2010). This approach provides a launching point to focus on key actors concerns in assessing and enhancing quality in VHU rather than imposing a preconceived research problem (Hoda Noble & Marshall, 2011). Hence, this qualitative method seeks to discover perceptions, experiences and reactions of actors towards a concept, process, phenomenon, and action or interaction. Our rationale to use this research strategy is that there is a need for inductive theory development to explain how actors of virtual institutions are experiencing quality assurance and enhancement as a phenomenon (Creswell, 2012). To do so, following research process in practice were fulfilled (see figure 1).

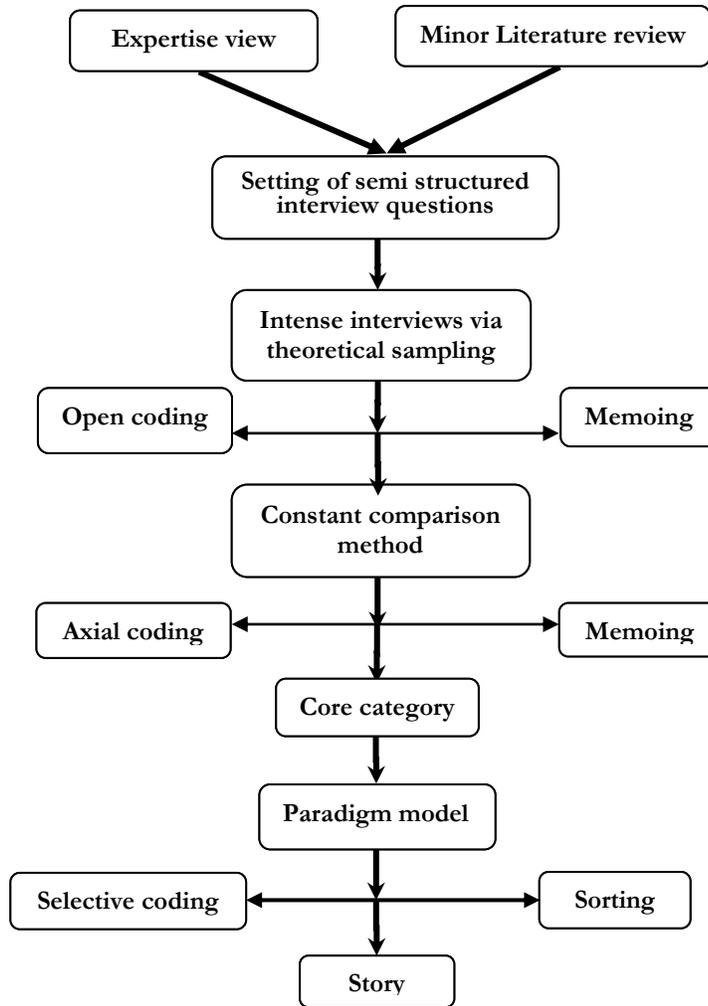


Figure 1. Research process in practice

Data Collection

The main source of data for this study came from semi-structured interviews. 16 interviews were conducted with experts and key actors in Iranian virtual higher education. In the interview protocol with eight questions, the following issues were addressed: quality in on campuses and VHE systems; components and contextual factors affecting VHE quality; strategies to promote virtual system evaluation; process and outcomes of quality in VHE. Interviews with the experts and key actors in Iranian VHE take between an hour and an hour and a half. Mention should be made that the ethical issues including privacy and confidentiality is taken into account in the study.

Participants

Theoretical sampling as "The process of selecting incidents, slices of life, time periods, or people on the basis of their potential manifestation or representation of important theoretical constructs" (Patton, 2001:238) is used for gathering data from rectors and policy makers of VHE; e-learning experts; and experts in quality of higher education especially in VHE (Strauss and Corbin, 1998). Interviews were continued until the data gathering

achieved saturation. Theme saturation as Hyde (2003: 48) argues, "No new data are added because that category has been adequately explained".

Four groups of key actors in HE participated in this study including: five e-learning experts, researchers and university teachers who have had more than five year experience in doing research and teaching in e-learning and virtual education; three experts in the quality in higher education in general and two experts in quality of VHE who have focused on quality of virtual higher education; Six rectors and policy makers of VHE who have been in charge of establishing and administering of virtual higher education institutions. An outline of the participants is indicated in table 2.

Table 2. Participants in interview

Group interviews	Number of persons
E-learning experts	5
Experts in the quality of HE and VHE	5
Directors and policy makers in VHE	6

Mention should be made that a majority of participants were engaged in teaching and learning activities in different virtual higher education institutions.

Data Analysis

The analysis of data in systematic approach grounded theory is done through open, axial and selective coding's (Strauss and Corbin, 1990). In the open coding, the data are usually broken down "into discrete parts, closely examined, compared for similarities and differences, and questions are asked about the phenomena reflected in the data" (Strauss & Corbin, 1998: 102). Then, the extracted categories in process called "Axial coding" are connected to their subcategories. Lastly, the final level selective coding is accomplished in the process of "selecting the central or core category, systematically relating it to other categories, validating those relationships, and filling in categories that need further refinement and development" (Strauss and Corbin, 1990:116). To ensure the accuracy of the findings, the following activities were taken into account in the analysis of data collected (Creswell & Miller, 2000).

Member Checking

The analysis and conclusions made based on the data collected were sent to the participants to verify that their understandings were accurately reflected in the analysis. Peer Examination: Four experts read and reanalyzed the transcribed interviews and made conclusions. Participatory Research: Simultaneous assistance of participants was received in the analysis and interpretation of data. Researcher Reflexivity: Addressing the possible prejudice and current prototypes, the researchers were tried to avoid such bias and prejudice.

Findings

In this part findings of the study presented and discussed based on GT Strauss and Corbin paradigm model (1998). Informed by Glaser's approach (1992) the findings is presented in following three parts, "open", "axial" and "selective coding" (see figure 1).

Open Coding

During open coding, all of the transcribed interviews and extracted categories were examined and reexamined in a way that saturating occurred in every category. Fifteen categories were extracted, including Teaching-learning activities, key actors, Administrative factors, General context, Special context, Learning quality, University, Association level, Higher education level strategies, Higher education factors, Conceptual and Cultural factors, Macro factors, Individual output, Organizational results and upper organizational consequences. These categories had 32 subcategories and 173 basic concepts (live code) that represented multiple perspectives about the main categories (Creswell, 2012).

Excerpt 1:

... The main focus of higher education institutions activities is centered on teaching and learning process. It can be said that if these institutions could not promote students competences as it promised, it has practically failed. ...In the same way, students learning is a critical issue in virtual education. (G. Y)

Key point: learning is seen as a core of educational system

Codes: learning hub of educational activities, learning instrument for achieving to functions of higher education, learning as pivotal in educational system at e-learning

Memoing

Memos as Glaser contends (1978: 83) are "theoretical notes about the data and the conceptual connections between categories written down as they strike the researcher". Memoing is considered a "core stage" or "the bedrock" of theory generation (Glaser, 1978). An example memo on "customized evaluation system for e- learning" is described below:

Information technologies provide a wide range of possibilities to enhance the learning and teaching procedure in universities. For instance, it provides unique opportunities to create, use and reuse learning resources which is not possible in face to face education. You can even record and present your lecturers in advance and discuss it in synchronize online sessions. These features provide great potential to enhance quality.

Constant Comparison Method

The codes arising out of each interview were constantly compared against the codes from the same interview, and those from other interviews and observations. This is GT's Constant Comparison Method (Glaser and Strauss 1967; Glaser 1992) which was used again to group these codes to produce a higher level of abstraction, called concepts in GT (see table 3).

Table 3. Emergence of Category “human actors” from underlying concept

Codes	Concepts	Category
<p>University teachers technological and pedagogical competences (teaching skills and experience in e-learning systems, digital literacy, recruiting full-time teachers in virtual environments, as well as using of the other universities and teachers’ experiences and competences)</p> <p>Faculty member commitment to virtual education</p> <p>The competence and readiness of inputs i.e. students enrolled: (e.g. cognitive readiness, attitude and psychomotor skills)</p> <p>Staff and gatekeepers approach to virtual education</p>	Key actors competences	Key actors attributes
<p>Recruiting qualified staff and promoting their competences</p> <p>Students motivation and willingness to learn</p>		
<p>Teachers and staffs’ motivation to learn and use ICT in their practices</p> <p>Integrating student in extracurricular activities (providing sort of social presence)</p>	Motivation	
<p>Enhancing the interactions between teacher - student and among students (with each other)</p> <p>Embedding emotion awareness virtual environments</p> <p>Fostering institutional values, morals, traditions among students</p>	Commination	

Axial Coding

In alignment with the Strauss and Corbin (1998) six categories model in axial coding, a paradigm was emerged out of the collected data. This paradigm comprises causal conditions, phenomenon, contexts, strategies, intervening conditions, and consequences. “Causal conditions” addresses events or activities that influence the phenomenon. “Strategies” refers to actions and interactions that is aimed and employed to resolve a problem, which, in turn, impacts on the phenomenon. “Contextual conditions” addresses a set of circumstances which events and actions are taken place within the given frame. “Intervening conditions” modify the impact of causal conditions on the phenomenon. “Consequences” refer to an action/interaction that is taken, resulting in a variety of different effects that may influence on the phenomenon (Hachtmann, 2012). According to the Strauss and Corbin’s (1998) paradigm model when causal conditions occur and influence on the phenomenon, the context and intervening conditions inform the strategies that are used to bring about certain consequences.

PARADIGM MODEL

The categories’ connections in this study are informed by Strauss and Corbin’s (1998) paradigm model. The developed model and story is reflected in Figure 2. Based on paradigm model, detail of axial coding, concepts and categories are outlined in the following six categories.

Causal Conditions

Causal factors that led directly to the quality of learning include three main categories:

1- Teaching and Learning Activities (Learning Process); 2- Key Actors' Attributes; and 3- Administrative Issues.

Learning process that involves five sub-categories

Pedagogic approach; content production; management of learning interaction; interface design; and learning evaluation. Quality of learning results from optimized use of appropriately configured environments which are built from prudentially designed components and interfaces (Lindner, 2006).

Based on the data collected, teaching and learning process is the most important factor in shaping the quality of learning. This issue is reflected in other studies and e-quality frameworks (see Excellence benchmarking model, 2006; The SEEQUEL core quality framework, 2004; Distance Education and Training Council, 2012; Wu & Lin, 2012; Khan, 2005; Institute for higher education policy, 2009; Ossiannilsson & Landgren, 2012; and Meier, Seufert & Eule, 2012). The participants also emphasized on the importance of teaching – learning process, pedagogical issues, course and content development, assessment and evaluation, surface and interaction design in enhancing of e-learning quality. The following excerpts exemplify the ways that the informants argue about learning quality:

Excerpt 2:

In designing and running courses in virtual contexts, interaction and quality of interaction between teacher and students and among students should be taken into account. Further, learning activities should be adopted based on students' individual differences. (M. D)

In the same way, A.M., another Informant, highlights that providing a digitalized version of learning recourses may not be considered as e-learning by saying:

Excerpt 3:

.... Scanning and putting digitalized resources in the university's portal cannot be considered as e-learning. Interactions between teacher and students should be initiated in virtual environments. (A.M)

Key actors' attributes

This factor comprises three sub-categories including key actor's competencies, motivation and communications. These factors and sub-categories are highlighted in other studies and e-quality models (see Council for Higher Education Accreditation, 2002; Chen, 2009; Jung, 2010; Distance Education and Training Council, 2012; Khan, 2005; Institute for higher education policy, 2000; Fresen, 2007; McKinnon, Walker & Davis, 2000; and Bhuasiri, Xaymoungkhoun, Zo, Rho and Ciganek, 2012). Further, ICT support for teachers and students as well as pedagogical support for teachers are highly emphasized by the participants. In the following excerpt, A.S. highlights that the quality of inputs i.e. registered students in virtual programs:

Excerpt 4:

The quality of enrolled students in Iranian higher education settings is an important issue. Typically, in the entrance exam which is nationally conducted every year, students with higher scores choose main state universities ... and students with lowest score often ended up to virtual higher education institutions. Moreover, a large number of them are employees who would like to study along with their careers. (A. S)

Administrative issues comprises following two sub-categories

Institutional support as well as management and leadership. Administrative issues' importance was highlighted in a large number of studies and models (see University of West Indies Distance Education Centre, 2006; Council for Higher Education Accreditation, 2002; Chen, 2009; Swedish National Agency for Higher Education, 2008; Masoumi, 2010; Distance Education and Training Council, 2012; Khan, 2005; McKinnon, Walker & Davis, 2000; Ossiannilsson & Landgren, 2012; and Wu & Lin, 2012). A.Z., one of the interviewed key actors, exemplifies the importance of administrative issues in general and students support in particular.

Excerpt 5:

Continuous educational and technical support is vital in e-learning program. Without such support dropout rate can be increased.... Student should feel that their needs are taken into account in no time! (A. Z)

This excerpt suggests that the virtual institutions strategies and activities should be articulated based on the students' needs and expectations.

Main Phenomenon (Core Category)

With a profound analysis of implementing interview text, it is verified that the "learning quality" is the main concern in virtual higher education institutions. Learning and teaching activities are key practices in educational settings, which are articulated differently in data collected such as "deep learning", "effective learning" and "value-added learning"; as well as "learning which can lead to entrepreneurship and employment". Learning is "...establishing new premises (i.e. paradigms, schemata, mental models, or perspectives) to override the existing ones" (Nonaka & Takeuchi, 1995). Cognitive and affective outcomes (Duque and Weeks, 2010) and degree of student understanding (Entwistle, 2000) are often seen as a sign of learning quality. Garrison and Anderson (2003) argue that learning quality is the most important factor in virtual institutions success. M.A., one of the interviewed experts, therefore argues that the students' learning process is the main phenomenon in higher education institutions.

Excerpt 6:

Higher educational institutions activities are mostly centered on students learning process. The institutions success also is usually measured with achieved competences, skills i.e. what learning. This is very critical in virtual education; due to students usually pay for what they supposed to learn. (M.A.)

Strategies

Data suggested that it is hard to ignore human agents and institutional actors' roles in learning quality as the main phenomenon. The analysis of empirical data resulted in three key strategies for intervention, including: Micro or university level, mezzo or professional associations' level and macro or higher education ministry level. These actions/interactions facilitated the process leading up the main phenomena to consequences. The addressed strategies in this model are in accordance with the previous studies about the quality of higher education (see Belawati & Zuhairi, 2007; and Harvey & Williams, 2010).

Excerpt 7:

Quality assurance and quality enhancement can be undertaken in different levels. However, it seems that a semi-accreditation can suits most of the Iranian virtual higher education programs. (G.Y)

Excerpt 8:

I think we need to have a quality control or evaluation department in each of virtual institutions. This can assure the quality of teaching and learning process. (N. M)

As indicated in excerpts 8, quality of learning as well as insuring and enhancing quality of learning is one of the main concerns of key actors in Iranian virtual higher education institutions.

Micro level strategies are introduced with four practical approaches that are used inside the universities: setting indexes and criteria of quality; designing quality improvement model; applying quality assurance approaches; and using systematic approach.

Mezzo level emphasizes on creating a professional institute as national VHE accreditation association, which is overseeing the external quality evaluation.

Higher education level means strategies and policies that are adopted in macro or higher education ministry level for improving quality in VHE.

Contextual Issues

Contextual issues refer to the circumstances which shape and inform the quality of e-learning. One of the interviewed experts, M.D., expresses an interesting aspect of how e-learning can bring in a new approach to teaching and learning.

Excerpt 9:

E-learning and virtual education should be aligned with a new pedagogical culture e.g. learner-centered, problem-based, self-directed learning. In other words, we cannot use or replace our traditional way of teaching in virtual education.

In excerpt 9 another interviewed key actor argues that to enhance the quality of learning, teachers should shift their pedagogical approach, by saying:

Excerpt 10:

It seems that reciting and reproducing the transferred knowledge is highly encouraged by some of the teachers. Such approach simply doesn't fit with e-learning..... (M.A.).

These contextual issues are identified and provided in two main categories including: General and Special contexts.

General context

As one of the contextual causes, include sub-categories of institutional culture; institutions willingness to change; and technological infrastructure. The given factors cover both the cultural-pedagogical infrastructure as well as technological infrastructures.

The importance of contextual issues particularly technological infrastructures are highlighted in other studies and frameworks (see: Chen, 2009; Fresen, 2007; Wu & Li, 2012; Khan, 2005;

Masoumi, 2010; Meier, Seufert & Euler, 2012; Ossiannilsson & Landgren, 2012, Khan, 2005; Masoumi, 2010; Meier, Seufert & Euler, 2012; and The SEEQUEL core quality framework, 2004).

Specific context

The contextual feature address the ways that e-learning is carried out in Iranian higher educational institutions. This factor includes two sub-categories including e-learning models and specific features of e-learning.

Features of e-learning, such as the disaggregation of processes, the distance of students, distributed feature of teams (mixture of full and part time tutors) and openness to review make it different; therefore, the need for independent QA system is felt (Jara & Mellar, 2009).

Intervening Conditions

Phenomenon of learning quality usually taken place in a certain circumstance. Environmental conditions mediate the process of main phenomenon through the strategies. In this study, circumstances include three main categories: Higher education factors; Intellectual and cultural factors; and Macro factors.

Higher education factors refer to policies, structures and established procedures in higher education institutions. E-learning is approached very differently in Iranian higher education institutions. This is highlighted in the following excerpt.

Excerpt 11:

In some higher education institutions, providing virtual education programs are centered in a center (as part of the main universities) while in some universities, virtual programs are provided by respected faculties. This informs the ways that e-learning can/should be carried out (M. A)

Organizational structure can be seen as a one of the main factor that informs the strategies and policies to improve the quality of e-learning (Jara & Mellar, 2009).

Cultural and cultural-pedagogical factors

Cultural and cultural-pedagogical issues play an important role in shaping educational practices. They are embedded in a specific culture at different levels, from the individual level, the interpersonal level, to institutional, regional, and national levels. The cultural issues embrace following sub-categories: national culture; institutional culture, pedagogical values and norms such as the role of the teacher, the nature of the tasks, the ways of communicating and the ways technologies is embedded as well as the ways quality is defined.

Excerpt 12:

I think Iranian students and teachers' norms and preferences such as vocal culture should be taken into account in developing and conducting virtual courses. (M. D)

The finding of the current study is in line with Shraim and Khlaif (2010) study that highlights the importance and role of culture as one of the main obstacles in success of e-learning in developing countries.

Macro factors

In an extracted paradigm, the macro factors include the political, economical and ethical issues which may influence on if and how e-learning should/could be implemented. The significance of macro factors is indicated in the following excerpt (13).

For example, Zanjan University was one Iran's three pioneer universities in e-learning.... But when the government changed, the university president was changed in 2006 and later the priorities were totally shifted. The new president of the University's announced "this educational approach (virtual education) is not our priority any longer". so organizational context is influential in everything (D. M)

Social, cultural, scientific, economic, political and administrative issues as well as the ways these issues are taken into account play a key role in shaping quality of higher education. The key role of contextual factors in designing and implementing e-learning is underlined in the Abdous conceptual model (2009). He concluded that accreditation, accountability, technology, economical pressures, students mobility, diploma mills, employer's needs, transnational education and competitiveness impact the process of quality assurance in e-learning.

CONSEQUENCES

Outcomes in the developed model are outlined in three main categories including personal, organizational (effectiveness; and process of enhancement) and upper - organizational (e.g. issues such as internationalization and meeting societies needs and expectations). One of the interviewed experts, R.A., similarly exemplifies in excerpt 14 how organizational and upper-organizational issues can inform quality in e-learning.

Excerpt 14:

... Enhancing the scientific credibility as well as high employability can often be reflected in student's achieved skills and competences. These outcomes should be clearly indicated and followed in virtual institutions road map. (R. A)

The success (i.e. high learning quality) of virtual higher education can be indicated by a variety of criteria. York (1998) highlights the importance of responsibility; Harvey and Williams (2010) argue for employability; and Barrie and Ginns (2007) stress on getting more funding, as an indicator of the higher education quality. Udo, Bagchi, and Kirs (2011) address students' satisfactions and the extent of reaching learning objectives (loyalty, complaints, etc.) as learning quality.

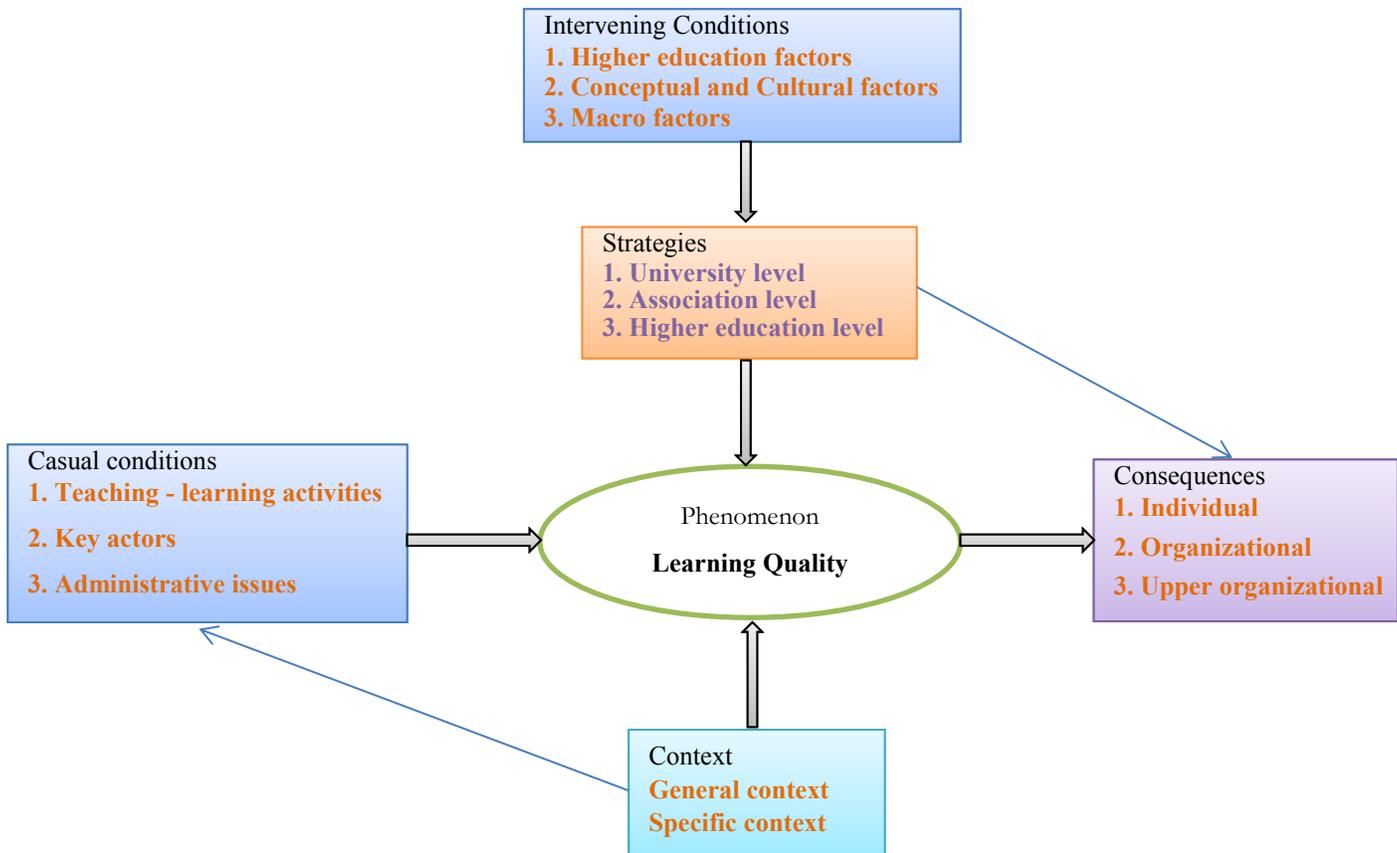


Figure 2. Paradigm model of quality improvement in virtual higher education

Selective Coding

Selective coding is the “process of integrating and refining the theory.” Integration means that categories are interconnected and organized around a “central explanatory concept”. The goal is to confirm those relations and to “fill in categories that need further refinement and development”. Selective coding involved several steps. The first step was to recognize the core category by asking “what the research is all about” (Strauss & Corbin, 1998, p. 146). At this stage researchers explored “learning quality” as core category and the central problem with which the interviewed and key actors are struggling. Finally, the following story is shaped.

The Story

The paradigm model developed as a result of this study suggests that learning process; competencies, motivation and communication of human actors; as well as administrative factors (casual conditions) alongside the general and special contexts constitute the learning quality (phenomenon). To enhance the quality of VHE, proper strategies should be developed at three levels i.e. micro, mezzo and macro. Developing such strategies in different levels cannot obviously be done without taking into account the Intervening Conditions issues i.e. Higher education factors, Cultural factors, and Macro contextual factors. The interactions between these factors can result in quality enhancement in virtual higher education. Mention should be made that learning quality in VHE has personal, organizational, and upper-organizational consequences.

Theoretical Propositions

As a result of the paradigm model based on the collected data (see figure 2 and the story), a series of theoretical propositions were developed that can explain the ways that quality improvement process occurs in Iranian VHE.

- Design, application and evaluation of teaching-learning activities, human and management factors are casual condition for improving learning quality in VHE.
- University level, professional associations, and higher education institutions strategies are suitable strategies for improving learning quality in VHE.
- General context (learning culture; key actors' willingness; educational context; and technological infrastructure) and specific context (e-learning models and specific features of e-learning) are producing special context for improving learning quality in VHE.
- Higher education (structure and policies of higher education); Intellectual and cultural (national culture; institutional culture, pedagogical values and norms, the ways of communicating and the ways technologies is embedded); and Macro factors (political, economic, legal and ethical issues) as intervening conditions are producing situation for strategies to improve learning quality in VHE.
- Improved learning quality has consequences such as individual outcomes, organizational outcomes (efficiency and effectiveness; and improvement of process) and upper - organizational outcomes (internationalization and meeting society's expectations).

