MobiSOOCs for In-Service Teacher Education: Design Considerations for Developing Countries

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Abstract

There is a considerable shortage of trained teachers worldwide, which is particularly increasing in countries that allocate low GDP for development of education. With advancement in wireless technologies and high access rate of mobile device used in developing countries, online or distant learning is a potential cost effective alternative to expensive teacher training programs.

Mobile learning enhances learners' intrinsic motivation by promoting self-regulated learning (SRL). This paper explores the underpinning principles, theories and action framework of a strategic open online course (SOOC) for in-service teacher training. The project was executed through mobile learning (m-learning) pedagogy in Pakistan by a private school system. Results showed that m-learning was cost effective and positively impacted participants' attention, confidence, satisfaction and relevance of the course material.

Keywords*:* m-learning, SOOCs, teacher training, self-regulated learning.

Introduction

Many developing countries face an increasing gap for trained teachers. A global total of 10.3 million teachers are expected to be recruited between 2007 and 2015 (UNESCO Institute for Statistics, 2009) however, most countries in sub-Saharan Africa, the Arab States, South and West Asia allocate low GDP for development of quality education and consequently suffer from low resources and finances to invest in continuous in-service teacher training. This increases the ratio of untrained teachers in developing countries. With advancement in information and communication technology (ICT), prior research establishes that different ICT embedded models offers potential solution to build teachers' professional knowledge alongside acquiring basic e-skills (Zhang & Aikman, 2007).

Online distant learning (ODL) has given a fresh avenue to ICT embedded instruction models. Advancement in mobile phone technology has opened up a huge array of possibilities for distant learning. In recent years, there have been numerous mobile learning (m-learning) projects implemented around the globe to promote self-regulated education (Binsted, Joseph, & Suthers, 2005; Brown, 2001; Cabrere 2002; Chinnery 2006; Kadyte 2003; Kiernan & Aizawa 2004; Levy & Kennedy 2005; Norbrook & Scott 2003; Ogata & Yano 2004; Paredes et al. 2005; Thornton & Houser 2005). A report published by

UNESCO WPS ML (2013) reveals several successful m-learning training initiatives taken in developing countries in recent decades. Some successful projects include Text2Teach (Philippines, 2003), SMS for Language Learning (Hong Kong, 2006), Literacy Promotion through Mobile Phones (Pakistan, 2009) and BBC Janala (Bangladesh, 2009). Most of these m-learning projects have been experimental in nature as there is little discussion disclosing formal underpinning theories and models contributing to their success. In most projects, the primary method of communication had been short message service (SMS).

In Pakistan, there has been a remarkable success in the development of reliable technological infrastructure for wireless telephony and computing. Advancement of Bluetooth, UMTS (Universal Mobile Telecommunications System), WAP (Wireless Application Protocol), GPRS (General Packet Radio System) and 2G Edge services ensure swift data transfer and broadband connectivity. This development assists users to create and share knowledge using ubiquitous devices. However, with all the infrastructure in place, m-learning is still in its infancy stage in the country (Iqbal & Ahmed, 2010). Rapidly increasing number of mobile users, low prices of smart phones and wireless services which can be used in an educational context (MacCallam & Jeffery, 2009) are the prime promising factors for successful projection of m-learning in Pakistan (Wang & Shih, 2009). However, in the country, there has been little documented research in this area. This project is the first of its nature that has been documented and reported to wider audience.

MOOCs VS SOOCs

Massive Open Online Courses (MOOCs), free and easy access to learning material, is a recent development in the field of ODL. Researchers classify MOOCs into three categories on the basis of their design model (Lane, 2012): (1) constructive MOOCs; (2) content-based MOOCs; and (3) task-based MOOCs. Many educationists also propose MOOCs as an alternative to traditional higher education (Kolowich, 2012; Martin, 2012; Pappano, 2012; Yuan & Powell, 2013). However, prior research also realizes that developing specific self-regulatory study skills are essential to benefit from a MOOC with several participants not necessarily sharing homogeneous academic background and development needs. In many cases of training or education delivered through a MOOC, participants report demotivation, frustration, and lack of collaboration and exchange of feedback with peers and instructor. These are repeatedly reported controversial issues in MOOC pedagogy that lead to a considerable rate of early drop outs (Cooper & Sahami, 2013; Daniel, 2012; Downes, 2010; Sharples et al., 2013,). To overcome these challenges, an alternative of MOOC pedagogy is to establish an interactive and exploratory environment for selective participants; a Strategic Open Online Course (SOOC).

