Investigating and Criteria Classifying and Effective Components on Mobile Learning among Faculties of Islamic Azad Universities, Mazandaran Province, Iran

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Abstract

The aim of present study was to identify the components and effective dimensions and its classification on mobile learning. The population of present study was all full time faculties comprising assistant, associated full professors of all comprehensive and very great branches of Islamic Azad University of Mazandaran province, Iran. The number of population was 449 individuals, based on stratified random sampling method and by using Cochran formula, 210 individuals were selected. 20 components were identified by literature review research and feedback from supervisors and co-supervisors. These components in the questionnaire were designed in 106 questions. To assess the reliability and validity the questionnaire was distributed among 30 individuals by using Cronbach's alpha (0.94). The data were analyzed using the SPSS and LISREL software and using descriptive statistics and inferential statistical techniques by exploratory and confirmatory after data collection, 20 components were identified as effective mobile learning components and in educational, technological, operational and environmental groups. The largest effectiveness contribution was related to safety component and the lowest contribution was related to the field component. Among dimensions, the most impact was technological aspects and the least impact was related to environmental dimension.

Keywords: Components, Dimensions, Mobile learning, Faculty, Islamic Azad University

1. Introduction

In the age of information and communication technology, many traditional methods have shown that they have no sufficient power to transmit new concepts to learners. E-learning is a new method of education which provides and manages learning opportunities to promote the knowledge and skills via the Internet and computer networks and has converted the nature of the education and gaining knowledge from teaching to learning (Rezaii-rad, 2012). Diversity of some fields and necessity of being uniform and the interaction with relating doctrine to achieve country development objectives, as well, educational content of some fields show the feature of classical-practical capability which facilitate this (Hawkes & Halverson, 2002). What are clear, student learning needs no long time and cooperation and interaction between students and professors as well between students with themselves are in low level in the matter of learning (Kamar & Ongondo, 2007). Academic support to help students and study groups for learning and accessibility to resources needed for research is low. Students don't inform with news and emergency information on time. Many students with respect to their field of study need practices and problem solving which is difficult to access such data for them. Students have no choice in how their training would be (Brown, 2003). Most of the universities still use system of preparing booklets for courses. While, we know that time is very precious for both professors and students, but also the time still spent on writing, preparing and propagating of pamphlets and exam resources (Gregson & Jordaan, 2009). Students don't benefit of consultation from a distance with their masters. At present professors can't evaluate students individually in the specific context and so transmit concepts required for each person to him. Teachers still teaching important concepts to their students by the use of boards (Balasundaram & Ramadoss, 2008). The existing teaching methods don't share the information required by students quickly, as well they're not flexible for various conditions of students so they couldn't motivate enough (Peters, 2007). Students need the techniques that will help them to understand the courses better and provide guidance to them with a unique orientation. Students always need comprehensive, universal and up to date information. Utilizing technology to access the information needed by students is obvious. Thus technology is an undeniable connector in increasing the availability of information (Herrod & Chase, 2007).

Because of the students' acquaintance with technology in an acceptable level, many training centers embrace the technology to deliver its educational content. Development of e-learning sites is a case in point. The one form of e-learning education that is mobile technology, whereby the mobile devices connect to the educational public networks and creates the concept called mobile learning (Balasundaram & Ramadoss, 2008). The high flexibility of mobile technology provides favorable conditions to assist the teacher and the learner in order to gain educational goals (Attewel, 2004).

It must be said that the definition of mobile learning is transmission and transfer of learning content through mobile devices such as laptops, PDAs, mobile phones or other mobile handheld devices, which allows learning to accompany the learner and facilitate its operation at any point in the learning process. Also, it learns to users to have had, what they want, where they want and when they want (Rezaii-rad et al, 2013).

In the tutoring method, teacher with close contact to learner is able to diagnose emotions such as fatigue and anger which have a negative impact on learning, and can control them (Liu & Jiao, 2010). Otherwise, learning process does not proceed well. In addition of preventing the negative effects of traditional learning in mobile learning, audio and video representations used in this type of education can have an important role in learner refreshment. Opportunities that mobile technology offers the learner enhance the learning efficiency. On the other side, teacher in traditional education present the same training to all audiences, while all the learners are not in the same level and each one differ from one another in terms of knowledge and capability. As regards mobile systems have been centralized and personalized which can offer education proportional to the learner's knowledge level and this will educate every one proportional to his knowledge (Bull, 2007). Researches and studies have been conducted in this context; often have been shown the usefulness of this type in learning and better academic achievement of the learners (Rezaii-rad et al., 2013).