CONCLUSION

The study aimed to explore the process of quality improvement in virtual higher education institutions in Iran and subsequently to develop a paradigm model to explain and enhance quality in virtual institutions. A grounded theory methodology is used to investigate quality improvement in Iranian virtual institutions. The developed paradigm model includes a variety of factors including: Learning process; competencies, motivation and interaction of key actors; and administrative factors with mediating role of the general and special contexts to create learning quality as a main issue. According to the findings, three levels of strategy i.e. micro, mezzo and macro are necessary for improving quality of learning in VHE. These strategies are informed by higher education environment. The interaction between these factors resulted in enhancing the quality of learning in VHE. The learning quality enhancement can have personal, organizational, and upper-organizational consequences.

The developed paradigm focuses on context, environmental intervention, strategies, outcomes and inter-relation among these factors that seems undermined in other studies (see; Wu & Lin, 2012; Marshall, 2010; Ireland, Mary Correia & Griffin, 2009; Abdous, 2009; Sung , Chang & Yu, 2011; Jara & Mellar, 2009; Ellis et al, 2007; Ossiannilsson & Landgren, 2012; Thurab-Nkhosi & Marshall, 2009; Jung, 2010; Udo, Bagchi & Kirs, 2011; Fresen, 2007; CHEA, 2002; Chen, 2009). Unlike other e-quality models, the outlined model in this study has tried to provide a comprehensive picture of quality in virtual institutions, including casual condition, core issue, context, strategies, intervening factors, and subsequences. Having a procedural approach highlighted in model developed, learning process could be enhanced to meet the aims and expectations of the key actors in virtual institutions (quality improvement).

It should be noted that quality in higher education is a highly controversial concept with multiple meanings linked to how higher education is perceived (Tam, 2001). Future research

may consider student perspectives about quality in VHE because “different stakeholder groups have different constraints, needs, and different motivations for using e-learning systems” (Bhuasiri, Xaymoungkhoun, Zo, Rho and Ciganek, 2012, p 852). The validation of the outlined model across countries in other developing countries may contribute to the literature. To address the quality in VHE, quality in traditional HE institution and its specific features should be investigated. The main question is do these two higher education system differ in paradigm or are they different only in delivery modes?

VHE in Iran and even in other developing countries is facing numerous challenges. By addressing enhancing and assuring quality as one the challenges in virtual higher education institutions, the model provided can be seen as a stepping stone to understanding quality dilemma. However, more studies and initiatives need to be done to promote VHE quality in Iran and other developing countries.

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STUDENTS' PREFERENCES IN ONLINE ASSESSMENT PROCESS: INFLUENCES ON ACADEMIC PERFORMANCES

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ABSTRACT

In the constructivist approach, various self-assessment techniques are being developed to enable students to assess themselves in the learning process. The purpose of the study is to investigate relation between students' preferences in assessment process and students' performances. The study was conducted with 67 sophomore students enrolled in Department of Computer Education and Instructional Technologies at a State University. The study was carried out in "Measurement and Evaluation in Education" course. At the beginning, Moodle LMS was used to define the preferences of students about their own assessment criteria (discussion, quiz, assignment and viewing of course content). Throughout the process, students were received the course instructional package in the classroom. Then they were asked to fill the assessment activities on the LMS. Students' actual performances in online activities in terms of their preference about assessment criteria was calculated as students course achievement scores. The mean value of the scores and the standard deviation were guided us to divide the participants into three groups (unsuccessful, moderately successful, successful) considering their means and standard deviations. Then, the preferences of students and their academic achievements were associated in each group. As a result, various criteria were come to front in both successful and unsuccessful groups. Surprisingly, none of the students preferred viewing course content and participating in discussions as the highest assessment criterion. Besides, it was found that all the students in successful group preferred viewing course content as lowest assessment criterion. The results indicated that, there were no prominent criteria in the relations between the preferences of students about assessment process and the academic performances. However, most of the students in unsuccessful group performed better in assignment although they did not preferred the assignment as the highest assessment criterion. At the end of the study, we noticed that while considering the criterion in the assessment process, taking students' perspectives and preferences into consideration motivated students positively and had somehow related to their academic achievements. Thus, it is hoped that the study can provides an insight to future studies to enrich assessment activities with giving responsibilities to students in learning, especially in assessment process.

Keywords: Students' preferences, assessment, online learning, moodle, academic achievement

INTRODUCTION

The constructivist approach highlights students' learning, tries to understand their individual improvements on the basis of their interests and habits, and aims to create an effective classroom environment, activities and methods (Richardson, 2003). Getting students to centre in learning process, students may construct meaningful knowledge based on their prior knowledge and experiences without strict classroom rules (Watson, 1996). Constructivist approach tends to use various teaching techniques and methods by getting students to centre in classroom. In evaluation stage, it declines the necessity of alternative evaluation methods to evaluate students' knowledge and abilities accurately (Ministry of National Education, 2006). Since, students construct their own knowledge it enables students to provide their own assessment and evaluation which is one of the indispensable component of the educational process (Kottail, 2009). In order to provide opportunities for students in the assessment process, teachers carry out various activities to direct the educational process according to students' demands. Therefore, students are able to do act new roles and have their own interpretations about learning. In relation to this, self-assessment provides individual routing for each student and decreases some of the burdens on teachers and eliminates the barriers between teachers and students (McConnell, 2006). As the students are decision makers about their own learning and assessment process, they feel the sense of responsibility and tend to act with this sense (McConnell, 2000).

Some research studies suggest that using different assessment methods within the framework of constructivist approach provide a positive contribution to their academic achievements and motivations and improve their thinking skills (Bahar, Nartgun, Durmus, & Bicak, 2008; Duran, Mihaladiz, & Balliel, 2013; Duran, 2013). In this respect, different assessment methods are being developed for students to evaluate them in learning process. Moreover, it is thought that their active participation in decision-making stage in assessment criterion and evaluation process is an important component for their real life preparation (Cukusic, Garaca, & Jadric, 2014). However, while implementing the self-assessment methods, students may assess themselves by putting forward certain criterion, students may act unilaterally and teachers cannot trust students much in some cases (Duran, Mihaladiz, & Balliel, 2003; Erdal, 2007; Silberman, 1996). In this case, the necessity of reducing teachers' concerns is revealed while giving responsibilities to students in the assessment process. It may be considered as sharing the assessment role of teacher in the learning process, but several studies addressed that students should act in the whole process of learning. Thus, to determine assessment criteria in a systematic way may contribute to the quality of the assessment process. Planning the assessment process through students' preferences may begin with defining the preferences, and continue with assessing the activities through these preferences. Because of the limitations in gathering students' preferences, many efforts have been provided to transfer this process in to online environment (Graff, 2003; Barrett, 2004). In this sense, the assessment activities generally have been conducted in multiple choice forms (Chang, Liang, & Chen, 2013; Henly, 2003). Reviewing these forms makes teachers' tasks easier and so an objective evaluation can be available. This alternative assessment named as online self-assessment provide positive contribution to students' academic performances (Chang, Liang, & Chen, 2013; Cukusic, Garaca, & Jadric, 2014; Kaklauskas et al., 2010).

Conducted studies about online assessment have grown rapidly during the past decade (Zuckweiler, 2012). Despite the growing rapidly and several benefits about online assessment, empirical studies are still needed to explore the benefits of the online assessment methods (Spivey & McMillan, 2014). For instance, in their study Russell et al. (2006) assert that an online learning environment enables to support learning, collaborative learning, and feedback between students and teachers. Also DeSouza and Fleming (2003) noticed that online assessment by supporting the learning process can be

used in online learning environments. Moreover, online assessment can enhance learning, facilitate collaboration, and improve sense of community (Morgan & O'Reilly, 2001).

Moreover, Buchanan (2001) emphasised that online assessment methods effect academic achievements positively even if students' face to face participation in courses are low. Furthermore, some research studies suggested giving roles to students in the assessment process by focusing on their motivation is getting higher (Birenbaum, 2007; Kaklauskas et al., 2010; Lai, & Hwang, 2015). Birenbaum, (2007) pointed out that students' assessment preferences play a crucial role for understanding learning process. For example, Traub and McRury (1990) assert that students prefer multiple choices because these tests are easy to prepare and take and bring higher points. Thus they generally prefer to learn with studying for exams.

Online assessments are generally carried out through LMSs. Since, LMSs provide valuable affordances for assessing the students such as quizzes, discussions, navigation patterns, assignment, etc. Research studies generally addressed how to design and apply these activities on LMSs (Rapuano & Zoino, 2006; Cavus, Uzunboylu & Ibrahim, 2007). The effects of students' roles in the online assessment process may provide insights for instructors or instructional designers to construct efficient learning environments and to define the role of assessment in the learning process. Considering the potential of students' preferences in assessment, in this study; we purposed to investigate the relation between students' preferences about assessment criteria and their performances. Thus, the following research problem was guided to the study.

Within the scope of academic performances; to what extend did the students' assessment preferences take place during the learning process?

METHODOLOGY

Participants

This descriptive study involves sixty-seven (n=67) sophomore voluntary university students at Computer Education and Instructional Technologies (CEIT) program from a state university in Turkey. We used convenience-sampling method to select the participants. The study was conducted in "Measurement and Evaluation in Education" course during 10 weeks. During the process, students applied some online activities using Moodle Learning Management System including quizzes, discussions, assignments, and viewing course contents. They have experiences on using Moodle components but they did not participate an online assessments process.

Research Process

In the research process, firstly participants were registered in Moodle LMS. Then, an online form was submitted to the participants to determine to what extend the online assessment activities (quizzes, discussions, assignments, and viewing course contents) effect on their course achievement in Moodle. Maximum rate was stated as 40% for all activities. Students assigned their preferences as effect rates on course achievement totally 100 points. Participants were informed that these points will be used as course achievement scores. They were also warned to be careful on assigning the meaningful rates including their real opinions by considering their qualifications and expectations in such activities. One student's preference about assessment criterion rates is illustrated below:

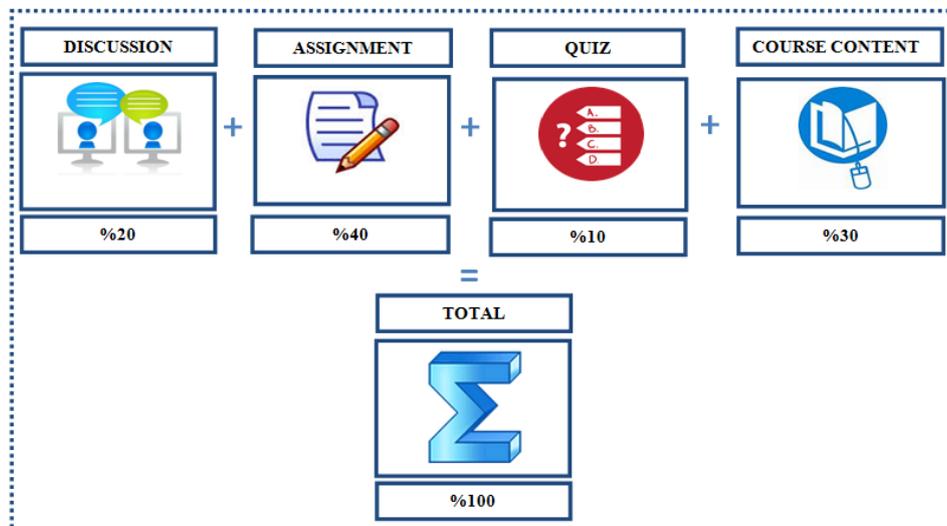


Figure 1. A sample for a student's preferences

As seen in Figure 1, the student preferred "assignment" activity as the highest assessment criterion (40%) and "quiz" activity as lowest assessment criterion (%10), totally 100 points. Furthermore, online activities uploaded in LMS for each week. In the study, students found opportunity for discussing on issues related to course content, participating in activities such as quizzes, assignments, viewing course content during 10 weeks. Each student's log data was stored automatically by Moodle for activities that they conducted.

Students' actual performances in online activities in terms of their preference about assessment criteria was calculated as students course achievement scores. The mean value of the scores and the standard deviation were guided us to divide the participants into three groups (unsuccessful, moderately successful, successful) considering their means and standard deviations. Then, a relation was investigated between students' preferences (SP_r), students' performances (SP_e) and their course achievement. While performing this, it was taken into consideration that they were active or not during the process. Active students can show high participation level in LMS and this was determined from students' log data and points about online activities. The points of online activities were calculated by norm-referenced evaluation. And also, viewing course content is important for determining that students are active or not.

The research process including the technical infrastructure, implementation, collecting data and data analysis phases that are shown in Figure 2:

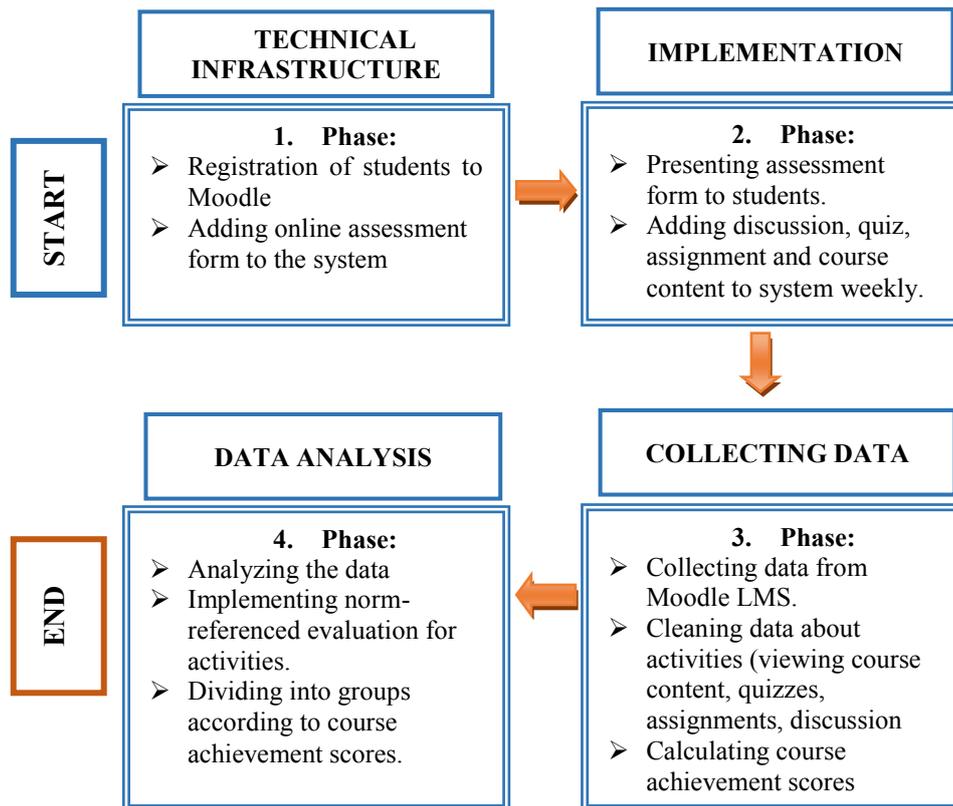


Figure 2. Research process

First step of this process was completed before the research started and implementation phase was carried out over 10 weeks. Collecting data phase continued during the study.

Data Collection and Analysis

In the data collection phase, data obtained from Moodle LMS were interpreted using descriptive analysis technique. Thanks to Moodle LMS which stores all students' log data about online activities, was the repository of data for each activity. Additionally, the scores from the activities calculated as course achievement scores at the end of the process which was from 0 to 100. Students were grouped according to these scores in order to examine the preferences and performances in the successful, moderately successful and unsuccessful groups. It is determined that how many participants prefer quiz, assignment, viewing course content and discussion criterion to be assessed and how many participants show performances in the same direction of preferences. The findings were presented through students' preferences including their lowest and highest rated assessment criteria. Thus, to find out how many participants prefer which activities as the highest and lowest rated assessment criteria, norm-references evaluation method was conducted.

RESULTS

For understanding relation between SP_r and SP_e, we classified students into groups aspect of course achievement scores. Participants' scores ranged from 21 to 93 points. The arithmetic mean of the achievement test was 69,76 (SD=12,79). The participants were classified in three groups by subtracting standard deviation from arithmetic mean or adding standard deviation to arithmetic mean: (1) unsuccessful group (under 56,96), (2) moderately successful group (56,96 to 82,55) and, (3) successful group (over 82,55). Scores of the participants included in unsuccessful, moderately successful, and successful groups ranged between 21 and 56, 58 and 79, 84 and 96 respectively.

11 of 67 participants are in successful group, 50 of 67 are in moderately successful group and 6 of them are in unsuccessful group. In this study, we focused whether SP_r and SP_e differentiate in terms of success groups or not. The results of the study were as follows.

Relationships between Groups and Assessment Criterion

Relation among SP_r, SP_e and, the preferred highest assessment criterion in groups

In Figure 3, the numbers of students who chose online activities as assessment criterion for students affecting course achievement in highest rate is illustrated.

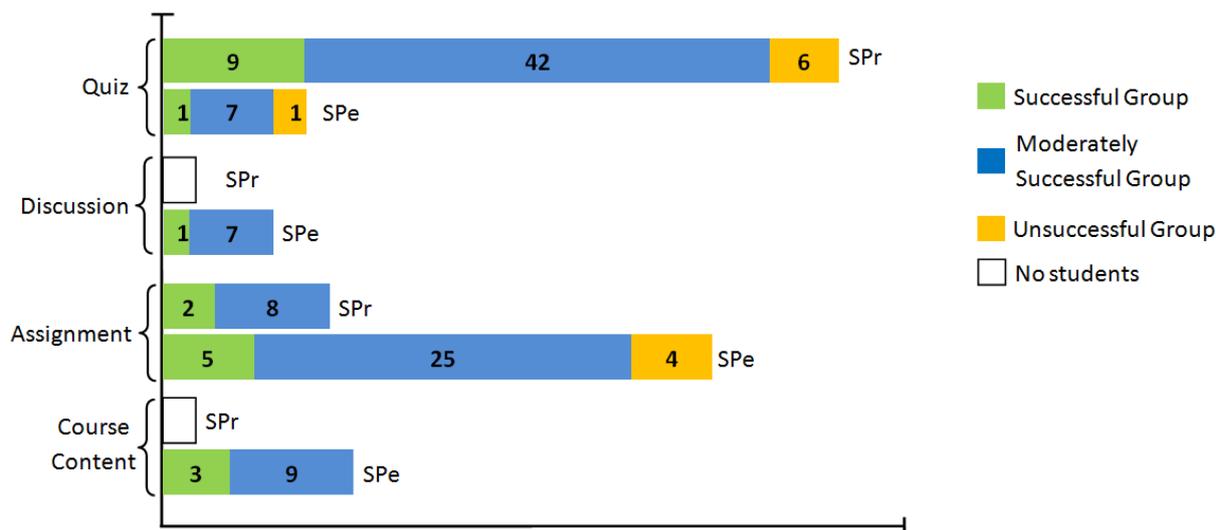


Figure 3. Number of Participants in terms of SP_r and SP_e in Groups

As shown in Figure 3, it is seen that none of the students preferred to be assessed as highest rate in online discussion and viewing course content. As the number of participants choosing quiz and assignments is 11 in successful group, this number is six in unsuccessful group. Although there are not any students preferring assignment in unsuccessful group, four students perform better in this direction. 42 of 50 moderately successful group members preferred quiz as the highest assessment criterion. Moreover, as indicated in Figure 3, as no participants preferred the viewing course content to be assessed as the highest assessment criterion, only 14 students performed better in this direction. When analysing students' log data in LMS, it was noticed that weekly mean duration of viewing course content is 58,9 minutes.

Overall, when viewing Figure 3 aspect of SP_r and SP_e, it emerges that only 19 students preferred the highest assessment criterion and show performance in the same direction as well. While 18 students show performance about preferences in moderately successful and successful group, only one student shows it in unsuccessful group.

Relation among SP_r, SP_e and, the preferred lowest assessment criterion in groups

The numbers of students who chose online activities as assessment criterion for students affecting course achievement in lowest rate is illustrated in Figure 4. When examining the Figure 4, it is seen that quiz and assignment activities were not preferred as the lowest assessment criterion by any of the students. All the students in successful group preferred the viewing course content as the lowest assessment criterion. There are only five of all students in successful group perform better about preferences in the viewing course content. 37 of 50 moderately successful group members stated that they preferred the course content activity as the lowest assessment criterion.

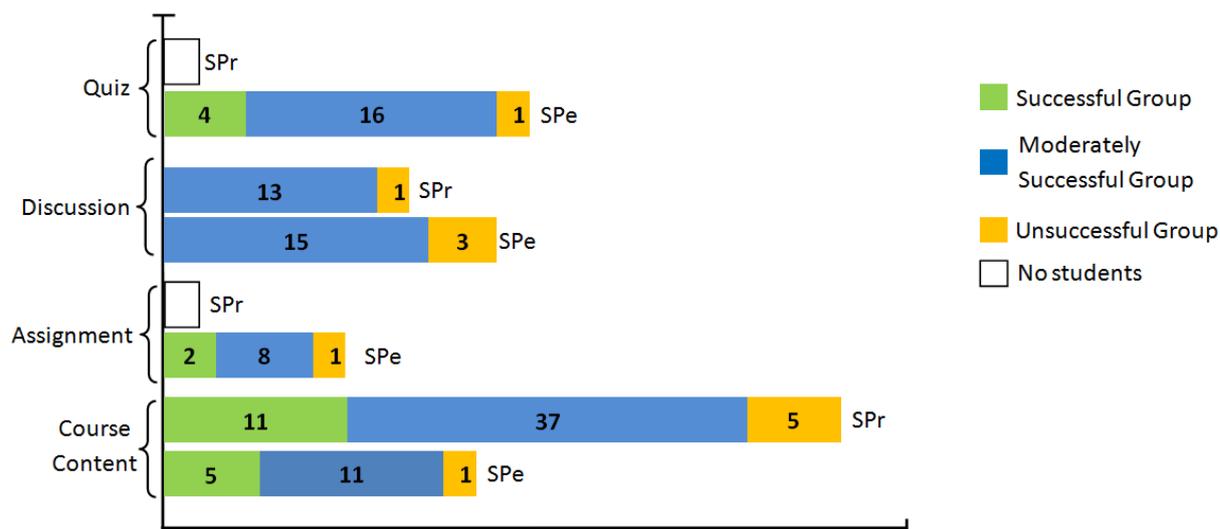


Figure 4. Number of Participants in terms of SPPr and SPe in Groups

Overall, when analysing Figure 4 aspect of SPPr and SPe, it emerges that only 31 students preferred the lowest assessment criterion and show performance in the same direction as well. While 29 students show performance about preferences in moderately successful and successful group, only two students show it in unsuccessful group.

CONCLUSION AND DISCUSSION

As a result, it was found that majority of the participants were in the successful group. As a SPPr various criteria were come front in the groups. Assignment was mostly preferred as highest SPPr in successful group, but no one preferred assignment criteria as the highest SPPr in unsuccessful group. It is generally known that assessment has an important role in the learning processes and new teaching methods (Brown et al. 1994; Gibbs 1999; Scouller 1998).

The criteria using the course content and discussion were not preferred as the highest SPPr by both successful and unsuccessful groups. Course content criterion is the lowest SPPr by both successful and unsuccessful group. When students have the chance to decide on their own assessment process, they feel more responsibility and tend to act with the sense of this responsibility (McConnell, 2000). In addition, the criteria about use of course content were preferred with expecting the lowest score by all groups. It reflects that most of the students could not give up traditional assessment methods and their old habits about not spending much time within the context in the system. Similarly, Gijbels and Dochy (2006) pointed out that the perception of a too heavy workload can arguably be an explanation for decreased preference for assessment criteria and Gunnar (2008) addressed that students do not track the courses in the LMSs if they are not meaningful for them.

On the other hand, taking students' preferences in the assessment process is partially positively effected on students' academic achievements. Some other studies using online self-assessment techniques also found similar effects on students' achievements (Cukusic, Garaca, & Jadric, 2014; Chang, Liang, & Chen, 2013; Kaklauskas, 2010). Defining the assessment criteria through students' preferences bring out some unexpected achievement scores for students. For instance, students who preferred to be assessed with giving high rates to quiz, discussion and assignments, only students' who preferred assignments could get high grades in assignments. Surprisingly, some other students who did not expect higher scores from quizzes and assignments also got their highest scores from these activities. In addition, it was observed that quiz and the assignment were the most preferred activities for highest SPPr. Since they were accustomed to be assessed through quizzes, exams or assignments in their educational

life, the result can be thought as a reflection from their previous experiences. However, it was found that students could not get the highest grade from their highest grade criterion that they preferred. Most of the students got the highest grade from assignment criterion although they preferred the quiz criterion as the highest rate. This is possibly because of their conventional assessment habits. In this sense, Struyven Dochy and Janssens (2006), argues that the way in which a student perceives about learning and studying, follow the way in which he tackles assignments and assessment tasks.

Since constructivist learning approach suggest students acting in the assessment in the instructional process, it is not easy to control students' assessment behaviours. Giving responsibility may support students' meaningful learning, but students sometimes cannot know the activities that they are better. This is may be due to their study habits or their experiences which they brought from their conventional courses. The study provided some clues that it is difficult for students to give up their habits from behaviour approach. Using online environment for assessment process is also useful to give responsibilities to the students. In addition, LMSs provide affordances for instructor to organize the assessment process using online environments.

Consequently, it is concluded that as the criteria for taking students' perspectives into account and their own preferences have a motivating role on students due to the idea of determining their own assessment process. The main difficulty for students is to estimate their real abilities. In this sense, instructors by reflecting their experiences may help students in the assessment process. Another conclusion may be drawn from the study is, there is no directly relation occurred between students' preferences and academic performances. Future studies may be focused on some qualitative data to interpret the reasons for why majority of students prefer classical assessment techniques.

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CONNECTIVITY OF LEARNING IN MOOCs: FACILITATORS' EXPERIENCES IN TEAM TEACHING

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ABSTRACT

The role of facilitators in distance learning environments is of substantial importance in supporting the learning process. This article specifically discusses the role of the facilitator in Massive Open Online Courses (MOOC), which are characterized by their stimulation of learning connections. The study analyzes the experiences of 135 facilitators in hybrid courses (cMOOC + xMOOC) where the following are explored: (1) the strategies used by the facilitators to encourage learning connections, (2) the challenges they faced in their activities, and (3) the basic skills required. A mixed method was used with a convergent design, through the application of a questionnaire qualitative and quantitative data were collected simultaneously. It was found that the collaborative construction of knowledge is the most widely used strategy to promote learning connections in MOOCs and that its design is the biggest challenge that facilitators faced while carrying out their activities.

