REVIEW ARTICLE

From E-learning to Ubiquitous Learning; Theoretical Principles

Mohammad Zare[1,*], Rahele Sarikhani[1]

[1] Young Researchers and Elites Club, Malayer Branch, Islamic Azad University, Malayer, Iran.

* Young Researchers and Elites Club Malayer Branch, Islamic Azad University
Parastar St,
Malayer, 6571961668
IRAN

Tel: +988 132 227 878
Fax: +988 132 228 236
Email:
zareeducation@gmail.com

Background: Because of approaches to learning in every place and at any time, ubiquitous learning with knowledge of the context and framework, and due to the development of wireless technologies and sensors, the learning process has changed. Mobile learning and ubiquitous learning as models of e-learning that refer to the acquisition of knowledge, attitudes and skills through wireless technologies. the purpose of the present research was to investigation two this technology.

Methods: this study was a Library research methods and note taking had been utilized.

Results: The effectiveness of e-learning and its new methods including mobile learning and ubiquitous learning are in need of attention to the approaches and theories of e-learning, because by employing e-learning methods, we can find solutions for teaching and learning that would meet the needs of today's education and training.

Conclusions: In recent years, e-learning researchers have found that the development of wireless communications and sensor technology has changed the research issues of e-learning to mobile learning and then, it has changed mobile learning to ubiquitous learning.

Keywords: E-learning, M-learning, U-learning

من التعلم الإلكتروني الى التعلم الشامل

التمهيد و الهدف: إن الرؤية في التعلم في كل زمان و مكان و التعلم الشامل مع وجود معرفة و ضوابط و ايضا وجود تطورات في التكنولوجيا اللاسلكية و اجهزة التحسس اوجدت تحولاً كبيراً في مجال التعلم. يعتبر التعلم السيار و التعلم الشامل نماذج من التعلم الإلكتروني في مجال كسب العلم و الرؤية و المهارة مستخدما التكنولوجيا اللاسلكية.

النتائج: إن مستوى التأثير و الاساليب الجديده في هذاالمجال كأسلوب التعلم السيارو الاسلوب الشامل يحتاج الى تمعن ودقة في الرؤية و النظريات التعلم الإلكتروني. في حال تم استخدام اسلوب التعليم الإلكتروني نستطيع الحصول على اساليب تعليمية تتناسب مع احتياجات التربوية اليومية في المجتمع.

الاستنتاج: وجد الباحثون في السنوات الاخيرة أن تطور التواصل اللاسلكي و اجهزة التحسس حولت التعلم اللالكترونيكي الى تعلم سيار و الان من التعلم السيار الى تعلم شامل.

كلمات المفتاح: التعلم الإلكتروني ، التعلم السيار، التعلم الشامل

از یادگیری الکترونیکی تا یادگیری فراگیر؛ مبانی نظری

زمینه و هدف: رویکردهای یادگیری در هر زمان و مکان و یادگیری فراگیر با آگاهی از زمینه و چارچوب، با پیشرفت فناوری‌های بی سیم و حس‌گرها یادگیری را متحول ساخته است. یادگیری سیار و یادگیری فراگیر به عنوان مدل‌هایی از یادگیری الکترونیکی اشاره به کسب دانش، نگرش و مهارت با بهره‌گیری از فناوری‌های بی‌سیم دارد. هدف از این پژوهش بررسی این دو نوع فناوری می‌باشد.

روش: در این پژوهش از روش کتابخانه‌ای با تکنیک فیش‌برداری استفاده شد.

یافته‌ها: اثربخشی یادگیری الکترونیکی و روش‌های جدید آن شامل یادگیری سیار و یادگیری فراگیر نیازمند توجه به رویکردها و نظریه‌های یادگیری الکترونیکی می‌باشد، زیرا با بکارگیری روش‌های یادگیری الکترونیکی می‌توان به راه حل‌هایی برای آموزش و یادگیری دست یافت که نیاز جامعه‌ی تعلیم و تربیت امروزه را برآورده می‌سازد.

نتیجه‌گیری: در سال‌های اخیر محققان یادگیری الکترونیکی متوجه شده‌اند که پیشرفت ارتباطات بی‌سیم و فناوری حس‌گر مسائل تحقیق یادگیری الکترونیک را به یادگیری سیار و اینک از یادگیری سیار به یادگیری فراگیر متحول ساخته است.