SOOCs follow an online pedagogic approach; specific need-based course content, continued motivation by regular feedback and collaboration with course instructor, social alliance with peers and interactive course tools are some distinctive features that make SOOCs more practical than MOOCs.

Project Prehensile Palms

In 2010 a web-oriented synchronous collaborative platform was designed to deliver a sixty-four hours long training program for twenty-one primary school teachers belonging to a private school system in Pakistan. These participants were located in different cities of the country and accessed course content with their smart phones. The aim of this model was to develop and test a low-cost mobile learning environment for connecting, collaborating, learning, and reporting to each other. The project design framework is an amalgamation of constructive MOOC pedagogic style with mobile learning (m-learning). On account of limited and selected participants, targeted content, course toolkit, and execution mode; the design model of this project is classified as a mobile-

SOOC (de Waard et al., 2012). This model is an infusion of ubiquitous m-learning with socio-constructive approach of using strategic online courses

The objective of this paper is to share the design framework of a mobile-SOOC (hereafter mobi-SOOC), the adopted pedagogic approach, and its impact on participants' motivation and learning outcomes.

Design Implications of mobiSOOCs for Teacher Training

In Pakistan, primary schools follow a notably varied curriculum and teaching style, therefore teacher training is unique to the context of each school. This diversity generates potential utility for SOOCs that are designed according to the context of selected participants.

In terms of design, SOOCs best lend themselves to the self-regulated learning (SRL) model that infuses self-centeredness and social interactions (Downes, 2012; Hendricks, 2013). The training model under discussion possesses a design model underpinned by SRL theory and promotes a great sense of autonomy amongst participants constraining them to dual learning skills: self-centeredness and social collaboration (Cazan, 2013). It facilitates different learning styles; participants specify their individual professional goals, select plans that enable them to achieve those goals by choosing from a variety of learning activities. They indulge in social collaboration by reflecting on their own practices and giving constructive feedback to peers. At completion of training program, these investments serve as indicators to differentiate between successful and unsuccessful participants (Tschofen & Mackness, 2012).

Research also supports that SRL, social connectivity, and peer feedback trigger intrinsic motivation. (Deci, Vallerand, Pelletier, & Ryan, 1991). Figure 1 shows over-lapping features of SOOCs and m-learning those generate elements to boost intrinsic motivation.
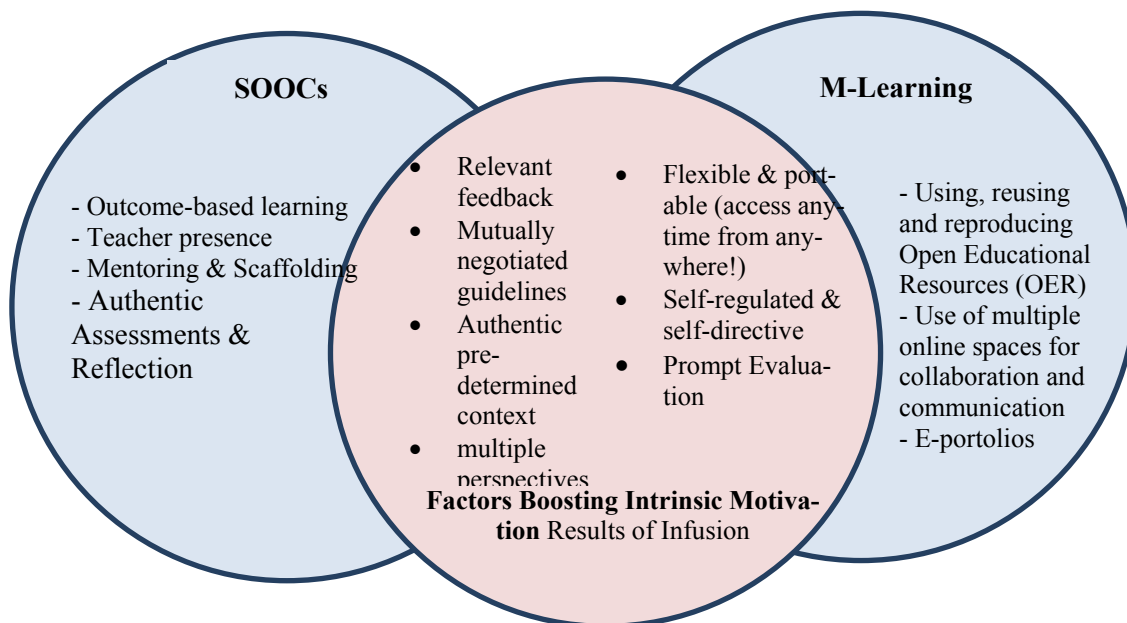

