Potential and Challenges of M-Learning in Education system of India

Navjot Kaur

Post graduate in Economics and Business administration, Punjabi university, Patiala.

ABSTRACT

This paper presents a synthesis of the research in the field of mobile learning initiative and challenges in implementing the same. It presents the case of India, which has immense potential due to its increasing mobile market size and internet user base. The paper begins with discussing present picture of internet connectivity in India. It then progresses to analyse how mobile learning can aid in learning, its strengths and current challenges. The focus of Indian education system has been to build basic infrastructure and provide basic literacy for all and mobile learning is a new learning landscape that offers opportunity for collaborative, personal, informal, and students' centred learning environment. In implementing any learning system such as mobile learning environment, it is important to understand challenges that affect its implementations in a particular culture. Additionally, learners' and instructors' expectations are deemed necessary for consideration. However, there is a lack of studies on this aspect, particularly in the context of India HE institutions. This research presents opportunities and prospects of m-learning, and discusses challenges and implications facing its implementation.

Keywords: Education, Learning, M-Learning, Mobile, Teaching.

I.INTRODUCTION

Information and communication technologies (ICT) have become one of the most important factors for the development of society in the twenty-first century. Their impact is revolutionary. The development of e-Learning in education and training provides a way of new technologies in modern education and training systems. M- Learning is more interactive, involves more contact, communication and collaboration with people. The research that has been done on the use of mobile apps has been very promising. For example, a recent study funded by the Department of Education, looked at the link between learning, and the PBS Kids educational gaming app, Martha Speaks Dog Party. The study found that after children had used the app every day for two weeks, the vocabulary of Title 1 children between three and seven years old improved by as much as 31 percent. A similar study, conducted at the Abilene Christian University, centered upon the use of the Statistics 1 app. Students used it in and out of the classroom and remarked that they understood the content better, and was more motivated to do well, when using the app. The instructors agreed with this observation, and added that the students were also better prepared for classes. According to a report by Ambient Insight in 2008, "the US market for Mobile Learning products and services is growing at a five-year compound annual growth rate (CAGR) of 21.7% and revenues reached $538 million in 2007. The data indicates that the demand is relatively immune

from the recession." (Adkins, 2008). The findings of the report indicate that the largest demand throughout the forecast period is for custom development services, content conversion, and media services and that the healthcare sector accounts for 20% of the total US market for mobile learning

II.PRESENT SCENARIO OF INTERNET ACCESS IN INDIA

In 2001, there were about seven million Internet users in India. That number could cross 550 million in 2018 in the best case scenario, making it the second largest online population in the world. But without proper enabling conditions, the user base could only be 400 million in 2018, according to the 20 report **India@Digital.Baharat** by the Boston Consulting Group (**BCG**) and Internet and Mobile Marketing Association of India (**IAMAI**). According to findings of report on the Mckinsey Quarterly website Titled- Can India lead the mobile Internet revolution? Conducted by McKinsey & Company, following are the highlights of current picture of internet users in India**:**

• India has relatively few Internet users: just 7 percent of its population is connected to the Web, compared with 32 percent in China and 77 percent in the United States.

• India's base of 81 million Internet users is the world's fourth largest. Yet this figure is a function of sheer population, not deep adoption: just 20 percent of India's urban citizens are connected to the Internet, compared with 60 percent in China.

• Even though typical Indian consumers have no Internet access, they have a remarkable appetite for digital content. In fact, they consume an average of 4.5 hours of it daily across offline channels such as television, DVDs, and CDs.

• While India is a relatively poor country, more than 70 percent of its urban consumers already spend about $1 a month on content and services through offline, unorganized retail channels – a market estimated to be worth more than $4 billion annually.

• The mobile Internet could deliver the personalized entertainment that Indian consumers crave. If India's latent demand is unleashed, McKinsey research forecasts that the total number of Internet users will increase more than fivefold, to 450 million, by 2015. Total digital-content consumption will double, to as much as $9.5 billion. Including access charges, revenues from total digital consumption could increase fourfold, to $20 billion-twice the expected growth rate of China.

