

An Introduction to M-Learning in Iranian Universities

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Abstract: *The first experience of remote education in Iran was started in 1970 by the Open University of Iran. In 1991, an e-learning site in Tehran University provided nine courses for students for the first time. Currently, the majority of Iran's universities offer these courses. To benefit more from modern facilities and technology, recently some universities have attempted to use Mobile Learning (M-Learning) based education. One of the most important challenges which these universities encounter is the lack of digital information resources and the difficulty of preparing digital content in the Persian language. In this research, services related to M-Learning are considered along with technical impediments in the development of these services in Iran.*

Keywords: *M-learning; Persian content; virtual universities in Iran.*

Introduction

Increasing the use of ICT in education has led to changes in methods, systems and resources. Migration of information resources from print mode to electronic mode has provided specific advantages for researchers and has changed the exploitation of information resources. In recent decades the development of education in a virtual environment and use of new tools have caused new methods of training to emerge.

The cellular phone is a telecommunication tool which is available in most parts of the world, both developed and developing countries, and is affordable for everyone. In this situation, it is possible to think about other applications of the cellular phone. Sending text is possible with almost any type of cellular phone and operator, and in more advanced models, sending audio and video files is also feasible. Even text files can easily include educational topics. Accordingly, utilization of mobile learning requires no expensive equipment.

Today, by creating and developing new information technologies, education for everyone, everywhere and at any time would seem to be obvious. On the other hand, attention to education in the modern world has persuaded owners of industries and technologies to innovate and provide education along with common telephone services. The complexity of the technology offered with cellular phones on one hand, and focusing on the educational needs of the applicants on the other hand, has become one of the most basic concerns of mobile technology custodians.

M-Learning implies a learning environment in which instructors and students can access the learning system with portable devices over a wireless network. The educational environment is becoming better than ever in ubiquity, instant connectivity, personalization, and a self-directed learning community with mobile technology (Kwon and Lee, 2010, p. 1885).

Here, the meaning of mobile learning is training by means of digital mobile tools which are portable and useable anywhere and anytime. These tools include:

- Mobile Telephones;
- PDAs (Personal Digital Assistants); and
- Personal Digital Media Players.

Although laptop computers can also be considered part of this group, our discussion focuses on the small screens with no standard keypad.

The definition of mobile learning has evolved with the advent of new technology. While mobile learning could, in its broadest sense, be said to cover books, CD-ROMs, radios, and laptops, most researchers in the field of educational technology consider mobile learning, or M-Learning, to be a

subset of e-learning. What differentiates mobile from electronic is the nature of the technology. M-learning terms, however, exhibit a shift away from a media immersion experience, or a structured, benchmarked set of activities, to words that express what are perceived as the primary attributes of a very different experience: "spontaneous, intimate, situated, connected, informal, lightweight, personal" (Laouris & Eteokleous, 2005, 3). S. Geddes (2004, p. 1) has provided a succinct definition: "mLearning is the acquisition of any knowledge and skill through using mobile technology, anywhere, anytime, that results in an alteration in behaviour".

For the purposes of this paper, mobile learning denotes instructional content or activities that are delivered on handheld (or mobile) devices, that accommodate limited multimedia delivery, primarily in the form of audio, images, animations (video), and text. Popular mobile devices include those capable of playing files that are often downloaded from the Internet on a computer and then uploaded onto the device which is then taken with the individual, who can play the files while not directly connected to a computer. Audio and video files can be played on handheld computers, audio file players such as iPod, and handheld devices that play video files.

M-Learning Technologies

E-Learning technologies were presented back in 1993 when bounded computer/email-based interactions were available (Electronic Learning, 2011). E-Learning, flexible learning, and distance learning definitions often go hand-in-hand and the goal of such learning methods is to give highest location independence and flexibility to get learning materials through online and media-based (e.g., CD and DVD) technologies.

The emerging web technologies have had profound effects on the quality of e-learning methods. Web 1.0 is a term referring to the early concepts of content delivery using basic web design technologies, including; HTTP (Hypertext Transfer Protocol) and HTML (Hyper Text Markup Language). Web 2.0 is a more recent term referring to the next generation of web-related applications and content delivery and presentations that facilitates secured multimedia-enabled information sharing. Web 2.0 includes the following concepts: Social Work 2.0, online interactions (e.g., blogs), XML (Extensible Markup Language), RSS (Really Simple Syndication) feeds, social networking protocols (e.g., FOAF "Friend of a Friend" and XFN "XHTML Friends Network"), and Web APIs (Application Programming Interfaces, such as REST "Representational State Transfer" and SOAP "Simple Object Access Protocol").