Key words: MOOC, connectivism, distance facilitators, open educational resources, open education movement.

INTRODUCTION

The use of social networks and new educational formats and mobile technologies are having an increasing impact on teaching and learning processes. Consequently, education has entered a process of transformation, resulting in, above all, an imbalance (deWaard et al., 2011). It is believed that an educational format that incorporates and even adopts the complexity of today's world, combined with emerging technologies, may be the path to achieving a new educational order. deWaard et al. (2011) argue that the format of Massive Open Online Courses (MOOC) allows for the type of participation that will lead precisely to a new educational balance that incorporates this complexity.

The argument that curricula should be open and unpredictable has been emerging for several decades (Iannone, 1995). The format of a MOOC is by definition open and online, as its resources are accessible on the Web so as to allow for the participation of all potential learners (deWaard et al., 2011). Laroche et al. (2009) state that this type of fluid environment blurs the distinctions between school and society, blending formal and informal educational settings.

The theory of connectivism, from which MOOCs emerged, speaks of this fluidity in learning environments. This theory argues that learning occurs when participants connect information in a learning community. Additionally, they also add that within connectivism, the most important skills for learning are searching for information and the ability to filter out secondary information (Kop & Hill, 2008).

In this context, environments that foster relationships between individuals and experiences that connect on an emotional level must be created (Shedroff, 2009). Creating an effective work environment is not enough to introduce some tools; however, it should encourage the creation of connections and collaborations between resources and people (Kop, Fournier & Mak, 2011). Kop (2011) states that a "place" where learners are comfortable and in which there is a certain level of trust among participants must be created, while the teacher's participation involves the design, organization, and course facilitation, as well as direct instruction. As a result, educators have now taken on new roles: facilitator, guide, coach, moderator, provider of technical support, etc. (Siemens, 2008).

In this sense the new roles adopted by educators in a massive online education environment must promote learning through dialogue and reflection between the student and the facilitator. MOOCs have the potential to engage participants and facilitators in a continuous stream of dialogue and exchange and promote reflexive action by the learner (Kop et al., 2011). For this reason, understanding the skills required of facilitators in order to promote connectivity of learning in these environments is very relevant (Ramírez, 2014). It is for this reason that this research study seeks to answer the following question: What is the experience of MOOC facilitators in supporting learning connections? Based on this, the following specific questions arise: (1) What are the strategies used by facilitators to encourage learning connections? (2) What are the challenges they face in their activities? and (3) What basic skills are considered necessary?

LITERATURE REVIEW

Connectivism

Connectivism is a learning theory developed by George Siemens in the digital age, in which the use of Information and Communications Technology (ICT) is the norm; however, it is based on principles explored by chaos, network, and complexity and self-organization theories (Siemens, 2005). The theory views knowledge as a network state and learning as

the process of generation of networks and adding and maintaining connections (Siemens, 2013). According to Siemens (2005), the principles behind it are:

- Learning and knowledge rely upon a diversity of opinions.
- Learning is a process of connecting nodes or information sources.
- The ability to learn is more important than what is known.
- It is necessary to nourish and maintain connections to facilitate continuous learning.
- The ability to see connections between ideas and concepts is essential.
- Decision making is a learning process.

In conclusion, connectivism can be understood as an approach to learning that places the importance of networks and connections at the forefront (Weller, 2011).

Massive Open Online Courses

From the perspective of the MOOCs as a new educational model, new ways of teaching and learning arise. The model appears as a complement to the changes in learning as a result of the rise of social media and new technologies (deWaard et al., 2011). In this regard, Kop et al. (2011) mention that this involves a network learning method that employs a structure that is different from traditional courses.

MOOCs are described taking into account the characteristics of (1) open access: there are no requirements to participate in these courses nor associated costs, although the term "open" also implies the reuse and adaptation of resources integrated in the course; and (2) scalability: the courses are designed to support any number of participants, where the interconnections are chosen by the participants themselves, and the architecture that promotes this is designed by course facilitators. Beyond these general characteristics, according to Siemens (2012), the adoption of a pedagogical model defines two types of courses: cMOOC and xMOOC.

cMOOC: This type uses connectivism's pedagogical principles of autonomy, diversity, openness, connectivity, and interactivity.

xMOOC: This type emphasizes a traditional learning approach through video presentations and tests.

Today there are a greater number of xMOOC courses. In this context of hegemony, the legacy of the first cMOOCs is that xMOOCs are increasingly integrating connectivist features, adding to the complexity of the design processes and delivery of this online model (Méndez, 2013). Given the characteristics of massive courses, connectivity of learning must be encouraged.

Connectivity of learning

The term connectivity must be understood based on its relation to learning. In basic connectivist theory, learning is the process of connecting information from different sources. Siemens (2005) notes that...

... the basic premise of connectivism is the individual. Personal knowledge is composed of a network, which feeds into organizations and institutions, which in turn feed back into the network, and then continues to provide individual learning. This cycle of knowledge development (personal-network-organization) allows students to remain up-to-date in their fields through the connections that have been made (para.7).

In the case of massive courses, connectivity is measured through social networks, and a great deal of online and free-access resources provide the study material (McAuley, Stewart, Siemens & Cormier, 2010). This makes it possible to assess the Internet resources made available in an interactive way in the educational space. In this sense, the learner follows his or her own path within the course, creating networks, evaluating the information universe and making important decisions, such as with whom to collaborate and, more importantly, what to learn.

Distance Facilitators

The facilitator figure is a key element in contributing to the learning connection processes in a MOOC. Open access (the participation of thousands of participants) and connectivist pedagogy (knowledge sharing), characteristics that define these educational spaces, have secured their integration in instructional approaches as they activate learning connection processes among participants. According to McAuley et al. (2010) these types of courses are based on the active participation of massive amounts of learners who self-organize their participation based on personal and shared learning, as well as their previous skills. In this regard, a facilitator's participation may have different levels.

In a cMOOC model, what participants can do for themselves leads to a complete learning experience. In this model, the participant becomes a certain type of person (ontological development), who as a learner is characterized by self-organization, motivation, and autonomy (Siemens, 2013). Therefore, over-instruction by educators can end up inhibiting the independence of learners (McAuley et al., 2010). Changing the paradigm in which the instructor is considered as the focal point and whose role is as an expert, can cause the learner to become aware of his/her own ability (expertise) and lead to networked learning approaches (Stewart, 2013), which represents the premise of connectivism. In this context, the facilitator may be responsible for designing the architecture that will foment the self-organization and learning connections of the learner, which represents his/her main activity.

However, since learning in MOOCs is based on active participation and communication among people, continued mediation efforts by a facilitator with advanced skills (expertise) can benefit a greater number of participants. Siemens and Cormier (2010) mention that in open learning, the facilitator figure continues to be of vital importance, as it facilitates interaction, sharing of information and resources, and contributes to the growth of learners' knowledge. In this context, the presence of the facilitator throughout the process of an online situation is essential to increasing learners' learning connections.

Whichever level of participation a facilitator adopts, both before and during a MOOC situation, the characteristics of these spaces pose challenges to carrying out their functions. The large-scale scope of learners complicates the forms of mediation. Adaptability to the characteristics and learning needs becomes essential to promoting interaction among participants and with the different areas of the course and the Web in which knowledge is distributed.

METHOD

Type of Study

The study followed a mixed method combining the collection and analysis of qualitative and quantitative data (Creswell & Plano Clark, 2011; Johnson, Onwuegbuzie, & Turner, 2007) in order to achieve a deep understanding of the learning connections of massive and open environments; the convergent desing (Creswell, 2012) involves simultaneous data acquisition of a different nature: qualitative and quantitative. The study was conducted in three stages: (1) exploratory stage: participation as a facilitator in order to explore the dynamic developed among participants in these educational spaces; (2) field work phase: focus on the application of a questionnaire in

the last week of the course, the first stage allowed participants access to and application of the tool; (3) analysis stage: after completion of the course, participants' responses to the applied tool were analyzed.

Context and Participants

The course "Educational Innovation with Open Resources" was the setting in which the facilitators' experiences were defined. The course was delivered in September 2014. Table 1 summarizes its main characteristics:

Table 1. Characteristics of the course "Educational Innovation with Open Resources"

Element	Description
Objective	To promote awareness of open educational resources and their integration into the open educational movement for innovation in educational processes.
Length	4 weeks in which the participant was asked an average activity 4-6 hours per week.
Openness	Access was open to any participant character; however, the course also functioned as a training space for a group of teachers from the Tecnológico de Monterrey university.
Course outline	I. Open educational movement. II. Searching for open educational resources. III. Use of open educational resources in learning processes. IV. Mobilization of open educational resources in learning environments.
Prior preparation	Basic knowledge of use of IT tools. Collaborative work. Self-management skills.
Course format	Each week will begin with opinion questions and a review of resources on the subject (videos and/or readings). Subsequently the participant will complete exercises on the subject, followed by self-evaluation, practice with digital portfolios, and peer review.
Pedagogical approach	The setting was designed following connectivist principles. The vision of the role of the participants involved the active participation of massive numbers of apprentices who self-organized their participation in accordance with the objectives of learning, knowledge, previous skills and common interests. Learning took place in a network, where the establishment of connections allowed its maintenance and growth.
Facilitator	The facilitator figure has the main function of supporting learning connection processes among learners. His/her function is to bring the learners closer to the course instructors, with the understanding that his/her task is to support the instructional approach designed by the instructors, guiding the students' actions in the space of course.
Work team	Plays the role of facilitating learning connections between learners; the team is composed of two facilitators teachers, two support facilitators and facilitators volunteers. Volunteers were selected via an initial survey and the selection was made according to the criteria: (1) previous experience in remote facilitation processes and (2) having some knowledge of the courses topic; this kind of facilitator has two functions, to act both as a learner doing all the course activities and as part of the work team supporting learning connection processes among learners.

It was decided to work with facilitators volunteers because they have a dual perspective: as a learner and as a part of the work team. A group of 203 facilitators responded to the tool. For research purposes we worked with a simple random sample of 135 with average age of 40.81 (SD=11.24) and a confidence level of 95% and a maximum error of 5% to achieve represent the population and manage the amount of qualitative data. Table 2 summarizes some of its most outstanding characteristics.

Table 2. Identifying data of MOOC participants

Characteristics		n (%)
Sex	Male	62 (46.9)
	Female	73 (54.1)
Education level	Technical career	8 (1.5)
	High school's degree	2 (5.9)
	Bachelor's degree	49 (36.3)
	Master's degree	61 (45.2)
	Ph.D.	14 (10.3)
Teaching experience	Hybrid education (virtual and traditional classroom)	70 (51.9)
	Traditional classroom	46 (34.1)
	Without pedagogic experience	5 (3.7)
	Virtual	14 (10.4)
Types organization of origin	Public	63 (46.7)
	Private	47 (34.8)
	Mixed	12 (8.9)
	Others	13 (9.6)

Tool

The tool was designed by a group of experts on massive courses with the aim of compiling the experiences of facilitators of MOOC courses with regard to connectivity of learning. The content validity of the tool was conducted by an expert judgement, various meetings to reach agreements were made. It consists of questions that obtain identifying data and 12 open questions to identify areas of opportunity in his/her role as facilitator and to understand, which are the main strategies to encourage learning connections.

Data Collection and Analysis

The tool was applied online during the last week of the course on the Coursera platform. Subsequently through the system management platform database was obtained for analysis. Qualitative techniques were used, such as content analysis to list the answers with the highest occurrence, as well as comparative analysis with contingency tables in order to compare data of interest. Responses were categorized, captured and recorded in the SPSS

statistical program version no. 23, with which descriptive statistical tests were applied in order to identify trends, differences or similarities. Chi-square test (χ^2) was used to determine whether there were significant differences between participants regarding the variables: reasons for involvement, strategies, challenges and skills; the analysis corresponds to nominal variables reason that determines the test selection.

RESULTS

The characterization of facilitators in MOOC courses is presented below; a distinction was made between the facilitators based on their experience in this area. To perform the following descriptive analyses, it was necessary to distinguish between the facilitators, in which said criterion was their type of experience in MOOC environments. In this sense the distinction was as follows: (a) teacher: facilitator who has previously been involved as an instructor in a MOOC; (b) student: only experience with MOOCs is as a student and (c) first participation: facilitators who are new to this type of training environment. In Table 3 the facilitators' aims at the start of the course are shown, which mainly demonstrates their interest in learning about Open Educational Resources (OER). Meanwhile, through Chi-square test (χ^2), it was found that the reasons for participation does not depend on the type of experience in a MOOC, as no statistically significant differences were found ($p=.340$).

Table 3. Reasons for involvement in MOOC course

Reasons for participation	Type of experience in MOOCs			Total
	Teacher (%)	Student (%)	First Participation (%)	
To learn about OERs	8 (25.8)	23 (37.1)	12 (28.6)	43 (31.9)
To update knowledge (participants with prior knowledge)	3 (9.7)	16 (25.8)	7 (16.7)	26 (19.3)
To improve teaching practices	5 (16.1)	8 (12.9)	9 (21.4)	22 (16.3)
To learn new things	8 (25.8)	3 (4.8)	7 (16.7)	18 (13.3)
Professional reasons	5 (16.1)	4 (6.5)	6 (14.3)	15 (11.1)
Other	2 (6.4)	8 (12.8)	1 (2.4)	11 (8.2)
Total	31 (100)	62 (100)	42 (100)	135 (100)

With regard to the necessary learning connection strategies of the facilitators, all of them agreed on the significance of all actions aimed at constructing knowledge through collaboration among peers (see Table 4). Through Chi-square test, it was found that certain strategy to encourage learning connections is not confined to one type of facilitator, as they did not show significant differences ($p=.619$).

Table 4. Most significant strategies for learning connections according to MOOC facilitators

Strategies to encourage learning connections	Type of experience in MOOCs			
	Teacher (%)	Student (%)	First Participation (%)	Total
CKC	14 (45.2)	34 (54.8)	20 (47.6)	68 (50.4)
ROL	5 (16.1)	9 (14.5)	3 (7.1)	17 (12.6)
MOT	3 (9.7)	5 (8.1)	6 (14.3)	14 (10.4)
IF	1 (3.2)	3 (4.8)	5 (11.9)	9 (6.7)
RPP	3 (9.7)	2 (3.2)	1 (2.4)	6 (4.4)
Unspecified	5 (16.1)	9 (14.5)	7 (16.7)	21 (15.6)
Total	31 (100)	62 (100)	42 (100)	135 (100)

CKC: Collaborative knowledge construction, ROL: Relationship with own learning, MOT: Motivation, IF: Information finding, RPP: Relationship with professional practice.

Moreover, the facilitators perceived challenges other than those they faced in promoting connectivity of learning. The two main challenges perceived were: (1) the design of the MOOC, which consisted of qualifying criteria, the development of activities, flexibility of the course, and instructional design and (2) the massiveness and diversity of participants, referring to the large number of participants that must be supported and the diversity of nationalities, among which the use of language is highlighted (see Table 5). The Chi-square test showed that the challenges that the different type of facilitator face are the same, as no statistically significant differences were found ($p=.638$).

Table 5. Challenges faced by the facilitators during the MOOC course

Challenges with regard to learning connections	Type of experience in MOOCs			
	Teacher (%)	Student (%)	First Participation (%)	Total
UT	2 (6.5)	8 (12.9)	9 (21.4)	19 (14.1)
DM	11 (35.5)	20 (32.3)	7 (16.7)	38 (28.1)
MDP	10 (32.3)	17 (27.4)	13 (31)	40 (29.6)
ATCP	0 (0)	5 (8.1)	1 (2.4)	6 (4.4)
CC	2 (6.5)	4 (6.5)	6 (14.3)	12 (8.9)
None	6 (19.4)	8 (12.9)	6 (14.3)	20 (14.8)
Total	31 (100)	62 (100)	42 (100)	135 (100)

UT: Use of technology, DM: Design of the MOOC, MDP: Massiveness and diversity of participants, ATCP: Attitude toward the course and participants, CC: Complexity of contents.

Lastly, the facilitators were questioned as to the skills required in order to achieve learning connections. In this regard three skills were identified that, according to the facilitators, are the most necessary in order to carry out their activities, which are the following: Communication (23%), Digital (20.7%) and Empathy (13.3%) (See Table 6). The Chi-square test showed a specific set of skills that are common among different types of facilitators, as no statistically significant differences were found ($p=.115$).

Table 6. Skills required by facilitators with regard to learning connections in the MOOC

Skills required to promote learning connections	Type of experience in MOOCs			Total
	Teacher (%)	Student (%)	First Participation (%)	
PED	2 (6.5)	2 (3.2)	7 (16.7)	11 (8.1)
EMP	6 (19.4)	7 (11.3)	5 (11.9)	18 (13.3)
DIG	6 (19.4)	12 (19.4)	10 (23.8)	28 (20.7)
SUBM	2 (6.5)	2 (3.2)	3 (7.1)	7 (5.2)
MOT	1 (3.2)	5 (8.1)	4 (9.5)	10 (7.4)
COM	5 (16.1)	22 (35.5)	4 (9.5)	31 (23.0)
No answer	9 (29.0)	12 (19.4)	9 (21.4)	30 (22.2)
Total	31 (100)	62 (100)	42 (100)	135 (100)

PED: Pedagogical EMP: Empathy, DIG: Digital, SUBM: Subject of the MOOC, MOT: Motivation, COM: Communication.

DISCUSSION

Learning connections in a massive course are increased when the facilitator focuses on constructing knowledge collaboratively with the participant and is highly digitally literate. Empirical evidence from the study suggests that skills associated with digital literacy and collaborative construction of knowledge as a strategy of the facilitators are the main factors that enhance learning connections. As a facilitator's participation in a MOOC is "teacher as learner as teacher" (Siemens, 2006), the importance of digital skills is critical; literature on the learner's experience has shown that possession of these skills is one of the main factors that shapes their experience in a MOOC (Kop & Fournier, 2010). Participating in these educational spaces requires self-management by the participant, which has a direct relationship with advanced levels of digital literacy; self-directed learning, presence of other participants and critical literacies pose challenges for learners who venture into spaces with a connectivist approach (Kop, 2011). If this requirement is not met by participants who enroll in MOOCs, its potential to democratize knowledge will be limited by the digital divide.

MOOC philosophy, such as massiveness and openness, pose challenges for facilitators, as they must promote different learning styles according to the characteristics of the participants. These two attributes of mass courses were identified by the facilitators as the main challenges they faced while carrying out their activities within the space of course. The heterogeneity of participants with different levels of knowledge and skills makes it impossible for the facilitator to individualize the experience of each learner (McAuley et al., 2010); to address the diversity of participants Maringe and Sing (2014) propose increase the curricular access and language teaching, increase staff with cultural understanding, increase opportunities for deep learning for all, continuous monitoring of participant satisfaction, diversification of evaluation and merit of the MOOC; a principle of "increase" in the same way that increase the participants. On the other hand, there is a tendency to integrate the

features of cMOOCs into xMOOCs adding complexity to these courses (Méndez, 2013); the facilitator is an ever-present element in these types of courses and in the construction with "others" as connectivism noted (Ramírez, 2014; 2015). This implies an opportunity to generate guidelines with regard to the design of the MOOC that integrate the facilitator into his or her instructional approaches, providing him or her with skills to increase the active participation and learning connections of participants, never limiting them.

CONCLUSION AND FUTURE RESEARCH

The research aimed to answer the following question: What is the experience of facilitators of MOOCs in supporting learning connections? The results show that MOOCs facilitate learning connections through peer exchange; this implies new roles for both facilitators and learners, focusing the educational experience on self-management of their own learning, which requires from learners greater responsibility and interaction with peers and with the resources available on the Web. On the other hand, open and flexible design of a MOOC, as well as the large number of participants and their diverse nationalities, languages, and cultures represent the greatest challenges to connecting learning in these environments. These results suggest that to maximize the connection of learning in an open environment and distance must be sought facilitators who are assertive communication with the apprentices, which is related to its ability to accommodate trainees despite the virtuality; and to achieve this they should be able to search, process and disseminate information and communicate and build knowledge through electronic means.

The study was carried out in a MOOC primarily aimed at teachers and administrators, which represented a constraint since the results may not be generalized with regard to MOOCs with other types of participants. In further research, it would be interesting to explore the experiences of facilitators and participants as to learning connections taking into account more heterogeneous samples, and even courses with different topics, as well as distinguish between the facilitators taking into account other characteristics such as level of education, level of digital competence and content mastery. This is beyond the scope of this study, but could help re-define the facilitator profile for these educational spaces.

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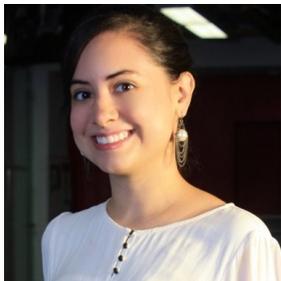
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A CONCEPTUAL FRAMEWORK OF VIRTUAL INTERACTIVE TEACHER TRAINING THROUGH OPEN AND DISTANCE LEARNING FOR THE REMOTE AREAS ENGLISH TEACHERS OF BANGLADESH

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ABSTRACT

Since we are living in the information age and the importance of the need for communication among people of different cultures is increasing day by day in the globalizing world, people need to learn the languages of different cultures, particularly English, which is the common language of this global communication. This need for learning English requires trained qualified teachers of English. A scan of those who are teaching English in schools of Bangladesh reveals that most of them are very limited in both English skills and teaching methodologies for English. This situation is exacerbated when one moves into the rural areas. Most of the teachers are staying far away from the teachers' training colleges and also for different constraint like administrative, financial, time constraint and were also unable to receive any training due to family problems. So Distance Education has a great demand to them. ICT is an effective media of distance education. For many years, universities with a significant commitment to distance and open education institutions have been at the forefront of adopting new technologies to increase access to education and training opportunities. Information and Communications Technology (ICT) is an umbrella term that includes all technologies for the manipulation and communication of information. Bangladesh Open University (BOU) is till now belonging to the second generation of distance education model but due to the enhancement of technology in Bangladesh, BOU can proceed further. The main purpose of this study is to identify a suitable technology for developing a virtual interactive teachers' training program for the disadvantaged English teachers of Bangladesh. Respondents were selected through random sampling and data were analyzed using both descriptive statistics and quantitative themes. From the opinion of the secondary English teachers their access and acceptability on ICT was identified and also a need analysis was done. It is hoped that the result of this study will encourage the policy makers to implement new ODL approaches for the training of disadvantaged rural English teachers.

Keywords: Open and distance learning (ODL), Bangladesh Open University (bou), virtual interactive teacher training.

INTRODUCTION

The role of English in Bangladesh is purely a functional one as English is used as an international link language. English is not used as an interpersonal and inter-institutional communication means there but English has been used for years and for different purposes and gradually it is becoming part of the socio-cultural system. Since we are living in the information age and the importance of the need for communication among people of different cultures is increasing day by day in the globalizing world, people need to learn the languages of different cultures, particularly English, which is the common language of this

global communication. This need for learning English requires trained qualified teachers of English. A scan of those who are teaching English in schools of Bangladesh reveals that most of them are very limited in both English skills and teaching methodologies for English. This situation is exacerbated when one moves into the rural areas but we know secondary education prepares pupils for employment at the entry level and serves as a foundation for those who aspire for advanced studies.

Secondary education of good quality is of utmost developments, which are necessary for successfully tackling the challenges of globalization. In Bangladesh, steady growth in primary education has resulted in concomitant expansion in the number of secondary schools, teachers and enrolments. There are 18,677 secondary schools recognized by the government. About 98% of them are private schools. There are over 8.6 million students, of whom about 53% are girls. The gross enrolment ratio in secondary education averages about 30% marked by significant losses as grades advance. (ADB Report, 2004)

The total number of teachers is about 240,000. The current proportion of female teachers is approximately 17%, against the Government's policy of having at least 30% female teachers. Notwithstanding the quantitative achievements, in the secondary education system weaknesses are reflected in the declining quality of graduates and teachers. About 60% of the teachers are still untrained, while most schools are devoid of standard conditions essential for the normal instructional process. The decline in the quality of secondary education can largely be attributed to poor teaching. (ADB Report, 2004)

A major issue particularly affecting the disadvantaged population of rural areas is inequitable access and opportunity. Development partners have been working with the Government on a number of projects to alleviate the problems of access, particularly for girls, through stipend programmes. More equitable access to teacher training should also be supported for female students and students from rural areas and disadvantaged groups, including ethnic minorities. Gender and social development policies need strengthening to tackle the inequitable gender balance in hiring and assigning female teachers.

One of the main objectives of the operational strategy of the Asian Development Bank (ADB) in education in Bangladesh is to improve educational quality and system efficiency, particularly in teacher training. ADB assisted the Government to lay the foundations for teacher education in secondary education through several projects, including establishing higher secondary teacher training institutes (HSTTIs), constructing secondary education science development centres (SESDCs), and providing facilities and equipment. ADB's support to Bangladesh Open University (BOU) has on its part also improved teachers' opportunities to further their studies in education. Accordingly, Secondary Education Sector Improvement Project (SESIP) aims to improve secondary education through sector reforms, including the development of policies for teacher education, standards and curriculum (ADB Report: 2004). A number of organizations, including teacher training colleges (TTCs), Madrasah Teacher Training Institute (MTTI), HSTTIs, SESDC, as well as National Academy of educational Management (NAEM), National University (NU) and Bangladesh Open University are involved in providing different aspects of teacher training in secondary education.

Teaching Quality Improvement in Secondary Education Project (TQI-SEP) has four components – improving teaching quality through organizational development and capacity building, improving teacher training facilities, strengthening in-service and pre service teacher training and increasing equitable access and improving community involvement. Implementation will encompass development activities at central Government level, at all teacher training colleges and institutes and on pilot basis at community level. The Continuous Professional Development (CPD) component of the TQI-SEP provides two-week

face to face subject-based training programmes that require participants to go to one of the government teacher training colleges (TTCs) for the duration of the training. Three Outreached Centres are serving rural and remote areas, are planned in order to be the link between remote schools and training colleges, but they will still require teachers to take leave from their schools to attend training. For many teachers it is difficult to leave their home, family, school and other obligations for an extended period. So, they did a study to explore innovative strategies, including distance learning and the application of ICT to serve educators in remote areas. They tried to examine the use of mobile connectivity in support of distance education because in Bangladesh there is high population density and wide mobile communication coverage. It had been hoped that because all of the participants were experienced phone users and mobile phone owners, they would be able to adapt to and easily integrate the Smartphone.