III.M-LEARNING AS A SUBSET OF E-LEARNING

Mobile learning is certainly not merely the conjunction of 'mobile' and _learning'; it has always implicitly meant mobile E-Learning and its history and development have to be understood as both a continuation of conventional E-Learning and a reaction to this conventional e-Learning and to its perceived inadequacies and limitations. It is the 'mobile' aspect of mobile learning that makes it stand apart from other types of learning,

specifically designing learning experiences that exploit the opportunities that mobility can offer us. Many authors (e.g., Mostakhdemin-Hosseini and Tuimala, 2005) view Mobile Learning simply as the natural evolution of E-Learning, which completes a missing component such as the wireless feature, or as a new stage of distance and E-Learning (e.g., Georgiev, et al. 2004). M-Learning is often described as occupying a sub-space within the E-Learning space, which is in turn a sub-part of digital learning.

According to El-Hussein & Cronje (2010), the definition for m-learning contains three key components– mobility of technology, mobility of learners, and mobility of learning processes.

 1. Mobility of technology- refers to the mobile nature of installed hardware and software that enable wireless Internet connection.

2. Mobility of learners- means learners are no longer physically attached to one or several learning sites, and they can be mobile and learn at the same time as long as the mobile devices are around.

3. Finally, mobility of learning is the result of mobility of both the technology and learners.

 If e-learning took learning away from the classroom or campus, then m-learning is taking learning away from a fixed point. Where e-learning is an alternative to classroom learning (actually e-Learning should/can be complementary to classroom learning) - m-learning is a complementary activity to both e-learning and traditional learning. M-learning respects that a user would like to interact with educational resources whilst away from their normal place of learning – classroom or computer.

IV.SCOPE OF M-LEARNING IN INDIAN EDUCATION SYSTEM

In India most of the universities are teacher centric, where teachers decide the learning curriculum, lectures and other learning material. It is often found that what teachers deliver in class may not be properly received by students, the reasons may be - teacher may not be properly audible, the instructions delivered may not be satisfying, mode of communication or language is not proper or understood by student, shortage of time, students may not be attentive or do have a lack of depth on previous knowledge. In order to improve the quality of education, few institutions have added extra initiatives like e-learning as an aid to its regular class room study, but, as time passes by, it is seen that e-learning is being more confined to distance learning courses rather than as an aid to regular class room study. Institutions of higher education are always looking for effective teaching methods that place the student at the centre of learning. Keeping this in mind, universities are increasingly exploiting technology in the teaching they provide. The use of technology in higher education is based on the interrelationships amongst at least three areas: **technology, theories of learning and issues of educational practice**. The increasing influence of globalization and the emerging information society, set new requirements for all areas of social life, including to higher education. M Learning became an important instrument in the new Higher Educational Environment in the digital age which creates student-centred learning and educational practice, offering new more flexible learning methods. It enables connections and collaborations between individual participants and through their role as always-on, always-available, flexible personal

communication devices. Following are some of the prospective initiatives in Education system in India to incorporate the advantages of m-learning:

Flipped classrooms: This is a new education delivery mechanism that is revolutionising the education sector across the world. Flipped classroom uses a combination of face-to-face content delivery and offline learning approach to take the learning experience to the next level. It involves mastering initial concepts of a subject offline by viewing lecture videos and then interacting with experts/teachers later for clarification of doubts and for the practice of advanced concepts like projects and practical sessions where face-to-face guidance is inevitable. The offline videos can be downloaded and viewed using mobile devices and live interactions with the teachers can be done using Smartphone.

Another variant of flipped classrooms that could be a boon for the education sector in India is the concept of Massive Open Online Course (MOOC). MOOC is an open source model for delivering high quality learning content/courses online to anyone free of cost, with no specific restrictions on attendance, age, geographies and so on. Top global universities have already joined MOOC platforms or started their own MOOC initiatives. Together, they host thousands of courses. The response from Indian students and teachers for MOOC courses has been fantastic. Globally, Indians form the second-largest pool of students attending MOOC courses. Some of the leading MOOCs providers are Co user, edX, and Khan Academy. Initiatives like MOOCs when coupled with their accessibility using mobile devices will definitely go a long way in providing high quality education anytime, anywhere to Indian masses who have been deprived of it for various reasons.

Game-based learning: Mobile games have always been a favourite pastime for people of all age groups. Game-based learning refers to the use of games as a mechanism for learning specific concepts. The advantage of game-based learning is its capability to grab and retain the interest and attention of the learner throughout the learning process. Several mobile applications for learning subjects like mathematics, English, and statistics already exist in the mobile application store. More such mobile games should be developed for subjects in all domains in order to make m-learning an interesting experience.

