# Effectiveness of Mobile Learning Technology in Open and Distance Learning: Prospects and Challenges

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**Abstract**—*Mobile learning or M-learning is usually defined as 'learning across multiple contexts, through social and content interactions with the help of personal electronic devices'. Mobile learning technologies might include handheld computers, MP3 playrs, notebooks, mobile phones and tablets. Distance education is one such field of education which has made extensive use of e-learning tools and technologies in order to reach out to the unreached. Mobile technology is a relatively new area of technology which has been utilized by numerous distance learning institutions. However, its usability in the field of distance education has seen a major turnaround in the past decade. The integration of digital technologies like Computer Aided Instruction (CAI) and Web Based Training (WBT) to the distance education palette has produced new models of learning, resulting in a richer and more interactive class environment.*

*This paper mainly intends to find out how to make effective use of mobile communication technology in order to assist the different types of teaching and learning. The paper also tries to analyse the impact and implication of mobile learning in the field of distance education along with its future prospects. This paper aims to provide a reference for educators who engage in research of mobile learning and application of distance education.*

**Keywords**: *E-learning, Mobile Learning Information and Communication Technology, Distance Education, Blended Learning*

## 1. INTRODUCTION

The advent of mobile technologies has brought in a revolution in the world of communication by way of its advanced facilities, providing access to information in the form of text, picture, video and sound. This platform also provides the facility to share information within a particular group. Thus, a mobile phone is more than just a simple communication device. It can be used in the acquisition of knowledge and skill by way of mobile technology, anywhere and anytime. Thus, mobile technology has far reaching consequences in the field of education – both conventional and distance education. India is one of the fastest growing economies and the surge in the growth of consumer base of mobile users bears testimony to the fact that cell phones have become a part and parcel of one's mundane life.

Distance education is making its ground in the country in recent years and is found to be preferred by a large section of the society due to its flexible nature. Thus, there arises a need to develop the existing new media technologies specially mobile learning technologies and bring distance learning system at par with the conventional system. Since distance learning is characterized by geographical barriers, so such technologies comes as a boon by delivering mobile phone based study materials.

This paper tries to bring to fore the effectiveness and implications of mobile learning technology in the field of open and distance learning. The paper also intends to study the effectiveness of mobile learning (M-learning) vis-à-vis Face to Face Learning (FTF)

## 2. OBJECTIVES OF THE STUDY

The main objectives of the paper are –
  i. To assess the use of mobile learning in Open and Distance educational system

  ii. To analyse the problems and prospects of using mobile learning in ODL

  iii. To find out whether mobile learning can replace other conventional methods of learning in distance education

## 3. METHODOLOGY OF THE STUDY :

The present study is basically a qualitative analysis of the mobile learning system that is used in ODL system and its future prospects. The study is based on observation method. Document analysis of secondary sources has been done to substantiate the fact that emerging mobile learning technologies help in delivering the coursework to the distance learners under open and distance learning system. Data has

been analysed from secondary sources like websites, newsletters, journals, magazines, books etc.

## 4. CONCEPT OF MOBILE LEARNING

Mobile Learning or M-Learning is defined as learning that takes place via wireless devices such as cell phones, personal digital assistants (PDAs) including iPhones, iPads, smart phones, tablet PCs ,laptop etc. A vast area of new possibilities have emerged for today's mobile generation due to the recent advancements in the field of computer technology, wireless communication, including Wi-Fi, and global wireless technologies like GPS, GSM, GPRS, 3G and now more recently 4G, the utilization of these technologies for learning purposes has led to a new learning paradigm known as mobile learning or m-learning.

Mobile learning falls under the ambit of Information and Communication Technology (ICT) which is used one a wide scale in the field of open and distance learning. Such technologies are used to supplement the face to face learning which takes place in the form of counseling classes on a weekly basis. Since the teaching-learning process in a distance educational system does not take place within the four walls of a classroom like the conventional mode on a daily basis, so the learners are provided with certain ICT based tools to supplement the self-learning materials. With the passage of time, more and more open universities are resorting to the use of ICT based courses including mobile learning in order to reach out to those residing in remote areas.