Most of the teachers are staying far away from the teachers' training colleges and also for different constraint like administrative, financial, time constraint and were also unable to receive any training due to family problems. So Distance Education has a great demand to them but the common problems of distance learners are that they have lack of personal contact and immediate instructor feedback, sense of isolation, lack of pre-course orientation and counselling sessions during course of study (Yousuf, 2006).

Thus, mobile learning can provide helps in various dimensions right from pre-admission counselling, admission, counselling, exams and results. The portability of mobile technology allows the learning environment to be extended beyond the classroom. There are several advantages inherent in mobile learning versus the Internet because it helps to raise self-esteem and self-confidence, cost is pretty affordable, not much technological pre-requisites, portable from one place to another and more wide spread and popular than internet. Mobile learning is more interactive, involves more contact, communication and collaboration with people (Georgieva, 2006).

This study intends to explore the background of remote areas English teachers in order to evaluate their access and acceptability in ICT and other media for developing a framework for virtual interactive teacher training programs.

OBJECTIVES

The present study is proposed to be undertaken with the following objectives:

- To analyse the access and acceptability of the remote areas English teachers' in ICT and other media and the need of teacher training through distance mode.
- To analyse existing teacher training approaches, curriculum, modules and audio-video programmes to develop a new approach to train English Language teachers of remote areas.
- To develop an appropriate and accessible model for teacher training using virtual interactive modes in ODL for the development of English teachers.

TOOLS AND METHODOLOGY

Samples of 819 respondents were selected for data collection consisting of 300 disadvantaged English teachers from 34 remote "Thanas" (Locales) of 15 districts of 6 Divisions. From the Teachers' Training Colleges of 13 districts, data were collected from 87 tutors and 292 students of Bangladesh Open University (BOU) Bachelor of Education (BEd) programme, 115 NGO professionals and 25 BOU teachers. All of the respondents were

selected randomly. Every attempt was made to ensure female teachers, students and tutors are represented.

Structured questionnaires were prepared for all the respondents. Interviews were conducted with individuals depending on their availability from the sample group.

The data were analyzed using both descriptive statistics and quantitative themes. From the opinion of the secondary English teachers their access and acceptability on ICT was identified and also a need analysis was done. The opinion of the BOU BEd tutors and students helped to identify the strengths and weaknesses of the existing English course of BEd program and also to evaluate their access in ICT. Lastly the opinion of the NGO professionals and BOU teachers along with literature helped the researcher to develop a framework of virtual interactive teacher training for the English teachers of remote areas.

IMPLICATIONS

It is hoped that the result of this study will encourage the policy makers to implement a new ODL approaches for the training of disadvantaged rural English teachers. It will have implications in the policy of BOU for developing partnership in teacher training with Government (GO) as well as Non-Government Organizations (NGOs). It will provide a valuable insight for all the stakeholders to help the disadvantaged and marginalized English teachers.

Present Status of the Remote Areas English Teachers of Bangladesh

Data were collected from 300 Secondary English Teachers of rural areas. Fifty nine percent of the respondents had teacher training degree whereas 41% did not have. Bangladesh Government provided short term training for different subject teachers and 62% of the respondents received that training. The teachers who did not receive any long or short term training they had some obstacles to receive that. Nearly half (40%) of the respondents faced administrative problems; (e.g., they were not given leave from their employment, or were excluded from selection because some areas were not using a fair transparent selection process). Furthermore 36% of the teachers could afford to lose their free time (which was spent providing private classes and tutorials) on training, as this additional money was required for basic livelihood needs. Another 12% had financial problems, so they could not receive any training and the final 12% could not participate in due to family constraints; (e.g., they had young children or they were not permitted by their families to attend training. Most (67%) of the teachers are residing at a distance greater than 20 kilometres from the teachers' training colleges whereas only 11% are residing closer than 10 km. In most of the villages the transportation system was not so good and costly, so it is problematic for them to go to the training centres every day from their residence. For all these reasons they felt necessarily of Distance Education which will help them to get training staying at home.

To evaluate the existing BOU TV and radio programme data were collected from them, 85% of the respondent watches BOU TV programmes but 15% did not. On the other hand 67% English teachers were listening BOU radio programme but 33% did not. Twenty one percent said the TV-radio programmes were poor quality and did not meet their needs and 68% stated that BOU should improve the quality of its programme. They said it is one way communication, so it creates boredom. To assess their access and acceptability some data were collected, which explored the following results. From the respondents almost all (97%) of the English school teachers of remote areas did not have access in internet, only a few (3%) had access in internet. This 3% of teachers found to live closest to the Dhaka division and were members of the younger group below 40 years of age.

Furthermore 85% of them have electricity at their school or workplace and 15% do not have. More than half (67.5%) of the respondents have access to mobile phone, 52% in TV, 9% in radio, 4% have computer and only 1% have computer with internet.

BOU students are predominantly rural students with little comfort with technology. However mobile phone is a familiar part of the lives of most teachers and Short Message Service (SMS) is highly cost-effective and very reliable method of communication. Clearly over 50% of the teachers would have no problems with the mode of delivery, having both access to a mobile phone and a television.

Forty-one percent of the teachers wanted to improve spoken and communicative English, with 16% only wishing help in spoken English, and only 3% wanted to develop their Listening, Speaking, Reading and Writing skills. Improvement of teaching was identified by the greatest demand was spoken English a total of 57%.

Existing Teacher Training Approaches, Curriculum, Modules and Audio-Video Programs

To review the existing BEd program data were collected through random sampling from 87 tutors and from 292 BEd students of 13 Teachers' training colleges. All of the BOU BEd tutors have Masters and BEd or MEd degree, because it is obligatory for the tutors of BOU BEd programme to have Masters with BEd or MEd. On the other hand among the sample students of BOU BEd programme, 80% were teachers and 20% were non-teachers and 65% have Bachelor Degree and 35% have Masters Degree.

About the English course of BEd programme, 41% tutors said that this course helps the teachers to increase the efficiency in English but nearly half (59%) thought the existing course does not improve capacity in English. On the other hand 34% teachers opined that this English course is helpful to make a good English teacher but 66% thought that it does not help to make a good English teacher. More than half of the respondents did not equate the course with the development of good English teaching skills and really pointed to the need to review outcomes and curriculum. The Tutors provided some suggestions to improve the courses. The majority of the respondents (52%) suggested to increase the duration of the English class, providing more tutorial sessions, 26% suggested to employ trained skilled tutors for teaching English and 22% suggested the use diversified and effective methods for teaching.

On the other hand, 59% students stated that the English course of BEd programme is suitable to increase the proficiency in English but 41% think it does not. Most (60%) of the students thought that this English course is suitable to make good English teachers and 40% thought this course is not helpful to make good English teachers. It is observed that students are more optimistic than tutors. To build up the efficiency in English (70%) students suggested providing more practical lessons in English where they will be able to practice the four language skills, 15% suggested giving emphasis on Grammar and another 15% suggested to build the foundation of English from elementary class.

Among the respondents only 54% are watching BOU TV program and only 30% listen to the radio programs. Ninety percent of the respondents suggested improving the quality of the TV and radio programs. They recommended a more interactive model, because the present situation is just one way communication resulting in boredom. They also suggested changing the broadcasting time from its current morning schedule when people are working to a time when the participants are in their home.

The majority (78%) of the tutors suggested providing TV and radio programme schedule to the students as well as tutors at the beginning of the semester.

Access in ICT

Among the remote areas English teachers most (67.5%) of the respondents have access to mobile phone, 52% have access in TV, 9% has radio, 4% has computer and only 1% has computer with internet.

Furthermore 25% tutors have access in TV and mobile or cell phone, 20% have radio, TV and mobile phone, 18% have TV, mobile phone and computer and rest 14% have TV, computer with internet and mobile phone at home. From the data of the students, it is observed that 92% has TV and mobile phone at home, 50% has radio and mobile phone, 20 has computer, TV and mobile phone, and only 9% has computer with internet, TV and mobile phone. It reveals a picture that most of them (the students, tutors of BEd programme and also the remote areas secondary English teachers) have access in TV and in a mobile phone.

Acceptability of ICT

Fifty six percent of the remote areas English teachers think that if BOU offer virtual interactive T. programme in which they will be able to interact through mobile that would be helpful for them. There is an overall fascination with Virtual Interactive Teachers' training especially because the majority of them access to be a mobile and TV, in fact these are the only pervasive technologies in rural areas. The table below shows that students of BOU have strong fascination to live TV, radio and in online interactive programs. Students are more positive to new technologies than tutors. Tutors have more interest to live TV programs and less interest to online interaction, they think in Bangladesh there is always power failure and most of the people do not have access in internet, so online interaction will not be feasible.

Table 1. Opinion regarding the usefulness and feasibility of ICT for virtual interaction

ICT	BOU BEd tutors	BOU BEd students
Usefulness of Live TV programme	93%	84%
Feasibility of Live TV programme	90%	92%
Usefulness of Live radio programme	67%	91%
Feasibility of Live radio programme	45%	91%
Usefulness of taking class through yahoo messenger or skype	62%	87%
Feasibility of taking class through yahoo messenger or skype	23%	84%

Framework of the Teacher Training Program for the Remote Areas English Teachers

Analyzing the views of the secondary English teachers of rural and remote areas, BOU BEd tutors, students, NGOs and BOU teachers we have come to the conclusion that everybody is feeling necessity of virtual interaction. Especially the secondary English teachers of remote areas have strong fascination for distance education programme which they will be able to do staying at home and not taking leave from the job. Through needs and situation analysis and also summarizing the opinion of the respondents following training structure could be proposed for the remote areas English teachers of Bangladesh.

From each village or Union one tutorial centre could be selected, it could be the coordinating office of BOU or any NGO office that has TV or computer with internet. A fixed time will be given for the students in the weekend and in that time they will come to the tutorial centre. One operator will work there, who will be trained by BOU, no tutor will be needed for those centres. Teachers of BOU and also the tutors of different TTCs will conduct the session. This tutorial session could be offered by TV or through Yahoo messenger and students will participate in the TV program using mobile because most of them have access in it. BOU can negotiate with different mobile company to reduce the charge for BOU students. If the

tutorial session is taken by Yahoo Messenger or skype, there could be the problem of power failure. To protect it IPS or generator could be used. Most of the teachers of BOU and the tutors of TTCs know how to operate computer, so there will be no problem at all to interact with the students through yahoo messenger or skype.

With the existing BEd course additional English course could be offered to develop the listening, speaking, reading and writing skills of the students. To develop their four skills some video CD could be provided which they will watch after finishing their class in those centres.

Students who have TV or computer at home they will be able to attend the class staying at home but those who don't have they will come to the tutorial centre. From the study it was observed that most of the teachers who are staying in the remote areas, they have access in TV and mobile. Mobile or cell phone has got access everywhere and it is affordable to everyone, even those who are living under poverty line, they can also afford cell phone. So it could be a very good media for virtual interaction. In the study it was observed that most of the developing countries have access in mobile but not in internet.

Exam will be conducted in different schools and colleges and the teachers of those schools or college will work as invigilator. All the four skills should be tested in the exam; otherwise they will ignore the skill which will not be tested.

This structure of training will help many people to be trained at a time and also it will help the remote areas English teachers to build up their efficiency in English and to get quality training.

CONCLUSION AND RECOMMENDATION

The main purpose of this study is to evaluate the access and acceptability of ICT to the remote areas English teachers, BOU BEd tutors, students, BOU teachers and NGOs to offer an ICT based teacher training program for the disadvantaged English teachers. It was observed that most of them have access in TV and mobile phone, so using those technologies and using the infrastructural facilities of BOU and NGOs, BOU can reach to disadvantaged people to provide them quality training. From the opinion of the existing BEd tutors and students the problems of existing BEd English curriculum, tutorial session and media programs were identified which will help to overcome the shortcomings and to improve the quality of the program to get a better result.

From the ICT policy report it was observe that with 27,000 schools in Bangladesh, teaching eight million students, ICT issues ranging from access, to professional development and infrastructure become magnified. Recognising how the opportunities afforded by ICT within a policy framework can help in this momentous task, Bangladesh intends to use ICT as the key-driving element for socio-economic development. In the ICT policy it was mentioned that a country-wide ICT-infrastructure will be developed to ensure access to information for all, empowering people and enhancing democratic values for sustainable economic development by using the infrastructure for human resources development, governance, e-commerce, banking, public utility services and all sorts of on-line ICT-enabled services. Furthermore, in order to utilize ICT fully, exploiting its immense potential in the economic, social, commercial, and scientific fields a National ICT Task Force headed by the Prime Minister has already been formed (ICT Policy: 2006).

Already mobile has created a good access for most of the people, so it is not far away to have access in computer or internet. So BOU need to take the challenge to offer virtual interactive teacher training program to train the disadvantaged unreached English teachers. Further research could be done to explore the scope and suitability to use cell phone technology in developing countries to make distance learning more interactive and to reach more students who are disadvantaged.

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EVALUATION OF FREE PLATFORMS FOR DELIVERY OF MASSIVE OPEN ONLINE COURSES (MOOCS)

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ABSTRACT

For the hosting, management and delivery of Massive Open Online Courses (MOOC) it is necessary a technological infrastructure that supports it. Various educational institutions do not have or do not wish to invest in such a structure, possibly because MOOCs are not yet part of official programs of universities, but initiatives by a particular teacher or a research group. Focusing on this problem, this study seeks to identify platforms that make it possible to create, host and provide courses free of charges for the offeror; find in the respective literature, the basic requirements for MOOC platforms and to evaluate the platforms based on the raised requirements. In order to identify the platforms, information was sought in scientific articles and websites dealing with the comparison of platforms and listing the existing MOOC providers. For the definition of evaluation requirements, there was a search in the Web of Science and Scopus databases, looking for the term "Massive Open Online Courses". After applying some filters, 62 works that address platforms and technology were selected for analysis. As a result there is the identification of six platforms that allow the free supply of courses, the proposal for 14 requirements for reviewing them and a frame containing the evaluation of the identified platforms. This assessment is important since it brings knowledge as a basis for selecting a platform that is the most suitable one in terms of the chosen structure and method to store, manage and deliver courses in MOOC format.

Keywords: MOOC platforms, MOOC, requirements, free platforms.

INTRODUCTION

The widespread availability of access to computing devices and the Internet allows educational resources and social media to create opportunities for new business models focused on education (Ahn, Weng, & Butler, 2013). The *Massive Open Online Courses* (MOOCs), have the characteristic of bringing disruptive innovation (Comeau & Cheng, 2013) into the educational system, as it happens whenever teachers adopt new technologies and innovative practices (Iqbal, Zang, Zhu, Chen, & Zhao, 2014). This transformation in education, as clarified by Sivamuni and Bhattacharya (2013), is not on Information Technology, but rather on the teaching and learning process.

The MOOCs, by being available to anyone with internet access, are considered a way to allow access to teaching and to democratize learning throughout life (Meyer & Zhu, 2013), since students do not need to attend physical institutions to have classes nor to pay any tuition (Chen, 2014), creating opportunities for knowledge socialization (Stuchlikova & Kosa, 2013). In educational institutions, this new course model emerges at a time when institutions are committed to attracting new students (bypassing geographical barriers), reducing educational costs and reusing existing materials.

The MOOC is an open course at no cost to the learner (Chen, 2014). However, it does not mean this model offers no cost to those who produce them and make them available. Simultaneously delivering a course to thousands of user needs, besides a technical staff for its production and support (Claros et al., 2013), a robust and scalable technology infrastructure (Meinel, Totschnig, & Willems, 2013). MOOCs can also be seen as a new business model. To this end, there are some issues to be discussed, being among them the financial viability and long-term sustainability.

Regarding technology, Clarke (2013) emphasizes the need for strategic investments in necessary infrastructure for the availability of MOOCs. However, not all educational institutions can afford or are willing to make such investments, as open education are not often part of official programs at universities (Claros et al., 2013) but initiatives by a certain teacher or a research group. This work intends to act in this scene of budgetary and structural constraints experienced by several universities, which prevents the expansion of an adequate infrastructure for the provision of MOOCs.

While building, deploying and maintaining learning environments dedicated to host MOOCs require a large amount of financial resources, the use of open platforms can help reduce these costs by providing subsidies for their storage and management (Claros et al., 2013). Thus, it is possible to build MOOCs focusing efforts and resources on the production of materials and not on the technological infrastructure needed to store, manage and deliver the course to the interested public.

The MOOC platforms are a central access point which has the function of managing MOOC courses (Jurado & Redondo, 2014). These platforms are not different from the traditional Learning Management System (LMS), regarding the tools to control the participants and the distribution of course content. The main difference is in the ability to handle thousands of students simultaneously accessing the environment (Gillet, 2013), apart from copyright and cost policies, exclusivity and ownership of course participants' data (Johnson, Prandoni, Pinto, & Vetterli, 2013).

Considering a technological approach and the context of educational institutions that do not have infrastructure to deposit MOOCs, we ask: how is it possible to identify and evaluate platforms that make it possible to store, manage and deliver courses for free?

Considering this research question, the article aims to: a) identify the platforms that make it possible to store, manage and deliver MOOCs for free; b) locate, based on literature, the basic requirements for MOOC platforms and; c) evaluate the platforms based on the identified requirements. For this purpose, it is initially presented a literature review on MOOCs and the MOOC platforms available for hosting and managing courses. In the sequence, this paper brings the works related to this research, the methodological procedures and, finally, the achieved results and closing remarks.

LITERATURE REVIEW

The MOOCs, as the name suggests, are courses designed to meet a large number of students geographically dispersed (Stuchlikova & Kosa, 2013). These courses integrate social networks, online resources and trained teachers in the study area (Clarke, 2013). Also, they take advantage of universities' expertise when it comes to distance education.

The term MOOC was coined by Dave Cormier and Bryan Alexander (Iqbal et al., 2014) to describe the course called "Connectivism and Connective Knowledge" in 2008 (Stuchlikova & Kosa, 2013). However, the term raised widespread interest in 2011 when the course "Artificial Intelligence" was offered by Sebastian Thrum. In this course there were more than 160,000 participants from 190 countries, and 23,000 of them completed it (Iqbal et al., 2014).

The MOOCs can be classified into two main pedagogical trends: xMOOCs and cMOOCs. The first follows a behaviorist pedagogy focused on the content or the teacher (Chen, 2014). The second one is focused on the connectivist approach and has a sophisticated and innovative way of learning: based on students' connection (Estévez-Ayres, Crespo-García, Fisteus, & Kloos, 2013). The central idea of the connectivist approach is that knowledge can be transmitted through the network connections (Rogers, Chan, & Isom, 2007), resulting in learning viewed through the learner's ability to establish and use networks (Leontyev & Baranov, 2013; Rodriguez, 2013, 2014).

The concept of MOOC is presented as a model for open courses, which means that anyone can join it and have access to its material and activities, without paying anything for that. However, several institutions charge those who wish to obtain a certification. Moreover, it is participatory and distributed because it enables the exchange of ideas among participants and access to the used materials (videos, links, texts), creating a network of connected content (Vaidya & Paranjape, 2014). It is not the purpose of MOOCs to replace formal education but to be an alternative to traditional training, expanding learning throughout life.

There are a number of terms that designate the location where MOOCs are stored, managed and made available. The most common ones are MOOC services and MOOC and LMS providers (Sivamuni & Bhattacharya, 2013). This work will use the term MOOC platforms for understanding that they are entities – online education websites (Pernías Peco & Lujan-Mora, 2013) – that provide a storage system, allowing the management of the entire life cycle of a course and making MOOCs available to a group of participants.

Such platforms are intended to provide independent producers' courses or courses in collaboration with universities (Chen, 2014) and they connect teachers and learners, supporting the entire MOOC cycle. Therefore, Coursera and edX are regarded as the main platforms for MOOCs (Iqbal et al., 2014).

In turn, the LMS systems (such as Moodle, Blackboard and Sakay) are more complete systems than those used in some MOOC platforms, especially when it comes to targeted tools for the design of activities (Kay, Reimann, Diebold, & Kummerfeld, 2013). However, they present scalability problems because they were not designed to support access by thousands of students at the same time (Pernías Peco & Lujan-Mora, 2013). Even with this limitation the Moodle, for example, is being used by some MOOC platforms as an open source management system.

There are currently three ways to store, manage and deliver MOOCs: The first possibility is the offering institution having its own technological infrastructure. This demands high initial

cost to implement, but enables access and complete control of all technology used. The second alternative is to adhere to proprietary platforms that require, in most cases, signing a contract, a partnership agreement and/or the payment of fees for maintenance. The third possibility is to opt for platforms that allow that the courses are available at no cost to the issuer (Pernías Peco & Lujan-Mora, 2013). All of them have advantages and disadvantages that should be evaluated by the course syllabus production team.

Related Works

When it comes to works related to this research, there is the use of open services in which Claros et al. (2013) sought to integrate the freely available tools in an online educational system. In contrast, Gillet (2013) focuses on the development of personal learning environments in order to assist teachers and learners in the aggregation of the free resources available on the Web – as Twitter, YouTube and Facebook – to their MOOCs. Sivamuni and Bhattacharya (2013) highlight a nomenclature on MOOC in their work, in which they include platforms, and also bring an analysis of different existing MOOC providers.

Regarding the definition of requirements, there are three relevant researches: the one by Leontyev and Baranov (2013), which evaluated chemistry courses available on different platforms, based on key attributes for MOOCs listed by the authors; another by Pernías Peco and Lujan-Mora (2013), in which the authors describe the construction of a course using Google CourseBuilder and then evaluate the platform and; one by Meinel et al. (2013) that highlights the important requirements for a virtual MOOC environment. Following, the methodological procedures adopted in this research will be presented.

METHODOLOGICAL PROCEDURES

This work is characterized as a predominantly qualitative research and it is divided into three steps outlined below.

Selection of MOOC Platforms Available for Use

For the selection of MOOC platforms that allow storing, management and delivery of courses for free, the following procedures were taken:

- Search for MOOC platforms: this search was performed in scientific papers, on websites that deal with the comparison of platforms, on sites that link existing MOOC providers and on Google search environment using the terms "Aggregate MOOC", "MOOC Platform" and "MOOC Provider". This step was completed in November 2015 and identified 53 operative MOOC platforms.
- Selection of platforms that allow storing, management and delivery courses for free: in this phase the following criteria were applied: a) Removal of MOOC platforms whose interface is in Mandarin, Korean and Japanese; b) Removal of platforms that clearly do not offer the possibility of including courses for free; c) The application of the criteria I and II resulted in the elimination of 31 platforms, leaving 22 of them. Of those, only 06 had, on their websites, the information that courses could be freely added in their platform. For the other 16 ones, it was necessary to get in touch with the providers to ask about the possibility for the courses to be available on the platform at no cost to the issuer. After ten working days, given as a waiting period for the reception of responses, nine platform providers responded to questioning. Three reported that they offered the service for free. Thus, those platforms that did not respond to the contact and also those that do not allow courses to be freely disposed were withdrawn from the analysis set.

- **Of the nine identified platforms, it was found that three did not offer to the user the possibility to create courses via interface. For those, access to a course as a teacher or administrator was requested in order to fully test and evaluate the functionality of the platform. In such case, the three platforms were removed from the final analysis because: they required filling a form for further feasibility analysis; they asked the course developer to take a prior course, offered by the platform provider, before releasing the course or they did not offer a position to specifically assess their platforms. Thus, six platforms remained for analysis.**

Identification in the Literature of Requirements for the Evaluation of Platforms

Once the platforms to be evaluated were selected, the second stage of the research began: to identify basic requirements for the evaluation of platforms in the scientific literature. To this end, a survey was initially performed using the term "Massive Open Online Courses" in Scopus and Web of Science databases on July 13, 2015. The search was restricted to studies published up to December 31, 2014 in the languages English, Spanish and Portuguese. From the selected works, those who were out of context and that did not provide the full text to read for free were removed, thus forming a set of 294 publications for analysis.

From the reading of the title, keywords and abstract and, in case of doubt, the full text, the works were classified into macro themes. For this study, 62 publications dealing with the subject technology were selected and the requirements for the evaluation of platforms were extracted from them.

Evaluation of MOOC Platforms Using the Requirements Determined in the Previous Step

After identifying the platforms as described in Step 1 and confronting them with the requirements set out in Step 2, it was possible to assess the raised platforms, which offer free storage, management and delivery of courses in MOOC format, in order to check whether they satisfactorily meet those requirements. In order to facilitate the evaluation of the requirements, for each platform was created a fictitious course containing the following features: a) a forum; b) a text containing an image; c) a link to a video filed in <http://vimeo.com> site; d) the creation of a questionnaire type activity.

RESULTS

The outcomes of this research will be shown in three parts: the first one deals with presenting the MOOC platforms selected in this research that allow storing, managing and delivering MOOC courses at no cost to the issuer; the second one sets the minimum requirements identified in the literature for the evaluation of platforms; finally, the third one is dedicated to the evaluation of platforms using the requirements.

MOOC Platforms

After the application of the different criteria for selection, defined in the methodological procedures in Table 1, it is shown the selection of platforms that allow storing, managing and delivering courses for free, with a brief description of each one.