Mobile computing and communication services are spreading rapidly. Research suggests that in 2009 there were nearly 250 million wireless data-capable devices in use in the United States (Paczkowski, 2009). Adoption rates for mobile technology dwarf those for non-mobile technologies; for example, there are eight times more iPhone/iPod Touch users two years after their launch than there were AOL users two years after its launch (Meeker et al, 2009). At the end of 2009, there were 4.6 billion mobile cellular subscriptions worldwide, representing two-thirds of the world population (International Telecommunication Union, 2010). Mobile industry analysts suggest that worldwide mobile data traffic will double every year through 2013, increasing 66 times between 2008 and 2013 (Cisco System, Inc, 2010).

M-Learning is on the same track as e-learning, however it features distinct device/application utilization, which is based on mobile or other types of portable devices in the e-learning process. M-Learning is completely location independent, which means that the M-Learning session can take place virtually in any location (e.g., taxi, restaurant, street, etc.) (Mobile Learning, 2011).

As cell-phone data-plans continue to decrease in price and increase in versatility and include more affordable contract terms (i.e., unlimited data usage), many people are considering M-Learning more attractive than e-learning, due to the fact that e-learning scenarios require the learners to be in a fixed location or with a limited mobility throughout the data learning delivery, mostly through the Internet. There are however a few challenges associated with M-Learning, including: limited battery life on mobile devices, variable wireless coverage and having limited or no coverage in some rural areas, and limited key and screen sizes (Mobile Learning, 2011).

In 1988, in the U.S.A. a powerful software program that represented a revolutionary change in the electronic system, entitled "Master Digital (Digital-Professor)", that offered one of the primary uses of phone computers in education, was used for the first time.

The M-Learning project was funded in 2001 by the European Commission's Information Society Technologies (IST) initiative with matched funding from the project partners and, in the UK, the Learning and Skills Council. There are five project partners: two university-based research units (Ultralab at Anglia Polytechnic University in the UK and Centro di Ricerca in Matematica Pura ed Applicata (CRMPA) at the University of Salerno in Italy), two commercial companies (Cambridge Training and Development Limited (CTAD) in the UK and Lecando in Sweden) and the Learning and Skills Development Agency (LSDA) in the UK (Attewell, 2004, p. 2).

Learner access to M-Learning project systems and materials was via a microportal (mPortal), which consists of a series of mini web pages with navigation pointing to:

- learning materials;
- mini web page builder tools;
- a collaborative activities tool (the MediaBoard);
- peer-to-peer communication services (messages, chat, discussion and blogs);
- the learning management system;
- simple help guides for the system; and
- links to places on the Web that may be helpful or interesting for the target audience (e.g. alcohol, drugs and sexual health advice services, job hunting and online learning services and dictionaries) (Attewell, 2004, p. 7).

Current Smartphone platforms, such as in Blackberry Storm and Apple iPhone, have remedied the screen and key sizes to some extent and the new technologies in the wireless domain fronts, including usage of localized cell coverage (i.e., femtocell and directing cellular traffic through the Wi-Fi Access Point (AP) using UMA (Unlicensed Mobile Access) technology, have also eased the wireless coverage issues slightly. The battery life issue is still the major challenge, though several power-save operation modes have been introduced and implemented in various cellular and Wi-Fi protocols, including: UAPSD (Unscheduled Automatic Power Save Delivery) in IEEE 802.11e and SMPS (Spatial Multiplexing Power Save) and PSMP (Power Save Multi Poll) in IEEE 802.11n (Adibi, 2010, p. 379).

E- Learning in Iran

The first experience of remote education in Iran was started in 1970 by the Open University of Iran (Peyam Noor University, 2011). In 1991, for the first time an e-learning site in Tehran University provided nine courses for students.

In 2006 the state of e-learning and application of information technology in Iran was reviewed. According to that research 15 universities in seven educational groups accepted students with a total of 1000 registered students that year. According to the research results three virtual universities received establishment licenses in the field of e-learning. In that year there was no M-Learning. (Montazer, 2006, pp. 126-127).

In Iran, use of the Web for learning with PCs is more than ten years old. During this period, the spread of e-learning was not so great. Only 13 universities and five Institutes admit students and train them for B.A./B.S. and M.A./M.S. degrees in different fields making use of e-learning. Considering the large number (more than 230) of public and private universities in Iran, the number offering e-learning is very small. The Ministry of Education also organized e-learning in 576 training centers. The eagerness of the students and their need for e-learning force universities to develop their educational services.

