

Evaluation of E-learning during COVID-19 Pandemic: State in Iran

Samaneh Ghadami ¹, Hadi Rezghi Shirsavar ²

¹M.A, Islamic Azad University, Iran

²Department of Educational management

Islamic Azad University, Garmsar Branch, Semnan, Iran

Abstract

More than three and a half million Iranian college students were required to take their courses via e-learning during the ongoing COVID-19 pandemic. Given that this e-learning experience has been administered on this scale for the first time, it certainly involves some shortcomings. For instance, there was no performance report available on the status of e-learning from the perspective of the final users (i.e. students). Accordingly, the main purpose of this study is to evaluate the state of e-learning in Iran during the COVID-19 pandemic of 2020. The present study is applied in terms of purpose and descriptive-survey concerning the data collection method. The demographic population of this study comprises all students attending electronic courses during the second semester of the 2019-2020 academic year. Due to the prevailing circumstances in Iran, almost all college students have been studying electronically and enrolled in online classes. Therefore, 400 college students were randomly selected (disregarding the demographic characteristics such as the type of university, gender, and degree). The tool employed in this study is a researcher-devised questionnaire [1]. This devised questionnaire contains 29 items and evaluates six aspects. The content validity of the questionnaire has been confirmed by several university professors. The devised questionnaire was presented to 25 members of the community and further examined to confirm the reliability of the research means after obtaining and confirming the validity. Finally, the reliability of the questionnaire was confirmed by Cronbach's alpha method of 0.916. The results of conducting the T-test at a 95% confidence level revealed that the poor status of e-learning in terms of system quality. Meanwhile, the satisfaction level of the students in terms of information and content quality, facilitating factors, user compliance, lecturer-student interaction, and e-learning success were found to be moderate.

Keywords: COVID-19, E-Learning, Virtual Education, Evaluation, Teaching

1. Introduction

At the beginning of 2020, humanity became entangled in a disturbing terrible experience that was almost unheard of. Speaking in terms of the pandemic pace and the damage done to the world's economic, political, social, and biological vistas, it has been no

less than the experience of war, but even more from some aspects. Humans do not have a precise description of the situation that has emerged by the COVID-19 outbreak, because they have not encountered a prior incident alike. Following the issuance of the first warnings by the World Health Organization, the world was alerted of the presence of a formidable enemy. Also, due to the inadequate knowledge and ambiguity associated with it, many immediate decisions were made only spontaneously to eventually make decisions based on understanding and scientific data. Meanwhile, higher education, like many other fields, was affected by this virus. The complexities induced by the virus to the extent that this event was similarly unknown in the world's higher education. At first, many countries closed the universities for a brief period. Finally, with the addition of new information and the ascertainment of the future that awaited humanity to combat this virus, it was the time to take further action and administer new decisions. One of the decisions adopted by many countries was to proceed with education virtually or electronically. According to the latest statistics of the Iranian Institute of Higher Education Research and Planning, the college student population of Iran in the 2020 academic year amounted to 3,616,114 people. This population maintained their education via e-learning based on the latest decisions taken by the Ministry of Science and the Ministry of Health. However, Iran lacked the experience of conducting e-learning with this extent and scope, and there was no prior feedback about e-learning performance.

2. Literature Review

The ongoing circumstances and the necessity to maintain higher education has made it imperative to evaluate the performance of e-learning. Accordingly, the main concern of this study is that what is the functional state of this education approach after one semester, considering the implementation of e-learning in all universities and higher education organizations in Iran.

E-learning is divided into various categories depending on the function and facilities including web-based education, computer-based education, education via mobile digital devices and tools, and education via mobile phones. One of the topics of interest in education literature is the success of e-learning [1].