Table 1. Selected platforms

Platform	Description
Open Learning	The Open Learning (https://www.openlearning.com) started at the University of New South Wales in Australia, as a startup. Currently it has more than 1040 courses, in various areas of knowledge, in different languages and it has about 125 thousand users. It enables a person - or group of individuals - unlinked from a university to create courses and make them available on the platform. The platform establishes a 10% rate of value if the issuer chooses to offer paid courses or monthly values for priority support. E-mail support is offered for free (OpenLearning, 2016).
CourseSites	The platform CourseSites (https://www.coursesites.com) was made available by Blackboard in February 2011 (Tekdal, Baz, & Catlak, 2015) and it enables people, connected or not to educational institutions, to create and offer courses for free. Currently it has over 12,000 registered institutions in 129 countries. The platform is free for teachers and students, without any fees for the implementation of the courses. However, for institutional use a licensing agreement is required. Support is offered for free to teachers and students, via chat, phone or email (CourseSites, 2016).
P2PU (Peer 2 Peer University)	The platform Pear 2 Pear University (https://courses.p2pu.org) was founded in 2009 by Hewlett Foundation and Shuttleworth Foundation. Besides offering MOOCs, it also provides an opportunity to anyone who is willing to teach and learn, to do it online and for free (Yuan & Powell, 2013). The technology used is open to allow experimentation and continuous improvement. The business model is based on users' donations (Tovar, Dimovska, Piedra, & Chicaiza, 2013).
Versal	Versal (https://versal.com/) is a North American platform maintained by the Versal Foundation, focused on interactivity and co-creation of courses (Kesselman, 2014). It has two versions: one facing the educational context and another for business. The platform is free for those who want to create public courses. As for the private courses, to access students' progress assessments and for centralized management of schools, an annual fee is required (Versal, 2016).
Udemy	The platform Udemy (https://www.udemy.com/) was launched in 2010 by Eren Bali, Oktay Caglara and Gagan Biyani in the US with an investment of 16 million dollars of venture capital (Wilson & Gruzd, 2014; Yuan & Powell, 2013). Currently the platform has more than nine million students and 35,000 courses in over 80 languages. For paid courses, Udemy charges 50% marketing fee for management and for each student captured by the platform (Udemy, 2016).
Eliademy	The platform Eliademy (https://eliademy.com) was founded by Sotiris Makrygiannis and Sergey Gerasimenko in 2012 in Finland. Its system is based on LMS Moodle and it is available in over 19 languages, including Latin (Tanas, 2015). The platform may be used by schools and universities to create and deliver online courses, acting as a content repository and provider. In order to use the Premium version, that is, to offer private courses, it is necessary to pay a monthly rate for each student in the courses (Eliademy, 2016).

Please note that the platforms mentioned here do not require prior contract, agreement or partnership between the parties, that is, anyone who wishes to offer a course, can simply do it by creating a profile and accessing the area of creating courses.

In order to compare the platforms and identify the one that best suits the MOOC course issuer's needs, it is necessary to identify requirements expressing the basic conditions that a platform should provide. Overlooking this, it was sought to identify such requirements in the scientific literature, and they will be presented in the next topic.

Requirements for Platform Evaluation

Accreditation: Accreditation refers to the student's possibility to receive a certificate after the course, once they have carried out the activities planned with a predetermined quality level. Nkuyubwatsi (2013) and Nkuyubwatsi (2014) point out that accreditation is as important as their own open course, because students can expand their participation by improving knowledge about a certain subject and thus prove participation. In this requirement, it shall be assessed whether the platform offers the possibility for the issuer to allow the student to obtain a certification at the end of the course, whether paying or not for it.

Accessibility: Accessibility means that anyone is able to perceive, understand, navigate and interact, as they can also help others through MOOC platforms (Caballe, Britch, Barolli, & Xhafa, 2014). Therefore, a platform should offer any person with an Internet access device, whether or not the bearer of special needs, the possibility to build and accomplish a course (Vaidya & Paranjape, 2014). So, this requirement should assess if the platform is accessible and visible on computers and mobile devices. In addition, it is necessary to verify whether the platform interface offers the possibility to select the language, so that the users can choose the one they are most comfortable with.

Usability: For Fini (2009) usability is the ability humans have in using a system in a facilitated way, with effectiveness and efficiency. The platform should offer intuitive and useful tools for editing and structuring content, encouraging its use, keeping a familiar environment for users and reducing the cognitive load of learning that involves its use (Meinel et al., 2013). To assess the MOOC platforms, it is suggested to use the System Usability Scale (SUS), a questionnaire developed by Brooke (1996) in order to verify the level of usability of a system. For the overall score, the criteria set by the NHS are applied and the final value can range from 0 to 100. The higher the final value, the higher the usability rate.

Information security: A critical aspect in MOOC platforms is the security of information, i.e., only administrators and teachers are able to create, modify or delete course content. On the other hand, students interact in basic form – participating in forums, answering questionnaires, writing collaborative texts – and only in specific situations they are allowed to create resources (Montes et al., 2013). The authentication of a system is another important point to ensure that personal information and course materials are not deleted or improperly modified (Miguel, Caballé, & Prieto, 2013). For such reason, this requirement evaluates whether there is a need of a password to access to the course in order to verify the user's identity and whether there are rules to differentiate teachers' access from students' access.

Platform policies related to costs and copyright: According to Johnson et al. (2013) and Chen (2014) platforms typically offer the same tools, but what changes are policies for author's rights on materials produced and costs so that "something more" is available. In this requirement, it should be assessed whether the platform has clear information on the policies of costs and copyright of the deposited material.

Interaction/collaboration tools: Interaction and collaboration are key elements to make the environment dynamic in order to increase student's permanence and achievement in a MOOC (Meinel et al., 2013). An interactive and collaborative environment enables participants to work together in a space where communication is fluent (Claros et al., 2013). For that

reason, the platform needs to offer communication tools that enable the collective participation of a large number of students, such as forums or the Web 2.0 (Ahn et al., 2013; Claros et al., 2013; Montes et al., 2013). Therefore, in this requirement it should be assessed whether the platform provides a forum tool for student-student and student-teacher communication.

Report submission tool: Sending mass email allows reports to be issued to participants enrolled in the course in an easier way (Pernías Peco & Lujan-Mora, 2013). In this requirement, it should be assessed if the platform offers the possibility to send e-mails to students enrolled in the course.

Content management tool: The platform should allow access to course materials in an easier way in order to attract participants for a positive online experience (Meinel et al., 2013). To do so, it should support the distribution of multimedia content and provide resources for administration (Montes et al., 2013). In this requirement it should be assessed whether the platform offers the ability to incorporate video, text, audio and images, besides allowing the connection of external tools, such as YouTube, Vimeo, Quizlet, Google Docs, Dropbox, Wikipedia, Slideshare and Prezi, to the MOOC that will be available on the platform.

Activity tool: According to Meinel et al. (2013), a platform should offer support to the learning process, allowing learners to test new skills and evaluate their progress in the course by means of activity resources. Therefore, in this requirement it should be assessed whether the platform offers a tool for providing online exercises.

Course schedule management: For Meinel et al. (2013) a platform should enable the management of course schedule. Therefore, in this requirement it should be assessed whether the platform allows the settings of course start and completion dates, as well as of deadlines for the submission of activities.

Tools for managing participants: A MOOC platform should offer features that enable teachers and administrators to manage course students, as said by Montes et al. (2013). Moreover, it should provide reports of students' activity and access. Assessing, monitoring and analyzing MOOC participants' activities is extremely important, to help improve course and content organization (Claros et al., 2013). In this requirement, it should be assessed whether the platform provides access statistics tools and reports of students' activities in the course.

Gamification tool: The Karma points (that the participant gets through positive feedback from other participants) and Badges (which are issued automatically by the platform when a certain goal is achieved) are motivational systems that encourage learning and collaboration throughout the course (Al-Atabi & Deboer, 2014; Anderson, Huttenlocher, Kleinberg, & Leskovec, 2014). The greater the number of Karma and Badges, the higher are the chances of getting prizes or even credibility within the community (Martín-Monje, Bárcena, & Read, 2014). In this requirement it is assessed whether the platform offers Karma or Badges scoring mechanisms.

Connection with social networks: Social networking platforms are characterized for allowing high interaction among participants, enabling understanding, mutual aid and participation in learning activities (Claros et al., 2013). According to Meinel et al. (2013), the platform should

facilitate a network among participants and should not block the user in their own limits, but allow them to connect their learning experience with their social networks. Therefore, in this requirement it should be assessed whether the platform offers the possibility to connect with social networks, as Facebook and Twitter.

Course visibility/dissemination (Marketing strategy): According to Johnson et al. (2013) and Pernías Peco and Lujan-Mora (2013), MOOC platforms contribute to increase the visibility of the institutions and of the courses kept by them. For such reason, in this requirement it is assessed whether the platform offers a list of provided courses, so that the interested parties can quickly choose and attend the ones desired. Table 2 summarizes the requirements for the assessment of MOOC platforms.

Table 2. Summary of requirements

Accreditation	R1. It makes it possible for students to generate a certificate of course completion.
Accessibility	R2.1 Accessible and visible on computer and mobile devices. R2.2 It makes it possible to change interface language.
Usability	R3. Level of usability.
Security	R4.1 Password requirement. R4.2 Control of access level.
Platform policy	R5.1 Cost information. R5.2 Copyright information.
Interaction/collaboration Tool	R6. Provides a forum tool.
Report submission tool	R7. It makes it possible to send e-mails to learners.
Content management tool	R8.1 It makes it possible to add texts, videos, audios and images. R8.2 It makes it possible to connect (embed) external tools.
Activity tool	R9. It provides tools for creating online exercises.
Course schedule management	R10.1 It makes it possible to set course start and end dates. R10.2 It makes it possible to set the deadlines for sending activities.
Participant management tool	R11.1 It has access statistical tools. R11.2 It has student activity report.
Gamification tool	R12 It has scoring mechanisms (Badges ou Karma).
Connection with social networks	R13 It makes it possible to connect the course with social networks
Course visibility/dissemination (marketing strategy)	R14 It offers a list of provided courses.

Platform Evaluation

The platforms were evaluated in January 2016, according to the procedures already described in the previous section. It should be noted that the course made available in the platforms was created only for testing and it was not available to the public. Table 3 presents the evaluation of each platform according to the established requirements.

Table 3. MOOC Platform evaluation

Requirements	Open Learning	CourseSites	2PU	Versal	Udemy	Eliademy
R1	✓	✗	✗	✗	✗	✓
R2.1	✓	✓	✓	✓	✓	✓
R2.2	✗	✗	✓	✗	✓	✓
R3	82.5	75.6	65.6	83.8	67.5	87.5
R4.1	✓	✓	✓	✓	✓	✓
R4.2	✓	✓	✓	✓	✓	✓
R5.1	✓	✓	✓	✓	✓	✓
R5.2	✓	✓	✓	✓	✓	✓
R6	✓	✓	✓	✓	✓	✓
R7	✓	✓	✗	✗	✗	✓
R8.1	✓	✓	✓	✓	✓	✓
R8.2	✓	✓	✗	✓	✗	✓
R9	✓	✓	✗	✓	✓	✓
R10.1	✓	✓	✓	✗	✗	✓
R10.2	✓	✓	✗	✗	✗	✓
R11.1	✓	✓	✗	✗	✓	✓
R11.2	✓	✓	✗	✗	✓	✓
R12	✓	✗	✓	✗	✗	✗
R13	✓	✗	✓	✓	✗	✓
R14	✓	✓	✓	✓	✓	✓

Legend: ✓ It meets the requirement ✗ It doesn't meet the requirement

It is important to emphasize that only the Udemy course needed to go through quality assessment by the team responsible for the platform before being made available to the public. This platform is targeted to people who want to easily build their courses and offer them to the public free of charge or through payment. For convenience, the platform offers a variety of information that assist in the creation and delivery of materials by teachers.

It is noted that the platforms Open Learning, CourseSite, Udemy and Eliademy were built for the purpose of controlling the entire process of MOOC production and providing. On the other hand, P2PU and Versal, in their free version, are characterized by a fast and easy availability of materials created by the teachers, but they are not so careful to manage participants or dates.

As for advertising, Udemy and Open Learning platforms regularly send e-mails to registered users, promoting their courses. There are also applications (apps) that may be freely installed, making it easier the interaction with users that have mobile devices.

CourseSites, due to its LMS Blackboard origin, offers a wide variety of tools that other platforms do not have which may require the users a higher cognitive load for learning in the platform. On the other hand, Eliademy and Open Learning are platforms that have fewer resources for making content and tasks available, which may require the users a lower cognitive load for learning in the platform. It is important to emphasize that CourseSites is the only platform that offers the possibility to incorporate materials in SCORM format.

Therefore, evidences indicate that Open Learning and Eliademy are the platforms meeting the greatest number of requirements, the first one not meeting only the R12 requirement concerning gamification tools. It is also worth noting that the Eliademy platform scored highest in the usability requirement. However, it is worth noting that the issuer of courses in MOOC format needs to select a platform that is more appropriate to the structure and chosen method, taking into account the most important requirements for that particular context.

CONCLUSION AND FUTURE STUDIES

This study aimed to identify platforms that enable hosting courses for free, to set requirements for measuring platforms and to evaluate them. From the data obtained in this work, developers can assess the advantages of running their courses on their own platforms or on free MOOC platforms.

A limitation of this article is regarding the usability evaluation of MOOC platforms. The usability of a platform is difficult to measure and may vary according to the user's understanding, experience and ability in dealing with technology. Therefore, in this work, evaluating the usability was restricted to researchers. Each one made their evaluation separately and the overall SUS score had its origin in the average score of the evaluations. For future work, it is recommended to have a greater number of users evaluate this requirement, with their different perceptions regarding the use of technology and, thus, it may bring a more reliable assessment of the usability of platforms.

Another point to be highlighted in the development and availability of a MOOC is the platform scalability. Scalability is the ability that the system has to extend its capacity as the number of users grows. Without this capacity, systems cannot support large number of users accessing the course at the same time, thus requiring expansion (Pernías Peco & Lujan-Mora, 2013). Even though it is considered an important requirement, scalability evaluation is not possible due to the need of access to servers in which platforms are hosted in order to perform load tests.

All platforms selected in this work require that the issuer fits the rules of use established by the portal for building materials. There is no freedom to go beyond what is offered. In

addition, there is always the question of how long the services will be offered for free. So it is important to make a careful analysis of the platforms in order to select the one that best suits the MOOC producer's needs.

Finally, it is believed that this work can help those who do not have adequate technological infrastructure to store, manage and provide a MOOC and wish to contribute in order to democratize knowledge and promote global citizenship. The paradigm of online learning is still new, but it has already been influencing the teaching and learning ways. So, having a platform that can adequately meet both teachers' and students' expectations is the first step to make knowledge a public good.

Future studies will assess free tools that allow the installation of MOOC platforms in institutions' own servers, allowing their full management, as it occurs with TIMTEC platform (Ribeiro, Catapan, Roncarelli, Vanzin, & Silveira, 2015).

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MULTIPLE ACCESS POINTS WITHIN THE ONLINE CLASSROOM: WHERE STUDENTS LOOK FOR INFORMATION

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ABSTRACT

The purpose of this study is to examine the impact of information placement within the confines of the online classroom architecture. Also reviewed was the impact of other variables such as course design, teaching presence and student patterns in looking for information. The sample population included students from a major online university in their first year course sequence. Students were tasked with completing a survey at the end of the course, indicating their preference for accessing information within the online classroom. The qualitative data indicated that student preference is to receive information from multiple access points and sources within the online classroom architecture. Students also expressed a desire to have information delivered through the usage of technology such as email and text messaging. In addition to receiving information from multiple sources, the qualitative data indicated students were satisfied overall, with the current ways in which they received and accessed information within the online classroom setting. Major findings suggest that instructors teaching within the online classroom should have multiple data access points within the classroom architecture. Furthermore, instructors should use a variety of communication venues to enhance the ability for students to access and receive information pertinent to the course.

Keywords: Information placement, classroom design, online classroom, student preference.

INTRODUCTION

Student engagement is a vital element in determining student achievement and success in the online classroom (Handelsman, Briggs, Sullivan & Tower, 2005; Wei, Chen, & Kinshuk 2012). With the continued growth of online education across the world, it is important for educators to gain an understanding of the impact of student's interactions with course content as it directly affects student learning and engagement (Murray, Pérez, Geist, Hedrick, & Steinbach, 2012). However, what precedes the ability of students to be able to be engaged in the learning

process of the online classroom is that students must first be able to find the critical information that allows them to be successful in the course. Where students look for, find, and ultimately choose whether or not to utilize the information is intertwined with other elements such as course design, teaching presence, and instructor information placement. Recent advances in technology only serve to magnify the urgency in garnering further understanding of the ideal ways to deliver course materials to better support the learning process (Murray et al., 2012).

COURSE DESIGN

Course design is one element of the information searching process that needs to be included when regarding information placement in the online classroom. Instructors are often not included in the design process which is why information placement can be critical to student's success. Kamlaskar and Killedar (2015) discussed how many schools have developed a "Teaching-Learning Process" model that consists of many components, but most notably is the delivery of information element. Additionally, when designing any online learning curriculum, there comes a choice of what elements to include that will engage the learner. Lister (2014) analyzed 17 studies on course design derived from 14 different peer-reviewed educational technology journals, to attempt to identify patterns or common themes that could emerge from the studies regarding e-learning and online courses. The findings of analysis suggested four major themes in the design of online courses: 1) course structure 2) content presentation, 3) collaboration and interaction and 4) timely feedback. Consequently, regardless of the course design instructors can control the content presentation, timely feedback, and interactions (Lister, 2014).

One study investigated the student's patterns of accessing course content and other materials to support the learning process and found that the increased access and convenience are often the most selected reasons for placement (Murray et al., 2012). Another study confirmed this by determining that the ease of navigation and course design are prominent predictors of the ability for a positive e-learning experience (Salyers, Carter, Carter, Myers, and Barrett, 2014). A common result emerged from the studies determined that many online students have busy lives and want the easiest route to course material. Knowing this, it becomes crucial for instructors to make the pertinent class materials easy for students to access. Finally, evidence from studies has denoted that in effective, well-designed online courses where engaging interactions occur between teachers, students, and content, students have been able to outperform students in comparable face-to-face classes (Salyers et al., 2014).

Teaching Presence

Garrison, Anderson, and Archer (2000) found that learning occurs in a community through three core elements of teaching presence, social presence, and cognitive presence that form the Community of Inquiry. Instructors can use teaching presence to set clear expectations as to where students can find relevant information. One suggestion is to set the tone for the class by planning the first exercise. Kamlaskar and Killedar (2015) explain how the objective of the first exercise is to build confidence in the teacher by displaying that the teacher is supportive, engaged, approachable and available. It also allows the teacher to set clear expectations as to where students can find certain valuable materials in the online classroom such as the syllabus, additional instructions, multimedia and other necessary resources.

An analysis of 17 different studies identified content presentation and interaction as the crucial elements in designing online courses (Lister, 2014). However, these items can also relate to a strong teaching presence component as well. The analysis indicated that students preferred a choice in content which could include a selection of the presentation of content such as posting information in various places in the online classroom to give students choices. Murray et al.,

(2012), found that students reported a tendency only to retrieve content that directly correlated to them receiving a good grade, or that was perceived to be necessary to complete the course. Hence, it becomes of extreme importance for instructors not to bombard students with unnecessary content. Also, Murray et al., (2012) determined that students in the online environment are often limited to time constraints causing students to access the materials that they perceive as useful. Thus, it becomes imperative for instructors to place pertinent information in places where students are most likely to access them.

Additionally, the study confirmed the importance of students being able to find educational materials to achieve the preferred learning results (Brown & Voltz, 2005; Murray et al., 2012). Students reported the propensity to repeat their access to course content while continuously finding content that they determined tied directly to their course outcome (Murray et al., 2012). This further solidifies the importance of instructors in ensuring that students understand where they can find the content necessary to help them be successful. Finally, the placement, modality and delivery of information become a vital piece of ensuring student success.

Instructor Information Placement

One of the most important aspects of communicating information to students within the online classroom is the instructor's introduction to students into the classroom (Joyner et al., 2014). An effective modality to send this welcoming message as noted by (Glikson, & Erez, 2013) is by the course email system. The welcome message can either be accomplished through communicating with the student via a message sent through some in class email system or a student personal email account. Welcoming new students to an online course can help alleviate preconceived notions that the online classroom is an unwelcoming and esoteric space in which students will have little, if any, interaction with their instructor (Gedera, 2014). The welcoming message can serve as an area to introduce students to the expectations of the course, directions for assignments, as well as provide insight on how to access materials related to the course (Ryman, Burrell, & Richardson, 2009). As deNoyelles, Mannheimer Zydney, and Baiyun (2014) indicated, an instructor introduction can provide information about classroom behaviors, set the tone for relationships, and communicate classroom policies to students. The welcoming email message should provide both supportive and instructional information to help students familiarize themselves with the class and develop a sense of belonging (Ryman et al, 2014). At an optimal level, an effective introduction provided by the instructor can relieve student fear, develop a positive rapport, and lessen the instructor workload concerning questions relating to accessing information throughout the duration of the course.

Providing ongoing communication is another important aspect of information communication as indicated by the literature. Joyner et al. (2014) indicated ongoing communication is crucial for providing updates about the class, where to access newly uploaded information, and general updates relating to course progression and student progress. The use of discussion forums or other asynchronous public forums within the online classroom provide an efficient area for instructors to communicate continually with their students (Stone & Chapman, 2006). Ongoing communication has the potential to increase student engagement in the class, which could help increase student success and lessen attrition rates. Delivering additional content is a critical function of ongoing communication (Stone & Chapman, 2006). Ongoing communication can help the instructor include content that meets the students' needs as the instructor increase his or her understanding of student informational needed, which, in turn, helps the instructor localize informational context and deliver to the proclivities of students.

The individualization of information is critical toward increasing viewership as students are increasingly demanding a personal approach to online learning (Gallien, & Oomen-Early, 2008). By personalizing information, instructors can increase the level of engagement with students that can induce an edifying dialogue about the course between the instructor and student (Ryman et al., 2009). Providing ongoing communication can help lessen many of the obstacles presented to the instructor in the online classroom setting and create a more edifying and friendly milieu for online students, which has the potential to increase the effective transfer of information within the online classroom environment.

The third important aspect of providing information to students within the online classroom setting entails the guidance provided by instructors. As the online classroom can be a complex and confusing environment for students. Thus, the promptness of instructors' response to student questions about information is important. Byron (2008) indicated instructors should respond to the question posed by students within 48-72 hours. Responding to student questions promptly, allows instructors to lessen the confusion students might have as well as provide guidance about how to access information about the course to decrease the need for future questions (Skinner, 2007). Creating learning communities in which students support one another and provide information is another route to providing effective information communication. Instructors can help create peer-to-peer learning areas where students both post and answer questions concerning information about the course (Ryman et al., 2009). By establishing and encouraging the use of peer-sharing areas, instructors form a sharing-oriented environment. As Brindley, Walti, and Blaschke (2009) noted, part of the process of guidance within the online classroom setting is creating an atmosphere in which communication, collaboration, cooperation, and community can develop. The effective guidance provided by instructors can help students feel comfortable in asking questions, encourage students to ask each other questions, as well as develop a milieu in which question students proactively seek out information about the class rather than being passive consumers.

Although the architecture of various online classrooms can and do vary, using the communicational tools embedded within the Learning Management Systems (LMS) can help instructors convey information to students in an effective manner. Most online classrooms have an intercourse email system, which allows instructors to contact students directly and privately, and instructors can use this feature in their efforts to communication information (Byron, 2008). As deNoyelles et al. (2014) indicated, students tend to be receptive and are likely to view emails sent directly to them as they feel there is a personalization of the information included in the email. Communication to the entire class, conversely, can require a different use of communicational tools in the online classroom setting. Skinner (2007) asserted that discussion forum areas in which communication is open to all students could be an effective area to provided general information pertinent to the course. This avenue of communication affords instructors the opportunity to provide course-wide information, without the need to contact students individually (Fullick, 2006). The effective use of the communicational tools provided within the LMS can allow instructors to communicate valuable information easily to students within a public forum that accessed easily and frequently by students, increasing the likelihood of students viewing and acting upon the information provided.

METHODOLOGY

The purpose of this study is to determine the ideal locations for placing classroom materials for optimum student view. The framework of the study used qualitative research methodologies. The study was undertaken to answer two specific research questions. The following are the two research questions for this study:

R1: Where do students look for information in the online classroom?

R2: What is the optimum location for instructors to place pertinent information?

A six-question survey was created to answer these questions using SurveyMonkey. The questions were designed to identify the informational access points used by students within the confines of the online classroom architecture. In the first question, students indicated in which course they were enrolled. The other five questions were open-ended questions that sought to provide a critical evaluation of where students go in the online classroom. Due to the open-ended nature of the questions, students had the ability to provide multiple answers (or informational access points) to each question.

The target population included students from three classes in the first year sequence of undergraduate courses from one small university in the Southwestern United States. Of the 72 students invited to take part in the survey, 43 responded, amounting to a 59.7% response rate as noted in Table 1.

Table 1. Participatory Data

Section	Total students in class	Number of students who took the survey
Class #1	26	13
Class #2	23	13
Class #3	23	17

RESULTS

The results of the survey indicated that students prefer to receive information from multiple sources within the classroom architecture, and will access information in multiple areas within the classroom setting. Students, according to the survey results, were satisfied with the current ways in which they received and accessed information within the classroom setting. However; one possible reason for preferring various information receiving and accessing areas relate to the diversity of the online student population, were competencies regarding online classroom technology as well as familiarity with the classroom setting are diverse (Kuo, Walker, Belland, & Schroder, 2013). Many online students also have experience with multiple LMS platforms, which might contribute to a wide array of preferences (Dykman, & Davis, 2008). The primary purpose behind why a student is searching for information and how they prefer to receive information can depend on the motivations and reasons for searching or receiving information. Examples as such, include motivations, and other causes can include grading feedback, classroom policies, interacting with their peers or instructors, and wanting information about upcoming assignments (Murray et al., 2012).

Interwoven in the section below are selected and representational responses from students to provide a more genuine example of student needs and wants concerning accessing and receiving information in the online classroom setting. Students provided the material in the survey that are paraphrased in the section below. Moreover, students received an indicator of S1-S43, as there were 43 students responded to the survey. This information could help

provide a more in-depth and personalized narrative of students' thoughts about receiving and accessing information.

Question four of the survey asked students where they looked for information about the course within the classroom, and there are two main access points students sought to find information related to the course. Twenty-five students identified that the course materials tab was their primary access point for information. For this study's purposes, course materials tab is the place where the majority of instructional material (lectures, assignment details, additional reading materials) that are separate from the syllabus. The syllabus closely follows the course materials tabs as 41.07% of the participants indicated the syllabus was where students primarily looked for information. S5 and S9 indicated the syllabus was the first place to search for information about the course. Possible reasons behind the syllabus being the most common area to find information are that the syllabus is a familiar source of information for a student in both online and ground-based classrooms, students find they have easy access to the syllabus, and that the syllabus provides a rich source of information. S1 and S23 noted, the syllabus was easy to access within the classroom, and this was one of the first places they sought information during the class. The majority of students indicated the syllabus was a useful asset to gain information and helped them have a better understanding of the course as identified in Table 2.

Table 2. Where do you look for information about the course in the classroom?

