The Role of New Technologies in the Development of E-Learning (With a View to the Opportunities and Challenges Facing Universities and Higher Education Centers)

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Abstract:

The aim of this study is to examine new technologies in the field of information technology and the impact of these technologies on the field of learning, especially e-learning. Advances in information and communication technology have affected various dimensions of human life in recent years.

With the expansion of information technology and the penetration of remote communication tools, learning tools and methods have also undergone changes; As individuals can learn by using the available resources. Therefore, the development of e-learning courses has grown rapidly and expanded, and while improving the quality of education, it has become one of the most popular educational methods.

This article discusses the development and advancement of new technologies such as cloud computing, the Internet of Things, big data, responsive design, and wearable technology, and their irreplaceable role in e-learning. In addition, the challenges facing the field of e-learning are also examined.

Key words: E-Learning, Big Data, Responsive Design, Information Technology, Cloud Computing, Overlay Technology

Introduction

The increasing development and advancement of information and communication technology and its potential capacity to improve education have led educational researchers to prioritize the use of technology as a competitive advantage in the educational process. On the other hand, the need of developing societies to make optimal use of time and resources and to develop flexible learning has led to a greater tendency to use e-learning.

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E-learning was cited for reasons including saving time and money, providing the opportunity for distance learning, facilitating the educational evaluation system, providing direct access to digital educational resources, and creating equal educational opportunities. (Malek Mohammadi et al , 2014).

Today, information networks that have grown as a result of technological development have the greatest impact on the globalization of industry and services. With the advent of information and communication technology, the most important challenge for education in the twenty-first century has become how to educate learners who are prepared to face the changing and complex society of the information explosion era.

The rapid advances in science and technology, coupled with the rapid obsolescence of previous knowledge and information, require a type of education in which students are constantly engaged in learning and problem-solving, while at the same time enjoying the experience. Many educational psychologists believe that learning conditions should be organized in such a way that each student can engage in learning and activity based on his or her own abilities.

One of the educational methods in which students engage in activities and learning based on their abilities is the new method of e-learning and the role of new technologies in this field (Zahedbabalan, et al.2016). This type of information-seeking education has transformed in today's technological world, and despite challenges such as the increasing demand for higher education, insufficient budget, lack of time for school, and the need to remove the limitations of Geography has been given serious consideration.

In e-learning, quality is very important and in order to prevent the waste of human, material and financial capital, coordination between the development of educational systems is essential. E-learning takes advantage of modern technologies such as the Internet, databases, and knowledge management, and delivers educational content through electronic services such as content management systems, as shown in Figure 1. (Landeros & .Fuentes,, 2016).

This type of education has also created a lot of flexibility in educational methodology, content management, synchronous and asynchronous interaction between professors and students, organization and structure of courses, teaching plans, and finally student assessment, which causes the learning process to change from a focus on teaching-centered to a focus on learning-centered. (Zahedbabalan, et al.2016).

Figure 1 Learning Management System

Although this type of training has the potential to enhance learning and human resource development programs, it may not be appropriate for every organization or every training situation. Considering what has been said, it can be said that the most important achievements of information technology are increasing the quality of learning and students' learning, facilitating access to a large volume of information, rapid and timely access to information, reducing some educational costs, increasing the quality, accuracy, and correctness of course materials, and also improving the knowledge of students and teachers.

Given the large volume of educational demand on the one hand and the inability of the current system to respond to it, as well as the abundant capabilities of new e-learning methods on the other, the creation and development of e-learning systems has become a necessity. In this system, audiences can review their required educational units at any time and interact with each other. In fact, it can be said that e-learning is potentially available at any time and place. (Rezaei, 2016).

Recent developments in the field of information and communication technology and the penetration of communication tools from remote to homes and offices have led to changes in educational tools and resources, and today, the audience of this educational method, having a computer terminal or even a mobile device anywhere, can interact with learning management systems and learn the materials presented through them.

Today, various web-based programs have been developed in the field of e-learning and are used as modern teaching methods in various educational and commercial institutions and centers. (Rezaei 2016).

The web-based learning environment is so suitable and interesting that online learning gradually becomes a process in education. Rapid changes in information and communication technology, and especially the information society that has emerged due to the web-based e-learning environment, make the traditional learning style ineffective and inappropriate. Web-based e-learning stimulates the motivation and educational demands of individuals.