Mobile phone penetration has increased in Iran in recent years, as well as in the world. It is natural that the number of operations and businesses in the electronic environment has also risen. Trust in the electronic environment has become vital, so information and communication security is expected more than before.

The three mobile operators in Iran are as follow:

- Irancell Co. (www.irancell.ir);
- Mobile Communication Co. (www.mci.ir);
- Taliya Co. (www.taliya.ir).

Considering the increasing number of cellular phone users and the possibility of usage of GPRS by these systems, features such as sending Mobile Information have led to the adoption of this facility by educational institutions. The number of universities officially using M-Learning is four. Some other universities are also exploring the use of M-Learning in their educational programs.

One can divide the major problems of Iranian universities in e-learning into three groups:

- technologies related to e-learning services;
- lack of resources in the Persian context; and
- security in information exchange.

Mobile Information Services

Features like SMS and Bluetooth are among the most common information swap services offered by cellular phones with widespread use among the Iranian youth. Some news agencies have tried to give information to their audience by means of these services, for example: Iran Book News Agency (www.ibna.ir/).

Recording and playing back the audio files and the video resources has recently become common in the e-learning system in Iran. Sources which in the past were on video cassettes or CD or DVD now are in the form of digital files and are able to be displayed on PDAs, Digital Multimedia Players or cellular phones.

The outsourcing of e-books, audio books, movies, and other multimedia content presents both benefits and challenges to libraries. With school, college, and university libraries facing severely constrained budgets, only the largest and most financially stable library systems have the resources to maintain in-house a full array of technical services, including the online public access catalog (OPAC), data store, e-mail, and web servers.

Learning foreign languages, especially English, through cellular phones is also one of the issues to be considered favorably in Iran. Some of the private language institutes use the cellular phone to send educational materials, including voice, image, films and texts. As the display screen is very small in cellular phones in comparison with PCs, the amount of information that is displayed is a disadvantage. So, if the information is more than one page, the format of the display should be changed, for example, diagram, flowchart and video formats can be used. Sending audio English to Persian dictionaries is the most common use of these resources.

Portable Documents are one of the major resources to display information for trainees. Books are an important example in this field. Because the use of Word Processing and desktop publishing has increased, the growth of production in digital documents in the Persian language has been significant. At the present time, several methods are available for cellular phone users to download a document. The volume of the content and the size of display are also important, so use of multimedia resources is not much favored due to the high volume, which causes problems in sending.

The noteworthy point is that educational contents should be designed for minimum equipment in order to be feasible on most regular phones and in the areas where cellular phone operators do not support all the features.

M-Learning in Iranian Universities

A number of Iranian universities attempt to provide their students with M-Learning, as follow:

1. University of Hadith Sciences¹

The relatively good cost of classes and also the opportunity to attend general classes free of charge are notable points of this university. Online contents and CDs are available to students. In addition to pictures and slides, the CDs also include audio courses suitable for use in mobile phones and audio devices.

¹. <http://vu.hadith.ac.ir/>

Communication with teachers is done via e-mail and text chat. Physical presence in the building during examinations is obligatory. The number of information sources provided is a negative aspect in the virtual education of this university.

2. *University of Shiraz*²

Access to the education system through cell phone is a positive point of the university. Materials are available for students as CDs. Communication with teachers is via e-mail and text chat. Physical presence in the building during examinations is necessary. Lack of simultaneous web-based classes and high cost of web classes are negative points of e-learning in the university despite its nature and the quality of resources and services presented.

3. *Amirkabir University of Technology (Tehran Polytechnic)*³

The Institute of Virtual Studies including four online classes is equipped with different facilities for e-learning used for simultaneous online courses. M-Learning facilities and conditions in this university are like Shiraz University. This system is a complement for e-learning at the University.

4. *Medical University of Tehran*⁴

This university is the only university offering e-learning for medical sciences. In addition to the typical M-Learning of universities, they have prepared special textbooks for mobile devices. Most of these information sources have been prepared by Java programming.

5. *Other Universities*

Using M-Learning is under study in many public and private universities of Iran. These studies are most common among courses which do not need practical classes or workshops. Among these universities some are mentioned below: Sharif Technical University⁵, Tehran University⁶, Islamic Azad University⁷, and Azerbaijan Virtual University.

By reviewing the services by Iranian universities via M-Learning we noticed that these services had been concentrated mostly on representation of curriculum content in the form of text and audio. Because of technological and infrastructural problems, the use of images, video and multimedia are not taking into account properly and in practice there is no application of them. Only two universities are using images for curriculum content in a limited manner.

