Integration of Mobile Learning in Education: Perceptions of Prospective Teachers

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Abstract

M-Learning is the use of mobile and handheld IT devices for learning. It became a cheaper source of information and communication, which is now in the access of anyone, anytime and anywhere using mobile devices. This qualitative research was conducted on 21 prospective teachers from the University of Education selected through stratified and random sampling techniques to explore the awareness and perception regarding M-Learning. The semi-structured interview protocol was used to collect the data. It was got validated by experts. Data were analyzed using thematic analysis. The study concluded that prospective teachers used mobile devices for communication, academics, recreation and social networking. M-Learning created ease in learning and improved it. It made learning flexible, gave better understanding and saved time. Lack of facilities, unethical use and traditional classroom environment were the hurdles in its implementation. Facilities needed to be provided; parents and teachers should protect the youngsters from unethical use.

Introduction

Over the past few year's information and communication technologies have improved greatly. The evolution of handheld portable devices (HPD) and wireless technologies has resulted in radical changes in the lifestyles of modern people (Boulos, Wheeler, Tavares, & Jones, 2011). These HPD's are reshaping user behavior in their daily lives in different ways (Vyas & Nirban, 2014). Laptops and mobile phones have the highest usage in percentage among the mobile technologies (Chen & De-Noyelles, 2013). Continual development of these mobile devices in the information age matches with the trend where information can be achieved at fingertips and independence of time and location. The evolution of HPDs and wireless technology has resulted in radical changes in people's lifestyle around the world, including for learning. Students have started using this technology to enhance their learning experiences (El-Hussein & Cronje, 2010).

The term mobile refers to the possibility of taking place in multiple locations, across multiple times and addressing multiple content areas using portable equipment such as laptops and smartphones (Sarrab, Eljamel & Aldabbas, 2012). This rapid development in mobile devices and internet technologies epitomized the concept of mobile learning (M-Learning). The term mobile learning (M-Learning) refers to the use of mobile and handheld IT devices, such as mobile telephones, laptops, and tablet personal computer (tablet PC) technologies, in training, learning and teaching (Sarrab, Eljamel & Aldabbas, 2012). M-Learning is a rising art of using mobile technologies to enhance the learning experience. M-Learning is an education model that emerged with the development of mobile technologies. M-Learning is identified as learning that can be realized by means of mobile computing devices that assists in the development of their skills in using information and communication technologies. M-Learning can facilitate students' access to educational materials and contributes to their learning with the help of mobile devices. The most important difference between M-Learning and other learning approaches is that

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learners can be continually on the move. M-Learning allows interacting with educational resources in situations away from the formal place of learning.

These recent innovations have made mobile devices more pervasive in the world, likewise in Pakistan. In recent years, M-Learning technologies have become cheaper and a more convenient source of communication. Information and communication are now in the access of anyone, anytime and anywhere, by using various mobile devices. The use of smartphones, laptops and tablets PCs for M-Learning is seen as an emerging trend among youngsters. In Pakistan, the adoption of m-learning is still considerably in infancy. This study focused on how students perceive the use of mobile devices to create a personalized learning experience outside the classroom.

Review of Related Literature

Technological advancements allow fast communications, and information processing is supporting new social patterns. As a result, communities are no longer only based on geographical proximity, and new tribes are disbanding according to interest, work patterns, and opportunity (Rheingold, 2002). The communication possibilities created by mobile technologies can significantly reduce dependency on fixed locations for work and study and thus have the potential to revolutionize the way people work and learn and can be delivered and supported outside traditional classroom settings (Rosenberg, 2002).

The proliferation of technology has changed the education system worldwide. Learning environments are now becoming more innovative and interactive (Huffaker, 2005). Research findings provide evidences as to how the rapid changes in technology have positively affected education. The use of the internet is providing wider access to information (Pickering & Walsh, 2011). The emergent paradigm in the ever-growing educational technology globally is mobile technologies. As highlighted by Peters (2007), mobile devices are small and autonomous enough to accompany people in their life. Their user-friendly interface assists interaction via voice communication or text messaging; they act as tools for people to access contents, or they are even useful for learning purposes. They are cheaper, educationally interesting and provide wider access to learning material (Suki & Suki, 2009).

Mobile technologies significantly reduce people's dependence on fixed locations. They have the potential to revolutionize the way people work and learn (Peters, 2007). M-Learning provides learners access to learning contents just by the tips of their fingers. M-Learning is the efficient and effective use of wireless and digital devices and technologies to enhance learners' individual outcomes in learning activities. The mobility and immediacy of mobile learning have offered new opportunities to students and changed their learning attitudes. Kim, Mims and Holmes (2006) explained an increasing number of universities are adopting mobile technologies as learning tools that are widely recognized by academics. Past decades have witnessed the unprecedented growth of the internet and a consequent transformation in the educational landscape (Yuen, Fox, Sun & Deng, 2009).