SOOCs
- Outcome-based learning
- Teacher presence
- Mentoring & Scaffolding
- Authentic Assessments & Reflection

- Relevant feedback
- Mutually negotiated guidelines
- Authentic pre-determined context
- multiple perspectives

- Flexible & portable (access anytime from anywhere!)
- Self-regulated & self-directive
- Prompt Evaluation

Factors Boosting Intrinsic Motivation Results of Infusion

M-Learning
- Using, reusing and reproducing Open Educational Resources (OER)
- Use of multiple online spaces for collaboration and communication
- E-portolios

Figure 1: Infusion of SOOCs and m-learning resulting into intrinsic motivation boosters.

Design Model

Theoretical model

The theoretical project design model was established in the light of Davis' (1985) Technology Acceptance Model (TAM) to increase participants' motivation and performance.
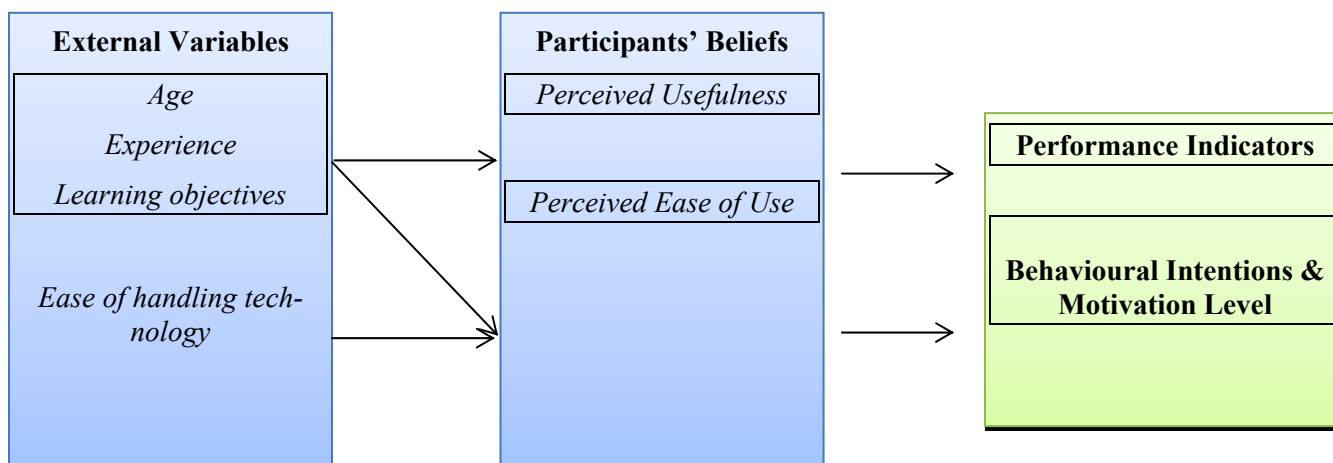

Figure 2: Project Design - Theoretical Model

Technical model

The project technical framework presents a pool of relevant technologies in order to share knowledge and learning material, collaborate, monitor, report, and evaluate. Table 1 gives a holistic view to technologies and perceived actions.

Table 1: Technical Model

	Technology Bank	Action
Tutor	Short Message Service (SMS)	Send course updates
Participants		Reporting\ feedback
Tutor	Main course blog at www.schoology.com	• Uploading course assignments and learning material. • Monitoring attendance sheets and participants' usage track.
Participants		• Access course toolkit • Collaborate with peers and tutor • Upload individual work samples
Tutor\ Participants	Tango	Digital collaboration and meetings
	Google Hangout	
	Skype	
	Email	One-to-one correspondence between peers and tutor
	Multimedia toolkit in a handheld device	Capture and share videos, audio recording, pictures

Action framework

The implementation framework of the project took inspiration from Keller's ARCS model (1979). Hypothesis of this action framework builds on interactive relationship between learning process

and individual context proposed by Song and Hill (2007). The aim is to keep participants active and motivated by empowering them to schedule, practice, monitor, and evaluate self-learning processes. All assignments and supporting material available at the central course blog can be accessed through participants' mobile phones whenever they need or want, ensuring positive attention, boosting self-confidence, increasing the degree of relevance and maximizing satisfaction of the participants. Figure 3 synthesizes advantages of moobiSOOC design model and its impact on self-regulated learning, level of self-direction and motivation (ChanLin, 2009; Chyung, 2001; Huang, Diefes-Dux, & Imbrie, 2006).