Educational media in distance education has commenced from print materials and now has attained educational television and advanced technologies that have facilitated interaction. The earliest forms of distance education in Europe, especially in the United Kingdom, were administered through correspondence education. Correspondence education prevailed until the mid-twentieth century when radio and television education became widespread. In the late 1950s and early 1960s, television production technology provided the means for an education program to be recorded or broadcasted live. In these programs, qualified and apt teachers taught the curriculum, and the lecture sessions were broadcasted on television. However, the problem was that the veteran teachers who were well-versed in the subject matter did not have the aptitude to perform on television, or their delivery was in a manner that did not appeal to the audience. In the early 1970s, radio and television recordings of veteran teachers received less attention and, instead, students and their educational needs were heeded. Subsequently, other television programs were produced to teach students original subjects that were not taught in schools. Nevertheless, these lessons were regarded as complementary to the main school subjects. The main issue with radio and television educational programs was that they were utterly one-sided. It means that there was no two-way interaction between the teacher/lecturer and student(s). Yet, the possibility of two-way interaction has further emerged thanks to the progress of educational technologies.

3. Computer and World Wide Web

Currently, the most common medium for rendering two-way communication between individuals is via computers and the World Wide Web. Computer and World Wide Web has provided the possibility of e-mail interaction, video conferencing, and other facilities for users [2]. At the beginning of the elaborate world of the third millennium, the augmentation of educational opportunities has become one of the main concerns of organizations. The main causes of such concerns are the dynamic nature of the economy and employment market and its attainment of knowledge, diversification of educational needs, the advancements of science and technology, the need for retraining and lifelong education due to the soaring expectations, resource constraints compared to the ever-growing population, and demand for more adaptable educational opportunities due to the impracticality of consistent attendance in physical and traditional classes [3]. The application of this technology is the basis for motivation, learning, experience, and innovation. In recent years, e-learning has established itself as one of the significant applications of new information and communication

technologies in the world, and extensive efforts have commenced in this regard. The implementation of electronic systems to provide new services and technologies in terms of teaching and learning has become a basic need considering the rapid changes that are gradually occurring in the environment. E-learning, as the most significant application of information technology, is presented in the form of various systems such as computer-based learning, network-based learning, and network education [4].

The term was initially coined by Kerass, which simply means the use of information technology for learning. In another definition, e-learning is a broad range of processes and information applications for learning. Yet in another definition, e-learning comprises a broad range of processes and applications such as web-based education, computer-based education, e-classes, and digital collaboration. It covers content delivery via the internet, intranets, extranets, and satellite broadcasting, along with video and audiotapes, satellite telecasts, conversational TV, and compact discs. E-learning has established a novel paradigm and has made it possible to learn in any field, for any person, anytime, and anywhere.

In this context, the student and the teacher are separated in terms of time and place or both, the educational content is presented to the student through course management software, multimedia resources, internet and video conferencing, and the student is expected to complete individual learning activities. Further, the students establish a group with the help of computer communication facilities with the teacher, classmates, and other individuals or communication resources.

E-learning is usually administered in three methods: asynchronous, synchronous, and combined. These three methods can also be acknowledged as three consecutive steps.

- i. **Asynchronous education:** It is defined as a method in which the learners are trained via the foreseen facilities and provided convenience, particularly the curriculum. In this method, the information and knowledge exchange is managed using electronic tools such as FTPT, Email, and text chat. The main advantage of this method is having no time and space constraints, convenient implementation, and less interaction than the synchronous method.
- ii. **Synchronous education:** Synchronous learning is the presentation of a subject at a specific time in an e-classroom by a qualified instructor/lecturer in the presence of multiple learners. One of the main advantages of this method is the possibility of shared conversation between learners and instructors, which results in more interaction and meets the psychological aspects of learners; however, it can impose constraints in terms of time

and requires the arrangement of specific hardware facilities. The learning management system is employed to set e-learning to provide communication grounds between learning components and users. This system enables the training managers to pay attention to the safety aspects in addition to monitoring the work process.

The learning management system can be employed in two ways.

Offline: programs are installed on the hardware via software packages and grants the possibility of defining users, defining courses, and evaluation systems. These programs can be used with credit cards and their common types are listed below.

