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# Offering a Model to Increase the Efficiency of M-learning with Approach to Evaluating Iranian Information Society

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**Abstract:** Nowadays, lifestyle has changed by increasing daily growth of communications technology, telecommunications and networking. These changes have had impacts on training; so thatby the help of these advances, training is not just limited to the classroom. Therefore, learning style has shifted toward M-learning by the use of mobile systems. The objective of this article is to develop M-learning with minimal restrictions by considering the limitations in the Iranian educational system. Utilizing from WiFi network has been among the features of this system, it develops education process by the use of mobile services; finally, short message service (SMS), sending notifications, assignments and testing services are provided with the ability to send feedback to learners and mobile-learning system will be considered as a complete system.

**Key words:** M-learning · Mobile · Short message service · WiFi

## INTRODUCTION

Advances in information and communications technology have had a significant effect on all aspects of our life and it seems necessary to estimate the costs of software [1].In the twenty- first century, these advances influenced on education method. Growing technology advances have introduced a new education generation called "M-learning" to the communites. According to figure (1), this capability is provided for people by mobile electronic tools; and M-learning is a combination of "distance learning" and "electronic learning". Because on the one hand, there is a gap between teachers and students as " distance learning"; and on the other hand, learning process is conducted through computer technologies as " electronic learning" but this time it is provided with the use of mobile electronic tools and more advanced technologies [2].

This learning method will be realized due to the limitations and capabilities of wireless equipments and mobile communication technologies; so, the identified learningal requirements and experiences in electronic learning cannot be directely transferred and applied to mobile learning with simplicity [3]. Daily increasing growth and development of wireless equipments market and cost reduction in these equipments have led peoples and organizations tendency toward these technologies. Recently, teaching method and learning environment, content and methods and management of learningal systems have been deeply affected by these developments. By using a wireless learning environment, physical presence of learners and teachers in the classroom is optional; and individuals are able to access to the facilities of M-learning environment and all other learning services by use of a mobile device such as PDA, mobile phone or laptop anywhere within a distributed wireless network.

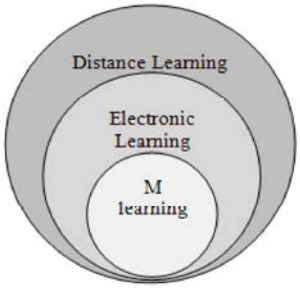


Fig. 1: Mobile learnig and its position in eduction

Electronic learning (E-learning) occurs through PC, network connections and interaction between users [4]. According to the definition given by control commitee, E-learning strategy includes the use of internet-

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based applications which are controlled and developed in an independent and pervasive position. E-learning software have a wide range thatlike an umbrella cover all internet-based applications in learning environments. Use of E-learning led researchers toward knowledge acquisition anytime, anywhere; and this in turn has led to the emergence of M-learning as a learning method that uses mobile systems. M-learning is a learning method that uses mobile devices such as digital cell phone, aid computers like PCs, PDAs and laptops; this method emphasises on new cell phone and laptop-based learning [5] that provide learning regardless of time and place by utilizing from wireless network equipments [6].

Since, information and communication technology (ICT) services have had a significant role in the revenue of the countries, economic indicator of information and communication technology (ICT) has declared ratio of products exports and ICT services to non-oil exports equal to 0.146 [7]. According to studies, the efficiency index of Iranian ICT services is expanding, however, necessary context is not available to publicize these facilities for all society categories. Based on statistics of the year 2014, Iran ranked world's 90$^{th}$ countries in terms of ICT development index; there is optimal bandwidth as a communication context only in the limited provinces and just about 21% of Iranian people use cell phone for their information and communication activities [7].

The purpose of this article is to provide training facilities with regard to the development of mobile-learning system and with the least restriction on tools, positions and applicable networks.This system has provided many training services by utilizing from WiFi networks; and M-learning system can be considered as a comprehensive system with the capabilities of SMS, notification and testingservices.

**Literature and Research Background:** "Mobile training" is a new concept that has been mentioned in the report of other countries with terms of M-learning, but less often with M-teaching; however, both words of electronic learning and electronic teaching have been raised for the term of E-learning. By removing restriction on physical place, M-learning involves learners in learningal activities. Modernity in M-learning is because of lightweight, small and portable equipments that simply provides the facilities of communication and cooperation for teaching and learning activities [8]. M-learning is an learning that is performed anytime, anywhereby help of a mobile computational device. This device should provide the capability to display learning content and mutual connection between teachers and students [9].

