Information and Communications Technology, assumptions and approaches within E-learning

Isa Ebrahimzadeh
Department of Education, Faculty of Education, Payame Noor University, Tehran, Iran

Ali Delavar
Department of Education, Faculty of Education, Allameh Tabatabaei University, Tehran, Iran

Mohammad Reza Sarmadi
Department of Education, Faculty of Education, Payame Noor University, Tehran, Iran

Marzieh Mahmoudi*
Department of Education, Faculty of Education, Payame Noore University, Ahvaz, Iran
*Corresponding Author

Abstract

Nowadays E-learning is a significant concept in higher educations. By development of internet and information and communications technology, E-learning has been known as a form of tele-learning within different societies. Web-based learning systems or virtual learning environments are communicational stations based upon webs that provide learning without the limitations of time and place, regarding learners’ requirements. Present study is the review, description and analysis of approaches, environment and tools utilized in virtual learning area.

Keywords: Information and Communications Technology, E-learning, Virtual learning.
Introduction

Today, quick economic, social, technological changes impact life and occupations of people. In order to deal with such changes, people shall learn continually, therefore, universities and higher education system must be compatible with quick changes in technology, industries, and societies. On the other hand, ICT have provided comprehensive changes in different areas of military, politics, social, cultural and learning, and above all, it has provided changes in production and distribution of knowledge and information. More than other organizations, it has provided an appropriate path for awareness and education procedures for teaching entities. Well-known and accepted standards on Windows OS caused the creation of many software and teachers can utilize them easily on the other hand.

Statement of the problem

ICT is: collecting, organizing, storing, distribution and using information in form of sound, image, graphic, text, digits and …through media and communicational tools and … (Raeis Dana, 2002). ICT is tools of storing, processing and providing information electronically by using a number of Medias (Javdani, 2003: 54). In other words, ICT includes all the technologies that connect different communicational networks among humans, humans and electronic systems and electronic systems with each other (http://tmanagmentperstanblog.com). In ICT, in addition to knowledge and information orientation, communications positions and communicational tools are insisted. In fact, communications position is considered as a tool for information transfer since its duty is communication of two sections of information and technology and this is important to the level that some people believe that without the existence of communicational tools of IT, informational society will not be made.

Diagram below will clear this concept better

(Figure 1. FAVA technology (Gooyabadi et al quoted Zare. 2008))
Increasingly development of ICT causes major changes in all aspects of human life. Educational system is one of the entities which is fundamentally in such changes and today, it is one of the manifestations of IT in field of education, or in other words, it is called virtual education or E-learning. In fact, quick growth of internet and digital education tools provides powerful and dynamic interaction in the world and virtual education system (electronic) is a new artistic approach and a comprehensive solution for institutions that are tending to develop according to technology in changing methods and education environments (Wu et al., 2008). According to definition by Khan, learning within virtual world is a new approach for providing an interactional educational environment with an appropriate design which facilitates learning, and by using different kinds of resources, in different forms of digital learning in every time and place for each individual compatible with a distributable, open and flexible learning environment (Khan, 2005). Nowadays, IT based education systems are having a special position in process of human learning and the process of teaching and education has become more flexible than before. E-learning is representative of a class and a very different branch of communications. Such learning method causes speed and ability increase of communications and increase of treatment capacity, receipt and using information and the ability to pass time and place for educational purposes (Zandi, 2011). On the other hand, tele-education is learning through an organization, in order to select and use of solutions for using new technologies in education to provide an interaction between the learner and instructor, and its purpose is to simplify learning process and its evaluation by the learner (Ibrahimzadeh, 1998). E-learning is a method of learning in which it is happened within an environment with sum of multimedia, super-media and telecommunication technologies. Internet is the main pillar of the change that creates E-learning. E-learning, philosophically is based on partnership viewpoint and according to the some experts, it is the most significant technology that can support new methods of teaching and learning (Dad, 2009, quoted from Grison Anderson, 2003). Horton and Horton (2003), believe that e-learning or E-education, in a comprehensive definition includes all kinds of using technologies of web and internet in order to create learning experiences. In fact, e-learning is the creator of quick and developmental changes in new technologies to their real concepts (ZareiZavaraki, 2008). According to Zandi, Grison and Anderson (2000), e-learning causes change in approaches of learning and education interactions. The main ability of e learning is lied within its communicational and interactional abilities.