In the field of learning assessment and exams, application of distance education systems is not common and students should be present physically during the exam period. In three universities an assessment system from a distance has been established for M.A./M.S. students.

Social science is more prominent in e-learning than other majors and favorite subjects Owing to the simplicity of preparing curriculum resources in this field. In medical science and in the arts still there is no activity. The University of Islamic Arts has begun a vast plan in the field of electronic education. Also, this university may start activities in M-Learning in the future.

². <http://www.shirazu.ac.ir/>

³. <http://www.aut.ac.ir/>

⁴. <http://www.tums.ac.ir/>

⁵. <http://cw.sharif.ir/>

⁶. <http://ut.ac.ir>

⁷. <http://www.iau.ac.ir/>

Table 1. M-Learning methods and models used in Iranian universities

		U. of Hadith Sciences	U. of Shiraz	Amirkabir U.	Medical U. of Tehran	Technical U. Sharif	Tehran U.	Islamic Azad U.	Azerbaijan Virtual U.
Methods used for content delivery	Text	x	x	x	x	x	x	x	x
	Voice	x	x	x	x	x	x	x	x
	Image				x	x			
	Film								
	Multimedia								
Methods used for e-assessment	presence	x	x	x	x	x	x	x	
	distance			x		x			x
Departments	Engineering		x	x		x			x
	Medical Science				x				
	Social Science	x	x				x	x	x

Conclusion

Cell phones play an important role in the lives of young people. They are used as a tool in voice communications and data transferring. It seems true at first glance that mobile learning is like using personal computers (only smaller in size), but our research findings indicated that in fact the technological limitations and lack of control over how and when training happens need different educational models.

There is a big gap between Iran and developed countries in technological issues. This lack of technological development has had a negative impact on the educational system. Lack of the necessary structures for telecommunication like cable broadcasting in some zones of the country has caused a more rapid growth of wireless infrastructures than in most countries in the world. Because of the low cost and wide range of cellular phone stations, more rural zones have been covered by wireless networks (Wireless LANs). Due to the vast application of cellular phones, the use of Internet has spread in many urban regions in Iran and now is available in all cities.

According to the investigations on the requirements, necessity, versatility, and projects done in Iran, the following subjects can be concluded about the problems. Schemes to solve the problems are then mentioned.

- *Lack of appropriate technological and networking infrastructures:* due to lack of proper infrastructure in rural and urban areas, the possibility of M-Learning with good quality is currently impossible and that is why virtual universities prefer not to provide these services.
- *Cultural problems in the society:* Not welcoming cellular phones as a means of sending non-audio data, and inability of most people to use this tool in education.
- *Unfamiliarity of M-Learning:* Research and investigation about M-Learning are not carried out in all universities and this system is still unknown for most of them.
- *Limited number of professors and experts:* Despite the increasing rate of growth of virtual learning and virtual universities, we still have a limited number of experts and professors who have experience in teaching students or in establishing and maintaining virtual universities. This

problem is quite palpable and has caused a tangible fall in quality of educational content, level of education and information literacy.

- *Problems related to learning and educational management systems:* Although examples of learning management systems for M-Learning have been produced already in the country, due to the lack of these systems and internal software and also their high cost, most universities and higher education institutions tend to use free foreign versions, which causes difficulty in maintenance, trouble shooting and working with these systems. Working with them is complex and time consuming, and security risks and potential security holes are inevitable.
- *Limitation of subjects and quality of electronic content in Persian language:* slow and time-consuming production of new electronic content in Farsi in the universities has led to lack of information resources. So, it leads the universities to use available resources in English.
- *Lack of support from top management:* top managers in all universities whether private or public do not look at this phenomenon (M-Learning) from a positive point of view and this has led to its slow development and weak educational system.
- *Poor or difficult educational content:* The educational material produced, despite the time-consuming and costly process, does not have an acceptable quality. It is so weak and superficial in content that the students are forced to use supplementary books, or is full of complicated phrases and too difficult due to poor translation so that students have to find alternative books or use original ones, if available.
- *Lack and non-use of national standards:* Despite existing international standards, we still do not have any electronic standard within the country to impose the use of M-Learning. Currently every university follows its own procedures and there is no centralized standard to synchronize universities for information transfer between universities.

Due to the various problems mentioned, the most important strategies to expand access and lower the limitations of M-Learning are as follow:

- Development of national standards for sending Mobile Information;
- Developing a culture of making optimal use of cell phones;
- Development of mobile learning in undergraduate levels;
- Enhancement of the software and hardware facilities;
- Preparation of required training content by professors and experts; and
- Reducing training costs.

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