M-learning can be defined as teaching and learning in personal and digitalcomputers, smartphones and cell phones [10]. In some sources, it is defined as E-learning by utilizing from computational device and considered as devoted to PDAs and digital mobile phones [11]. There is a common point that M-learning has been defined as E-learning by using mobile devices [12,13]. A general classification of existing M-learning systems can be provided [14]; also a framework can be drawn for M-learning system in terms of learning component (3); and finally, a framework can be proposed for mobile teaching based on M-learning that its basis is to complete the missing elements of E-teaching.

A model has been provided for effective use of learning technology in higher learning,it suggests 8 criteria to determine type of used technology. Theyconsider this technology only suitable for students; and ease of use and reliability, costs, teaching and learning methodes, interaction, organizational issues, modernity and the speed effective on the type of technology [15].

Short message system is a component of phone text messaging services, Web or mobile communication systems that by using standard communication protocols exchanges short text messages between fixed-lines or mobile phones [9]. Universities students have cell phones, they are increasingly using other cell phones services. Short message service is present everywhere. The flexibility of short message system is one of its main characteristics; messages can be sent to every single student or a group of them. This method is not enjoying from mass marketing approach by an advertising agency; but gives the deans of faculties and schools possibility to transfer the desired information to the students at the appropriate time [16].

**Related Researches:** Nowadays, extensive studies have been done in the field of M-learning method along with mobile information technology [17]. One of the M-learning methods has been SMS-based M-learning that is able to send audio message and also be able to create the limited transmission features not only among users but also among learners and the internet server [16]. Because of extensive use of mobile phone to PDA devices, the studies were conducted in the field of teaching English words by help of mobile phone [18]; also, a case study was performed on M-learning environment for students ( such as finding the place of confrence presentation [19]. Web 2.0 and mobile devices were used in these studies to identify application rate of mobile technology and social software and their impact on

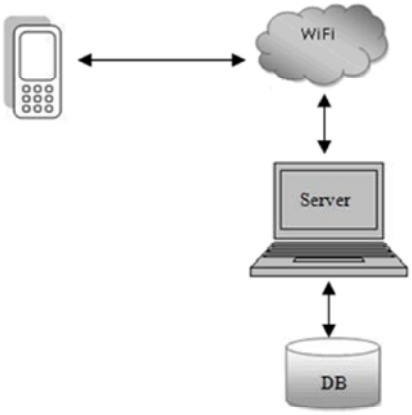


Fig. 2: A conceptual model of the proposed system

collective learning, sharing of knowledge and understanding and creation of virtual communities. Also, students interaction rate during teaching session and the features of the mobile device to be affected during session have been studied [20]. Bluetooth network can be used in this teaching method [21] and all issues can only be created by copying and pasting information [17]. Teaching files can include text and multimedia tools to improve the quality of learning [22].

In this article, a testing system will be proposed which has the ability to be exploited anytime, anywhere. The aim of designing this system is to create sub-structures for storing accomplishment and correcting academic tests [23].

**Introducing the Components of the Proposed System:** As shown in figure 2, the proposed model has two types of users, server (teacher) and user ( student); each user has the distinguished facilities and the system puts certain operations at their disposal, depending on the type of user.

**Server:** Server is for teacher's access to system services; submitting assignments, sending notifications and SMS and uploading tests by use of WiFi networkcan be mentionedamong such facilities (services). The capabilities provided for teachers include:

- Access to all system activities,
- adding, updating and deleting students' information ( their real name, ID and password),
- sending a notification that includes the date and time of creating notification,
- submitting an assignment that includes the date and time of assignment,
- sending SMS directely or automatically,
- creating a new multiple-choice test ( 5 options)to determine features such as test subject, test time, test date and score.
- updating and deleting test informations.
- use of test bank for selecting question from each of previous tests and adding it to the new test.

**User:** This section is related to the students be allowed to use the system;it allows users to connect to the server and receive assignments, SMS and notification, respond to tests and get feedback by use of WiFi network. Among the capabilities that system provided for users are:

- Connecting to the system via mobile device and by use of user name and valid password.
- reading notification from server.
- receiving assignments from server.
- receiving short message (SMS)
- performing multiple-choice testquestions (4 options).
- changing the password.

**System Design:** Server encryption ( desktop operation) was applied by use of NetBeanIDE 6.5.1J25 (Java 2 Standard Edition).