Features and assumptions of online-education and learning through ICT within Web Network

Any web technology- based purposeful program is for training people through which anything of interest can be taught anywhere at any time.

Web-based training is the confluence of distance learning, computer based training and online technologies. This type of training progressed since 1998 that web pages display developed. (Feizi,Quoted Beneke, 2001)

By combining distance learning models with FAVA It is necessary to check the characteristics of this type of training. FAVA-based learning has the following features:
Partnership and cooperation

Undoubtedly, it is the biggest change that it provides for online-education, Increase of tendency for participation among learners and instructor. Most of online-projects require to be shown based on sharing information among 12th class (Amir Teymouri, 2007). Providing cooperation and participation environment within learning environment, specifically within experimental activities of educating interaction, collection and information analysis, scientific tours within virtual cooperating environment and providing knowledge and training communicational skills are considered as a significant mechanism for improvement of learning process.

Comprehensive- oriented
One of the features of e-education is process-oriented. Although still teachers are having a major role on organizing and holding classes, but learners can determine its orientation by their own activities. Instructor defines targets and facilitate learning process and manage it and the learners find their own appropriate contents and they accomplish their projects. Online courses are less structured in comparison with traditional courses; it means that learners take more responsibilities for learning. In this regard, IT is considered as a significant facilitator.

Society
Education is happened within society. In fact, computer network provides the possibility to define virtual societies that individuals are gathered with similar tendencies and principles (RinGoaler 1994). In virtual environment, we can provide a school or a university, which includes a learning society without real buildings (Anderson, 2003). One of the basics of designing e-learning is known within social learning or “society-centered”, he says “here we determine general concepts of Vigotsky (1978) social recognition for review whether how students can work with each other in an environment in field of e-learning and they produce new knowledge through partnership. Wilson (2001) described participants of electronic environment in a way that they have common senses of belonging, trust, expectation for learning and commitment for participation and having share in this society.

Being unlimited and flexibility
Online education can provide the opportunity for learners to access individuals and information from any region on the Earth. Online education has some limitations including who the learners are and where and when they learn. One significant aspect of flexibility is use of non-online inferential method to connect by using tools like computer conference, discussion boards and electronic posts. Non-online communication method facilitates self-learning and reinforces active search for information and exploration (FarajAllahi et al, quoted from Harrasim 1996).

Exploration
Many online activities in e training require a kind of adventure and exploration learning. An official exploration method is problem-based learning method that is applicable in professional trainings (like Judgment, Science, Engineering and Business). In this approach, learners place in problematic situations and case studies are given to them, and they are asked to provide solution, plan or a strategy. Problem-based learning is highly compatible with online training: since access to resources and skills is from main aspects of problem-solving.
Interaction
The method of relation with ICT, provides online and non-online interactions. Online communication method, like voice, visual and textual conference provides the ground for learning interaction in a temporary period. From period conferences, not only it is vital for presenting the period, also it impacts on support for learner and education interaction (Grison, 2003, 64).

Communication-based technology provides cognition or social interaction among trainers specifically in non-online interaction which is the features of flexible learning model or 4th generation of on period training (FarajAllahi, 1390). The advantage of e-learning is its ability for supporting attitude interaction on text regardless to time and place. Electronic communications change the structure of training and learning by different media forms of textual, visual, voice and their ability for developing interaction within time and place borders (Zandi, 2011). Interaction with others for developing learner’s personal perception is highly significant. Today technology has provided the possibility for social and group learning through computer conference.

Multi-sensory experience
Learning is more effective when it is involved with the senses of sight, hearing, tasting, touching and smelling. Also we know that individuals are having different preferences in using different senses (known as recognition methods), multimedia technology (are in access through webs) is supplier of different kinds of multi-sense learning experiences. Sum of motion pictures (video) is one of the main aspects of networks. Since, it provides the possibility of face to face contacts through conferences, videos, live or simultaneous or in form of recorded videos. Provided information in form of videos are highly richer than texts and it provides the option to approach computer interactions to human communications closer (Amir Teymouri, 2007).