- G Netg software is a simple software in which only the user is defined and the particular course for studying is specified and the user is tested eventually.
- Skill Vantage software is more advanced education software that contains more options. In addition to the browsing, the user can be defined, and assigned a specific password, and determine the type of intended training based on the user's organizational status. When the user enters with his password, they know exactly what courses are demanded of them. Next, by selecting the desired course, they can learn the material and answer the questions. Skill Vantage also displays a help menu. Eventually, the user is evaluated with a variety of four-choice closed, semi-open, and open test questions by the software. Specific system feedback and even debugging are done electronically.

Web LMSs: There are active sites that allow organizations to purchase e-learning domains on that site and provide online e-learning. One of the features of this type of learning management system is that in addition to having the features of the mentioned programs, it is administered online. Besides, it renders the opportunity to conduct sessions synchronously or asynchronously, resulting in more interaction. This type of inclusive management system is usually expensive [5].

iii. Combined methods: Combined methods are the outcome of a combination that includes synchronous and asynchronous methods together. This method is relevant in cases where the organization has undergone the first and second stages and does not want to face the constraints of the first two methods [6].

Evaluation patterns can be regarded and categorized from different aspects. The simplest

classification was proposed by [7]. He categorized the evaluation patterns into two forms of formative and final. Other divisions are provided by other authors likewise. Popham, for example, divides patterns into three categories that are listed below.

- Achievement-goal based patterns
- Judgmental patterns (internal and external criteria)
- Decision-making aid patterns [7]

There are four-items, five-items, and other classifications with a greater number of items available. Among these classifications is the seven-item classification of the Center for Evaluation Studies (University of California). These seven categories are as follows:

- Goal-oriented patterns
- Decision-oriented patterns
- Responsive-oriented patterns
- Experimental-oriented patterns (to explain the causal associations)
- Goal-free patterns
- Advocacy-oriented
- Utilization-oriented patterns

In this classification, the first category patterns emphasize the evaluation of learners' academic achievement. The second set of patterns highlights the information needs of decision-makers. The third category emphasizes the program process. The fourth category of patterns strives to illustrate the effects of the program and establish a cause-and-effect association in the evaluated program. In other words, the fourth set of patterns employ experimental research methods to establish a causal relationship. This model can be adopted, for example, in evaluating the effectiveness of at-the-job teacher training programs. The fifth category includes goal-free patterns. These patterns evaluate the outcomes of the learning regardless of the initial framework of the program. In other words, this evaluation model obtains the evaluation information that can estimate the program's capacity to meet the needs of individuals regardless of the program's main purpose. The sixth category assesses the individuals' understanding of the program by organizing a quasi-legal process and hearing the opinions and positions of defenders and non-defenders. In the seventh category of patterns are the utilization-oriented

patterns. In this category of patterns, the evaluation information is collected with the maximum convenience for the relevant individuals. The focus of this category of patterns is to recognize the real users of the evaluation information. Next, through evaluation, the most relevant information is provided to them [8].

Cerezo et al. [9] conducted a study titled “Process mining for self-regulated learning assessment in e-learning”. We aim to investigate students’ self-regulated learning processes during e-learning courses using data processing techniques. In terms of e-learning, the subjects were at a desirable level. Yet, the results of the pre-test and post-test evaluation for the two groups of control and test revealed a significant difference in the self-regulatory learning process adopted in e-learning. Moreover, the results of the self-regulated learning evaluation determined that e-learning will foster self-regulated learning.

Qiu et al. [9] assessed “E-learning for tourism education LISREL-assisted intercultural tourism perception and data integrated satisfaction perspectives”. The results revealed that, given the special status of education in tourism development, more relevant attention should be heeded to e-learning, along with the development and betterment of evaluation models based on this education method. The results additionally determined that e-learning is deemed as an opportunity in the current global situation to promote and strengthen cultural relations and satisfaction of tourism customers.

Iqbal et al. [10] examined the subject under “Multimedia based IoT-centric smart framework for eLearning paradigm, multimedia tools, and applications”. The results indicate that students’ participation is more efficient toward the teacher and learning in synchronous and asynchronous methods. The performance was assessed by comparing the answers to tests related to Ask MSR-QA and through MAQAS.