M-Learning allows access to learning materials anywhere and anytime which creates the potential for it to be the next new learning environment (Wu & Chao, 2008). Wireless networks increase the flexibility of accessing resources in learning by using mobile devices. M-Learning can be used as a new learning tool in education. Many researchers reported the integration of technology in the process of learning that amplifies students' performance (Jamil & Shah, 2011). M-Learning is an education model which is carried out fully or partially with mobile technologies. It increases lifelong learning. The most important difference between M-Learning and other learning activities is that learners are continually on the move (Vavoula & Sharples, 2009).

In recent years there are many studies related to M-Learning in education (Franklin, 2011; Hussain & Adeeb, 2009; Keskin & Metcalf, 2011; Korucu & Alkan, 2011; Liu, Li, & Carlsson, 2010; Zhang, Song, & Burston 2011). Previous studies also reveal that students like to use mobile devices to learn. Students are motivated and engaged while using mobile devices, and that achievement levels increase when students use mobile technologies (Wang, Shen, Novak & Pan, 2009). The adoption of M-Learning is not the same in all countries. Many researchers have focused on M-Learning in developed countries. M-Learning can provide increased access to educational materials and services (Valk, Rashid & Elder, 2010). Many people resist change in learning with new technology because they do not think of themselves as part of a new learning culture (Thornton & Houser, 2002). Pollara and Broussard (2011) quoted researches on students' perceptions of M-Learning. They claimed it an area of interest for future research. The majority of the researches indicated its positive results where it improved

learning experiences (Al-Fahad, 2009; Cavus & Uzunboylu, 2009; Maag, 2006; Manair, 2007; Uzunboylu, Cavus & Ercag, 2009; Wang, Shen, Novak & Pan, 2009).

Objectives and Research Questions

This research study was conducted to:
1. Explore the awareness in prospective teachers regarding M-Learning integrated into education.
2. Explore the perception of prospective teachers regarding M-L integrated into education.

In light of the above-given objectives, two research questions were framed:
1. How informed are the prospective teachers of M-Learning integration in education?
2. How do prospective teachers perceive M-Learning integration into education?

Methodology

The study uses a qualitative research approach. Qualitative data was collected and analyzed to understand the phenomena. It gave possible deeper themes that might be challenging to capture with quantitative data. Owing to the time limitation and financial constraints, this research was delimited to the prospective teachers studying at the University of Education, Faisalabad Campus. The population of the study consisted of 208 prospective teachers (BEd Hons 103; MA Education 90; MEd 15) studying at the University of Education, Faisalabad Campus. Through stratified random sampling technique, 21 prospective teachers (BEd Hons 10; MA Education 09; MEd 02) were selected as a sample of the study. A semi-structured interview was developed based on research objectives, relevant literature and the researcher's observation. Semi-structured interviews encouraged the participants to describe their experiences and perceptions on the subject under investigation. The instrument was got validated by three experts. It consisted of 12 questions on two sub-factors of M-Learning. Seven questions were developed on awareness of M-Learning, while five questions were developed on the perception of prospective teachers regarding M-Learning. Two mock interviews were conducted to further test the validity of the instrument. Every participant responded to all the 12 questions, which took about 30-35 minutes. Before the data collection, participants were informed of the purpose of the research. Participants of the study were assured of the confidentiality of data. Interviews were conducted in the concerned organization in a calm location on the day and time decided in advance in consultation with the participants. Prior permission from the concerned authority was taken before the data collection. Data were coded for thematic analysis. Frequencies were computed for each theme. Qualitative validity was guaranteed through the use of a variety of strategies like follow up interviews with selected participants.

Ethical considerations were followed by the researcher while conducting the research. Moreover, prospective teachers were not forced for the interviews. Appointments with the prospective teachers were made using the '*Informed consent form*'. Information reported by the respondents was based upon their personal opinion. Although respondents were guaranteed the confidentiality of data, yet it might be probable that they either over or underreport their opinion. Responses of individuals who did not participate might differ in some manner from those who participated.