Web-based training characteristics are as follows:
- learning management by the individual and by the own desired speed (individual training)
- It can be used on-line in the internal network or Internet
- it is Multimedia
- It will provide learning opportunities for many people with the enhancements achieved in computer technology
- Design of training course and how users interact or the usage is the main cause of the success or failure of this type of learning. (Kurtus, 1999)

Advantages Web-based training can be summarized in the following cases:
- Universal Access
- Multiple applications and right of choice
- Valuable information
- Financial sharing for information.
- Participate and Interact
- The timeliness
- Learning with the desired speed
- Saving Costs
- Better measurement of the work done
- Learning new technologies
- Dynamics of the course material

**Technologies of electronic education**

Used tools and technologies in electronic education include simple tools such as texts and graphics to advanced technologies like simulation and virtual teachers.

Text is one of most usable tools is web and plays a fundamental role in an education environment and exhibition of educational concepts.

Documentation are resources that besides main contents of lessons, can help to understand. They are:

- Graphs (for example documentation of excel software)
- Essays and articles (for example documentation of acrobat program software in shape of pdf)
- Educational slides which are related to lessons (for example, power point program) (Fathian and Mahdavipoor).

Nowadays, sound and image are very important in multimedia systems of web. Millibank(1994) considered effects of sound and image in distance education. He understood that when a teacher and student interact to each other, percentage of student’s learning increases from 20% (in usual methods) to 75%.

Desmoad Reegan theory said that distance education should recreate relation of teaching and learning artificially. It means distance education should be similar to face to face teaching experience. It is realized by new technologies like audio visual communication.

**Electronic mail (E-mail)**

Electronic mail like usual mail is used to exchange messages and other information with different people. In this system, instead sending of postal services to postal address of individuals, are send to a computer address (Email) by internet software and computer programs. Electronic mail is one of most important tools to communicate in educational systems.

**Instant messaging and chat**

If some students are active in the same time, they can communicate to each other by instant messaging software such as yahoo and msn. This technology likes to chat but have some differences in few aspects. For example web browser is necessary for chat but instant messaging programs are independent software which are installed on computers.

**News groups**
Each news group includes persons who like a particular subject and discuss about it.

**Bulletin boards**

It is a set of some news groups that put important point on a virtual board and show the other.

**White boards**

White boards are places that users can paste their favorite texts or pictures. This is a suitable technology for audio training. Another product which is used in white board technology is Microsoft Net Meeting.

**Shared applications**

Each user can share practical programs of a set to other users in own computer.

**Video or sound conferencing**

This technology which acts online and audio-visual, is popular in the world. Most interactive video conferencing systems use digital images which have high capacities.

**From point to point**

Interactive video conferencing usually are used to communicate between two places which utilize computer technologies. Core of interactive video conferencing has decoder. This electronic machine sends and receives visual symbols and then students can see them in monitors (Kal Bres 1995).

**Kinds of video conferencing systems**

Small room video conferencing, this system is designed basically for small groups (1-12 persons). All places are designed as a desktop of conferencing.

Class video conferencing, this system usually is used by high quality of audio visual, passwords and screen and all participants can see them on monitors.

Desktop video conferencing, this system uses a personal computer and software of video conferencing. This system is cheaper but suggests limited solution. Of course these solutions are useful for small groups.
Multi-functional virtual spaces

Virtual spaces that users can enter it by a special name and communicate to each other. Technology growth causes to change in educational places and teaching-learning process. In addition to new innovation of computers, technologies and communication, three facilities technologies are provided in distance education:

Computer assisted instruction

A user is the first kind of education technology which is act as training aid instruments in teaching and periodic skills.

Instruction by audio visual instruments

Continuation of distance education is owed use of audio visual communication systems.

Instruction by computer

These technologies like training through audio visual instruments facilitate knowledge transformation between a teacher and student and don’t provide real training as computer assisted instruction.

First wave of educational technology which began with audiovisual trainings, called educational technology generation. Second generation was made in last 1950s and 1960s which included TV educational programs. Third wave began with computer appearance that issued informational technology. Today, by development of education technology and appearance of various early detection and rapid understanding media, fourth generation (internet) was created that virtual universities and electronic training results from this generation (Raoof Ali, 2001).