واژه‌های کلیدی: یادگیری الکترونیکی، یادگیری سیار، یادگیری فراگیر

الکٹرانیک تعلیم سے بہم گیر تعلیم تک علمی نظریات

بیک گراونڈ: تعلیمی روشیں بر زمانے اور مکان میں تبدیل ہوتی رہتی ہیں وائر لیس اور سینسرز کی ٹکنالوجی میں ترقی آنے سے تعلیمی میدان میں بھی تبدیلیاں آئی ہیں۔ موبآئیل ڈیوائسز سے تعلیم حاصل کرنا الیکٹرانیک تعلیم کا ایک نمونہ ہے۔

نتیجی: یہ ساری چیزیں وائر لیس ٹکنالوجی سے استفادہ کرنے کے نمونے ہیں۔ الیکٹرانیک تعلیم کی روشیں استعمال کرکے تعلیم کے نئے طریقے اپنائے جاسکتے ہیں جو آج کی تعلیمی ضرورتوں کو پورا کرسکتے ہیں۔

سفارش: حالیہ برسوں میں الیکٹرانیک روش تعلیم کے محققین اس بات کی طرف متوجہ ہوئے ہیں کہ وائرلیس اور سینسرز ٹکنالوجی میں ترقی نے الیکٹرانیک تعلیمی روشوں کو موبائیل تعلیمی روشوں میں تبدیل کیا تھا اور اب انہیں وسیع البنیاد تکنیکوں میں تبدیل کردیا ہے۔

کلیدی الفاظ: الیکٹرانیک روش تعلیم، موبائیل روش تعلیم اور بہم گیر تعلیم۔

INTRODUCTION

Horton and Horton believe that e-learning in a broad definition includes any use of web technology and the Internet to create learning experiences. In fact, e-learning was made out of the cycle of rapid and growing changes of new technology in its real meaning [1].

The use of technology in education would reduce training costs, save time, increase opportunities for teaching-learning, increase academic success, and offer quick access to information. Therefore, in recent years, education policy makers in many developing countries including Iran, have paid a particular attention to e-learning [2].

E-learning as a new approach in providing an equipped, and interaction and learner-centered learning environment with a good scheme for everyone, in anywhere and at any time, employs different technologies and digital resources and features, and it is along with other forms of learning environments in order to create a more open, flexible and distributed learning system. (Mathew et al, 2006. As quoted by Davani) [3].

In other words, we can say that e-learning is the systematic use of information and communication technology in teaching and learning. In general, e-learning is a concept that suggests the use of information and communication technologies such as the Internet and multimedia systems as tools for improving the quality of learning by providing facilities for easy access to educational resources and services, and for providing mechanisms such as distance interaction and cooperation [4].

This might be the question on the minds of many people: despite the current methods of teaching and learning, why is it important to consider e-learning? To answer this question, several factors can be pointed out that will lead to the use of e-learning capabilities.

- National factors: due to the steady increase in the number of applicants to higher education institutions, the distribution and heterogeneity of individuals, the need of training at the same time as serving, etc. the need of a new educational model for learning can be felt.

- Structural factors: some of the factors related to the use of e-learning are concerned with the characteristics of this type of education. Some of these structural factors are as follows:

• The flexibility of e-learning to learners' needs and having more access to learning resources and teaching materials.

• High-performance e-learning systems for managing large numbers of learners and reducing training costs.

• Creating training and learning opportunities through distance learning.

• Improving the quality of learning and teaching using various means and creative and effective methods [4].

• Due to the spread of information and communication technologies, there have been profound changes in all aspects of human life; educational system is one of those institutions that has fundamentally been in the direction of these changes. In fact, with the rapid growth of the Internet and digital technology, the Web has turned into a powerful, interactive, dynamic, economic, and democratic medium of _____

learning and teaching worldwide. The Internet provides an opportunity for the development of education and vocational training based on learners' demands [5].

Because of the pervasiveness of e-learning and its new methods such as mobile learning and ubiquitous learning, it is necessary for those involved in the field of education and training to understand the theoretical principles and the environment of e-learning and then compare each of its characteristics with one another. Certainly, by knowing IT infrastructure and its ability, we can have an effective learning. When its infrastructure and ability are neglected, even the best technology will be defeated. Therefore, in this study, we are going to study the theoretical principles and environment of e-learning and its two new methods that are mobile learning and ubiquitous learning.