Table 1. Alignment of Data Analysis with Objectives and Research Questions

Research Objectives	Research Questions	Instrument	Analysis
1. Explore the awareness in prospective teachers regarding M-Learning integrated into education.	How informed are the prospective teachers of M-Learning integrated into education?	Semi-structured interviews	Thematic analysis
2. Explore the perception of prospective teachers regarding M-Learning integrated into education.	How do prospective teachers perceive M-Learning integrated into education?	Semi-structured interviews	Thematic analysis

Findings

Use of Mobile Devices

Prospective teachers used a variety of mobile devices. They used mobile devices like smartphones (100%, N=21), laptops (95%, N=19), table PCs (30%, N=6). The use of smartphones being the highest could be attributed to the fact that prospective teachers feel the usage convenient and easy to carry with them. All the prospective teachers had access to the internet through Wingle, DSL, Witribe and cellular net (100%, N=21).

Financial and Technical Issues Regarding Mobile Devices

Prospective teachers had diverse opinions related to the financial issues faced by the prospective teachers regarding their mobile devices, the majority (75%, N=16) of the prospective teachers were of the view that facilities of the internet are very costly, while 40% (N=8) of the prospective teachers reported that the cost of mobile devices is very high. Fifteen percent (N=3) of prospective teachers opposed the concerned authorities for imposing high taxes on internet facilities. Due to this fact they had to pay extra money for availing internet facilities which make these facilities expensive for them. Twenty-five percent (N=5) of the prospective showed no financial issue regarding their mobile devices. One of the respondents was of the opinion, *"I have to face no financial issues because I handle and use my mobile devices with care. So, I do not face any problem regarding them."* Prospective teachers also faced some technical issues regarding their mobile devices. The vast majority (70%, N=14) of the prospective teachers were of the view that software was not available to them, and they also reported the high cost of the mobile devices as well. On the contrary, 60 % (N=12) of the prospective teachers were aware of the installation of software.

Usage of Mobile Devices by Purpose

Prospective teachers used their mobile devices for different purposes. Fifteen prospective teachers (75%) were using their mobile devices for communication purpose. They used their mobile phones to communicate with their peers and some time to some of their teachers, while 70% (N=15) of prospective teachers reported using their mobile devices to search their learning material, prepare assignments and projects. They found it more convenient to search for the learning material because of ease, and they could access the material from anywhere. Six prospective teachers (30%) were of the view that they are using their mobile devices for entertainment and recreation purpose. Some prospective teachers (20%, N=4) also used their mobile devices to prepare their assignments and presentation. They found it convenient because learning material is available online, and they didn't need to go to the library and spent long hours in books. Search engines provide them access to their learning material without wastage of time. Some prospective teachers (15%, N=3) used their mobile devices for social networking purpose. They used social networking sites like WhatsApp, Facebook and Twitter etc. They used these sites for social interaction.

Knowledge of M-Learning

A vast majority (85%, N=17) of prospective teachers was unaware of the concept of M-Learning. They came to know about M-Learning when they were introduced to the research study. Before the interview, they were introduced to the researcher as well as the research study for developing rapport and a better understanding of the research. Although they were using mobile devices for different purposes like learning and social networking yet, they were unaware of the formal concept of M-Learning. Only 15% (N=3) prospective have some information regarding M-Learning.

Mobile Phone as a Learning Tool

When asked about the use of the mobile phone as a learning tool, they had a different opinion. A large number of prospective teachers (75%, N=15) were using their mobile phones for searching online learning material, while 60% (N=12) of the prospective teachers were of the view that they use their mobile phones for the preparation of their assignments and projects form online learning material. Some of the prospective teachers (40%, N=8) used their mobile phones for group studies and group discussions. They shared and discussed their

academic problems, and most of the time, their problems were solved in this manner. One of the prospective teachers (5%) discovered an innovative use of mobile phone where the mobile phone was used to record the lecture in audio form that used to listen to it later on for clarity of thought and assistance in academics at home.

M-Learning Support in Traditional Classroom Learning

A large number of prospective teachers (55%, N=11) were of the view that M-Learning provided ease in traditional learning. They were able to learn quite efficiently with the flexibility of time and place. They can learn from anywhere and anytime, which provided them eased learning and improved their academics. Some of the prospective teachers (25%, N=05) described a different perspective of M-Learning. They were able to discuss their problems using mobile devices with their peers and teachers without the restriction of time, which in return solved most of their academic problems. And the same number of prospective teachers (25%, N=05) were of the view that M-Learning is the best alternative to traditional classroom learning because it improved their traditional classroom learning and made it more meaningful. While 40% (N=8) prospective teachers viewed that M-Learning creates interest in traditional classroom learning. Four prospective teachers (20%) said they have not any knowledge of whether M-Learning supports traditional classroom learning or not.