Molly Mamaril et al. [12] examined the issue in a study titled “Weaving evaluation into the Waipā ecosystem: placing evaluation in an indigenous place-based educational program”. According to these researchers, environmental and indigenous educational programs, while adopted as tools for cultural revitalization and immortalization, render learning. In a pilot evaluation of the Waipa Mai uka a l kai summer environmental program, it was confirmed that the short- and medium-term results associated with the rational program pattern are generally consistent, particularly if qualitative measurement means are employed.

Ivar Rafen et al. [13] further questioned the issue in a study titled “Shared language of feedback and assessment: perception of teachers and students in three Icelandic secondary schools”. They examined the diversity of teachers’ and students’ perceptions concerning feedback. The primary focus of this study

is on examining how teachers and students perceive assessment in the Icelandic context.

Graham [14] reviewed the issue in “PESTEL factors for e-learning revisited: The 4Es of tutoring for value-added learning”. This paper reported the findings of the 2007 paper and reviewed the application of the present transnational framework for the application of e-learning before using PESTEL (political, economic, social, technical, environmental, and legal) factors for e-learning.

Kevin et al. [15], in “Evaluating Teacher Preparation Programs with Teacher Evaluation Ratings: Implications for Program Accountability and Improvement”, claim that the governments are integrating evaluation rankings into the novel multi-outcome teacher partner program (TPP) evaluation systems. However, our knowledge is limited to the link between TPPs and program evaluation ratings of the graduates.

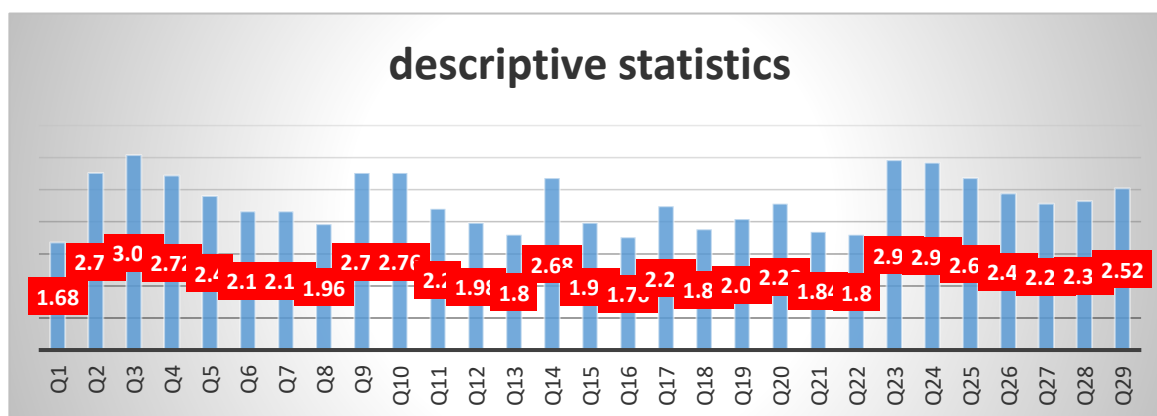
2. Research Method

The present study is applied in terms of purpose and descriptive-survey concerning the data collection method. The demographic population of this study comprises all students attending electronic courses during the second semester of the 2019-2020 academic year. Due to the prevailing circumstances in Iran, almost all college students have been studying electronically and enrolled in online classes. Therefore, 400 college students were randomly selected (irrespective of demographic characteristics such as the type of university, gender, and degree). The tool employed in this study is a researcher-devised questionnaire [1]. This questionnaire contains 29 items and evaluates six aspects shown in Table 1. The content validity of the questionnaire has been confirmed by several university professors. The devised questionnaire was presented to 25 members of the community and further examined to confirm the reliability of the research means after obtaining and confirming the validity. Finally, the reliability of the questionnaire was confirmed by Cronbach’s alpha method (see Table 1) and the results of descriptive statistics (see Table 2).