However mobile learning differs from e-learning which aims to do the same job but through the medium of laptops and computers. Thus, electronic learning is location bound whereas mobile learning allows the learner to attend lectures, read and also ask queries to the teachers from anywhere and anytime. Mobile Learning or M-Learning is not a novelty. Rather it is a mainstream, pervasive learning delivery medium which is relied upon by thousands of post-secondary education institutions and millions of workforce and distance-educated students the world over.
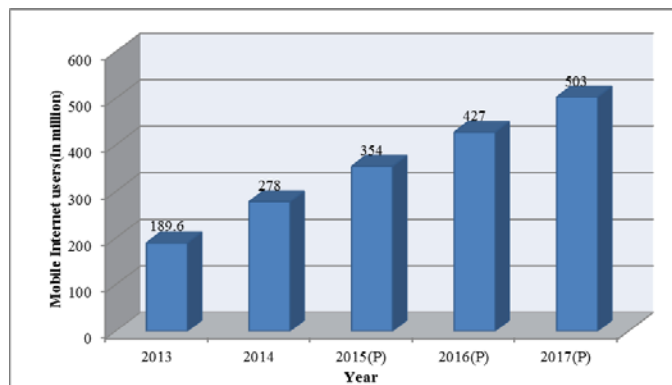


*Source: IAMAI*

In India, the use of mobile learning has been necessitated by the fact that a growing number of customers use mobile for different purposes- browsing, online access to learning materials, apps, email, shopping, social networking instant messaging, mobile banking, SMS etc,. The mobile internet users have been increasing at a rapid pace in the country. A report by the Internet and Mobile Association of India (IAMAI) and KPMG entitled 'India on the go- Mobile Internet Vision Report 2017', projected that India will reach 236 million mobile internet users by 2016 and 314 million by 2017. This is shown in the diagram given below-

However, the 2G user base in India has been projected to decline in the coming years as more and more customers are expected to shift from 2G to 3G. The 3G user base in India is rapidly gaining market and is projected to grow at a CAGR of 61.3% from 2013-17. There were approximately 82 million subscribers in India by the end of 2014 and the number is projected to reach 284 million by the end of 2017. Nowadays, with the entry of 4G, the customer base is expected to double. The report further said that rural growth story in the coming years will likely be through 2G technologies while 3G and 4G may continue to be primarily an urban phenomenon for the next few years.

## 5. INCORPORATING MOBILE LEARNING IN DISTANCE EDUCATION: EQUITABLE, EFFECTIVE AND SUSTAINABLE

The practice of distance education has been catching up very fast in all countries- developed, developing or underdeveloped, socialist or capitalist, western or non-western. Technology has assumed an increasingly important role in the evolution of distance education. Technology can be synchronous or asynchronous. Different types of technologies that are used in the teaching learning process are usually known as educational technologies. Such technologies can be Teaching technology, Instructional technology, Behavioural technology and Instructional Design Technology. Educational technologies makes use of e-learning technologies of which mobile based technologies is an essential part. When we think of e-learning, our mind veers towards the use of internet, intranet/extranet, audio or video tape, satellite TV and CD-ROM. It can be self-paced or instructor-led and includes media in the form of text, image, animation, streaming video and audio. Mobile learning is also another important emerging form of technology based learning. Mobile learning is a part of e-learning technologies which are widely used in most of the open universities and distance educational institutes the world over. This is shown in the following diagram given below-
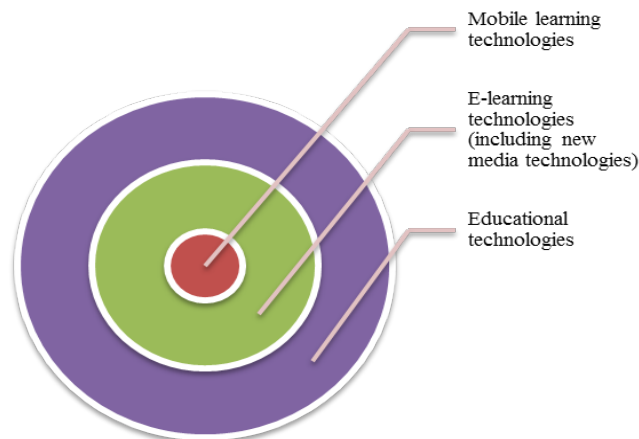
Fig. 1: Figure showing the different types of technologies that are widely used in both conventional and non-conventional form of education