Information Access Point:	# of Students	Response rate
Course Materials	25	44.64%
Syllabus	23	41.07
Calendar	2	3.57%
Forums	2	3.57%
Announcements	1	1.79%
GCU Library	1	1.79%
Internet	1	1.79%
None	1	1.79%
Grand Total	56	100.00%

The results of the survey indicated that students preferred to access the discussion forum area of the online classroom when first logging into the site. Over 39% of respondents indicated the discussion forum was their first destination when logging into the classroom. One possible reason for this is students receive participation points for posting responses to discussion questions as well as responding to student and instructor posts. Thus, there is a grade-based motivation for entering and participating in the discussion forums. The discussion form is also where interaction between students and the instructor occurs (S2, S4, S8, S17, S26, S33), which might be a source of motivation for entering the discussion forum upon initial entry into the classroom (Brindley et al., 2009). Discussion forums provide a chance for dialogue and peer-to-peer learning as well (deNoyelles et al., 2014). As S39 noted, the first place they accessed when entering the classroom was the discussion forum as it allowed them to interact with their fellow students. Areas that allow students the ability to interact with one another are popular and accessed extensively (Gedera, 2014). A salient and actionable result from this portion of the study could be that placing information in areas in which students' first access when entering the online classroom can increase the likelihood of viewership. Response rates for the primary access points are provided in Table 3.

Table 3. What is the first area in the classroom you go to when you log in?

Primary Access Point	# of Students	Response rate
Forums	19	39.58%
Calendar	13	27.08%
Gradebook	7	14.58%
Announcements	4	8.33%
Syllabus	2	4.17%
Resources	2	4.17%
Assignments	1	2.08%
Grand Total	48	100.00%

The results of the survey further indicated that the discussion forum area of the online classroom was the area students frequented. At a 58.70% response rate, overwhelmingly those surveyed indicated the discussion forum was the area of the classroom they visited most frequently. S29 stipulated that the discussion forum is the area they most often visited because this was the area in the classroom they could interact and create connections with their instructor and classmates. Brindley et al. (2009) noted the students tend to participate in discussion forums or other areas of that provide space to interact with their classmates as this helps to lessen the sense of isolation frequently felt by online students. The responses of S10, S14, S18, S24, S31, and S42 who specified the discussion forum allowed them to perceive a sense of connection with their classmates and made the impersonal nature of the online milieu less intimidating and more individualized. The discussion forum, based on the results of the survey, can provide a rich area for information placement as students tend to access this area both when first entering the online classroom and visit this area most frequented as compared to other venues in the online classroom. Response rates for the area of classroom frequented most by students appear in Table 4.

Table 4. What area of the classroom do you frequent most often?

Classroom Area:	# of Students	Response rate
Forums	27	58.70%
Gradebook	7	15.22%
Calendar	5	10.87%
Resources	3	6.52%
Syllabus	2	4.35%
Course Materials	1	2.17%
Assignments	1	2.17%
Grand Total	46	100.00%

Deciphering the modality to send information to students in the online classroom is an important aspect of the online instructors' job, and the results from the survey indicated that e-mail was the optimal modality for how students preferred to receive information about the course. Of those surveyed, 36% reported that e-mail was the preferred method for receiving information about the course. As S22 noted, receiving e-mails about course information would ease the process of searching for information. One of the main reasons for the e-mail preference is the familiarity students have of receiving information through e-mail as indicated by S10 and S20 responses about receiving an e-mail to a personal e-mail address. Both students also mentioned how this would be useful as this would cut down on the number of areas one would need to search for information. Sending e-mails can additionally allow instructors to contact students even when students do not log into the classroom, as S8, S11, and S24 noted, receiving information about the class in close to real-time could be helpful to understand in a more acute manner the class as well as the obligation of the course. The results of the survey indicated that students want to receive information about the class in a form

they find convenient, familiar, and that allows them to receive information immediately. Response rates for student preference on receiving information are provided in Table 5.

Table 5. How would you like to be notified about information in the classroom?

Information Access Point	# of Students	Response rate
Email	18	36.00%
Forums	11	22.00%
Text Message	6	12.00%
No Change	6	12.00%
Pop Up	5	10.00%
Announcements	3	6.00%
Calendar	1	2.000%
Grand Total	50	100.00%

The final and perhaps most curious result indicated by the survey was students tended to be satisfied with the current information location and delivery systems in the LMS platform. Responses to the question on the desired location for information placement within the online classroom architecture showed that 38.10% were content with the current design of the LMS. S4, S5, S6, S7, S8, S12, S13, S20, S25, S29, S32, S36, and S41 all stipulated they were *happy* with the existing architecture of the classroom concerning how they accessed and received information. One probable reason for this result is students who participated in the survey did not have experience with other LMS and did not have a comparison system to judge against their current system. Students may have also not fully understood the nuances behind online LMS, which might bias responses based on unfamiliarity. An additional possible reason for this result is students who participated in the survey did so during the last week of the course, and they may have grown accustomed to the features of the system as well as believed that no changes were necessary to improve information receiving or information access. As Ryman et al. (2009) noted, gaining familiarity with an online learning platform could help students to become more comfortable operating within the platform. A critical result from the survey might be that students are adaptable and willing to learn about the particulars of online classroom design, but familiarity with the system is paramount. In addition, creating principles within the classroom design could help the process of having students learn to navigate the system to receive and access information in an efficient manner.

DISCUSSION

The results of the study indicated that students prefer to access information in different areas as well as receive information in different settings, but in general were satisfied with their current classroom's architecture. These findings can have a positive effect on how instructorsteaching online courses place information within the classroom to promote increased viewership by students. The syllabus was the main area students sought to access information about the course, and the result was not surprising given the familiarity most students have with the concept of a syllabus. From the instructors' perspective, this result should prompt them to direct students to the syllabus at the beginning of the course and to review the syllabus continually as the course progresses (Gedera, 2014). Possible strategies to accomplish this are to post reminders about the syllabus within the discussion forum, post information generated from the syllabus in the discussion forum, and send e-mails to students reminding them to access the syllabus. These strategies could potentially relieve the confusion many students have regarding the requirements of the course. The discussion forum, as stipulated by the survey results, was the area in which online students first accessed when entering the classroom and was the area students visited most frequently. Instructors teaching online courses could use these findings to employ the discussion forum as a vehicle

to communication information in an effective manner to their students. Information placed in the discussion forum could include external information the instructor wishes to include in the course, information about classroom policies, procedures, and expectation, as well as any changes or events occurring during the progression of the course (Brindley et al., 2009). The students who participated in the study indicated that receiving e-mails about course information was another primary modality of communication. As such, instructors can use this modality – often embedded within the architecture of the online classroom – to communicate with students. E-mail communication with students can help create a sense of personalization, open an arena for dialogue between the instructor and the student, as well as encourage students to contact their instructors when regarding questions or concerns pertaining to the course. Receiving an e-mail from the instructor could additionally help students feel less isolated in the online classroom setting (Joyner et al., 2014). The results from the study additionally indicated that student familiarity with the online classroom was an important aspect of information accessing and receiving the majority of students stipulate they are satisfied with the features of their current classroom. Instructors can help to improve information accessing and receiving by ensuring students have a full understanding of the various communication features within the online classroom.

The findings of the study found that students expressed desire in having course information delivered to them through multiple electronic means, with the majority of them favoring having information sent through e-mail. Although this contradicts Lenhart, Ling, Campbell, and Purcell's (2010) research that suggested students are moving away from e-mail as their primary communication tool, e-mail is an effective information delivery method for students in an online learning environment. Traditionally students receive a school e-mail, which instructors can use to send reminders and other pertinent information. Furthermore, McAnally, Espinosa-Gomez, and Lavigne (2011) found that instructors favored the use of e-mail as a communication tool in online classrooms. When instructors use the communication strategy that they are most comfortable with, it can lead to higher student-teacher interaction (McAnally et al., 2011).

Further analysis of the data revealed that student preference on information placement centered on the usage of technology. Imran, Ahmad, and Mushta (2012) noted that with the advent of technology, successful online course design offers opportunities to tailor education to a student's needs. In addition, students in online learning courses tend to be digitally literate and need access to information in a conveniently digitized manner. These type of students would benefit from having access to information via innovative technology tools.

One effective Web 2.0 tool for information delivery is the Remind (formerly Remind 101) App. With the Remind App, students can sign up to receive pertinent information from their instructor via text message. Online instructors can use the Remind App to send out information updates, reminders of upcoming tests, or even to send out helpful tips and hints on the homework assignment. The Remind App is an effective method of information delivery as Troung (2010) noted that over 99.8% of college students own one or more mobile phones, and over 97% used short message service (SMS) as their main method of communication. Bobbitt, Inman, and Bertran (2013) theorized that if students are moving to a mobile means of communication, instructors should think of using text messages to communicate with their students, as it is a more reliable and rapid delivery method. Research shows students who have used the Remind App prefer it for communication purposes and wanted other instructors to use the service (Bobbitt, Inman, & Bertran, 2013).

Students can also benefit from having information delivered through multimedia content. Jonasses (2003) defines multimedia as the usage of multiple forms of media,

including text, graphics, animation, videos, and pictures (as cited in Surjono, 2015). Surjono (2015) found students had higher achievement scores in their online electronics course when using their multimedia preferences and learning styles. One multimedia platform instructors can use for course information is Moovly. Moovly is an online tool that allows the user to create personalized multimedia content. Instructors create personalized information through animated objects, videos, voice, music, and add them to a timeline interface, allowing for simple multimedia-based videos and presentations. Once the information has transferred into a Moov (Moolvy's multimedia format), an instructor can upload it into the architecture of the online classroom or have students access the multimedia content through a web link.

LIMITATIONS

There are limitations to this study that need acknowledgment, several of which offer future research opportunities. First, the basis of the research was unique to the student population in higher education. All the research participants are in their first-year sequence, and as a consequence, are still learning how to navigate the learning management system. Future work would benefit from administering the study to those students who are in their second, third, or fourth-year sequence.

A second limitation relates to course design as all the research participants were from one specific critical thinking course. This specific course implies a possibility of the limitation of the generalizability of results. Additional courses across different disciplines could have increased the response rate and provided a stronger argument on generalizability.

Finally, the study did not address the different needs students may have while taking an online course. It did not look at their level of familiarity with technology, type of system used, nor learning style. Future research should address multiple platforms of technology as well as identify how familiar a student is with navigating the architecture of an online learning management system.

CONCLUSION

The students who participated in this study indicated they prefer to access and receive information in multiple areas, want instructors to use emerging communication technologies to connect with them, use multimedia technologies in the classroom as a form of communication, but were satisfied in general with how they received and accessed information in their current classrooms. These findings could have profound effects for how instructors in online courses communicate information to their students. Instructors should make use of the multiple communication modalities embedded within the classrooms to increase the likelihood of student viewership as students tend to access information in multiple areas. Students prefer to receive information from instructors in different regions of the classroom, and using the different areas will help instructors communicate with their students in a more effective manner. Online students in this study indicated that they would prefer their instructors to use multiple means of communication (i.e. texting, e-mail, message boards) when conveying information, and enjoy the use of multimedia technologies for information dissemination. Instructors in the online classroom have multiple modalities to communicate information. The results indicated instructors should use these communication venues, especially the ones embedded in the course, to enhance the ability for students to access and receive information pertinent to the course.

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THE NEED FOR A MORE EFFICIENT USER NOTIFICATION SYSTEM IN USING SOCIAL NETWORKS AS UBIQUITOUS LEARNING PLATFORMS

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ABSTRACT

While carrying out formative assessment activities over social network services (SNS), it has been noted that personalized notifications have a high chance of “the important post getting lost” in the notification feed. In order to highlight this problem, this paper compares within a posttest only quasi-experiment, a total of 104 first year undergraduate students, all of which are prospective ICT teachers, in two groups. A formative assessment system in the ubiquitous learning context is delivered over an SNS in both groups. In the first group, the SNS has been used for the entire assessment task. In the second group, the questions have been delivered and responses were received over mobile phone “SMS” messages, while the SNS was used solely for providing feedback. The cases were compared in terms of voluntary participation rates and academic success. Both response rates and academic success have been significantly higher in the SMS group. When asked their reasons for not responding to questions; the SNS-only group frequently reported “not noticing the questions being sent”. This may indicate a flaw in message design for using social networks as LMS's. Sensible use of push-messages is advised.

Keywords: Ubiquitous learning, formative assessment, LMS design, social networking.

INTRODUCTION

The past two decades have introduced such rapid advancements in information technology that, many concepts in our daily lives have been redefined. The field of Educational Sciences is no exception and the recent advancements in IT have currently brought around an age of Learning Environments in Instructional Design (Warren, Lee, & Najmi, 2014). Numerous systems have been developed in the past decade to offer students appropriate and dynamic learning environments, including but not limited to, digital Learning Management Systems (LMS).

The use of technology in delivering instructional material to the new generation, who are most often thought to have much different and open-minded perspectives towards the said technologies than their predecessors, is most often viewed as a highly plausible idea. This notion is backed by the the famous Digital Natives theory by Prensky (Prensky, 2001).

However, as far as education is concerned; the learners of today fall into the category of the Millenium Generation, who are considered to be digital natives only in their “zones of comfort” (Oh & Reeves, 2014) i.e. environments which are comprised of few highly popular platforms, including Social Networking Sites. This fact has led educational researchers to the question as to whether Social Networking Sites, where today’s learners seem to use so frequently and efficiently, could be used as Learning Management Systems (Wang, Woo, Quek, Yang, & Liu, 2012). As displayed by DiVall and Kirwin, who have compared statistics on the use of the popular social networking service named Facebook and a traditional LMS named Blackboard, it was found that students were more likely to generate and be exposed to educational content on the Facebook social network service than on the traditional LMS, Blackboard (DiVall & Kirwin, 2012). Thomsen and colleagues (2016) also reported that as far as higher education is concerned, students are more likely to prefer using their existing Social Networks as learning systems than they do platforms specifically tailored for the purpose, such as Moodle.

Another rising trend in the past decade, Mobile learning has been defined by Crompton as “learning across multiple contexts, through social and content interactions, using personal electronic devices” (Crompton, 2013). Considering that most social network services are cross-platform applications that operate on the Web, it is a fact that they can much easily be accessed ubiquitously with all popular smart mobile devices of today. And indeed, given the technical capabilities and the current popularity of social networks, the implications for their use as learning management systems in not just conventional but ubiquitous learning scenarios can be noted.

Typical usage purposes of Learning Management Systems have been reported to be Class Management (Registering, Enrolling, Displaying schedules, etc.), Communication (E-mail, Chat, Forums, etc.), Content Delivery (Learning Resources, Learning Object Repositories, Links) and last but not least; Assessment, both summative and formative (Coates, James, & Baldwin, 2005). Whereas, formative assesment has been described as assessment that is specifically intended to generate feedback on performance to improve and accelerate learning (Sadler, 1998). And as far as online formative assessment is concerned, Kibble has noted in his work that “voluntary participation in online formative quizzes is a sensitive predictor of student success” (Kibble, 2011).

Altogether, these findings could be used to back the notion of implementing a formative assessment system in the ubiquitous context over a popular social network platform, which can be accessed via PCs and Smartphones alike, for delivering drill and practice questions and providing feedback to students.

There have already been attempts to carry out formative assessment activities over social network services at an undergraduate level, but it turns out that although educational activities over the platform is welcomed by students, academics are “advised to rethink its deployment in ways that foster student engagement, interaction and collaboration in a more constructivist and effective learning environment” (Shraim, 2013) That is, ways to deploy formative assessment over a Social Networking Service (SNS) for positively affecting student performance need exploring.

It has also been reported that various factors influence students’ participation and interaction with social network services used as a learning management systems. Among concerning factors are, the lack of notifications associated with posts in public domains that fail to alert and catch the attention of respective users; which results in “a high chance of the important post getting lost somewhere in the news feed of the target audience” as displayed by research conducted on the popular Facebook social network service by Shridhar and colleagues (Shridhar, Gupta, & Shridhar, 2014) . The same study has also displayed that the students also

reported feelings of having their area of privacy invaded. These clearly indicate problems in message delivery and/or interaction design, implying that although social networks are popular among today's learners, notifications regarding course activities may get lost among notifications of a more personal nature and/or simply fail to go above the attention threshold of the recipient.

Understanding Smartphone Notifications

Notifications; which are visual, auditory or haptic alerts that seek to grab the attention of the user, play a vital part in users' interaction with content presented by their smartphones. As explained by Iqbal and Bailey (2010) a notification "represents the proactive delivery of information to a user and reduces the need to visually scan or repeatedly check an external information source". Within the research domain of Human Computer Interaction, there exists numerous studies pertaining to understanding the nature of how users interact with smartphone notifications. Most of the time, the goal of these research efforts is to get the message across to the user as effectively and with as little disruption/interruption as possible. Many factors contribute to achieving this goal, such as timeliness of notifications (Iqbal & Bailey, 2010), mode of sensory cue (Gallud & Tesoriero, 2015), perceived sense of urgency of the message (Gallud & Tesoriero, 2015), the nature of the relationship between the user and the sender of the message that triggered the notification (Mehrotra et al., 2016), the nature of the application that triggered the notification (Mehrotra et al., 2016). As such, it can be said that not all applications and messaging channels create the same effect of interruption/ignorance/annoyance in the user (Turner, Allen & Whitaker, 2015).

Findings indicate that the greatest factor in a user's response to a notification is the "urgency" of the notification, and notifications create a greater sense of urgency in the following conditions:

- When they are coming from messaging apps (as opposed to Social Media apps)
- When they are sent by an actual person (as opposed to being generated by a computerized system) (Mehrotra et al., 2016).

These show that relying on notifications generated by Social Media applications for notifying users of content may be troublesome. In addition to the social media notification feed being overly congested by notifications from non-educational activities; Pielot, Church and Oliveira (2014) have explained as a result of their study investigating mobile phone notifications, that "Increasing numbers of notifications, in particular from email and social networks, are correlated with negative emotions, such as stress and feeling overwhelmed". These, in turn, may cause students to ignore the delivered educational content, particularly content that requires user input.

One probable solution that may address these problems could be to retrospectively re-design the message interface of the ubiquitous formative assessment system to operate over the relatively older and fundamental "SMS" (short message service) functionality found in all contemporary cellular phones of today, costly or not. The rationale is that, as an utterly basic personal messaging tool, SMS messages offer a complete one-to-one and private communication channel between the sender and recipient, enabling to directly address each member of the target audience and successfully alerting them (assuming that this channel of communication is not much preferred anymore after the introduction of more sophisticated mobile data networks). Moreover, the SMS was projected to be more successful in going above the recipient's attention threshold by creating a greater sense of urgency and importance compared to social network notifications; and that participation rates may increase with the inclusion of students who have mobile phones that are not in the "Smartphone" category (i.e.

phones that are incapable of connecting to mobile data networks). Although SMS costs money per message sent, charges per SMS have dropped greatly since the introduction of GSM mobile phones to the general public approximately two decades ago and most GSM carriers offer free bulk SMS packages as part of subscriber plans. It has also been shown by previous research that SMS is indeed a viable tool for delivering learning content to students in an ubiquitous learning context (Gasaymeh & Aldalalah, 2013). Moreover, using SMS in a learning scenario could mean including not only the students who can successfully connect to the Web with their Smartphones, but also students who may have a mobile phone but for one reason or the other may not have Web connectivity over such expensive devices.

The successful delivery of mobile phone notifications seems to be a valid issue in Human Computer Interaction research, but a review of the literature reveals that this topic has been largely ignored in instructional design of ubiquitous learning activities. It might therefore be worth investigating whether preferring a notification scheme in educational applications to another might cause a different educational outcome. It is thought that the use of messages that directly address recipients from over a less congested channel -as opposed to social network notification systems and in the form of SMS messages within the context of this research paper- for a formative assessment application has a potential to attract more students; which could then translate into higher academic success. An experimental setup has been considered for answering this question and regardless of what the outcome may be, it is thought to be important to raise the awareness of instructional design academic community towards the semi-technical aspect of user notifications that seems to have fallen under the attention of Human Computer Interaction practitioners, so far.

Purpose

The aim of the study is to determine whether directly addressing students with messages over a separate, less congested notifications channel to increase student engagement and academic success as opposed to relying on social network service notifications for notifying students of ubiquitous drill-and-practice based formative assessment activities in taking place in a social network. The rationale is that, although mobile applications of most social networks have push-notification capabilities for grabbing the attention of users, notifications concerning educational activities might get lost among the many other notifications of different contexts.

In this context, the following research questions have been formulated considering two groups of students; with one receiving and responding drill-and-practice questions over SMS and the other using social media (SNS) user groups for the drill-and-practice activity while relying on the built-in notification system:

1. Which group will submit a greater number of responses to the drill and practice questions?
2. Which group of students will show greater participation (measured by social network interaction units) to the "social phase" of the program, a phase included in both groups and involved peer discussion and instructor feedback over the social network?
3. Which group of students will show greater academic success in terms of subjects covered by the drill and practice program?
4. What will be the reasons for non-participation in the relevant drill and practice programs in each of the groups?

METHODOLOGY

The study follows a posttest only quasi-experimental design with two groups. In order to provide additional control, the groups were matched and deemed non-inferior to one another with prior knowledge tests and surveys. The entire study group is comprised of 104 first year undergraduate students at Marmara University Atatürk Faculty of Education, Department of Computer Education and Instructional Technology; which are actually two classes of students (N1 = 49, N2 = 54) who are prospective information and communications technology (ICT) teachers. The two classes are actually daytime and evening education programs in the same department, and are taught the same content by the same instructor in the same subjects. For the purpose of this research, each of the classes are designated as separate groups with different interventions on each.

The paper therefore seeks to compare two non-inferior groups in an intervention design where a formative assessment system on a popular Social Network Service is used for delivering drill-and-practice questions on a reference ICT subject of "SQL queries" to undergraduate students. In the first group's case, the entire system (comprised of the initial question delivery, response collection, peer discussion and instructor feedback) is handled over a popular social network platform, which notifies users of educational activities with its built-in notification system. Whereas in the second group, the question delivery and response collection phases were handled over SMS messages and the social network platform was used only for providing feedback to students regarding their activities over SMS.

For the purpose of determining the type of intervention a particular group will receive, a purposive selection was made based on data from one Survey on Mobile Phone and SNS Usage, with the formula being the group that uses internet connection more often on their mobile phones to be designated as the "Social Network Only" group. The rationale has been to maximize the exposure of students to push-notifications, which can be received only from over mobile applications that operate on smart mobile devices with internet connectivity.

Data Collection Instruments

Data have been collected as part of the 1st year course of "Information Technologies in Education". The subject matter has been SQL queries. The reference social network service chosen for collection of data in both groups was Facebook, due to its popularity among students, whereas mobile phone SMS messages were chosen as a representation of messages directly addressing students via a non-congested channel. Furthermore, the following instruments have been used for collecting data that was compared between groups:

Prior knowledge test on SQL queries

The study began in the middle of the semester, while instruction was already taking place. This has proven to be a limitation, and to cover for reasons of group inequivalence that may arise due to different levels of understanding students in each group may have, a statistical method of comparison for non-inferiority of groups has been sought. A multiple choice test named "Prior knowledge test on SQL queries" has been used for this purpose. The test consisted of multiple-choice-only items measuring bulk knowledge pertaining to a limited subset of SQL commands. It was decided to exclude items requiring the use of a higher order cognitive skill, namely the formulation of SQL queries from scratch. The rationale has not been to assess student academic achievement (which is more related to query formulation), but only to see whether one group outperformed the other in terms of bulk knowledge.

The test, which is comprised of 32 multiple choice questions, and scored over 100 points was used to determine equivalency, in the form of statistical non-inferiority, between groups in terms of academic pre-knowledge. The test was administered to 3rd year students at the same

undergraduate program in a different university and it was found to have an Internal consistency Cronbach's Alpha value of .917.

Post-test on SQL queries

This test has been used for comparing academic success between groups after the interventions. It measures command over SQL language for performing queries in a given database and is comprised of 15 Multiple Choice, as well as 10 open-ended query-formulation questions. Scored over 100 points, the test was also administered to 3rd year students at the same undergraduate program in a different university and it was found to have an Internal consistency Cronbach's Alpha value of .835.

Survey on mobile phone and SNS usage

The survey has been used to find out about the mobile phone, mobile internet and social network usage habits of students. Comprised of items of ordinal measurement and open-ended questions. It has been used for determining the social network to be used within the study, as well as for determining which group will receive which intervention. It was planned to designate the group that more frequently uses mobile internet connection as the "Social Network Only" experimental group, in order to maximize exposure to mobile push-notifications of mobile applications (as opposed to SMS notifications).

Drill and practice questions

16 drill and practice questions, delivered via Facebook group wall in Group 1 and via SMS messages to each student in Group 2, using a bulk text messaging software on a desktop PC connected over USB cable to a GSM mobile phone. The responses to these questions have been collected over the same Facebook wall as post comments in Group 1, and as SMS replies in Group 2. In each case, the students had a 3-hour time frame to respond to the questions, at the end of which, correct answers were revealed to students as Facebook wall comments/posts in Group 1/Group 2, respectively.

Several examples of the drill and practice questions on basic SQL queries, which were delivered to students from over their respective delivery channels, are as follows:

Add an entry for the province of Yalova, which lays in the region of Marmara and has a 850 km square land with 200000 population, into the table Provinces (name, region, landarea, population).

Use the table Personnel (name, title, salary) to set the salaries of all employees with the Manager title as 4000 Turkish Liras.

Use the table Grades (firstName, lastName, score, project) for rewarding a 10% increase in the score of all students who have contributed in a project (shown as "true" boolean property set in the project field).

Use the Provinces (name, region, landArea, population) table for listing provinces that have their names begin with letter A and that are located in the Mediterrean region.

Facebook comments and likes

Student interaction with the Facebook Wall of their relevant groups. The instructor has befriended each of the students in each group under a formal alias (not through a personal account). The data was interpreted and analyzed as the level of interaction over the social network in a given group, and used in answering research question 2.

Final survey

Used for discovering the reasons behind student interaction with the practice program and the lack thereof. Comprised of open-ended questions, the content analysis of the survey has been carried out by one of the researchers. To provide for reliability of coding measures, the content has been coded by two researchers and the results have been compared to yield a good (Altman, 1990) Cohen's Kappa intercoder agreement rating of $\kappa = .762$, $p < .05$.

Instructor observation

The instructor has operated the Facebook Groups through which the interventions have been carried out; sending questions, collecting responses and providing feedback. As such, she has befriended each of the students over the Facebook social network. The instructor's observations have thus been referred to when discussing the results for non-participation.