Formats of e-learning

Negash et al (as quoted by Ebrahimzadeh) were inspired by the Flash perspective, and in their study, they presented six classifications of e-learning and they discussed their differences and similarities. These six formats of e-learning are as follows;

• E-learning with physical presence and without e-communication (face-to-face format)

• E-learning without presence and without e-communication (self-learning format)

• E-learning without presence and with e-communication (non-synchronous format)

• E-learning with virtual presence and e-communication (synchronous format)

• E-learning with occasional presence and e-communication (blended/hybrid, non-synchronous format)

• E-learning with presence and e-communication (blended/hybrid-synchronous format)

Mobile learning

Mobile learning was often limited to the use of mobile technologies in the past, but now, the criterion in this regard is the mobility of learners [6].

Koole believes that mobile learning can expand and improve learners' abilities to communicate and access information through wireless and mobile devices [7].

Cellphone is the most popular mobile technology for learning. Perhaps the most important reason for this popularity is because this device has many features [8].

It seems that this definition is the most complete definition of mobile learning; mobile learning means the acquisition of any kind of knowledge, attitudes, and skills with the use of mobile technologies in everywhere and at any time, and it will cause changes in behavior. Because of mobile technologies, learning could be more effective than times when e-learning is being used [9].

Mobile learning as its name implies, is a kind of learning that is independent of time and place. Mobile learning is a new technology that lets people participate in learning activities without being tied to a fixed location and it enables users to have easy and flexible access to learning resources in everywhere and at any time [10]. Mobile learning is a phenomenon that can effectively equalize learning opportunities

in all walks of life. Mobile learning is looking for personalizing learning and it is the perspective of pedagogy center and it is based on principles of constructivism and connectionism [11]. Mobile learning is based on constructivist theory and based on this theory and with the help of its principles, it is looking for achieving learning goals, and understanding learning methods and lifelong learning.

Studies on mobile learning opportunities in Iran have shown that the majority of students in urban areas have cellphones, and mobile phones are the only available type of communication for rural students [12].

Many people in rural and remote areas, have access to cellphones and players. Witchfield et al have emphasized it is necessary to pay attention to the knowledge and pervasiveness of mobile devices in modern societies. In this regard, they said that in the history of the use of technology in education, there have never been such accessible technologies for citizens like mobile technology is now [12]. Such an accessibility and high permeability are the most important advantages of mobile devices in learning that would lead to the development of e-learning among the general public, elimination of illiteracy off society, elimination of educational discrimination, development of lifelong learning, etc. On the other hand, the penetration of mobile devices, especially cellphone, is rising among different communities [13].

Some of the mobile learning opportunities are as follows:

- Learner is free to choose what, how, where, and when to learn [14].
- It leads to the realization of public education and training [15].
- It focuses on collaborative, creative, and knowledge-based learning [13].
- Since there is no need to have physical facilities and classrooms, infrastructure costs will reduce. [8]

Ubiquitous learning

New developments in wireless technologies and sensors have led to a new evolution in learning environments and it is called ubiquitous learning environment with the knowledge of framework. It can sense learners' situation and provide an adaptive support [16]. In recent years, e-learning researchers have found that the development of wireless communications and sensor technology has changed the research issues of e-learning to mobile learning and then, it will be changed from mobile learning to ubiquitous learning [17]. Some notable features of ubiquitous learning which make it different from traditional e-learning are:

direct service (mediator-less), services with knowledge of framework, and information about framework and consistent service delivery. To understand the concept of ubiquitous learning, the term "background knowledge" is being used. Finally, ubiquitous learning can be defined as a new learning model that uses a comprehensive computer technology and necessary infrastructure to actualize the awareness of anything at any time. (Same source) Huang et al said ubiquitous learning is a learning with knowledge of the context and framework that is more appropriate to _____

ubiquitous learning. Hens (2008) considers the features of ubiquitous learning as follows: urgent need to learn, the acquisition of creative interaction, the interaction of learning process earning, the position of training activity, the awareness of context and framework, the provision of services for individual activities, self-organizing learning, integrating learning, compatible content, and group learning.

METHODS

This study was a Library research methods and note taking had been utilized.