Server encryption (mobile operation) was applied by use of NetBean IDE 6.5.1J2ME (Java 2 MicroEdition).

Database tables and DML operation were applied by use of MySQL Server5.1. Powerpoint 2007 Smart Drow was applied.

**Characteristics of the Proposed System:** The characteristics of the proposed system that distinguish it from other similar systems are as follows:

- The system uses the database to store all information about services.
- the system offers possibility of participating in test to more than one student at the same time and scoring system is done automatically.
- the scoring process and comparing user response with the availableresponse are performed in the database. After calculating by system, these values are summed up to obtain the score and store it in the database.
- students can download the test answer key and store it as a text file.

**The System Allows Teacher to Send Sms in Two Ways Simultaneous Sending Sms:** This option allows teacher to send SMS immediately. There is also the possibility of sending collective and group SMS that its process is as follows:

In collective sending method, the teacher uses the option "SEND NOW" and sends SMS to all students; if the options "ALL" and "SEND NOW" to be selected, the SMS will be sent to all students and correct sending of message notified by displaying the message "YOUR SMS SENT SUCCESSFULLY".

In group sending method, the teacher can select a group of students for sending the message; here, the option "CUSTOM CHOICE" is selected then a list of students numbers appears and the teacher can choice his/her preferred students. If students numbers are forgotten, students information can be seen only by clicking the SEARCH button.

**Saving the Message and Sending it after a While:** In this method, the teacher can type the SMS and save it with the date and time of sending, so, the system will automatically send it; here, the teacher can also send the message collectively. The student can see the lastest notificationsand assignments; therefore, the system updates automatically these services and only the final version is sent by the teacher to the student.

**M-learning in Iran:** In Iran, cell phone as a tool for audio communications and data transfer plays an increasingly important role in youth life. It may seem simple at first glance and this image is created in the mind that M-learning is like the use of personal computer ( just on a smaller scale); but our research findings indicate that in fact both technological limitations and lack of control over how and when learning takes place require different learning models and M-learning is completely different from learning through home computer system (Traxler). In terms of technology, there is a huge gap between Iran and the developed countries. This lack of technology development has negative impact on the learning sector; but, due to lack of necessary telecommunication infrastructures in the form of cabling in some areas of the country, the growth of wireless infrastructures is much faster than many countries in the world. Also, due to low cost and wide range of cell phone stations, most rural areas have been covered by wireless networks. Simultaneous by the growing use of cell phones, use of internet has also been expanded in many Iran's urban areas and is now available in all the cities.

The following conclusion about the current problems can be summarized with regard to assessment of needs, requirements, capabilities and the projects conducted in Iran.

Lack of appropriate network and technological infrastructures; cultural problems of the society; unfamiliarity with M-learning; limited number of professors and experts; limited topics and electronic content quality in persian language; lack of support by senior management; weak or difficult learning content; and finally, absence of national standards are parts of the problems that we are faced in the field of M-learning. Due to variety of the aforementioned problems, the most important strategies to expand access and reduce limitations of M-learning are: codification of national standard in the field of mobile data transmission; culture creationin the field of optimal use of mobile phone; development of M-learning at the undergraduate levels; enhancement of software and hardware capabilities; providing learning content required by professors and experts; and reducing learning costs.

A detailed comparison from-rate-of learningal activities in the field of M-learning and the situation of M-learning in Iran were investigated [24].

## CONCLUSION

M-learning is inattentive to time and place, therefore, gives more flexibility to users and also byutilizing from wireless networksprovides learning possibilityfor them. In this article, a model was presented for M-learning, it provides learning possibility in the form of interaction to the teacher and studentand enables users to use M-learning by correspondence; its goal is to expand M-learning communication systems. This model uses wireless network and mobile phone equipments for data exchange and provides the possibility to store and retrieve data by use of a database.The database contains basic and updated informationin accordance with the level of learning and takes advantage of new generation technologies.This system helps learners to experience learning opportunity anytime, anywherewith only internet access and receive SMS,notification or assignments.Main services of the system include testsectionthat provides the possibility of automated testing.Thus, the students can receive pilot tests;after responding to the tests, theyreceive their scoresdirectly through available mobile electronic devicessuch as cell phone or PDAs.

This project is usable for all the people who work on the field of M-learning and its application.Most people interested in this field of research are scholars, teachers, students and learningal organizations such as universities, schools, institutions and those who are looking for an appropriate learning system to meet their learning needs.

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