Table 1. Reliability of Cronbach’s alpha method

Column	Item	Cronbach’s alpha
1	System quality	0.861
2	Information and content quality	0.915
3	Facilitating factors	0.919
4	Lecturer-student interaction	0.939
5	User compliance	0.877
6	E-learning success	0.755

Table 2. Descriptive Statistical Tests



The results of descriptive statistics revealed that the following items are inadequate state according to the respondents' point of view.

- How appropriate the infrastructure (Internet and internet speed) is?
- How easy it is to understand the provided information?
- To what extent is there a specific person to guide you if needed?
- To what extent do professors answer to your uncertainties during the course?
- How satisfied you are with the answers provided by your professors?
- How determined are the teachers in helping you to learn?
- How easy is it to interact with students and faculty?
- How easy is it for the students to interact with their peers?

5. Inferential statistics

Evaluating the state of e-learning in Iranian universities.

1. Evaluating the state of e-learning in terms of system quality

	N	Mean	Std. Deviation	Std. Error Mean		
System quality	400	12.5950	4.17427	.20871		
	Test Value = 12.5					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
System quality	.455	399	.649	.09500	-.3153	.5053

The results of conducting a T-test at a 95% confidence level indicate that the e-learning state in terms of system quality is poor.

2. Evaluating the state of e-learning in terms of information and content quality

	N	Mean	Std. Deviation	Std. Error Mean		
Information and content quality	400	9.0400	4.26190	.21310		
	Test Value = 10					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Information and content quality	-4.505	399	.000	-.96000	-1.3789	-.5411

The results of conducting a T-test at a 99% confidence level indicate that the e-learning state in terms of information and content quality is average.

3. Evaluating the state of e-learning in terms of facilitating factors

	N	Mean	Std. Deviation	Std. Error Mean		
Facilitating factors	400	6.9375	3.17471	.15874		
	Test Value = 7.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Facilitating factors	-3.544	399	.000	-.56250	-.8746	-.2504

The results of conducting a T-test at a 99% confidence level indicate that the e-learning state in terms of facilitating factors is average.

4. Evaluating the state of e-learning in terms of user compliance

	N	Mean	Std. Deviation	Std. Error Mean		
User compliance	400	11.0000	4.14281	.20714		
	Test Value = 10					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
User compliance	4.828	399	.000	1.00000	.5928	1.4072

The results of conducting a T-test at a 99% confidence level indicate that the e-learning state in terms of user compliance is average.

5. Evaluating the state of e-learning in terms of lecturer-student interaction

	N	Mean	Std. Deviation	Std. Error Mean		
Lecturer-student interaction	400	7.1200	2.73575	.13679		
	Test Value = 7.5					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Lecturer-student interaction	-2.778	399	.006	-.38000	-.6489	-.1111

The results of conducting a T-test at a 95% confidence level indicate that the e-learning state in terms of lecturer-student interaction is average.

6. Evaluating the state of e-learning in terms of e-learning success

	N	Mean	Std. Deviation	Std. Error Mean		
E-learning success	400	20.3075	9.04530	.45227		
	Test Value = 22.5					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
E-learning success	-4.848	399	.000	-2.19250	-3.0816	-1.3034

The results of conducting a T-test at a 99% confidence level indicate that the e-learning state in terms of e-learning success is average.

6. Conclusion

COVID-19 pandemic, the unwelcome phenomena of 2020, paralyzed the world entirely, and higher education was not immune to this virus, either. At first, the universities suspended their actions. Following the recognition of the coronavirus and the fact that this virus will linger around humans at least for the next few years, new decisions were made. One of these decisions was to continue education electronically and virtually. In Iran, as one of the most exposed countries concerning the coronavirus, this command was implemented. The best alternative for Iranian university presidents and directors of higher education organizations was to enforce e-learning. Yet, admitting that the necessary programs had not been executed for this education method at this level and extent, the results revealed that the satisfaction of the college students as the most fundamental criterion of higher education was not very significant. Accordingly, the researchers of this study decided to evaluate the level of this satisfaction with e-learning by the means of a field study, via the distribution and collection of e-learning satisfaction questionnaire. The results of the evaluation that was completed at the end of the 2019-2020 academic year's second semester designated that student satisfaction was very low in terms of system quality. Consequently, it is suggested to increase the access speed to virtual education. Given the inadequacy of infrastructure, the extent of user access is inappropriate such that with a sudden increase in the number of users, the access speed declines dramatically. Besides, considering that many students have not experienced this method of education, the user must interact with the virtual education program. Additionally, the extent of user interaction should be increased. Similarly, the virtual learning environment should be interactively devised in a manner that the classroom environment could be simulated and executed at the highest level of effectiveness.