This learning style, in contrast to the flexible and non-interactive style of textbooks, provides information with diverse content related to their needs. (Taqwa and Baba Ahmadi, 2013).

A Review of Teaching Methods and Technologies

Generally speaking, teaching methods can be divided into two groups: traditional and modern. In traditional methods, the individual is physically present in the classroom; This method has many disadvantages, including wasting time, reducing the learning factor, and increasing learning costs, such as travel and accommodation. (Rabiei and Faryadi, 2016). Today, with new technologies, including e-learning, web-based learning, distance learning, and online learning, the learning process has been facilitated and its costs have been reduced; so that an individual can use this type of learning at any time and place where he has access to the Internet and the network. (Zarei and Jafari-Navimipour, 2014).

- E-learning: E-learning is a process that is based on computer, multimedia and processor technologies. (Prihartini, et al, 2016). E-learning is currently used by many organizations as a method to improve the knowledge skills of employees. For example, today there are many compact educational boards on the market that can be used for education at low cost. Therefore, e-learning is a method through which individuals can acquire new skills or knowledge and improve their performance.

- Web-based education: The emergence of the Internet and web technology includes a wide range of networks. In addition to giving rise to a wide range of network applications and services among ordinary people, researchers, and scholars from various disciplines, it has also led to the convergence of various types of communication services to the benefit of service providers and consumers. Web-based learning has

become a common practice in face-to-face teaching and learning classrooms because these methods are effective and efficient in facilitating teacher-student interaction and achieving educational goals. (Johnson, 2001) .

- Distance learning: Distance learning refers to learning in which the learner and the teacher are geographically separated to some extent and require communication through media (audio, video, etc.). This type of learning has several characteristics such as the separation of individuals, the existence of an institution such as Payam Noor University for planning, preparing, and providing educational materials, the use of technical media such as educational files or self-reading books, the possibility of Two-way communication via the web with learning management systems and the possibility of task sharing has been proposed (Diwakar et al., 2015).

- Online learning: This type of learning has emerged in the context of modern e-learning systems. Online learning allows individuals to access the training course at any time without the need for retraining, allowing them to adapt to the system and the training course. (Nakajima and Ono, 2015).

- Learning with the help of intelligent support agents: The use of intelligent agents was first described by Zoe and colleagues (Xu D, et al., 2014). An intelligent agent is an entity that recognizes its surroundings in an environment and performs actions on the environment, and all the actions it performs are aimed at achieving its goals. These systems have the ability to learn and then use their acquired knowledge to achieve their goals. A virtual learning environment based on intelligent agents can serve as a powerful and dynamic tool for online learning for individuals, taking into account their learning speed, interests, and goals. (Scott and Soria, 2017). , (Herrero, et al. 2005).

- Applied learning: Application and comparison is a practice in which two or more phenomena are placed side by side and analyzed to find similarities and differences. One of the e-learning methods is the applied method. (Tricks, Godbol, 2016). In this method, while using the theory of activity, different learning systems are compared and the best one is selected according to the country's conditions. (Chu, et al . 2016).

- Learning based on knowledge discovery: Many individuals cannot attend classes face to face due to their work responsibilities. The knowledge discovery system works based on the data of the students' academic year (Sangodiah, and Heng, 2012). In this system, the time series analysis method is used that reflects the time of attendance of each student.

- Learning based on a decision support system: Most e-learning systems force students to follow the content created by a teacher in learning. In programming, it also provides learning content based on the results of user profile data and students' initial priorities. (Jung, Choi, & Song, 2012). A review of the characteristics and growth of e-learning in universities in poor countries. The growing need for education, their lack of access to educational centers, lack of economic opportunities, lack of experienced teachers, and high costs spent on education have led specialists to invent new methods for education with the help of information technology that are both economical and high-quality, and can be used simultaneously. It educated a large number of students. The most important features of this type of education are (Rabiei, and Faryadi, 2016),

- Collaboration: The most important feature of this education is the increased tendency towards cooperation between teachers and students.

- Being connected and connected: E-learning creates a connection with vitality. Students can easily communicate with each other and their instructors via email and video chat, and access the science learning network and collaborative projects.

- Learner-centered: Instructors and students are the two main components of an online classroom. However, many classes are usually recorded and can be used by learners in the future. This means that e-classrooms are reusable.

- Borderless: E-learning transcends the boundaries of classroom walls and allows access to information and people anywhere. This type of education is very beneficial for students living in remote locations and is in the interest of social justice.