Use of Mobile Devices in Classroom and Facilitation of M-Learning

A vast majority of the Prospective teachers (80%, N=16) were of the view that they are restricted to use their mobile devices in the classrooms. Only four interviewees (20%) expressed that though the use of mobile devices is restricted by the majority of the teacher yet, some enlightened teachers encourage using mobile devices in the classrooms. Respondents expressed their views regarding how M-Learning could facilitate their learning. The vast majority of the respondents (80%, N=16) expressed their views in favor of M-Learning due to the reason that due to mobile devices, they were able to self-learning. Some prospective teachers (55%, N= 11) favored M-Learning as it provided flexibility to learn. They were able to learn without the restriction of time and place. Six (30%) prospective teachers gave favor to M-Learning due to the reason that it gave them a better understanding of their learning material. They could read online learning material, which not only gave them access to the learning material but also blesses them with sound understanding. Three (15%) prospective teachers were of the view that M-learning helped them in emotional development. They could share their problems which cannot be shared in the face-to-face interaction. They could not share their problems in a much better way which could not be expressed due to shyness. Two prospective teachers (10%) favored M-Learning due to its time-saving factor. It felt convenient to learn from anywhere and anytime, which saved their time because it did not require a fixed place to interact and learn.

M-Learning Usage, Barriers and Recommendations

In the use of M-Learning, the Vast majority of the prospective teachers (70%, N=14) were of the view that the main factor which hurdled in the implementation of M-Learning was the attitude of their teachers that discouraged them to use mobile devices. They did not favor the use of mobile devices. A possible factor behind that might be the unethical and misuse of the mobile devices for which their teachers restricted them. Ten prospective teachers (50%) blamed lack of facilities in the implementation of M-Learning. They lacked facilities for M-Learning at their institutions and sometimes other places. Another factor that was reported as a hindrance in the implementation of M-Learning was the high cost of M-Learning facilities. Prospective teachers narrated that mobile devices and internet facilities are very costly that hurdle in the implementation of M-Learning. Some of the prospective teachers (30%, N=06) expressed that prospective teachers misuse mobile devices. They adopted unethical ways to use mobile devices and thus created hurdle in the implementation of M-Learning. Three prospective teachers (15%) expressed that the traditional classroom environment is accountable for the hurdles in the implementation of M-Learning. A large majority of the prospective teachers (55%, N=11) were of the view that M-Learning can make conventional learning better and more meaningful. Four prospective teachers (20%) were of the opinion that M-Learning can reduce their stress because they can learn and share their problems outside the classrooms and their institutions too. In this way, their problems are solved, and their stress is reduced. Eight prospective teachers (40%) favored M-Learning due to the ease it provides in learning. They

can be able to learn without the restriction of time and place. A vast majority of the prospective teachers (60%, N=12) was of the opinion that M-Learning could be implemented by creating awareness among students, teachers and the parents as well. The same number of prospective teachers (60%, N=12) said that by providing facilities and by lowering the cost both financial and technical, M-Learning could be implemented. Only nine prospective teachers (45%) emphasized changing the attitude toward M-Learning if it is wished to be implemented.

Discussion

A vast majority of prospective teachers use smartphones and laptops as mobile devices. The use of smartphones in the present generation was found to be most popular because smartphones have all the features required by them. They could use smartphones for information, entertainment and social networking. They use them like mini computers. All the prospective teachers had access to the internet at home and in institutions. The findings are in line with many research studies (e.g. Conradie, Lombard & Moller, 2013; Ismail, Azizan, & Azman, 2013). These results contradict the findings of Benham, Carvalho, Cassesn (2014). The vast majority of the prospective teachers faced financial problems associated with these devices, like the high cost of the devices and the internet services. This high cost restricted the use of mobile devices. Yet, at the same time, few of them reported not facing any problem associated with these devices because they handle their devices with care. The majority of them found the software to be costly. Al-Fahad (2009) also reported in his research that respondents made such complaints. Such conditions restrict the usage of technology in teaching and learning. They use their mobile devices for communication, search the learning material and preparations of assignments as well as presentations. They also use them for recreation and social networking purpose. Social networking sites were used for social interaction with their peers and teachers (Almiah & Jalil, 2014; Foti & Mendez, 2014; Mao, 2014; Mtega, Bernard, Msugnu & Sanar, 2012). Economides and Grouspoulou (2008) unveiled in their research that respondents used their mobile devices for entrainment and social media usage.