Personalised learning: When it comes to learning, people will have their own choice about the preferred mode of learning. For example, some learners would like to read and learn whereas others would prefer to watch a video and learn a concept. With the advancement in the field of learning analytics, it is possible to display content in a preferred mode of learning for each learner. Learning analytics refers to the application of analytics to the data created by each learner to track their personal likes and dislikes with regard to various aspects like type, format, and depth of content coverage in the courses. This would go a long way in enhancing their learning experience. For example, Testbook.com is an EdTech company started by 6 IITians to provide students a personalized one-stop learning platform. The company started its journey in January 2014 and has been quite successful in developing a powerful testing and practice platform with 3 lakh registered users and over 2.5 crores questions solved.

Social learning: The use of Web 2.0 technologies like blogs and communities to facilitate learning by collaboration and sharing of knowledge is called social learning. Nowadays, many social media networks like

LinkedIn and Twitter have also contributed their share to learning by forming communities and conducting Q&A sessions with experts in various domains. The most prominent usage of smart phones is for accessing social media networks. Support for learning provided by the social media networks will go a long way in promoting social learning using mobile devices.

The government has already taken some initiatives to popularise m-learning in India like the distribution of Aakash tablets to college students. However, these initiatives should be accelerated to ensure that the benefits of m-learning penetrate across the length and breadth of India and not only the student population. Some of the steps that could be taken by the government to promote widespread adoption of m-learning are:

• The government should offer subsidies to mobile service providers for providing special tariff plans for accessing education portals and specific education sites.

• Conduct m-learning promotion and awareness campaigns extensively in villages and other remote locations in India.

V.M-LEARNING CHALLENGES

Research indicates that m-learning offers considerable benefits to build and support creative, collaborative, and communicative learning environments . The implementation of efficient m-learning project, however, within educational environment is still a challenge due to the complex environment that incorporates management, pedagogical, technological elements, and socio-cultural issues. The following sections address and discuss some of the challenges imposed by the implementation of m-learning projects, these are: Management and Institutional Challenges; Integration to Technology Challenges; Technical Challenges; Design Challenges; Evaluation Challenges; Cultural and Social Challenges.

Management and institutional challenges: Managements of educational institutions need to define clear policies, and technical and pedagogical support, in order to go for wide scale implementation of m-learning. Lack of support and institutional policies were cited as institutional obstacles [23]. One of the most crucial challenges facing the educational institutions, when implementing m-learning project, is managing the change within the institution. Managing such change will affect processes, activities, and components, as well as people such as managers, decision makers, content designers and developers, employees, students, and instructors, of the educational institution [24]. The principles of change management have to be applied properly in order for the change process to succeed, starting with extensive and in advance planning [25]. The goal of the change management is to change the attitudes and behaviours in the educational sector at different levels that includes different organizational and individual layers. Adopting a new m-learning strategy is a major change and naturally, people resist it, therefore, using the change management techniques will support moving towards the new era with confidence.

Integration to pedagogy challenges: It is challenging to properly integrate technology into their wider educational activities, and serious consideration must be given to teaching and learning strategies. The main

drivers of innovation of m-learning should not be just deploying technology; there must be an integration of pedagogy and new methodologies that achieve educational goals. In order to develop successful mobile educational applications, design guidelines and new methods for the learning process must be followed, and, it is important to consider the methodological issues to develop appropriate pedagogical models. Significant efforts and steps have been made to provide methodologies and strategies in order to integrate mobile devices into teaching and learning practices [26]. Dahlstrom and Bichsel [27] urge researchers to look at pedagogical insights that will help instructors to better embrace mobile technologies. It is stressed by McGreal [28], that to accomplish this, mobile learning requires a successful integration between educational content and technology to achieve educational goals and to provide a successful teaching and learning environment. Alhazmi and Rahman [29] argued that the technological features of mobile applications such as mobility and interactivity are essential to successfully integrate this technology into wider educational settings.

Design challenges: It is important to understand that mobile devices are equipped with various features such as: Camera, location, recording, sensors, search, media player, calculator, calendar, etc. Understanding these capabilities of mobile devices will help designers to explore the potential of mobile learning, which can truly support informal and social learning models. Designers of m-learning applications need to understand the three types of design, that is: instructional design, which is the educational design of the application; interface design, which is the transparent to the user; and screen design, which is the design of the graphics and the visual display. Al-Hunaiyyan [30] pointed that the more emphasis the developer puts in these designs, the more useful and functional the application will be. It is essential for instructional designers to design e-learning courses effectively for mobile devices, he pointed out that m-learning should be viewed differently from that of e-learning, due to mobile characteristics such as the screen size, screen orientation, mobile storage and memory, and network bandwidth.