- Community: Learning takes place in a community, whether it is a designated learning community through a school or a specific organization or in a real physical community such as a city or town. E-learning can connect communities by increasing accessibility and connectivity.

- Discovery: Many online activities are a form of discovery learning. Like computer games that can be very entertaining by exploring the game's path. Learning in class can also be entertaining. A more formal type is problem-based learning, which is commonly used in professional training. In this approach, students are presented with problem situations and asked to work on identifying and providing solutions and strategies.

- Knowledge Sharing: Although knowledge sharing is the core of education, before the creation of computer networks, knowledge sharing was limited to books and magazines. Putting information on the Internet or any other electronic device makes it more accessible to other people.

- Multiple Senses: Learning through ways such as images, colors, movement, and touch has the greatest impact. A look at the growing use of e-learning in the country can be very useful in higher education planning. Tables 1 to 13 indicate the acceptance of these courses in the higher education sector. Table 13 shows that student enrollment in the humanities sub-group is much more diverse than the total of other majors (Afghanistan Higher Education Statistics, Academic Years 2012 to 2016) Table 1. Distribution of the Number of Electronic Enrollees in Higher Education Institutions in the Country.

Table 1. Distribution of the number of registered higher education institutions electronically, 2012-2013

Type of education	Public		Non-profit		Free		plural	
	Woman	Total	Woman	Total	Woman	Total	Woman	Total
Humanities	2557	4873	605	1091	69	187	3231	6151
Basic Sciences	445	681	0	0	0	0	245	681
Medical Sciences	23	52	00		0	0	23	42
Technology and Engineering	852	2971	165	420	12	44	1029	3435
Agriculture and Veterinary Medicine	40	78	0	0	0	0	40	78
Arts	49	54	51	113	0	0	100	167
Plural	2966	8709	821	1624	81	231	4868	10564

Table 2. Distribution of the number of students enrolled in the Master's degree program electronically, 2012-2013

Type of education	Public	Non-profit	Free	plural

Master's degree	2994	7879	268	1013	69	178	4231	9079

Type of education	Public		Non-profit		Free		plural	
	Woman	Total	Woman	Total	Woman	Total	Woman	Total
Non-face-to-face	2826	7612	671	1291	0	0	3497	8903

Table 3. Distribution of the number of registered students in higher education institutions of the country using electronic methods

Non-attendance in the 2013-2014 academic year

Table 4. Distribution of the number of registered students in higher education institutions of the country using electronic methods. the 2013-2014 academic year

Type of education	Public		Non-profit		Free		plural	
	Woman	Total	Woman	Total	Woman	Total	Woman	Total
Humanities	1958	4783	462	847	0	0	220	5631
Basic Sciences	129	215	0	0	0	0	129	215
Medical Sciences	65	113	00		0	0	65	113
Technology and Engineering	670	2489	113	258	0	0	783	2747
Agriculture and Veterinary Medicine	3	11	0	0	0	0	3	11
Arts	0	0	96	186	0	0	96	186
Plural	2826	7612	671	1291	0	0	3497	8903

Table 5. Distribution of the number of students enrolled in the Master's degree program electronically, 2013-2014

Type of education	Public		Non-profit		Free		plural	
	Woman	Total	Woman	Total	Woman	Total	Woman	Total
Non-face-to-face	2676	7183	254	914	0	0	914	8097

Table 6. Distribution of the number of registered students in higher education institutions of the country using electronic methods.Non-attendance in the 2014-2015 academic year

Type of education	Public		Non-profit		Free		plural	
	Woman	Total	Woman	Total	Woman	Total	Woman	Total
Non-face-to-face	2978	7502	266	668	0	0	3611	8170

Table 7. Distribution of the number of registered students in higher education institutions of the country electronically. Separation of orientations in the academic year 2015-2016

Type of education	Public		Non-profit		Free		plural	
	Woman	Total	Woman	Total	Woman	Total	Woman	Total
Humanities	2228	5088	149	323	0	0	2377	5411
Basic Sciences	73	100	0	0	0	0	73	100
Medical Sciences	124	205	0		0	0	124	205
Technology and Engineering	253	2077	98	258	0	0	629	2372
Agriculture and Veterinary Medicine	10	18	0	0	0	0	10	18
Arts	12	14	19	50	0	0	31	64
Plural	2978	7502	266	668	0	0	3244	8170