RESULTS

Chau et al (2008) believe that awareness of the background and comprehensive computer technology in learning environments that motivate learners is one of the features of ubiquitous learning. (As quoted by Zare et al. 2012) [17]. Regarding, we can say that in spite of the spread of e-learning in the society, especially in education and training, its concepts, dimensions, and formats are different among different individuals. According to above mentioned principles, e-learning can be defined as follows: "The use of various components of information and communication technologies (particularly the Internet) to organize and manage the teaching-learning process as well as the delivery of education". In this study, a variety of e-learning was introduced in the form of six formats, of these six formats, the fourth one, namely, e-learning with virtual presence and e-communication (synchronous format) has been the objective of the present study. Therefore, the two methods that have been proposed for e-learning (namely mobile learning and ubiquitous learning) are such e-learning methods that can be learned in any place and at any time. Mobile learning is also independent of time and place. Mobile learning is a new technology that lets learners participate in learning activities without being tied to a fixed location and it enables users to have easy and flexible access to learning resources in any place and at any time. Therefore, this method can be used to establish educational equity for learners.

Like mobile learning, ubiquitous learning is independent of time and place, and it relies on learning infrastructure. However, there is a difference between these two methods: ubiquitous learning relies on "the awareness of the situation, context, and framework". It means that ubiquitous learning uses the sensors in the teaching-learning process to understand the learner's situation, context, and framework.

DISCUSSION

Because of fast-growing new technologies and the existence of required background and infrastructure, e-learning has become mobile learning, and then it has turned into ubiquitous learning with knowledge of context and framework. E-learning and its two proposed methods are based on the principles of constructivism; it emphasizes the learner should be active and his needs should be considered. We should employ these methods and take advantage of their benefits, because they are considered basic necessities of

_____

today's education and training. In order to achieve this purpose, there should be more studies on these methods appropriate to the society's facilities and infrastructure.

REFERENCES

1. Zarei Zavaraki, E. Assessment and evaluation of e-learning. Higher Educ 2008; 1(3): 73-88.
2. Rahimi Y. A study on computer anxiety of high school and the relationship between use of computer and ownership of personal computers. Proceedings of the electronics of conference. University of Science and Technology, Tehran, Dec 18-19, 2009. [In Persian].
3. Davani S. Offering information architecture framework for a virtual university. MS. Dissertation. Tarbiat Modarres University, 2005: 2. [In Persian].
4. Razavi A. New issues in educational technology. Shahid Chamran University, Ahvaz, 2007. [In Persian].
5. Ebrahimzade E, Zandi B, Alipour A, Zare H, Yazdani F. Formats of e-learning and types of interactions in it. Media Journal, University of Medical Sciences, Shiraz 2012; 1(1): 11-22. [In Persian].
6. Hashemi M, Ghasemi B. Using mobile phones in language learning/teaching. Procedia Soc Behav Sci 2011; 15: 2947-51.

7. Koole M, McQuilkin JL, Ally M. Mobile learning in distance education: Utility or futility? J Dist Educ 2010; 24: 59-82.
8. Mansouri S, Kaghazi B, Khrmaly N. The study of students' attitudes of Gonabad University to Mobile Learning. The First Conference of Value Added Mobile Services in Iran, 2010. [In Persian].
9. Brown T. The role of m-learning in the future of e-learning in Africa. Presented at the 21st ICDE World Conference. [cited 2005 Jan 14]. Available on: http://www.tml.hut.fi/opinnot/T-10.556/2006
10. Monahan T, Bertolotto M, McArdle G. Usability testing of a Collaborative and Interactive University on a Mobile Device. IJIM 2009; 3(4): 21-32.
11. Mileva N, Simpson B, Thompson J. A framework for mobile learning pedagogy: A critique underpinned by constructivism. 227828-CP-1-2006-1-IE-MINERVA-M, 2008: 1-56.
12. Fotouhi-Ghazvini PS, Excell A, Robison DJ. A psycho-pedagogical approach to m-learning in a developing world context. Int J

Mob Learn Organ 2008; 2(1): 62-80.
13. Nili M. Educational Technology Conference Proceedings. Tehran: Allameh Tabatabai University, 2007. [In Persian].
14. Sandberg J, Maris M, Genus K. The Mobile English learning: An evidence-based study with fifth graders. Comput Educ J 2011; 1334-47. Available on: www.sciencedirect.com
15. Javadifard Z. Comparative study of learning in Virtual University, England, Japan and Iran, Dissertation. Tehran: Faculty of Educational Sciences and Psychology, Allameh Tabatabai University, 2011. [In Persian].
16. Hwang GJ, Tsai C-C, Yang SJH. Criteria, strategies and research issues of context aware ubiquitous learning. Educ Technol Soc 2008; 11(2): 81-91.
17. Zare M, Sarikhani R. Ubiquitous learning and its underhand challenges. National Conference on Psychological-Educational Challenges of Today's Educational Systems. Malaer University, 2012.