The Intervention

Once after the Pre-test on SQL queries and Survey on Mobile Phone and SNS Usage instruments have been administered, the groups' non-inferiority has been confirmed. This was followed by the choosing of the social network for use, which was "Facebook" as it was the most popularly used one among students. Depending on smartphone ownership data, it was decided which group would receive which intervention.

The intervention thus began with 16 short answer practice questions on the subject of "SQL Queries" being delivered to both groups over the course of two weeks. It was made sure that at least one question was sent every day, and that both groups received their questions simultaneously. The time of sending questions varied randomly in the range of 1 PM to 4 PM for each day. This time range has been determined as the intersection of daily activity hours between groups, as one of the groups received their college classes after 5 PM as per after-hours education policy while the other group received classes normally during the daytime, starting at 9 AM.

The intervention with Group 1 ("Facebook Only"), which received the questions on the wall of their relevant Facebook Group, has been explained in Figure 1a and detailed as follows:

- Drill-and-practice questions are sent to the Facebook group as wall posts.
- A time window (i.e. three hours) is given to the students for submitting their responses as comments to the wall post.
- Instructor is notified of student activity through Facebook alerts and provides real-time monitoring and feedback for student responses.
- At the end of the time window, the instructor shares the correct answer with the students as comment to the wall post, also providing feedback.

Whereas, the intervention with Case 2 ("Facebook + SMS"), which received the questions on their mobile phones via SMS, has been explained in Figure 1b and detailed as follows:

- Drill-and-practice questions are sent to the students individually as SMS messages to their phones.
- Students respond the questions directly by replying with SMS messages, within a given time window (i.e. three hours).
- At the end of the time window, the instructor heads to Facebook wall and creates a wall post, revealing the question several hours ago, as well as the correct answer and the names of the respondents, in the chronological order of their relevant responses.
- Feedback is provided by the instructor for any wrong answers as comments to the wall post.

Following the interventions, the academic success regarding the subject matter has been measured in each group with the Post-Test on SQL Queries.

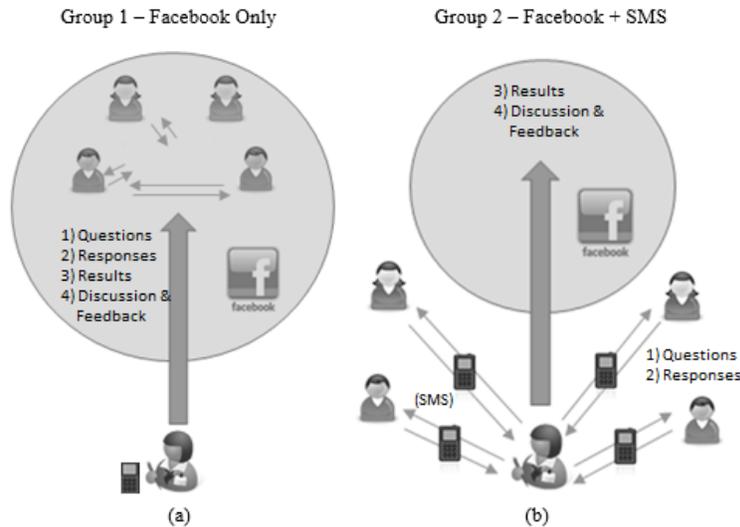


Figure 1. The Groups and their relevant interventions explained (a) Facebook only group, (b) Facebook + SMS group.

RESULTS

Equivalence between Cases

The equivalence between two cases in terms of subject matter (SQL Query) pre-knowledge and Facebook usage habits have been controlled for by administering and comparing the results of one SQL Query Skills pre-test and one question from the Survey on Mobile Phone and SNS usage, respectively. Independent sample comparisons have been carried out for statistically comparing the average scores from each set of data. The cases have been compared in terms of subject matter pre-knowledge by analysing their relevant SQL Query Skills pre-test scores. The independent samples non-parametric statistical comparison of non-normally distributed data obtained from each case have been shown in Table 1.

Table 1. Mann-Whitney test results comparing the average scores in pre-test on SQL queries

Group	N	Mean Rank	Sum of Ranks	U	p
Group 1	49	54,66	2678,50		
Group 2	55	50,57	2781,50	1241,50	.46

It was understood that there is no significant difference between groups in terms of SQL Queries pre-knowledge (Mann-Whitney U = 1241.50, p = .46).

Choice of Social Network and Assignment of Groups to Interventions

The cases have also been compared in terms of their social network usage habits by analysing the question "How often do you use the social network whose name has been given below" displayed in the Survey on Mobile Phone and SNS Usage. The response categories for the question have been [1] "Never heard of it", [2] "I only heard of it", [3] "I have an account that

I don't use", [4] "I rarely use it (one or two hours a week), [5] "I actively use it (Most days of the week, at least half an hour a day)", [6] "I use it very often (Every day, at least 3 hours a week)". The results have been detailed in Table 2.

Table 2. Descriptive Statistics pertaining to the question "How often do you use the social network whose name has been given below" found in the in Survey on Mobile Phone and SNS Usage, scored over a scale of 1 to 6.

Social Network	Group 1 (N=49)		Group 2 (N=55)	
	\bar{x}	S	\bar{x}	S
Facebook	4.61	0.99	4.65	0.93
Twitter	3.22	1.10	3.07	1.41
Google+	2.83	1.00	2.72	0.78
Friendfeed	1.24	0.43	1.36	0.55
Reddit	1.14	0.35	1.18	0.54
Delicious	1.08	0.27	1.12	0.38
Tumblr	1.32	0.51	1.51	0.81
Edmodo	1.06	0.24	1.09	0.29

It was therefore understood that, the most frequently used social network for the students in both groups was Facebook, with average scores of 4.61 and 4.65 in Groups 1 and 2, respectively. It was therefore decided that Facebook would be used as the social network of choice for the study.

In order to provide for additional control, the groups have been compared to determine whether there was a statistically significant difference between the distributions of their responses on how often they used the social network of choice for the research, Facebook. The independent samples non-parametric statistical comparison of non-normally distributed data obtained from two cases have been shown in Table 3.

Table 3. Mann-Whitney test results comparing the average scores pertaining to Facebook obtained from the question "How often do you use the social network whose name has been given below" found in the in Survey on Mobile Phone and SNS Usage

Group	N	\bar{x}	S	Mean Rank	Sum of Ranks	U	P
Group 1	49	4.61	0.99	51,54	2525,50	1300,50	.74
Group 2	55	4.65	0.93	53,35	2934,50		

It was understood that the distribution of groups' answers to how often they used the Facebook social network did not differ from one another statistically (Mann-Whitney U = 1300.50, p = .74). The groups have therefore been considered equivalent and comparable to one another in this context, assuming that initial habits for using Facebook would not alter the outcome of the research.

The next step has been to determine which group would be treated with the Facebook Only intervention and which with the Facebook + SMS intervention. Examination of responses to the questions of "do you own a mobile phone" and "how often do you access the Internet using your mobile phone" in the Survey on Mobile Phone and SNS Usage have shown that 100% of students in both groups owned a cellular phone. As for frequency of Internet access from

mobile phones, students answered in a scale ranging from [1] Never, [2] "Sometimes", [3] "Often", [4] "Always". Distribution of scores in student responses has been given in Table 4.

Table 4. Descriptive Statistics of Scores Showing Student Responses to the question "How often do you access the Internet using your mobile phone" found in the in Survey on Mobile Phone and SNS Usage

Group	N	\bar{x}	S
Group 1	49	2,49	1,05
Group 2	55	2,29	0,91

It was seen that Group 2 displayed a lower mean score for frequency in accessing the Internet from over the mobile phones as compared to Group 1. This has led to the decision of assigning Group 2 as the "Facebook + SMS" group and Group 1 as the "Facebook Only" group for convenience purposes.

Number of Responses (RQ1)

The bulk numbers of responses sent by students in each case have been compared for answering research question 1. Descriptive statistics on average number of submitted responses per student in groups, as well as the statistical comparison of the non-normally distributed data has been given in Table 5.

Table 5. Mann-Whitney test results comparing the average number of responses in the Cases

Group	N	#of Responses	\bar{x} (responses per student)	S	Mann-Whitney U			
					Mean Rank	Sum of Ranks	U	p
Facebook Only	49	13	0,26	1,19	43,89	2150,50	925,50	.00
Facebook + SMS	55	92	1,67	2,79	60,17	3309,50		

It was seen that throughout the two week duration of the intervention, students in the Facebook + SMS group (N = 55, total # of responses = 92) have submitted a significantly larger number of responses over SMS, than the students in Facebook-only (N = 49, total # of responses = 13) group who were required to submit answers as comments to a Facebook wall post (Mann-Whitney U = 925.50, p = .00).

In both groups, there were students that did not submit a single response throughout the intervention. Number of students that submitted at least one response has been found to be 22 for the Facebook + SMS group (N = 55), whereas the same figure for the Facebook Only group was just 5. Figure 2 shows a stacked graph of number of responses, with each stack representing a single student's total number of responses.

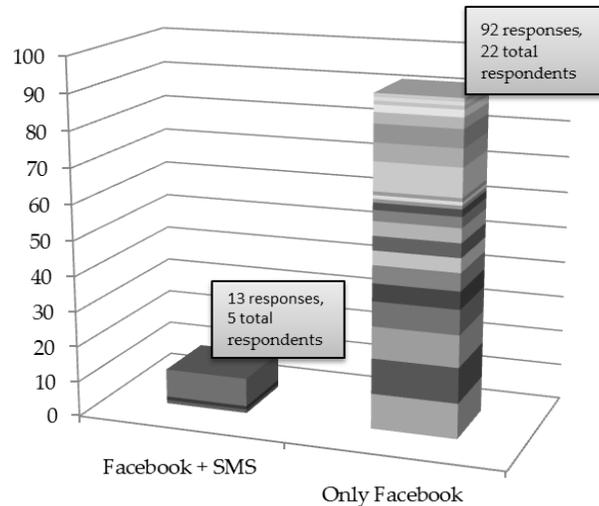


Figure 2. The graph representation of number of responses per respondent and total number of respondents in each group.

Visual examination of the graph in Figure 2 shows that the 92 responses are distributed more or less homogenously among the 22 respondents in the Facebook + SMS group, whereas majority of the few responses in the Facebook Only group has been submitted by a single student.

Social Participation (RQ2)

The amount of participation to the social phase of the program, which comprised the peer discussion and instructor component of the formative assessment program, has been measured by number of comments and likes to posts at each group’s Facebook group wall. The results have been shown in Figure 3.

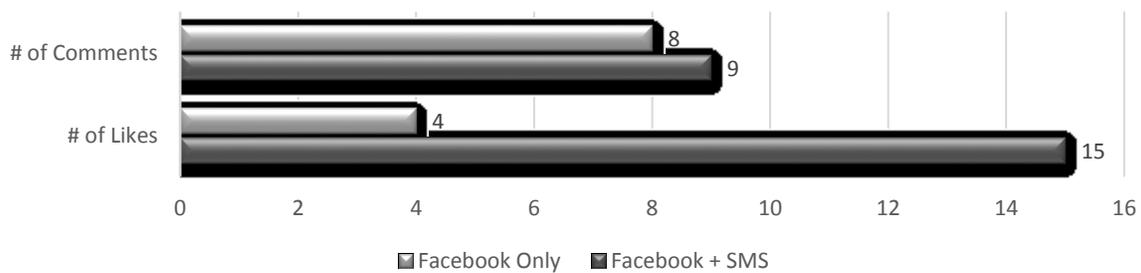


Figure 3. Number of Facebook Wall Comments (excluding comments that featured a response to the practice question) and Likes on Posts for each group during the drill and practice program.

As it can be seen from the graph, both groups have shown relatively poor participation in the social phase during their two week practice runs. Still though, the activity in the Facebook + SMS group seems to be slightly higher compared to the Facebook Only group, due to the greater number of Likes.

Academic Success (RQ3)

At the end of their relevant two-week drill and practice programs, students at both case groups have taken a post-test that measures their academic success in the subject matter. The results of the independent samples t-test comparison of normally distributed data obtained from each case have been shown in Table 6.

Table 6. Student's T-test results comparing the average academic success in the Cases at the end of intervention

Group	N	\bar{x}	S	df	t	p
Facebook Only	49	45,18	20,43			
Facebook + SMS	55	53,50	17,75	102	-2,22	.03

It can be seen from the results that there is a significant difference between cases in terms of SQL Queries academic success following the drill-and-practice intervention in favor of the Facebook + SMS group, the members of which are more successful than those in the Facebook Only group ($t(102) = -2.218, p = .03$).

Reasons for Non-Participation (RQ4)

The final survey administered to each group at the end of the program was used for collecting student feedback. Among the questions of the survey, one open ended question urged the non-participating students to explain their reasons for doing so. The responses have been coded into categories and the results have been compared between groups. This has been shown in Figure 4.

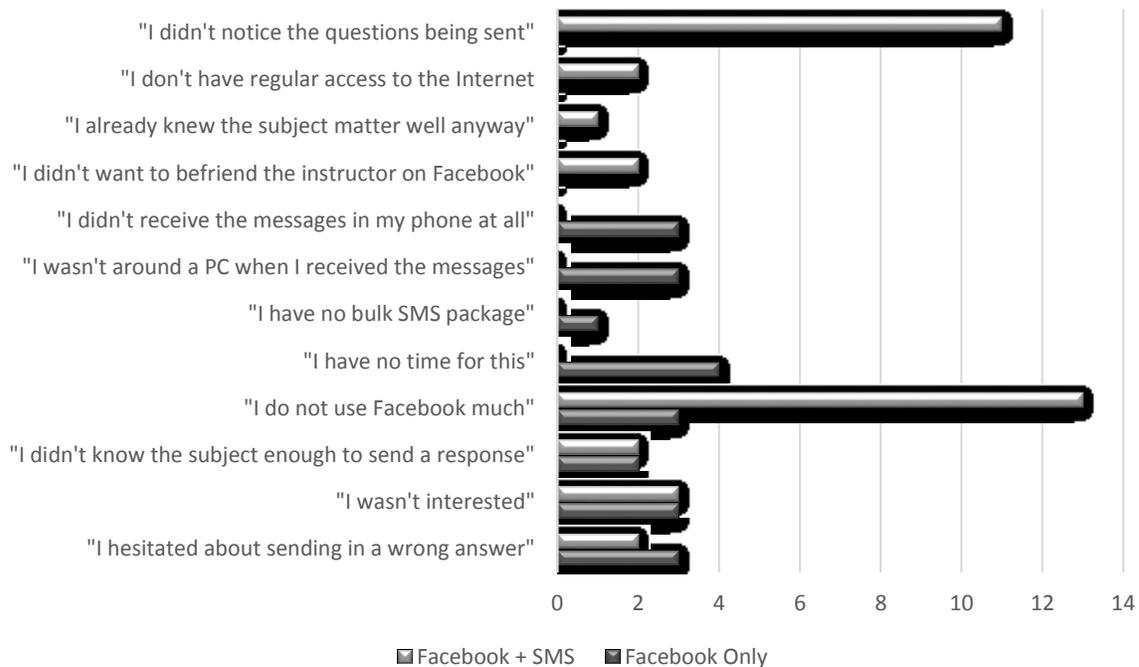


Figure 4. Coding categories of student responses in each group to the open-ended question "I did not participate in the practice program because..."

It can be seen that, anxiety about answering wrong (G1: 2 Codes, G2: 3 Codes), disinterest in the activity (G1: 3 Codes, G2: 3 Codes) and lack of knowledge in the subject (G1: 2 Codes, G2: 2 Codes) have been reasons for non-response in both groups. Not being a frequent Facebook user has been another reason which was found in both groups, although this reason was much more prominent in Group 1 (13 codes vs. 4 in G2). However, when this last reported reason was compared with instructor observations of students' Facebook activities, it was inferred that student statements in this sense are not entirely true and possibly rather a simple excuse for evading the question. Other reasons found only within Group 1 were, knowing the subject matter too well (1 code), not wanting to befriend the instructor in Facebook (2 codes), not

having regular Internet access (2 codes) and last but not least, not noticing the questions being sent (11 codes).

DISCUSSION

This research has aimed to uncover whether messages directly addressing the learner from over a non-congested message channel could have a positive effect on student participation in formative assessment quizzes that are delivered over Social Networking Services in the ubiquitous-learning context, with the additional belief that results might provide insight in LMS design heuristics. A reference messaging system of "SMS" has been chosen to represent a non-congested direct-messaging medium due to convenience purposes and a quasi-experiment has been carried out with preservice ICT teachers as subjects.

Although no initial significant differences were found between cases in terms of prior knowledge in the reference subject (SQL database queries) and Facebook usage frequencies; it has been shown that students who received the drill-and-practice questions over the Facebook wall have yielded significantly lower response rates compared to group of students who received questions in their mobile phones. This finding is highly consistent with results from a recent study by O'Bannon and her colleagues where a treatment group of students, who were asked to partake in educational activities over Facebook groups, have shown poor levels of participation and where no difference in terms of academic success between experimental and control groups have been observed (O'Bannon, Britt, & Beard, 2014).

This situation could be explained with a simple allegory by likening the activity in the "Facebook Only" group to a teacher asking a question to the pupils to her students in a real-life classroom, where many factors -including but not limited to- shyness and anxiety could cause non-response. And just as clicker systems (Stowell, Oldham, & Bennett, 2010) that enable private communication between instructor and pupil are used in a real-world class, private messaging mediums, which is represented by SMS in the context of this study- could be used in online social environments to overcome peer pressure.

At the end of the day, no matter how confident she may be, a student can still choose to be non-respondent if a question is not addressing her directly. And aside from dealing with peer-pressure, messages that directly address the learner may be helpful in this sense too, as addressed students may feel the immediate urge to respond, considering the instructor's full attention is now on her.

Although the difference in the number of responses is almost tenfold between groups; the participation levels at the "social" phase of the formative assessment activity where students were expected to interact with each other or with the instructor's feedback through Facebook comments and likes, is not equally proportional. This could help reinforce the underlying fact within the interpretation of the previous question, i.e. students will not engage in an educational activity, especially in the social networking site, which they mostly use for leisurely activities, unless urged to do otherwise. However, it is important to note that the reason for low number of student comments in Group 2 could be due to the fact that, the use of Facebook wall in this group has been solely for the purpose of providing feedback to students at the end of 3-hour time windows throughout which they were expected to send responses over SMS. As such, most of the communication had taken place between student and instructor in private and when final feedback was provided over at the Facebook wall, there was not much else left to discuss.

As far as academic performance is concerned, it is also notable that the student group who has responded relatively well to the drill-and-practice questions over SMS has also shown significantly better academic performance, indicating that voluntary participation in formative assessment indeed is a predictor of success (Kibble, 2011) and that SMS is still a viable tool for use in formative assessments in the mobile-learning context (Cosgun & Ozdener, 2014).

When asked their reasons for non-response, students have reported various reasons. Among these, the most striking contrasts were observed in terms of two reason categories. The first of these was "I did not receive the questions being sent", which was highly pronounced in the Facebook Only group but not even once mentioned in the Facebook + SMS group. This finding was an actual manifestation of the claim that important social network service notifications may still go unnoticed in the recipient's news feed (Shridhar et al., 2014). The second important code of reasons for non-response has been the ambiguous statement of "I do not use Facebook much". Instructor observation of participating students' leisurely activities which comes into effect at this point however, shows through inference that this statement could be untrue and more or less an excuse to evade the question. At this point, it could be meaningful that none of the non-respondents at the Facebook + SMS group have thought to come up with the equivalent of such excuses.

All and all, it can be inferred that students in this study have not shown much participation in the "social phases" of their practice activities that were carried out over the social networking service.

CONCLUSION AND SUGGESTIONS

It has been claimed in the literature that, as far as educational applications over social networking services in the ubiquitous learning context are concerned, there can be problems regarding the delivery of activity notifications to recipients. The significantly higher response rate and the consequential academic success achieved in this study by substituting public posts with direct messages that address learners personally over a non-congested channel could be considered to reinforce this claim. The SMS messaging system chosen in this study for convenience purposes, has been proven to be capable of serving as a personal messaging medium in the ubiquitous learning context in cases where the rate of smartphone ownership among students is not very high. As technology continues to become more and more accessible to the public, the SMS, which could already be perceived as an obsolete technology due to its usage costs and text limitations, could definitely be substituted with other forms of instant messaging. It should also be noted that a study by Amanullah and Ali reports that SMS, as opposed to contemporary messaging apps, has a higher rate of being congested by "spam" messages (Amanullah & Ali, 2014) and this can reduce user attention span. However, no matter what type of technology is used, the main idea is that leaving questions out in the open to be answered while using Social Networking Sites as Formative Assessment Tools in the ubiquitous learning context, may not be a best practice.

It seems that the definitive results shown by this paper poses a dilemma: When planning to use a learning management system as a formative assessment tool in the ubiquitous context, one could always choose to use popular social networks for the job in order to harness their popularity but this means risking losing touch with the learners while notifications of leisurely posts get in the way. This risk was alleviated in the context of this paper by sending direct messages to learners through a communication channel that is considered non-congested. This approach also has implications in the way of LMS design in general, making sure once again that notifications regarding important activities that take place over the system should be successfully delivered to their recipients directly and through a non-congested channel.

That being said, it should be noted that the "SMS" technology used in this study has the affordance of providing clear notifications to each cellular phone user, assuming that this relatively old

technology is almost unused for other purposes in the modern world. Considering the technical aspect of notification delivery in the ubiquitous context, notifications that are as powerful as SMS can be displayed only by native smartphone apps via their powerful feature of "push-notifications". Most Social Networking Services have highly popular native applications, but considering modern Learning Management Systems, one could not help but notice that most of these are applications can run only in Web browsers, which unfortunately render them unable to provide push notifications. There is always the option of using email-based push-notifications, but this could perhaps share the same fate with push notifications that are delivered by social network services: failing to go above the attention threshold of the recipient. This implies that future LMS designers might want to come up with native mobile application versions of their systems or at least complement their existing Web applications with SMS functionality, in order to provide for ubiquity in learning.

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A RE-EVALUATION OF MOBILE COMMUNICATION TECHNOLOGY: A THEORETICAL APPROACH FOR TECHNOLOGY EVALUATION IN CONTEMPORARY DIGITAL LEARNING

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ABSTRACT

We live in an age of continual technological development. Rapidly developing technologies have found use in nearly all aspects of life. As such, it is understandable that technology has also infiltrated the field of education. Information and Communication Technology (ICT) has provided us with the technical underpinnings for distance and lifelong learning. Our understanding of learning has shifted in accordance with the capabilities of technology in such a way that we have had to re-think our approach to learning as a whole. Connectivism is one such approach which aims to re-consider learning within the scope of our relatively new, networked social structure. The Theory of Connectivism relies heavily on what we are technically capable of, and therefore it is also important that we re-evaluate our approach to the technology we use in learning. Due to these aforementioned shifts in our approach towards learning, this study aims to provide a theoretical framework for the re-evaluation of the technology we utilize in connectivist learning; more specifically, how to evaluate our perception of mobile communication technology. A combination of the Technology Acceptance Model and the Media Naturalness Theory is proposed for the evaluation of user perception of mobile communication technology, and the implications of possible outcomes of this re-evaluation are discussed with regards to connectivist learning and education as a whole.

Keywords: Connectivism, communication technology, media naturalness theory, technology acceptance model.

INTRODUCTION

The 21st century has brought many innovations to various fields, many of which have been initiated by technological developments. Even before the advent of technologies such as the Internet and voice over IP, it was speculated that communication technologies would geographically reduce the world to a "global village" by eliminating the constraints of time and space (McLuhan, 2003). It is therefore understandable that the rapid developments in communication technologies have had a drastic influence in our social structures. Considering the changes and possibilities enabled through ICTs, Castells (2004) proposed that our social structure has moved away from hierarchies and towards that of a "network society". This change in social structure is caused by the fact that contrary to the developments of the industrial age, communication technology has made information a greatly sought commodity and has inadvertently caused a shift towards a "techno-economy" paradigm in which knowledge carries the greatest value. Castells (2004) states that within this techno-economy, the only way for societies, establishments and individuals to flourish is through an educational approach in which individuals learn to rapidly acquire and develop new skills that allow them to stay current throughout their lives.

The field of education has also been influenced by the development of ICTs and the affordances they allow. The basic concept of distance education relies on the fact that geographical distance is no longer a limiting factor. This being the case, theories developed towards traditional modes of education may be insufficient in their explanatory power. Siemens (2005) proposes the Theory of Connectivism as a new approach to learning in a digital age. This approach takes into account the technological basis of how we interact as a society and will be discussed further in following sections. The main focus of this study, however, is the issue of user perceptions regarding mobile communication technologies. These technologies were selected for this study due to their relevance regarding the “anywhere, anytime” approach to connectivist learning. Following a short description of Connectivism and connectivist learning, the Technology Acceptance Model and Media Naturalness Theory are discussed as viable approaches to the evaluation of user perceptions of mobile communication technologies for use in connectivist learning.

CHANGES IN KNOWLEDGE AND LEARNING: CONNECTIVISM

With the advent of technologies that significantly manipulate the educational process, the explanatory power of behaviorism, cognitivism, and constructivism may not be sufficient to analyze the learning that takes place today. This is the basic argument behind proponents of Connectivism, which aims to provide a learning theory that incorporates the networked nature of today’s society along with the technological developments that allow us to maintain this networked structure (Siemens, 2006).