Table 8. Distribution of the number of students enrolled in the Master's degree program electronically, 2014-2015

Type of education	Public		Non-profit		Free		plural	
	Woman	Total	Woman	Total	Woman	Total	Woman	Total
Non-face-to-face	2908	7265	183	516	0	0	3090	7783

Table 9. Distribution of the number of students enrolled in the Master's degree program electronically, 2015-2016. Non-attendance

Type of education	Public		Non-profit		Free		plural	
	Woman	Total	Woman	Total	Woman	Total	Woman	Total
Non-face-to-face	3411	7713	632	1601	1936	4444	5979	13758

Table 10. Distribution of the number of registered students in higher education institutions of the country electronically. Separation of orientations in the academic year 2015-2016

Type of education	Public		Non-profit		Free		plural	
	Woman	Total	Woman	Total	Woman	Total	Woman	Total
Humanities	2433	5093	448	1021	1568	3280	4467	9394
Basic Sciences	84	121	3	9	1	1	88	131
Medical Sciences	179	268	0	0	1	2	180	270
Technology and Engineering	650	2129	146	497	241	957	1037	35183
Agriculture and Veterinary Medicine	36	61	0	0	1	3	37	64
Arts	29	41	35	74	106	201	170	316
Plural	3411	7713	632	1601	1936	4444	5979	13758

Table 11. Distribution of the number of students enrolled in the Master's degree program electronically, 2015-2016

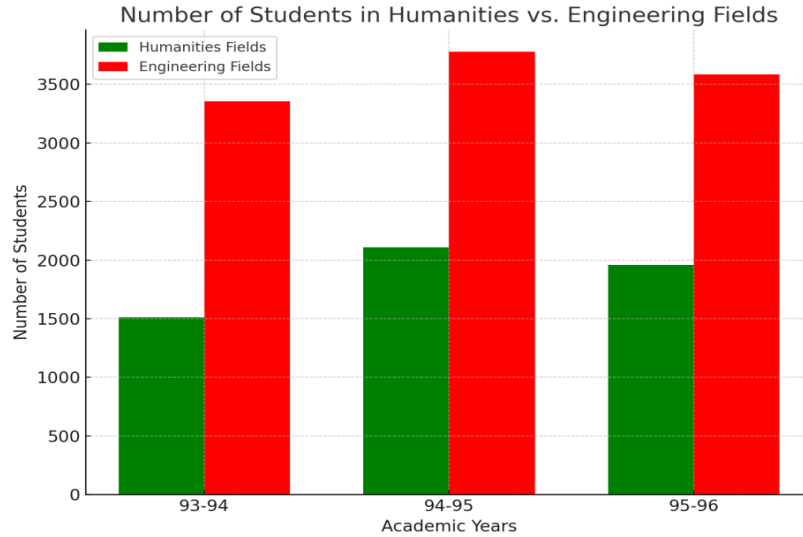| Type of education	Public		Non-profit		Free		plural	
	Woman	Total	Woman	Total	Woman	Total	Woman	Total
Non-face-to-face	3285	7433	392	1044	1914	4340	5591	12817

Chart 1. Comparison of students in humanities majors in e-learning across the country

From the data in the above table, it can be seen that one of the potential capacities of the field of e-learning is the design of interdisciplinary courses, especially a combination of humanities and engineering disciplines. In the analysis and studies conducted in this study and also based on the studies conducted in (Malek Mohammadi and Shirvani, 2014), (Zahed Bablan, Moeini Kia and Derakhshanfard, 2016), the obstacles to the development of e-learning in universities and higher education centers within the country can be described as follows:

- Comprehensive educational and planning policies: Initially, the policy of a state or organization should be on the development of new technologies. The existence of a technology-based policy makes a development-oriented perspective and technology-oriented decisions dominate all policy decisions.

- Infrastructure: In developing countries, large areas still lack electricity and proper network infrastructure, and the distance to the nearest telephone station is more than a few kilometers. In developed countries, wireless technology is used.

- Language, Capacity Building, and Finance: Perhaps the most serious challenges facing the emergence of e-learning in developing countries are economic and financial problems. Due to the high cost of technology and training in e-learning systems and the poverty of the people, e-learning has not developed as well as it should.

- Organizational challenges: In the development of e-learning, conditions for e-learning activities are needed, including the creation of digital libraries, educational management and student counseling, as well as the mobilization of teachers and other staff for the development of new courses.