Figure 3: Amalgamation of m-learning and Keller's ARCS Model

Methodology

This is an exploratory case study that examines how an online distant learning program for selective participants impacts learning outcomes when the mode of instruction and learning is through a handheld device. The use of a case study method is appropriate because it provides in-depth examination of the impact of mobile learning for a strategically selected group of participants. This approach can provide a holistic account of the phenomenon under investigation (Yin, 2003). This pilot study examines twenty-one primary school teachers. All teachers make use of their personal smart phones; each participant receives a bundle SMS package along with 15GB data contract for four months from a local 3G mobile service provider (UFONE). Participants of the project age from 21 to 50 plus years and possess a range of generic IT capabilities from basic to advanced level. The researcher carried out a basic ICT skill analysis before designing course material. Group communication takes place via main course blog at a freemium service provider. The digital platform provides access to course reading material (pdf. files), audio and video resources. Other free web resources mentioned in Table 1 were used for collaboration in small groups or one-to-one sessions with the researcher.

Data Collection

The researcher collected relevant data over a period of sixteen weeks. Robson (2002) proposed three basic rules in collecting data for a case study: (1) multiple sources of evidence, (2) a case study database, and (3) a chain of evidence.

The researcher collected data from three sources, established a database of the evidence, and used consistent questions for all data collected. The three data sources include the following: (1) Teachers' digital focus group, (2) Personal digital diaries, and (3) Surveys forms focusing on areas affiliated to handling technology, participants' beliefs and motivation.

Qualitative data was collected through fortnightly focus group discussions held via Google Hangout. The discussion focused on the following areas: (a) impact of m-learning on freedom and ease to learn, (b) advantages and disadvantages of strategically selected group members, and (c) m-learning approach VS face-to-face learning method.

The meeting recording serves as minutes for participants to review and verify for accuracy.

Results

All respondents were female (100%). The majority (68%) of the respondents were above the age of 30.5 years, 6% respondents had 5 years or more working experience as a teacher. Only 31% respondents had work experience less than 4 years.

The prime quantitative data represented in Figure 3 was collected by tracking participants' usage log throughout sixteen weeks, which shows frequent visits throughout the course.
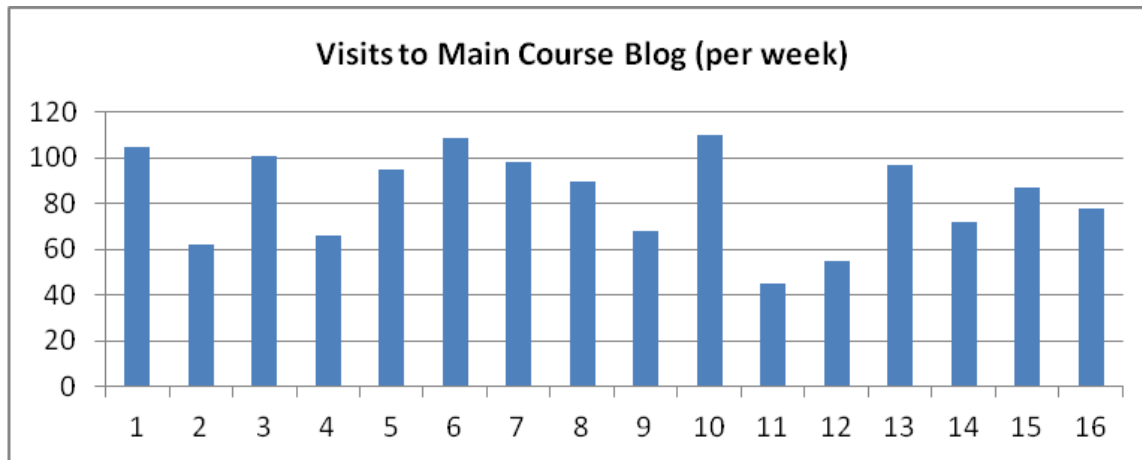

Figure 3: Data showing participants' visits to main course blog

Reliability Measurement

Cronbach Alpha is used to measure the reliability of the instrument (see Table 2). The results show that the instrument is highly reliable, the alpha values for LO, PEU, IUE, and PU are 0.793, 0.754, 0.870, and 0.792 respectively. Alpha values for aforementioned are considered reliable as they are higher than 0.70 which is generally considered reliable (Tabachnick & Fidell, 2007).

Table 2: Cronbach's Alpha

	Cronbach's Alpha	No of Items
Learning Objectives (LO)	0.793	4
Perceived Ease of Use (PEU)	0.754	4
Intention to Use e-learning (IUE)	0.870	4
Perceived Usefulness (PU)	0.792	4
	0.80225	16
Alpha value > 0.70 shows a reliability.		