Taylor (2011) has highlighted five different generations of distance education – right from the Correspondence model to the Intelligent Flexible Learning model. In the present context, the fifth generation model is widely . The fifth generation introduced automated and dynamic student access and response/advice systems through "multiple types of media outputs from a single source document" .This not only provided enhanced flexibility and freedom to the learners but also reduced cost considerably.

Of late, there has been the tendency of distance educators to make use of different electronic resources in order to provide a rich technology-based learning environment that fosters flexibility, connectivity and collaboration. They look to provide the learners who have access to mobile technology such as laptop, computers and other hand-held devices as opportunity to engage in an interactive, mobile environment. Mobile learning comprises providing access to learning anytime and anywhere via handheld devices and wireless networks and making the resulting content available to learners in non-traditional locations. Distance learning has matured from a tethered delivery strategy offered through mail into a delivery strategy mediated by electronic devices (E-Learning) and now a robust mobile learning strategy delivered wirelessly to learners in a virtual, mobile classroom.

Now the question that arises is why mobile learning? The answer is simple and clear cut. Mobile learning delivery method seems to have overcome the competitive challenge from the face-to-face teaching learning environment of conventional system. In fact, it has managed to establish itself as a viable contender in the instructional delivery arena. It continues to develop at a rapid pace making use of the wireless technologies and delivering information and academic course content within the shortest possible time. It has become an important mode of instructional delivery system whereby learners make use of the different hand held and other mobile devices to attend virtual courses. Thus,

mobile learning in distance educational system enhances blended learning, increases the flexibility of learning and encourages and support ubiquitous learning (just in time, anytime, anywhere) via mobile technologies.

Mobile learning can also provide good support to a new and effective learning known as 'micro-learning'. In other words, people can learn more effectively is information is broken down into smaller, more easy-to-comprehend units. Apart from units, SMS, pre-recorded MP3 etc. can be sent through the medium of mobile technologies. Recent innovations in mobile technologies have mostly centred around the creation of digital content, largely in the form of digital textbooks accessed via e-readers and the development of mobile applications (apps) and software platforms for accessing educational resources via mobile devices.

Let us look at some of the important features of mobile technologies which have managed to bring about a sea change in the way communication takes place -

**Digital textbooks and e-readers**

The transition from self-learning study materials to digital textbooks is one of the most established mobile learning trends. One need not carry huge amount of books physically from one place to another. Instead, one can download the necessary learning materials of reference books in digital format. In fact, open and distance learning universities can make such provisions available to the learners so as to spare them the time and cost needed in travelling from their place to residence to the universities or institutions. As e-readers and e-reading applications continue to improve, the experience of reading electronically has become more interesting and pleasurable. Future e-books could make use of technological tools like voice recorder, camera, timer, GPS locator, accelerometer, compass and tilt sensor for exploratory learning.

**Mobile apps**

Mobile apps are basically applications which have provided an entirely new distribution mechanism for content, thereby stimulating substantial investment in software development for mobile devices. For instance, educational apps provide new tools for educational activities like annotation, calculation, composition and content creation.

However, in spite of innumerable advantages of using mobile communication, there are some underlying problems in this field. Each and every person is not technically sound. Thus, the biggest constraint in mobile communication is faced by the learners who might not be technologically savvy to handle sophisticated devices. This often results in a feeling of isolation. During this crucial period of time, the learner might experience the absence of an instructor. Another issue that arises is the issue of cost effectiveness. In most of the developing and third world countries, a sophisticated and an

expensive mobile device with built in features is a still a distant dream for many people.