In parallel to use of information and communication technology in all aspects of human life, world is transmuting to an informational society. Today, internet access and use of informational resources increase in all human societies and different societies use benefits of information and communication technology according to various infrastructures.

Virtual graphical environments

Virtual graphical environments are similar to multi user virtual space except that the virtual environment isn’t based on text such as palace.

Simulation

Simulators usually try to make an environment similar to the environment that where real training takes place. Creation of simulation programs and games is most difficult stage in distance education. In most cases, students work easily with programs of this method. So,
different subjects are simulated as a real model. Many dangerous and expensive works such as physical and chemical experiments or cases which need short and long periods can be simulated in this method. It means a computer which is a main tool of distance education through internet, can be converted to a fully equipped laboratory (Jabal Ameli, Jalal, 2004).

**Database**

Databases can be used in different educational environments. Databases can be played a main role in educational programs. Saving, management of user profiles, exam questions, record and retrieve of tests results are not impossible without use of databases.

**Remote software**

Remote software is a program that is installed on computers and client position and server (an instructor) can control student’s computer operating systems. This technology uses for electronic education of computers and operating systems subjects.

**Virtual teacher**

It is a set of various technologies which allow us to model presentation of a teacher in a classroom. This technology can include powerful and intelligent processor of sound and texts.

**Conclusion**

Nowadays, technology have connected world through interrelated and inter-web communications. Nowadays, by having access to advanced ICT, we are able to transfer information quicker than ever. Individual around the world can receive the latest demanding information at every cost. Undoubtedly, the highest impact of ICT was on educational environments. Application of FAVA technology in education has led that learning environment becoming a virtual one. Information technology is a powerful tool that makes connection among peoples of the world in the shortest time possible. This powerful communication tool is concerned with information. Information technology has brought landscape to the world in today’s world, which affected on all aspects of political, military, economic, social and educational life of twenty-first century’s human. Such a way that led more learners to computer and working with them. Using FAVA technology to achieve the goal of quality learning for all is inevitable. (Brewer, E. W2003). Information technology refers to process of knowledge and methods of using it in the production, processing, transmission and circulating information (Karamipour, 2003). By combining distance learning model using FAVA technology, it is necessary to check the characteristics of this type of education (Mason, 2003). Technology-based training is divided into not online communication and online communication. These two methods make the learner able to participate in a class in a real time with other learners, instructor and learning resources at the time, location and the desired speed. Through tools such as e-mail and website systems, have access (Neon and Keira, 2000, Khatib, 2009).

FAVA technology-based learning has the following features:
Collaboration, comprehensive-oriented -society -being unlimited and flexibility, interaction, multi-sensory experience.

Entrance of new communication technologies in the field of education has changed nature of university teaching-learning process. These technologies not only varied methods of verbal training in university, it has developed its borders outside of physical classes and has created ICT-based distance learning environments (Zareh and Kashan, 2010). Learner and instructors are separated from each other in terms of time and place, or both, this environment and educational content through new media sources, Internet and video conferencing are offered to learner communicate with the instructor, classmates and other people for individual and group learning activities with the help of computer communication (Attaran, 2007, Eskalow and Pelton, 2006).
References


Amirteymoori, Mohammadhasan, Rahman, Bahaaldin(2007) Online education teaching-learning via the Internet (Translation), Tehran Savalan publications.


Bowles, Jerry(2000); "The E-learning Potential"; Available at: www. Kdgonline. Com/ webpages/whitepapercontent2.htm,o


Farrajolahi,Mehran,Zare,Hosein,Hormoz,Hormood,Sarvari,Mohammadreza,Zarif sanaei,


Feyzi, Kamran, Rahmani, Mohammad (2004) Electronic learning in Iran: affairs and methods, plan and research in education quarterly, number 3


Karimzadegan Moghadam, Davood and Mahmoudi, Marziyeh (20011). “Information Technology and New Approaches in Distance Education, International Distance Education Conference, Malaysia.

Nahid (2001) Distance learning in communication and information age, Tehran, Payame Noor University publication.


- http://itmanagementpersianblog.com