Connectivism is based on the concept that along with the changes that took place in society towards a networked arrangement, learning itself has transformed in that access to information is of paramount importance. Siemens (2006) argues that the sheer amount of information is too much for any one person to handle and therefore it is of even greater importance that we know how and where to access information. Following this logic, connectivist learning implies that information rests in nodes of networks (where nodes are sources of specialized information, human or otherwise) and knowledge itself has adapted to these circumstances as it resides in the network itself, thereby enabling continuous learning in formal and informal settings (Siemens, 2006). Siemens (2005) states that traditional approaches to learning treat knowledge as an internal or internalizable object, and thus these approaches fail at analyzing the rapidly changing concept, content and landscape of education and learning regarding knowledge. Considering the constantly shifting nature of society, then, Siemens (2006) argues that arriving at any constant definition of knowledge as a concept renders it useless for diverse implementation, thereby indicating that traditional approaches to learning also fail to account for the diverse methods in which we learn. In this regard, Siemens (2005) draws attention to some significant trends in learning:

- *Many learners will move into a variety of different, possibly unrelated fields over the course of their lifetime.*
- *Informal learning is a significant aspect of our learning experience. Formal education no longer comprises the majority of our learning. Learning now occurs in a variety of ways – through communities of practice, personal networks, and through completion of work-related tasks.*
- *Learning is a continual process, lasting for a lifetime. Learning and work related activities are no longer separate. In many situations, they are the same.*
- *Technology is altering (rewiring) our brains. The tools we use define and shape our thinking.*
- *The organization and the individual are both learning organisms. Increased attention to knowledge management highlights the need for a theory that attempts to explain the link between individual and organizational learning.*

- *Many of the processes previously handled by learning theories (especially in cognitive information processing) can now be off-loaded to, or supported by, technology.*
- *Know-how and know-what is being supplemented with know-where (the understanding of where to find knowledge needed).*

Based on these trends in learning and drawing from the aforementioned changes in the landscape of knowledge, Siemens (2005) states that connective learning addresses these issues by proposing a learning approach which allows for constant adaptation through always current information accessible through connections. The principles of Connectivism are stated as follows (Siemens, 2005):

- *Learning and knowledge rests in diversity of opinions.*
- *Learning is a process of connecting specialized nodes or information sources.*
- *Learning may reside in non-human appliances.*
- *Capacity to know is more critical than what is currently known.*
- *Nurturing and maintaining connections is needed to facilitate continual learning.*
- *Ability to see connections between fields, ideas, and concepts is a core skill.*
- *Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.*
- *Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.*

In accordance with these principles, it can be argued that technological developments in the field of communication are an important aspect of the fulfillment of connectivist learning.

CHANGES IN SOCIETY AND TECHNOLOGY

In the face of changing circumstances surrounding our understanding of knowledge and learning, it is paramount that we also understand the technological innovations that not only permit the aforementioned developments in learning, but also how they have interacted with society thereby transforming our personal connections with technology. The rapid development in digital technology has even birthed a new generation whom grew up immersed in technology: digital natives (Prensky, 2001). As opposed to digital immigrants, digital natives have developed their awareness regarding technology on a much more personal level, thereby reaching a level of digital literacy that is arguably difficult for digital immigrants to achieve (Prensky, 2001; Irving & English, 2011). This has also impacted the personal nature of technology, as in a knowledge-economy based society, constant access is a key aspect of the modern networked individual.

One of the most significant developments in digital communication technology has been the addition of mobility to the hardware utilized for communication. This additional aspect of technology has spawned "portable" technology, or the concept of a person carrying technology on their person. While the terminology utilized to denote this concept has evolved into the utilization of the term "mobile", the basic ability to communicate anywhere via devices we can carry on our persons without major hindrance to our everyday lives has massively transformed our approach to time and space. Mobility has been a second stage in the communication revolution that spawned the network society, by increasing the level of disconnection between ourselves and space/time (Kakihara & Sorensen, 2001). Our immersion with technology has reached such heights that through mobile communication technology, a class of people who utilize these technologies to stay constantly connected regardless of geography or medium has risen: digital nomads (Kakihara & Sorensen, 2001). Digital nomads who take advantage of their network connectedness gain personal mobility yet carry their interactive lifestyles on their persons

through the utilization of wireless, mobile communication hardware and network services and software (Sorensen, 2002). As society reaches a previously unforeseen level of connectedness and flexibility, the deeply personal aspect of mobile technology begins to surface.

To better understand the personal aspect of mobile technology, along with how deeply integrated it may become in connectivist mobile learning environments, we must consider the definitive difference between that which is “mobile”, and that which is “portable”. In this regard, Jon Agar (2013) draws attention to the innate and personable importance of each object we choose to carry upon our persons. Just as one would carry a comb if they place importance on their personal appearance, the notion of the ability to communicate beyond the constraints of time and space – while in motion – is most likely the appeal that has led users to carry first or second generation mobile phones. The distinction of being able to communicate “while in motion” is most likely the driving cause of the proliferation of mobile communication technologies in our daily lives, ensuring a constant and permanent connection to individuals, information, and society. Agar also notes that mobile phones have drawn attention as radical new personal devices in that they replace single-function items, combining their utility into a single device, exemplifying this as follows: while a lawnmower is arguably a single-function device, it may also be used to prop doors open. In the case of the mobile phone, smart phones are basically fully functioning computers, thereby being capable of all the functions that computers are capable of. As a result of this flexibility, Agar argues that one would therefore want to be able to carry these capabilities with oneself. Based on this approach, Agar provides three distinct definitions regarding the “three concentric rings of personal technologies” (2013):

- *The outer ring:* Items “owned” by an individual that are for the most part immobile and do not move with them, such as desktop computers or refrigerators.
- *The middle ring:* Technologies which are “portable” in that they may be carried by an individual when necessary, but their mobility requires effort or exertion that may be an inconvenience, such as laptop computers.
- *The inner ring:* Items carried without effort and on one’s person such as smartphones, the weight of which may be disregarded due to their utility, making them “intimate” technologies.

These “rings” provide a method of defining mobile technologies based on a constant: the individual. As such, these definitions will most likely also remain true throughout various iterations and developments of technologies, no matter how drastic the change and transformation. In reference to the use of mobile technology for connectivist learning, however, it may be argued that the defining characteristic of mobile technologies and especially smart phones is that they have expanded beyond their intended role of mobile communication, and through the convergence of various multimedia features, “is no longer simply a phone” (Westlund, 2008).

Demographic studies conducted on mobile technology use indicate that while there is an apparent majority in mobile technology use in relatively younger generations, technology adoption is not limited to digital natives (Zickuhr, 2011). Horrigan (2007) studied the qualities of various user groups regarding ICT use in society, and repeated his study with emphasis on mobile and stationary technology, revealing that while youths primarily utilized ICTs to their fullest potential, an important portion of active users are somehow related with higher education (in the form of active studentship, or as graduates) (Horrigan, 2009). Network (or with respect to Horrigan’s study, Internet) access was determined to be a determining factor in mobile technology preference and considering the data regarding users who utilize mobile technology to its fullest (referred to as Elite Users) overlaps with previous data indicating high technology utilization among students,

a better understanding of the perception of mobile technology could provide useful for a better understanding of its current and potential uses. Mobile technology tends to be very “personal” in nature, and it can be argued that studies conducted on the relationship between technology and society on an organizational or institutional level fail to grasp the personal experience and distinct, personalized needs utilization of technology (Wiredu, 2007). To address this issue, and to better understand the relationship between mobile technology and its users this study proposes a combination of approaches to technology use: a combination of the Technology Acceptance Model (Davis, 1989) and the Media Naturalness Theory (Kock, 2005).

A NEW APPROACH TO EVALUATION

The concept of evaluation covers a broad context in the realm of learning and education. Studies of evaluation cover issues from policy changes to specialized course content, teaching and learning strategies to the implementation of learning tools. As a field developing in collaboration with ICTs, distance education in particular draws benefits from the evaluation of the ICTs currently and prospectively implemented in learning. The concept of evaluation itself, however, has been limited in that as far as the evaluation of educational and learning technologies are concerned, emphasis is placed (arguably rightfully) on the learning outcomes associated with the use of these technologies, along with other key considerations for the evaluation of learning technology as per indicated by Oliver (2000). This approach, however, is arguably less applicable in the case of connectivist learning, as the act of learning itself relies heavily on the capability of the learner to create and maintain new connections through which they can access and create knowledge. Connectivist learning relies on the accessibility of information, and the ubiquity of the tools to gain and maintain that access. The act of learning itself is therefore heavily dependent on the use of technology by the learner, along with the level of communication (and therefore access) provided to the learner by this technology. It is due to this distinction that this study draws attention to the evaluation of mobile communication technologies as primarily tools of communication, as such an evaluation would provide insight into the possible strengths and weaknesses of these tools in connectivist learning environments. Similarly, Motiwalla (2007) proposes a framework and evaluation for mobile learning, indicating that the intended use for such a framework or method of evaluation is to “provide the requirements to develop m-learning applications that can be used to complement classroom or distance learning”; yet continues to state that “ Learning on wireless/handheld devices will never replace classroom or other electronic learning approaches.”, thereby somewhat negating the underlying potential of communication technologies in learning. The proposed framework focuses distinctly on mobile communication technologies as handheld apparatus utilized to access supplementary learning materials outside of the classroom environment, disregarding the possibility that learning may take place anywhere, any time. Such limitations in the understanding of the technologies utilized in learning lie at the core of a lack of theoretical models on which assessment and evaluation of these technologies may depend. Either by focusing on the learning process and disregarding the tools utilized, or by focusing only on the possible learning scenarios afforded by these tools, currently established frameworks and models overlook the potential for utilizing technologies in previously unforeseen ways. This is the inherent reason that this study emphasizes the evaluation of mobile technologies primarily as tools of communication. If the Theory of Connectivism is to be adhered to, knowledge may lie in both the tools and in the users, and access to these resources lie in learners’ ability to create and maintain connections to

these nodes. Taking into account the “mobile” aspect of learners, evaluating mobile communication technologies that may be used for learning purposes must start by evaluating their prospective uses – how users themselves perceive these technologies – along with their ability to successfully achieve their intended purpose – as mediums of communication.

Within the context of this study, the proposed two-pronged approach to the evaluation of mobile communication technology incorporates the Technology Acceptance Model, and the Media Naturalness Theory, both of which are further discussed below. The Technology Acceptance Model has been previously utilized individually in evaluative capacities (Lee et al, 2003) whereas the Media Naturalness Theory is a proposed extension of the Media Richness Theory, which has prominently been used in previous research in communications – though with distinct shortcomings related to its capacity regarding new communication technologies (El-Shinawy & Markus, 1997). As of the writing of this article, no previous research has been encountered in which both approaches are combined for the distinct purpose of evaluating mobile communication technologies. It is believed that the explanatory power of the combination of these two approaches would provide a more substantial and dependable framework for such an evaluation.

TECHNOLOGY ACCEPTANCE MODEL

One of the most widely utilized explanatory models regarding the relationship between society and technology is the Technology Acceptance Model (TAM). Davis (1989), recognizing the issues regarding user acceptance in technology and the lack of high quality measures for user acceptance, developed TAM based on two main constructs:

- *Perceived Usefulness:* The degree to which a person believes that using a particular system would enhance his or her job performance.
- *Perceived Ease of Use:* The degree to which a person believes that using a particular system would be free of effort.

Davis expands on perceived usefulness, stating that individuals are more likely to use or not use a technology based on their belief of whether or not it will do a job better. Regarding perceived ease of use, Davis indicates that even if potential users believe in the usefulness of a technology, they may also believe that the effort and exertion to use that technology may surpass the performance gains to be obtained through use, thereby believing the system to be too difficult to use.

TAM has been criticized for reducing the complex mechanism of technology acceptance to two seemingly vague measures. The prominence of TAM in studies, however, could be considered an indication of its versatility in the matter, and research has shown that TAM’s measures retain their efficacy under a variety of circumstances (Lee et al, 2003). In its eventuality, TAM has evolved into the Unified Theory of Acceptance and Use of Technology, yet studies indicate that the involvement of further measures upon the two bases of TAM introduces unnecessary complexity relating to the additional measures (Bagozzi, 2007). An intermediary iteration of TAM, called TAM2, which incorporates social factors and cognitive tools in addition to the two basic measures of TAM could be considered as a viable approach to technology acceptance and use. Studies, however, have indicated that the incorporation of factors such as Usage Attitude did not have a determining effect on intended or actual use (Wu & Wang, 2005). Within the scope of this

study, it has been decided that educational theory takes precedence regarding the social aspects of technology use for learning and is the defining reasoning behind the selection of TAM as the first part of the proposed two-pronged approach to technology use.

MEDIA NATURALNESS THEORY

Media Naturalness Theory (MNT) is based on the evolutionary theory of Charles Darwin in that it attempts to explain our communication preferences based on are existing communicative apparatus: our senses. While developing MNT, Ned Kock took into consideration the shortcomings and limitations of the Media Richness Theory (MRT) (Kock, 2005). The fundamental flaw that Kock presents regarding MRT is that there are many studies supporting the media richness hypothesis that fail to explain peoples' preference towards face-to-face interaction, stemming from the fact that MRT fails to explain our lenience towards "rich" media (Kinney & Dennis, 1994; Kock, 2005; Kock 2001). Studies have also indicated that MRT fails to retain its validity when studying new communication technologies (El-Shinawy & Markus, 1997). Kock provides a theoretical basis for his argument for media "naturalness" as a primary precedent for our selection of communication media through our natural tendency towards face-to-face communication through the evolution of our biological apparatus. From this basis, MNT has five fundamental elements in defining a communication medium relative to face-to-face communication (Kock, 2005):

- *A high degree of colocation, which would allow the individuals engaged in a communication interaction to see and hear each other.*
- *A high degree of synchronicity, which would allow the individuals engaged in a communication interaction to quickly exchange communicative stimuli.*
- *The ability to convey and observe facial expressions.*
- *The ability to convey and observe body language.*
- *The ability to convey and listen to speech.*

Kock (2005) states that communication that takes place based on these factors may accommodate the elements of face-to-face communication, and adapting these elements to electronic communication environments can provide an experience closest to face-to-face communication. MNT provides a method for evaluating communication preferences through psychological and physiological dimensions, and its explanatory power is based on our evolutionary tendency towards face-to-face communication. As such, MNT combined with TAM from the previous section provides us with a flexible yet decisive theoretical method for evaluating mobile communication technology.

THEORETICAL MATRIX OF MOBILE COMMUNICATION TECHNOLOGY EVALUATION

In accordance with the measures of both TAM and MNT portrayed above, these two approaches may be combined to provide a comprehensive strategy for the evaluation of communication technologies. The combination of these measures are portrayed in Table 1 below:

Table 1. Theoretical Matrix.

		MEDIA NATURALNESS THEORY				
		Colocation	Synchronicity	Conveying and Observing Facial Expressions	Conveying and Observing Body Language	Conveying and Hearing Speech
TECHNOLOGY ACCEPTANCE MODEL	Perceived Ease of Use	Mobile communication Technologies may open channels of communication independent of location, thereby providing ease of use by negating the necessity for colocation.	The synchronous and asynchronous communication facilities afforded by mobile communication technologies may prove both beneficial and detrimental. When the technical requirements of synchronicity are not satisfied, ease of use may be negatively affected.	Despite being able to satisfy the need for facial expressions through synchronous video calling, mobile communication technologies may also satisfy this requirement asynchronously through messaging services and symbols (emoticons).	While conveying and perceiving body language may be difficult with mobile communication technologies, it is arguably possible. Synchronous video calling may allow for this under certain situations (though body language is not easily conveyed through text-based communication formats). Observing body language through mobile communication technologies may require more effort.	The perceived ease of use regarding conveying and hearing speech may vary based on different contexts of the user (such as when it is inconvenient to talk).
	Perceived Usefulness	One of the fundamental usage characteristics of mobile communication technologies is their responsibility to satisfy the need to communicate anytime, anywhere, independent of colocation.	Synchronous communication may prove useful in circumstances where immediacy is important. In instances where immediacy is not a priority, synchronicity may not be useful. Immediacy may be hindered due to the technical limitations of mobile communication technologies.	Under circumstances in which facial expressions carry importance, the limitations of mobile communication technologies may prove insufficient; however the necessity may be variable on a per-user basis.	The limitations of mobile communication technologies may prove them insufficient in conveying and observing body language. Additionally, this usage scenario may lie beyond the intended use and design scope of these technologies.	Conveying and hearing speech is historically one of the original intended and thereby usually innate capabilities of mobile communication technologies.

As can be observed in Table 1, the combination of the key elements of both TAM and MNT reveal certain emerging themes from which an evaluation of mobile communication technologies may be conducted. Through this matrix, the intersection of each of the proposed measures of each theory provide a guide in which tangential correlations are formed. This, in turn, combines the explanatory power of both theories into a flexible frame of reference from which both qualitative and quantitative methods of measurement may be derived. Additionally, this frame of reference may also be used to develop a checklist with regard to the design and implementation of mobile communication technologies in learning environments, both as an a priori element to establish the requirements expected of mobile communication technologies in learning environments, and as a posteriori reference to assess the achievement of predetermined goals through mobile communication technology.

CONCLUSION

At this point, the matters discussed above converge regarding issues being faced by the field of education. Learning has undeniably been influenced by developments in technology, as those developments have also manipulated society as a whole, and individuals on a personal basis. Learning has transcended into a realm combining formal and informal learning, in which knowledge and information have become matters of accessibility. The Theory of Connectivism provides some perspective on the matter in that it takes into account the shifting nature of learning and knowledge in accordance with contemporary modes of learning and information access. To accommodate this approach, we are also in need of a method to evaluate the technologies involved in the process. The departure from traditional learning forms brings with it a departure from traditional learning mediums and incorporates a plethora of technologies capable of serving various needs for today's learner.

Emerging technologies have proven exemplary in the opportunities they provide. Constant network access accompanied by Wikis and social media has brought information accessibility to a whole new level, drastically changing the mediation of information and our consumption of data and information in daily life. Connectivist learning dictates that the skills needed to efficiently utilize the affordances these new technologies allow us are rapid adaptation and connection-forming. While digital natives and digital nomads may not face that many issues regarding technology utilization, digital immigrants are confronted with a level of information throughput they may have never faced before. On a fundamental level, we must be capable of understanding the process of media selection and technology adoption before we can effectively utilize emerging technologies in learning spaces. The two-pronged approach of TAM and MNT proposed in this study introduces a method for evaluating technology in a way that will help us understand the opportunities, benefits, and shortcomings of the technology we seek to grasp and utilize in learning. This proposed method of evaluating mobile communication technologies allows us to gather essential information regarding how much use these technologies are likely to see in a learning context along with how effective they will be at conveying the information necessary for learning to take place. This understanding, in turn, could allow us to adapt the conception, design, implementation, and evaluation of technology in learning for beneficial and cost-effective results, allowing us to make these evaluations not as a learning outcome after everything is said and done, but before implementation as a precursor to learning taking place.

In the battle to better understand and incorporate learning and life-long education, understanding the tools we use to learn – consciously or otherwise – is an elemental step in the constant development process of tailoring learning to society. As such, while this study focuses mainly on the application of the proposed two-prong approach to technologies that are intended for utilization in connectivist learning environments, it is also plausible and in fact suggested that this approach may prove beneficial in assessing the technological infrastructure of all forms of learning in which mobile technologies are to

be utilized. This includes but is not limited to mobile learning, e-learning, u-learning, and distance and open education, and is especially true considered the current ubiquity of mobile communication technologies in society.

The opportunities afforded by the development of mobile technologies are truly astounding, and these technologies find application in a plethora of educational situations ranging from formal to informal, structured to unstructured. They allow for the presentation of learning content and application of standardized testing beyond the constraints of time and space, yet also allow the opportunity for learners to manage their own learning space and pace. It is precisely due to these opportunities afforded by mobile technology that the educational community as a whole develops a better understanding of the underlying technology and how it is perceived and utilized by the users and learners.

Author's Note: Article derived from theoretical framework of Ph.D. thesis.

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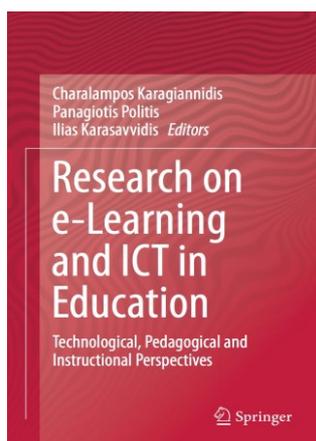
BOOK REVIEW

RESEARCH ON E-LEARNING AND ICT IN EDUCATION

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Information and Communication Technologies (ICT) have had a substantial impact on current society. The way we communicate, work and entertain has changed deeply. Education is one of the fields where ICT applications have been used expansively over the years. Educators have recognized the importance of digital materials since the early days of computers and believed that these materials can be easily managed and distributed to learners to improve the quality of education via multimedia, hyper media and interactivity.

The advent of the Internet and the web has given the opportunity to educators to distribute the digital learning materials and support new forms of web-based learning. Accordingly, the development of e-Learning systems, which support sharing of digital learning material and facilitating communication between learners and educators, has become a vital issue in education platforms.

At the same time, lifelong learning emerged as a vital necessity since all citizens need to be educated throughout their lives in order to remain competitive in the knowledge-based economy. To meet these needs of supporting access to education and training to anyone, anytime, anyplace, the e-Learning industry has experienced rapid growth over the past decade becoming the second largest industry evolving around the Internet and the web (second to e-Health industry). In this context, ICT in Education and e-Learning have become a spirited research interest worldwide during the past decades.

This volume entitled "Research on e-Learning and ICT in Education" aims to contribute to the literature in ICT in Education and e-Learning by addressing several core issues. The Volume includes 19 chapters, which cover a wide variety of topics.

Part I: Situating ICT in Education

The first part includes three chapters; ICT is scrutinized in a broader educational context. Underwood questions why digital technology has penetrated our lives so much, but has failed to make an impact in the classroom. Mikropoulos, Sampson, Nikopoulos, and

Pintelas investigate the evolution of educational technology through a bibliometric study. They analyze the 849 papers presented in a specific series of educational technology conferences (HCICTE from 2000 to 2012) in order to study the e-Learning scientific community in Greece and to identify the evolution of salient topics, and the emergence of the trends in the field. Apostolopoulou, Panagiotakopoulos, and Karatrantou conclude this part through an investigation of the learning theories underlying the development of educational applications for supporting teaching and learning of Mathematics, Physics, and Chemistry in Secondary Education.

Part II: ICT in Preschool and Primary Education

The second part includes three chapters, which examines ICT use in preschool and primary school settings. Nikolopoulou investigates how educational software is used in kindergartens. Her analysis reveals that various educational software is used in these classes, most of which are open-ended software aiming to advance language, reading, and writing skills. Findings show that the main difficulties that children face with the use of this software are related to the required motor skills and the language readiness necessary for their operation. Zaranis examines how ICT can facilitate first graders' Geometry concepts employing the Realistic Mathematics Education (RME) and the van Hiele models, and associates them with "traditional" teaching methodology. Halki and Politis investigate how educational software affects the learning outcomes of primary school students in high-level skills of critical thinking and programming.

Part III: ICT and Teaching Programming

The third part includes two chapters, which address the teaching of programming concepts through ICT. Malliarakis, Satratzemi, and Xinogalos investigate teaching of programming through educational games. They review the most recognized educational games critically for teaching programming, which can guide the development of future applications. Misirli and Komis also focus on programming through robotics in the context of early childhood education. They form a framework with educational scenarios that integrate programmable toys as a guide to teaching programming concepts. Their framework includes seven phases for designing educational scenarios, including identification of the teaching subject, identification of children's prior knowledge, determination of scenario goals, selection of ICT teaching materials and etc. Their framework has been tested and verified by 46 educators on 864 children between the ages of 4–6.

Part IV: Web 2.0 Tools and Learning

The fourth part includes three chapters, which explore how Web 2.0 technologies can affect education and describe the advancement of a Community of Inquiry (CoI) in a blended learning environment developed through hybrid learning. They analyze the social, cognitive, and teaching presence within a CoI in a specific class, where students use a blog to achieve specific learning objectives. Eteokleous-Grigoriou and Photiou investigate how blogs can be integrated in primary education. Altanopoulou, Katsanos, and Tselios investigate the effectiveness of a framed wiki-based learning activity. They report a study with 139 first year undergraduates who used Wikis to learn about Web 2.0 and its applications in the context of an introductory course. It was found that students benefited from the implementation irrespective of their role in the Wiki project. Kazanidis, Valsamidis, Kontogiannis, and Karakos address the evaluation of courseware at the exams, usage, and content level.

Part V: ICT for Learning in Museums

The fifth part includes two chapters, which explore technology-based learning in museums and cultural institutions. Yiannoutsou and Avouris recommend the use of digital games as a means to actively involve museum visitors to participate in the process of culture creation. Nikonanou and Bounia discuss digital applications created by museums and other cultural institutions. They present a qualitative evaluation study of digital applications created by Greek museums and other cultural institutions during the past few years. The study is based on contemporary theoretical approaches in the field of museum education and aims to explore the extent to which these approaches are taken into account when designing a digital application for museum education use.

Part VI: ICT and Pre- and In-service Teacher Practices

The sixth part includes three chapters, which investigate how ICT affects Pre- and In-service teachers and their practices. Karasavvidis and Kollias examine the ways in-service teachers integrate technology in their designs after an extensive Professional Development Training program. They surveyed how teachers' backgrounds influence their responses to an extensive PDT program. Conducting two studies, their results show serious doubts on the contemporary PDT programs to transform teaching practices through technology and discuss the implications of their work for future conceptualizations of PDT.

Khaneboubi and Beaune investigate the effect of ICT in French middle schools involved in a national endowment program on digital textbooks. In the study, there were 89 teachers as participants and the two datasets were collected in 2010 and 2012. The research provides useful insights into the school dynamics in this context. Vekiri examines the challenges and needs that should be addressed in teacher preparation for educational technology. She conducted a study, which analyzed 30 pre-service elementary school teachers' lesson plans, representing their first endeavors to design a web-based lesson. The analysis primarily focused on the types of activities, the characteristics of the web resources, and the scaffolding techniques planned to use to support their students. Study findings show that using the Internet productively and creatively is essential and teachers need to develop multifaceted forms of knowledge that require the integration of knowledge about technology, pedagogy, and content.

Part VII: ICT for Specialized Uses

The seventh part includes three chapters, which highlights specialized topics in ICT in Education. Tegos, Karakostas, and Demetriadis address conversational pedagogical agents in individual and collaborative learning settings. They present the results of an experimental collaborative learning activity exploring whether the different agent roles might affect the students' insights of the agent or their conversational style in their responses to it. Apostolidis and Tsiatsos present a prototype device called "Galvanic Skin Response" which measures the anxiety level of a person by collecting bio-signals. They pilot-tested their device with 13 volunteer students. Chatzara, Karagiannidis, Mavropoulou, and Stamatis examine the potential value of using Digital Storytelling for teaching social skills to children with Autism Spectrum Disorders. They used DiSSA (Digital Structured Storytelling for Autism) tool, a software application to create digital stories with a structured approach. The system is designed to supply the needs of students in the autistic spectrum, exploiting structured teaching in the design of the application.

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