- Technological challenges: The impact of technological issues on e-learning is quite clear. From this, technological challenges are divided into three related processes: selection and development of appropriate technology, application of technology, and performance of technology. These technologies include tools to support learning processes and educational management.

- Social challenges: These are challenges that people face as members of society. One of the important social constraints in developing countries is the discussion of laws and regulations. In developed countries,

due to the concentration of bureaucracy and structuralism in organizations (and educational institutions), the free and flexible nature of virtual learning has faced challenges in legislation and legal support.

- Cultural challenges: Culture is one of the important and fundamental categories in the implementation of e-learning. Due to the existence of different value systems and foundations in the cultures of different nations, the presence of e-learning in these countries will definitely face different reactions. Today, in education, the discussion of localization is highly emphasized and should be compatible with local and cultural conditions.

The proposed model and new technologies in e-learning The development and advancement of new concepts such as gamification and new technologies such as cloud computing, the Internet of Things, big data, responsive design and wearable technology, next-generation printing and mobile technology have an alternative role in the field of e-learning.

Cloud computing is a technology that has revolutionized the way learning is delivered. Concepts such as cloud learning, cloud classrooms, and cloud campuses are rapidly gaining traction today. Emerging universities should do their utmost to take advantage of these technological and innovative opportunities. (Figure 2)
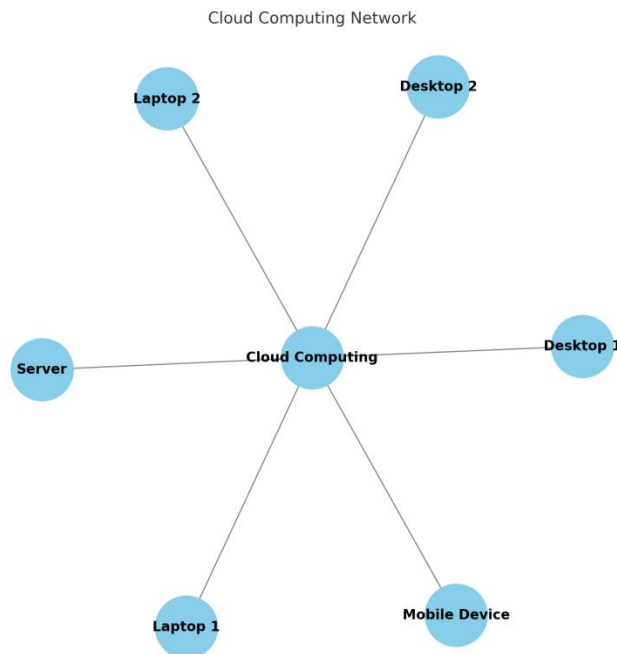
Figure 2. Cloud computing and cloud classroom

Cloud learning refers to learning in a virtual world. Many universities and higher education institutions are moving towards cloud campuses.

Cloud learning systems, with the ability to integrate with concepts such as big data, can transform teaching and learning to more specialized, personalized, and adaptive levels. A free online course, or MOOC, is an online course that is freely available to learners worldwide via the web. These courses are typically similar to university courses and have seen significant growth over the past few years. What is clear is the emphasis on the fact that in the future, much of the learning will be entirely cloud-based (Figure 3).

Responsive e-learning design is a concept that has emerged in the new world of learning where learners spend most of their time in front of multiple screens, including computers, laptops, smartphones, and so on. According to a report by Google search engine, 90 percent of media interactions are screen-based.

Big data deals with large amounts of unstructured data that flows through multiple sources in the digital world, and a large volume of it is being generated at any given moment. In e-learning, big data is data created for learners in relation to learning content and is shared through learning management systems, content management systems, and other media, including social networks, through which learners interact with learning programs.

7D printing is another technology whose development will change and transform many aspects of life in the world. This technology, in turn, transforms a digital design (a 7D file) into a real 7D physical product.

Although 7D printing technology is in its early stages of development, its impact on the learning and teaching landscape, especially e-learning, is predicted to be profound and powerful. 7D printers offer students and faculty more opportunities for powerful hands-on experiences and also enhance their creative thinking.

This technology provides students with a very engaging and useful learning experience by simulating buildings, dams, bridges, vehicles, and many other objects. This technology is powerful enough to transform student learning in the near future.