Although a large majority of prospective teachers was found completely unaware of the concept of M-Learning yet, they were using mobile devices for assistance in learning. Only a few of them had heard of the concept of M-Learning. The findings are contradictory to the findings explored by Miller (2012), where students were found fully aware of the concept and usage of M-Learning. Prospective teachers used their mobile phones for accessing the learning material, for group studies and for discussion. It made their learning and interaction more convenient. Researches (Benham, Carvalho & Cassesn, 2014; Foti & Mendez, 2014) confirmed the findings. Some other researchers (e.g. Almiah & Jalil, 2014; Cavus, 2011) also confirmed the findings. Mao, 2014, concluded in his research that respondents used their mobile devices as means to solve their problems related to instruction.

A large number of prospective teachers were of the view that M-Learning provided them ease in learning. It gave them the flexibility to learn because they could learn without the restriction of time and location. Some were of the view that M-Learning is the best alternative to traditional classroom learning. It created interest in traditional classroom learning. Parallel findings were discovered by Almiah & Jalil (2014) and Mao, 2014, Conradie, Lombard & Moller (2013) concluded from their research that respondents reported flexibility and convenience in learning with mobile devices. They were able to learn efficiently with the flexibility of time and location. Many other researchers confirmed these results, e.g. Miller (2012). They were able to discuss their problems with their peers and teachers, which solved most of their academic and non-academic problems. Researchers (Cavus, 2011; Mao, 2014) explored M-Learning to be the best alternative to traditional learning due to the flexibility of time and location. While some others viewed M-Learning to create interest in traditional classroom learning. Yusri, Goodwin and Mooney (2015) also unveiled such findings. Many of the prospective teachers were of the view that they were restricted by their teachers to use their mobile devices in the classrooms due to excessive and misuse of these devices. Researchers (e.g. Benham, Carvalho & Cassesn, 2014; Ismail, Azizan & Azman, 2013) confirmed these findings. Some of the prospective teachers encouraged them to use mobile devices in the classrooms. Zhao and Cziko (2001) also explored these findings in their research.

The majority of the prospective teachers favored M-Learning due to the flexibility to learn. They can learn without the restriction of time and location. Many researchers also affirmed the findings (e.g. Foti & Mendez,

2014; Mao, 2014). Some of the prospective teachers were of the view that M-Learning gives them better understanding because they had access to a variety of learning material. Shuller et al. (2012) also confirmed that that M-Learning gave students better comprehension in learning. M-Learning helped in sharing the problems with peers and teachers (Foti & Mendez, 2014). M-Learning was favored due to its time-saving factor. Yusri, Goodwin & Mooney (2015) and Miller (2012) also favored M-Learning due to this reason. In the use of M-Learning, the majority of the prospective teachers were of the view that the main factor that was considered a hurdle in the implementation of M-Learning was the traditional attitude of the teachers. A possible reason behind that may be the unethical use of these devices. Many researchers are of the same view (Ismail, Azizan & Asman, 2013; Mohamad, Maringe & Woollard, 2012).

The majority of the prospective teachers were of the view that lack of facilities and high cost is the main hurdle in the implementation of M-Learning. The traditional classroom environment is also a hurdle in the implementation of M-Learning. These findings were confirmed by Al-Fahad (2009). The vast majority of the prospective teachers were of the view that M-Learning can make conventional learning better. They can share their problems from outside the classroom. In this way, their problems were solved (Yusri, Goodwin & Mooney, 2015). Some of them favored M-Learning due to the ease provided by M-Learning (Almiah & Jalil, 2014; Foti & Mendez, 2014; Mao, 2014). Many of the studies (e.g. Addison, 2011 and Chanchary & Islam, 2012) confirmed the existence of challenges and barriers in the implementation of M-learning.

Conclusion and Recommendations

It can be concluded that prospective teachers use mobile devices. They face certain financial and technical problems related to the usage of mobile devices. It is also concluded they use them for communication, social networking, searching learning material and preparing assignments as well as presentations. It is explored that majority of them was unfamiliar with the concept of M-Learning. It is also explored they used their mobile devices for learning tools. M-Learning provides support in traditional classroom learning. It is also concluded that the majority of the teachers restrict them to use these devices in the classroom. It is concluded that M-Learning facilitates traditional classroom learning. It is also concluded many factors restrict the use of M-Learning. It is also concluded that M-Learning could be used as an additional learning tool to bring new opportunities for learning. It is also concluded that M-Learning can be promoted by creating awareness, changing attitude and decreasing the financial as well as technical cost related to mobile devices. The researcher made some recommendations based on the data analysis and the findings. Government should provide facilities for M-Learning and exempt Internet facilities from taxes. Financial and technical costs of mobile devices should be reduced. Parents and teachers should ensure mobile devices and internet facilities from misuse. Attitude toward the use of mobile devices needs to be changed. Students should use mobile devices for learning purpose.

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