Pearson Correlations

The results of the Pearson correlations are presented in Table 3. Results show there is:

- no significant relationship between Age (A) and Gender (G);
- a weak positive relationship (a=.198 significant at 0.01) between Pay Scale (S) and Age (A);
- a weak negative relationship (a=-.291 significant at 0.01) between Learning Objective (LO) and Age (A);
- a strong positive relationship (a=.296 significant at 0.01) between Perceived Utility (PU) and Age (A);
- a strong positive relationship (a=.296 significant at 0.01) between Perceived Utility (PU) and Learning Objective (LO);
- a weak negative relationship (a=-.258 significant at 0.01) between Perceived ease of Use (PEU) and years of experience (E);
- a weak positive relationship (a=.172 significant at 0.05) between Perceived ease of Use (PEU) and Learning Objectives (LO);
- a weak positive relationship (a=.222 significant at 0.01) between Intention to Use e-learning (IUE) and Learning Objectives (LO); and
- a moderate positive relationship (a=.465 significant at 0.01) between Intention to Use e-learning (IUE) and Perceived Ease of Use (PEU).

Table 3: Pearson Correlations

	A	E	LO	PU	PEU	IUE
Age (A)	1					
Experience (E)	.198**	1				
Learning Objective (LO)	-.291**	-.142	1			
Perceived Utility (PU)	.296**	-.095	.751**	1		
Perceived Ease of Use (PEU)	.003	-.258**	.172*	.229**	1	
Intention to Use E-learning (IUE)	.111	-.066	.222**	.216**	.465**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Responses from a post-course qualitative survey show that 87% respondents found it a user-directed course. Due to selective participants, homogeneous context, and a variety of feedback gathering platforms, peers' comments and reviews on classroom practices 95% respondents rated peers' feedback as the most significant tool through which they gained a range of expertise in

practical learning. 88% respondents reported m-learning promoted personalised learning and because of self-directed targets and deadlines, the ownership was higher compared to previous face-to-face trainer-led training sessions.

Analysis drawn on data collected fortnightly during teachers' focused group discussions is summarized and an extract of findings is listed in Table 4.

Table 4: Emerging Themes in Participants' Beliefs and Motivation Levels

Emerging Themes of Elevated Motivation	Evidence: Quotes extracted from focused group discussions
Improved ICT skills	"I am tech savvy now, even this word I learnt during reading one of the reading materials uploaded on the blog." Using the blog for this course has enabled me to create a simple blog for my class, now I can stay connected to my students around the clock" "This phone that I use, so many features I had never tried before. It is really a smart phone, I say out comments and speech detector types in for me while I cook for my family, no hassle for especially sitting down and thinking about my professional development. It is now just like another task on the list for me to do while cooking, cleaning and sometimes ironing clothes, it's really cool." "I was expecting to improve my computer skills, instead I improved my mobile skills and now I can teach one whole lesson using only my phone. I never thought before that this thing is a door to open world in a closed classroom."
More time to invest in professional-development	"With my mobile in the hand, my training is on the go 24/ 7 I am really happy that Beaconhouse has taken such an initiative and now I won't have to stay out for long training hours, I think thi sis the way it should be for women with families." "I got so excited about this week's assignment, I did it and then again I tried another online resource to try with my students. Thanks for a detailed instruction guide and letting me be the in charge of my own learning." "When I have a problem, all I have to do is post a query on the blog within minutes I get professional advice from course fellows, no more waiting for the next class now."
Active engagement	"I don't have to switch on the computer especially for my work. With this crazy load-shedding and power failure, I think my mobile is the best gadget that keeps me working whenever I wish to work."

Conclusion

The results of this case study indicate good prospects of introducing SOOC embedded with mobile technology model. It also reveals that distant learning or web-based training programs are most practical cost effective remedy to overcome the growing gap between demand and existing trained teachers in developing countries like Pakistan. This model opens new horizon for teacher training in remote areas of Pakistan with low budget. Such models that use self-regulated learning have potential to boost most learners' autonomy and intrinsic motivation (Barnard, Lan, To, Paton, & Lai, 2009; Hodges, 2005) leading to lifelong learning skills and provides them a vision towards becoming better practitioners.

Limitations

The current study focuses on a professional learning and development course for teacher education, a customised professional qualification matching the context of only one private school system in Pakistan. Similar studies may be conducted in other related sectors in order to fully capitalize upon the benefits of m-learning in the country.

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Biography

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