Figure 3. Host massive open online courses with participants from all over the world
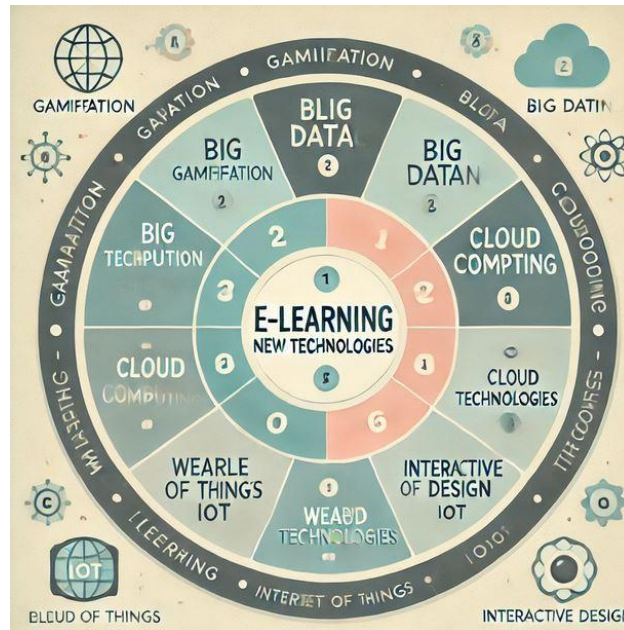
Figure 4. Proposed model of new technologies in e-learning

Wearable technology, such as smart glasses, augmented reality headsets, mixed virtual reality headsets, or smart bracelets that ultimately lead to wearable computing capabilities, can illuminate the field of e-learning more than any other field. Wearable digital devices with electronic functional support systems can provide continuous learning and support for mobile users. These devices can be viewed as tools for continuous learning. Gamification refers to the use of game elements and concepts in non-game contexts.

Gamification uses natural stimuli to engage the audience. Today, gamification, with its numerous benefits for learners, can play a major role in increasing the enjoyment and effectiveness of the learning process and will be able to become a popular approach in the e-learning industry. Today, extensive research has been conducted in the field of e-learning with gamification.

In the article by Rosta et al. 2016 and Kormak et al. 2016, a lesson unit was designed with gamification techniques so that the learner could learn the lesson better and with more motivation.

Discussion and Conclusion

Information technology has been able to play an important role in various fields. The field of education is also one of the fields that has undergone significant changes due to information technology. The increasing demand for higher education and public acceptance has led to a very large number of applicants for higher education every year, which has led universities and institutions to shift their approach towards e-learning.

In addition to the growing demand for e-learning, the possibility of diversifying discussions and trends based on individual interests, the possibility of using sound, images and multimedia, providing more space for thinking and understanding the material because the presentation of education is not limited to a specific time, providing the possibility of repeating and reviewing the lesson, the communication between the teacher and the student is two-way and continuous, and the possibility of asking questions and answering them is always and at any time.

The obstacles that universities face in their development should be identified in a professional manner and steps should be taken to remove them. This article introduces new technologies in the field of education

and suggests the use of these techniques and technologies, including gamification, to increase the quality of e-learning.

New methods are emerging in light of the new needs of society and the problems of previous methods. By utilizing these technologies and concepts, while paying attention to human interactions alongside discussions related to the field of educational psychology and educational technology, Azainro contributes to better learning of concepts and the advancement of e-learning.

References

Chu, S. L., Angello, G., Quek, F & ,.Suarez, M. (2016, July). A Systemic Analysis of Making in Elementary Schools: Understanding Making for Children through Activity Theory. In 2016 IEEE 16th International Conference on Advanced Learning Technologies (ICALT) (pp. 478-482). IEEE.

Diwakar, S., Kumar, D., Radhamani, R., Nizar, N., Nair, B., Sasidharakurup, H & ,.Achuthan, K. (2015, September). Role of ICT-enabled Virtual Laboratories in Biotechnology Education: Case studies on blended and remote learning. In Interactive Collaborative Learning (ICL), 2015 International Conference on (pp. 915-921). IEEE.

Herrero, P., Greenhalgh, C & ,.De Antonio, A. (2005). Being on guard: intelligent virtual agents reporting information from collaborative virtual environments .Presence, 14(4), 423-433.

improvement of the teaching and learning process, Second International Conference on Modern Findings in Science and Technology, Publisher. Qom, Soroush Hekmat Mortezawi Islamic Studies and Research Center.