7. References

- [1] Ghanbary, S., Shirsavar, H.R., Ziaee, M. S., Mosleh, M. (2020). Evaluating the effectiveness of virtual education for health care management students, *Health Management Quarterly*, Volume 10, Number 2 - Serial Number 32, Summer 2020, pp. 49-60.
- [2] Mohammad Beigi Dehaghi, A. (1994). Investigating the valid factors in improving the educational quality of on-the-job training courses of Shahid Farsi Higher Education Organizations from the perspective of students and instructors, Master's dissertation in planning, Islamic Azad University of Khorasgan.
- [3] Mohammadi, R. et al. (2005). Quality Assessment in Higher Education; Concepts, principles, methods, and criteria, Iranian Education Evaluation Organization (SANJESH.)
- [4] Nili Ahmadabadi, Mohammad Reza. (1992). a comparative study of the opinions of the University of Isfahan's faculty members on the factors affecting the quality of education, Master's dissertation in planning.
- [5] Fathi, Maryam. (2010). Virtual education models for adapting and devising an appropriate model, dissertation for receiving a master's degree, Tarbiat Moallem University.
- [6] Farasatkah, Maghsoud. (2006). Devising and presenting a framework for evaluating and authorizing Iranian higher education based on the experiences of Iran and the world, Ph.D. thesis in higher education, Tehran - Faculty of Educational Sciences and Psychology, Shahid Beheshti University.
- [7] Ghorchian, Nader Gholi. (1993). An analysis of the quality in the higher education system; *Quarterly Journal of Research and Planning in Higher Education*, No. 7 and 8, pp: 13-20.
- [8] Farasatkah, Maghsoud, Bazargan, Abbas and Tabatabai, Mahmoud. (2007). Comparative Analysis of Higher Education Quality Assurance Systems in the World, *Quarterly Journal of Research and Planning in Higher Education*, No. 44.
- [9] Cerezo, R., and Bogarín, A., Esteban, M. and Romero, C. (2019). Process mining for self-regulated learning assessment in e-learning, *Journal of Computing in Higher Education*, issues:3, no:5, pp 1–15.
- [10] Qiu, L., and Qi, L. (2019). E-learning assessment for tourism education LISREL assisted intercultural tourism perception and data integrated satisfaction perspectives, *Journal of Computing in Higher Education*, no:7, pp 1–20.
- [11] Iqbal, M.M., Farhan, M., Jabbar, S., Saleem, Y., and Khalid, S. (2019). Multimedia based IoT-centric smart framework for eLearning paradigm. *Multimedia Tools Appl.* 78, 3 (February 2019), 3087–3106. <https://doi.org/10.1007/s11042-018-5636-y>.
- [12] Mamaril, M.N., Cox, L.J., Vaughan, M. (2018). weaving evaluation into the Waipā ecosystem: Placing evaluation in an indigenous place-based educational program, *Studies in Educational Evaluation*, Vol.56, P.42–51.
- [13] Ívar Rafn, J., Kari, S., Guðrún, G. (2018). Shared language of feedback and assessment. Perception of teachers and students in three Icelandic secondary schools, *Studies in Educational Evaluation*, Vol.56, P.52–58.
- [14] Graham, D. (2018). PESTEL factors for e-learning revisited: The 4Es of tutoring for value-added learning, *E-Learning and Digital Media*, 15(1), pp: 17-35.
- [15] Kevin C., B., Kristina M., P., Yi, P. (2017). Evaluating Teacher Preparation Programs With Teacher Evaluation Ratings: Implications for Program Accountability and Improvement, *Journal of Teacher Education*, P.1-19.