There are some correlated elements in mobile learning and education. Ozdamlia and Cavus (2011) classified the important elements in five categories, including learner, instructor, the learning environment, content and evaluation (Ozdamlia & Cavus, 2011). Researches that could be linked to a subject of studied are as follows:

Agnes Kukulska and pettit (2007) represented the research entitled "Emerging procedure in teaching, personal mobile learning, learn, work and play" in courses from distance of master's degree which had been fulfilled in the Institute of Technology of Britain at the London. Data accumulation of this project has been done in the form of online questionnaire and interviews followed up by phone or email. Questionnaire has been forwarded to 1500 students that are covering quantitative and qualitative questions about the use of various tools (mobile phone, smart phone and ...) in 5 types of activities: 1.training 2.learning 3.work 4.the social transaction 5.playing. Of course these areas sometimes overlap, as do someone works as teacher or somebody learns with playing. About ¾ of respondent has been 35-54 years old and more than half of them (55%) have been women. In this project, we show the percentage of people who used this tools in different cases and also for what they use them, fractionally and finally peruse with our results (Kukulska & pettit, 2007).

Evgeniya et al (2010) performed a research entitled "Evaluation of mobile learning system", this paper approved assessment of Mobile Learning system called (flag man) that is outspreaded at the University of rose in Bulgaria. This system supports foreign language learning by using mobile devices. (Personal digital assistances - smart phones or wireless laptops) all system interactions and learning items are in seven languages, there are: English- German- France- Spanish- Portuguese - Greek and Bulgarian, research and discussion method has been used for assessment of the system. A questionnaire consisting of 35 questions divided into seven expanded sections. The first section contains questions about personal background of the user. While other sections consist of questions about feasibility or possibility of getting executed technically, learning efficiency, cost effect, user companionship, advanced apparatus and instruments used in and offers. Assessment of the system through this tests has been took place in British Hellenic College in Athens, Greece, the International College, Dobrich, Bulgaria and Bulgarian rose university. Two hundred fourteen users (students and university lectures) applied to fill out this questionnaire after using the system. Analysis of the results of this evaluation showed that mobile learning system is the possibility of technical, educational result, and user concomitant (Evgeniya et al, 2010).

Ozdamlia and Cavus (2011) performed a research entitled "the basic elements and characteristics of mobile learning", they expressed that mobile learning is a type of learning which allow learners to take educational stuff from anywhere and at any location by the use of internet and mobile technology. It is necessary to organize mobile learning elements properly and to incorporate interaction between elements in a favorable route so that mobile learning succeeds and implementation is effective. Moreover, mobile learning features must organize and apply as mobile learning activities and also, to progress applied methods and usage time must be planned pretty well. As a result, deeper insight is required into the theory based on university research to better understand of main motivations that led to the adoption of elements and mobile learning characteristics. Learner, teacher, environmental, content and evaluation are essential elements of a fully mobile learning. Learner, teacher, environment, content are the main effective elements in evaluating the mobile

learning. The goal of this project is description of the basic elements and characteristics of mobile learning, according to new trends of developing technologies (Ozdamlia & Cavous, 2011).

Vahidi (2013) has designed questionnaire to develop a model for measuring e-readiness of training centers for the educational establishment and shares to 45 persons as teachers implementing e-learning and training managers who related to the subject of e-learning. His model is presented in 4 dimensions and 15 indexes:

Policy dimension with preparedness of educational policy index, implementation dimension with preparedness of management and human resources index, assessment and supervision dimension with preparedness of educational assessment and supervision index and support dimension with the index of preparation of supporting factors, culture, standards, finance, laws and regulations, educational content, security, networking and mobile equipment (Vahidi, 2013).