On the other hand, user interface design is important factor for successful application. Thus, designing and developing an efficient educational interface within a learning environment is still a challenge for most developers, facilitators, and educators [31]. Udell [32] stated that user's interface for mobile must be consistent and stressed to keep the application simple when designing interfaces on mobile devices.

Technical challenges: Technical difficulties are a significant aspect in the implementation and integration of m-learning technologies in education. Qureshi et al. [33] listed some of these difficulties which include "installation, availability of latest technology, fast Internet connection, and uninterrupted supply of electricity, maintenance, administration, security and absence of technical support". There are technical challenges related to the infrastructure, mobile device, application development, technical support, security, and technical knowledge of instructors, learners, and other stakeholders, which must be considered when employing m-learning project. These challenges resulted from the rapid change in technologies, programs and devices. Furthermore, Park [34] listed some technical limitations related to the physical attributes of mobile devices such as: small screen size; insufficient memory; limited battery; network reliability; excessive screen brightness outside; limitation of software applications; safety and privacy. In addition, connectivity and bandwidth need to

be considered when developing m-learning. Bakari et al. [35] pointed that most of the developing countries lack quality and expert in technical support and maintenance of Information and Communication Technologies (ICT).

Evaluation challenges: Evaluation is an essential activity in the lifecycle of any interactive learning systems design, and mobile learning adds additional challenges for evaluation of both the technology and the learning outcome. There is a lack of evidence regarding the effective use of mobile learning in education, which he believes will limit the widespread adoption of mobile learning. Kukulska-Hulme and Traxler [36], urged to integrate evaluation strategies into the development and implementations of m-learning technologies. Traxler [37] said that evaluation of mobile learning is challenging. He identified some attributes that a 'good' evaluation should be: "Efficient (cost and time); Rigorous; Ethical; Proportionate; Consistent with the teaching and learning strategies; Aligned to the technology of learning; and Authentic". Furthermore, Park [34] stressed on using various assessment methods of learners using mobile devices.

Cultural and social challenges: There are cultural norms and social concerns while accepting the deployment of m-learning. Kadirire and Guy [38] pointed a drawback to mobile learning is the personal uses of the device with less control over the students makes mobile learning activities are subject to frequent interruptions. Ethical and practical implications such as: resistance to change amongst lecturers; concerns about new social practices affecting lecturers' personal time; increasing amount of information to be stored on his device; privacy issues; data security; and cyber-bullying, were addressed by [39,40]. The accessibility of mobile devices is another challenge. If mobile learning is to be implemented successfully, students and instructors must own a mobile device. Naismith et al. addressed issues related to the implementation of m-learning including technology ownership and the digital divine. Furthermore, Park [34] listed social limitations of m-learning such as: Accessibility and cost issues for end users; frequent changes of mobile device models; and risk of learners' distraction.

VI.RECOMMENDATIONS

McQuiggan et al. (2015) noted the following as important factors that could determine the success of mobile learning:

Professional Development: Teachers, school leaders, school districts should be trained to use the technology effectively. The teaching programs must make use of mobile learning and relevant pedagogies to train the teachers to be effective in the use of mobile technologies in classrooms.

Using data to personalize learning: Mobile devices allow novel ways to interpret data in form of logs and screen trackers which can be used by teachers to learn better about the students. Assessments and progress can be tracked in new ways and this can help the teacher provide a more personalized experience of learning for the students.

Changing instruction: Integrating mobile learning involves rethinking about learning and usage of mobile phones. Adding apps to automate instruction will be of no use and have no impact in the long run.

Good content: Apps and contents must be aligned to the content taught in classrooms and should be localized to cater to contextual requirements for providing effective balance to mobile learning programs (use of local language for assistance, cultural elements in storytelling and games, etc.)

VII.CONCLUSION

By providing educational services using wireless and mobile technologies, educational institutions can potentially bring great convenience to those off-campus students who do not always have time to find Internet enabled computers to get important educational information from their academic institutions. With the M educational services apps, students and instructors can access services any time and any place they want.

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