Jeong, H. Y., Choi, C. R & ,.Song, Y. J. (2012). Personalized Learning Course Planner with E-learning DSS using user profile .Expert Systems with Applications. 39(3), 2567-2577.

Johnson, S. M. (2001). Teaching Introductory International Relations in an Entirely Web-based Environment: Comparing Student Performance across and Within Groups .ED, Education at a Distance, 15(10), n10.

Kermek, D., Strmeki, D., Novak, M & ,.Kaniki, M. (2016, May). Preparation of a hybrid e-learning course for gamification. In Information and Communication Technology, Electronics and Microelectronics (MIPRO), 2016 39th International Convention on (pp. 829-834). IEEE.

Landeros, J. R & ,.Fuentes, M. D. L. M. (2016). Development of a Framework for the Use of a Tool for Machine Learning and Data Mining .Research in Computing Science, 122, 127-139.

Malek Mohammadi Faradnebeh, M.; Shirvani, Z.; Khalozadeh Mubarakeh, S. and Malek Mohammadi, M. (2014)Challenges of implementing e-learning in developing countries, Second International Conference on Management Challenges and Approaches, Shiraz, Publisher. Center for Scientific Conferences, Conference.

Nakajima, A & ,.Ono, Y. (2015, July). The Prospect of Open Online e-Learning System Based on the Free Culture Movement-Development of YouTutors as an Auto-Assignment Generator by Utilizing Creative Commons Contents Online. In Advanced Applied Informatics (IIAI-AAI), 2015 IIAI 4th International Congress on (pp. 397-402). IEEE.

Prihartini, N., Soemitro, H. L & ,.Hendradjaya, B. (2016, October). Identifying aspects of web e-learning in LMS-based for requirement engineering process modeling. In Data and Software Engineering (ICoDSE), 2016 International Conference on (pp. 1-6). IEEE.

Rabiei, F. and Faryadi, M. (2016) E-learning; An inevitable necessity for the promotion and

Rezaei, B. (2016) E-learning in Farhangian University, Identification of Implementation Factors and Its Challenges, Second National Conference on Physical Education, Isfahan, Publisher. Farhangian University, Isfahan University.

Roosta, F., Taghiyareh, F & ,.Mosharraf, M. (2016, September). Personalization of gamification-elements in an e-learning environment based on learners' motivation. In Telecommunications (IST), 2016 8th International Symposium on (pp. 637-642). IEEE.

Sangodiah, A & ,.Heng, L. E. (2012, June). Integration of data quality component in an ontology based knowledge management approach for e-learning system. In Computer & Information Science (ICCIS), 2012 International Conference on (Vol. 1, pp. 105-108). IEEE.

Scott, E., Soria, A & ,.Campo, M. (2017). Adaptive 3D Virtual Learning Environmentsˇ A Review of the Literature .IEEE Transactions on Learning Technologies, 10(3), 262-276.

Statistics and Information Technology Research Group. (2012) Higher Education Statistics in Iran Academic Years Institute for Research and Higher Education. Publisher. University of Tehran, Iran.

Taqwa, M.; Rajabpour, A. and Baba Ahmadi, S. (2013) Factors affecting the acceptance of web-based e-learning systems in service learning, Publisher. Journal of Information Technology Management Studies, (3) 1 .188-165.

Trikha, N & ,.Godbole, A. (2016, August). Adaptive e-learning system using hybrid approach. In Inventive Computation Technologies (ICICT), International Conference on (Vol. 2, pp. 1-4). IEEE.

Xu, D., Huang, W. W., Wang, H & ,.Heales, J. (2014). Enhancing e-learning effectiveness using an intelligent agent-supported personalized virtual learning environment: An empirical investigation .Information &Management, 51(4), 430-440.

Zahedbabalan, A.; Moeinikia, M. and Darakhshanfard, S. (2016) The role of e-learning in the higher education system and its challenges ahead, First International Conference on Modern Research in the Field of Educational Sciences, Psychology and Social Studies, Iran, Qom, Permanent Conference Library, Publisher. International Institute for Middle Eastern Studies and Development.

Zarei, B. and Jafari-Navimipour, N. (2014) E-Learning: Existing Methods and Future Challenges, First National Conference on Information Technology Management Challenges in Organizations and Industries, Publisher. Tehran, Payam-Noor University.