Taheri and Niaz-azari (2014) have been preceded in their study entitled "Evaluation and ranking of factors affecting the admission of mobile learning usage in the Mazandaran Islamic Azad University" to review and rating the factors affecting the adoption of using mobile learning in Islamic Azad universities of Mazandaran province. The results of the analysis showed interest in mobile training systems, skill gaining and learning of using mobile educational system, social prestige of using mobile educational system, previous knowledge of students for using mobile educational system, safety of using mobile educational system, tend to use mobile educational system in the future, the interaction between teachers and students in the use of mobile learning system impress in mobile learning but instructing the use of mobile learning system to students, the support condition of training centers on the mobile educational system, technical infrastructure for use of mobile educational system and accessibility of mobile learning content do not impress in mobile learning. Also, the interest in mobile learning with an average rating of 9.08 is most effective and accessibility of mobile learning content with a mean of 4.22 is the least effective factor on mobile learning (Taheri & Niaz-azari, 2014).

Taheri and Niaz-azari (2014) have been concluded in the research entitled "The effect of demographic factors on mobile learning" among students of various disciplines that is age, field of study and degree impact on desirability of mobile learning though gender does not affect on it. Recent research imparts the importance of computer admittance to the human life, especially in the field of education. Mobile learning technologies, eliminating the borders and cooperation of environment provides learning between exterior groups. In addition, advances in mobile devices facilitates the use of applications and multimedia in mobile phones that allows to mobile phone learners to access the extent range of various enriched sources of learning (Huang et al, 2010) (Laurillard & Pachler, 2007). In the new age, mobile devices such as mobile phones connect everyone to his workplace like umbilical cord, and now, he is not separated from the workplace. Wherever he is, work is looking for him. Everywhere can be his place of work and learning. Another point that is important is that mobile devices have distorted border of public and private area (Taheri and Niaz-azari, 2014). According to the literature discussed and the importance of mobile learning for students in the age of information and communication technology, the researchers of this study intend to investigate and analyze factors affecting mobile learning from the experts studied viewpoint and discretion of faculty members with the rank of assistant professor or above in the case of these components. In this regard, we trepan to discover and ranking the dimensions and effective components of mobile learning. Research questions were as follows:

- What are the dimensions and factors affecting mobile learning?
- How is the ranking of this dimensions and components?

2. Materials and Methods

The purpose of this study was applied and it was descriptive survey based on control of researcher on the variables. The research conducted in the field of research. Also, this research was exploration and developmental due to using in previous researches and idea of faculty members and experts and searching in websites for finding components and effective aspects on mobile learning. In this study, the data was performed through a questionnaire that the extracted components from the research literature are shown as follows:

Table 1: The extracted component from the research literature

No.	Component	Question
1	Tool	1-5
2	Learner	6-12
3	Teacher	12-17
4	Community	18-22
5	Field	23-27

6	Content	28-32
7	Interaction learning	33-41
8	Capability using tool	42-51
9	Communication	52-56
10	Technology	57-60
11	Culture	61-65
12	Security	66-69
13	Coordination	70-74
14	Control	75-79
15	Evaluation	80-85
16	Performance	86-89
17	Policy	90-93
18	Economic issue	95-98
19	Learning experience	99-101
20	Cooperation	102-106

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3. Results

In this section, we aimed to investigate the descriptive statistics and then, to test research questions. The results of descriptive statistics were as follows:

Table 2: Distribution of respondents by sex

Gender	Number	Percent
Female	94	44.8
Male	116	55.2
Total	210	100

Table 3: Distribution of respondents by age

Age	Number	Percent
30 years old<	3	1.4
31-40 years old	89	45.4
41-50 years old	67	31.9
50 years old>	37	18.9
Total	196	100
NO answer	4	1.90

The result of inferential statistics is as follows:

The results of the first question of research: What are the dimensions and affecting components on mobile learning?

KMO (Kaiser -Meyer fit test) and Bartlett was used to recognize the fact that the data are qualified in implementation of the exploratory factorial analysis. KMO is the sufficient index of variable and its value is always between 0 and 1. In the event that less than 0.5 data, data is not suitable for factorial analysis. If it is between 0.5 and 0.69, data is moderate for factorial analysis and if the data is larger than 0.7, it is suitable for factorial analysis. Bartlett test is usually approximated by the chi-square test and the chi-square table is used to find the critical value. In here,

Bartlett amount was investigated by the chi-square value with 95% confidence or the error of 0.05 or degrees of freedom (3). In this study, data were analyzed by using exploratory factor analysis by Kaiser-Meyer and Bartlett test that the results are presented in Table 4:

Table 4: Exploratory factorial analysis of theoretical foundation

Dimension	KMO and Bartlett test	The obtained components in order of importance in explained variance	Percentage of explained variance
Educational	KMO=0.930 Sig=0.000 Data were qualified for factorial analysis	1. Learner 2. Teacher 3. Content 4. Interaction learning 5. Evaluation 6. Learning experience	71.976%
Technological	KMO=0.925 Sig=0.000 Data were qualified for factorial analysis	7. Tool 8. Using capability 9. Technology 10. Security	66.096%
Environmental	KMO=0.902 Sig=0.000 Data were qualified for factorial analysis	11. Community 12. Field 13. Culture 14. Policy 15. Economic issues	69.447%
Performance	KMO=0.931 Sig=0.000 Data were qualified for factorial analysis	16. Communication 17. Coordination 18. Control 19. Performance 20. Cooperation	67.891%

KMO value or sampling adequacy index was greater than 0.5 and significant level was more than 0.05. This demonstrated that the data is suitable for factor analysis. Percent of the variance in the last column of Table 4 represents the percentage of the variability in question explained by the extracted components, that demonstrate this percentage was high in all of dimensions. Then, dimensions were named based on the previous literature review and expert opinions. In answer to the second question:

2. How is the ranking of these components and dimension?

Dimension	Rank	Component	Rank	Load mean	Factorial load mean
Technologic	1	Security	1	0.875	0.814
		Technology	2	0.874	
		Tool	3	0.789	
		Using capability	4	0.720	
Performance	2	Communication	1	0.812	0.7939
		Coordination	2	0.795	
		Performance	3	0.733	
		Cooperation	4	0.772	
		Control	5	0.709	
Educational	3	Content	1	0.826	0.780
		Learner	2	0.802	
		Learning experience	3	0.794	
		Interaction learning	4	0.755	
		Evaluation	5	0.753	
		Teacher	6	0.750	
Environmental	4	Community	1	0.788	0.7496
		Policy	2	0.770	
		Economic issues	3	0.749	
		Culture	4	0.742	
		Field	5	0.697	

The exploratory factorial analysis and determining the amount of each component and aspect was carried out in order to rank components and investigate the known dimensions. By investigating the impact of effective components on mobile learning loadings, all components were higher than 0.5 that confirmed the effect of them on mobile learning. The most impact is related to security component with factorial load 0.88 and the least impact was related to field components with factorial load (0.70). Regarding to the approval of the dimensions, the largest influence was technological dimension (with factorial load of 0.81), then, an executive with factorial load of 0.79, then, educational dimension with factorial load of 0.78 and finally, the least impact on the environmental dimension with a load factor of 0.74.

4. Discussion and Conclusion

The aim of this research was to investigate the components and affecting dimensions on mobile learning in order to complete the previous researches on mobile learning. In this study, the authors were studied mobile learning on students of different majors, and in another research they were measured the effects of demographic factors on the acceptance. Hence, this study was quite different and developmental both in the statistic population and in the parameters studied. Confirmatory factorial analysis showed that 20 factors were affected on mobile learning included: tools, learner, teacher, society, context, content, interactive learning, the ability to use tools, communication, technology, culture, security, coordination, monitoring, evaluation, implementation, policy, economics, experience, learning and working in four technological, environmental, educational and administrative dimensions. It was consistent with the findings of Vahidi (2013) in components included tools, content, learner, teacher, communication, evaluation, policy, performance, economical support and cultural issues, also it was consistent with the findings of Ozdamli and Cavous in components included tools, learner, teacher and evaluation, but in Vahidi's research (2013) components were only 15 cases and dimensions were different, and the model was used for measuring e-readiness. Ozdamli and Cavous did not talk about dimensions. Hence, this research was considered dimensions. In chord, rankings of these factors were only in works of Vahidi (2013) based on the known factors that mobile equipment or tools were the highest of importance. The component of culture had the lowest impact which was true in this research but it was the last area of influence and was not studied in Vahidi's research. Among the factors that most influenced in this study was security, while the first important factor in Vahidi's research was mobile equipment.

Important differences of this study with other researches are the number of components and ranking of these components using exploratory factorial analysis. It is worth to consider the results of educational leaders due to factors affecting mobile learning and the influence of the experts' view on the possibilities of mobile learning in education to obtain better benefit. Researchers have been performed many researches in this direction and demonstrated that with evaluation and feasibility of mobile learning can do a lot of applied researches.

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