Language constraint is another problem which is seen in countries like India. There are a number of learners who are not comfortable and proficient in English and would rather prefer to study in their regional languages. Moreover, very few e-books or online materials are available in languages like Assamese, Bengali or Tamil. As far as sending SMS through mobile devices is concerned, one must be careful in constructing the sentence in order to keep the important points intact.

## 6. THE FUTURE OF MOBILE LEARNING

With over 5.9 billion mobile phone subscriptions worldwide, mobile devices have transformed the way people live. The next decade and beyond could be transformational in incorporating mobile based technologies to meet the needs of the learners of both formal and non formal system of education. Some of the technological advances that is most likely to have an impact on mobile learning in the near future has been given below-

*a. Technology will become more accessible, affordable and functional*

With the development of new Information and Communication Technologies, people will have better access to it at an affordable price. Increased availability and penetration of 'smart' mobile devices and cloud-based services with advanced functionalities will open up a world of new possibilities for mobile learning solutions allowing the types of initiatives that are currently happening to be replicated on a large scale. The day will not be very far when every learner in the world will have access to a powerful touch-screen tablet device and be able to afford both the hardware and the connectivity that enables fast and seamless access to the internet and other networks.

*b. Mobile phone devices will have the capability to collect, synthesize and analyse massive amounts of data*

With the advancement in technology, the new devices in the mobile segment will come with better features and applications. For instance, the mobile devices will have inbuilt data storage facilities of a larger volume. Generally data is being collected in a multitude of forms, right from personal data to institutional data. This vast global data set is known as 'big data'. Mobile devices connected to the cloud will have the capacity to synthesize larger amounts of data to analyse and process data sets. This will further enable new opportunities in areas such as learning analytics and learning profiles.

*c. Availability of new types of data*

These days most of the mobile devices have different types of sensors. For example, some sensors can sense sound through a microphone, locate a place through GPS and sense movement,

speed and direction through an accelerometer. There are also certain mobile apps that analyse sleep patterns and monitor vital signs.

*d. Breakdown of Language barriers*

Recent advances in natural language recognition like Apple's Siri application, Nuance's Dragon software and Google's Google Voice message transcription service will enable mobile devices to successfully translate spoken language as well as text with a high degree of accuracy. Along with improvement in the translation apps, learners will be able to get access to a large number of educational resources in different languages.

*e. Bigger screen sizes*

Presently most of the mobile devices have smaller screens which makes reading quite difficult and causes eye strain. However this is going to be a thing of the past as bigger and better screens will come up in the coming years. In fact, at the 2013 International Consumer Electronics Show (CES), flexible display technologies were showcased by Samsung which allowed users to fold a tablet-sized screen in half or roll a large screen into a small cylinder for easy portability.

One of the recent trends in technology-enhanced learning has been the expansion of Massive Open Online Courses (MOOCs). Mobile technologies will enable MOOCs to offer more personalized assessment and tutoring. Mobile technology will also enable the expansion of experiential and location-based learning which basically refers to learning within and about locations like field trips, tours of heritage sites and museum visits. Mobile technologies will lead to new forms of assessment. It will allow for self-evaluation and reflection throughout the teaching-learning process. Learners will be able to collect data to help them understand and describe their own learning practices. This will give the learners, teachers and researchers a more holistic sense of a learner's progress over a period of time.

## 7. CONCLUSION

Thus, we can conclude by saying that though there are certain problems in the implementation of mobile learning technologies in the field of distance education, yet mobile learning has turned out to be a major tool in the hands of the learners and the instructors. Today, mobile technologies-originally marketed mainly as communication and entertainment devices, have come to play a significant role in the growth of an economy and the society at large. Mobile devices have had a massive impact in every field- form banking to politics to education and are currently being used to increase productivity in numerous sectors. As these devices become increasingly prominent worldwide, there is a great deal of excitement building around mobile learning. Thus, mobile technologies will enable greater levels of international

collaboration including collective compilation of vast global databases for educational purposes.

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