Original Article

The Desirability of the Quality Components of E-learning Payam Noor University from the Students Perspective of National Lms

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Abstract

The conditions of the corona virus forced online education with LMS (learning management system). The main purpose of this research is to investigate the desirability of the quality of electronic education of Payam Noor University from the students' point of view of ISFAHAN LMS. The current research is a survey. The research tool was the USELEARN questionnaire and the checklist of the National Learning Association website. The statistical population includes all students who were studying at the Bachelor's degree and Master's degree (LMS) in the 2023 at Payam Noor University through electronic education. The simple random sampling method was used. The sample size was 384 students.

Benson et al.'s and Salmon's models have been used to evaluate the quality indicators and components of Payam Noor University's electronic education. The average values of the ratings showed that the indices of "Professor", Information Technology" and "University Support" had the highest average and the most importance, and the index of "Contextual Factors" had the least importance.

Based on the ratio test, the factors "teacher ", "electronic interaction" and "Access to facilities" are desirable factors." University support and support" has been evaluated as a low desirability. There is a significant difference between the evaluations of the desirability of the quality of e-learning indicators and gender.

Multivariate regression analysis showed that among the independent variables entered into the equation, the variables of the "Electronic lesson score", "The teacher's interest and friendly behavior toward all students", "Inviting students to use electronic education", "Evaluation of face-to-face training" and" Ease of use of electronic education system" have the greatest impact on evaluating the desirability of electronic education that could explain 73% of the variance of the changes related to the dependent variable. The variables have been able to explain 73% of the variance of changes related to the dependent variable.

Keywords: e-learning, evaluation of desirability, quality of e-learning indicators, LMS.

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Introduction

The special conditions of the corona virus have increased the demand for e-learning.

The acceleration of technology, the high volume of applicants for higher education and the limitation of traditional education to time and place have provided the basis and momentum for the movement toward electronic education.

The increasing trend of using electronic education in higher education has been accelerated by using smart education through new communication technologies to transform the educational system. Payam Noor University is also affected by this rapid trend in electronic learning.

Environmental and socio-economic changes are effective in the demand for virtual education. Corona conditions in Iran and the world have increased the demand for virtual education.

Information and communication technology has changed learning (Mohammad, Mohibbi, &

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Hedayati, 2021).

Higher education is combined with quality evaluation of educational indicators and components, and the desirability of quality is one of the goals of higher education. The increase in social demand for continuous education and the lack of space and physical and material facilities have caused the social system to look for an alternative way to provide more services to its customers. The higher education system as a social subsystem with continuous delay, seeks to provide alternative services, reorganize the teaching-learning process and transfer knowledge, skills and attitudes to learners.

With the emergence of constructivist pedagogy and the development of information and communication technology, this issue has accelerated and another form of education called virtual education has emerged. universities and educational institutions for reason of entry the era of information and communication and considering the problems of investing in education, the ever-increasing and unprecedented increase in the entry of young people into higher education, job creation, air pollution caused by the movement of faculty members and students, educational costs, have become inclined toward educational approaches including virtual education (Javadi-Bora et al., 2013). Due to the continuous evolution of technology, there is no universal definition for e-learning.

Lee et al. (2011) defined e-learning as "an information system that can deliver a wide variety of educational content (via audio, video, and text media) via e-mail, live chat sessions, online discussions, and Defined associations, tests and other researchers use the concept of e-learning to refer to the intervention of technology in the learning process (Sun et al., 2008). In this research, we adopt a definition that considers an e-learning system as an information system. E-learning provides countless opportunities for learning that were not possible before. In this way, the chance to learn from a reputable and famous university is available and there is no need to change the overall lifestyle and it does not cause him or his family to leave his job or emigrate. Learning in an invisible classroom provides unlimited access to information (Yacoubi et al., 2009:162).

Many traditional teaching methods are ineffective and do not have enough power to convey concepts to learners. Thus, by using the tools and methods created by this technology, while increasing the speed of learning, possible to provide learning conditions for different talents and tastes. Moving toward new approaches in higher education has required many universities in the world to use virtual education technology in providing courses. The ever-increasing effects of technologies on all aspects of life, including at the level of education, growth and development of countries have made it necessary to progress in the field of higher education through the adoption of educational systems and technologies. (Qurbankhani and Salehi, 2014).

Accordingly, the quality of e-learning systems has attracted considerable attention, and a large number of researchers have attempted to identify the success factors of e-learning to maximize the effectiveness of these systems (Wang, 2003; Wahab, 2008; Lee and Lee, 2008; Lee et al., 2009; Lee, 2010; Park, 2009; Ali and Ahmad, 2011; Islam, 2013; Fatemeh et al., 2015; Mohammadi, 2015; Motbeh and Raphael, 2018). In general, most of these studies have investigated the main factors that determine the success of e-learning systems in isolation and have ignored the synergistic effects of success variables interacting with each other (Eshil and Aum, 2018). Another direction of research is the direct relationship between quality factors of e-learning and satisfaction (Salim, 2003; Ozkan and Osler, 2009).

In fact, what is called electronic learning is rooted in a phenomenon called distance learning; from learning based on printed materials to educational television and current interactive technologies (Sheri, 1996: 339-337, Zandi et al., 2014: 25).

Virtual education as an educational system complementary to the traditional educational system with the aim of paying attention to individual differences, providing equal educational opportunities and educational democracy for education for everyone, at all times and "fit" for age, gender and employment, distance education. Also, distance education has played an important

role in fulfilling the human mission of "bringing education to the people" due to having a dynamic, up-to-date and collaborative environment.

Payam Noor University, as the trustee and executor of the distance education system in Iran, by creating physical, financial and human infrastructure, must carry out needs assessment, design, compilation and evaluation of the components of the acceptance of this type of technology in the classroom. In recent year, the way to culture and prepare students to accept and use technology in Iran's educational system, especially in Payam Noor University, has been controversial (Javadi-Bora et al., 2013).

User satisfaction is also considered as a factor in evaluating the success of e-learning systems. For example, Sun et al.'s model (2008) consider six dimensions - learners, instructors, course, technology, design, and environment - as important and influencing learner satisfaction.

In the era of communication and information explosion, the priority of public education is on technologies. Based on this evaluation of the qualitative components of e-learning from the students' point of view as one of the pillars of the e-learning system. Considering that Payam Noor University is the largest electronic education university in Iran, this university was selected for investigation. The purpose of this research is to investigate the desirability of the quality of electronic education of this university from the perspective of students of Payam Noor University. The basic question of this research is what factors are related to the desirability of educational quality components in Payam Noor University?

Background

Sayaf (2023) conducted a research entitled "Adoption of E-learning systems: An integration of constructivism theories in higher education" the results showed that the outcomes of peer interaction and instructor interaction have a favorable impact on satisfaction and teamwork, which have a beneficial impact on the usage of e-learning in higher education. This is advantageous for sustainability as well as the adoption of e-learning systems. Finally, the study demonstrates that user happiness and collaborative have a favorable impact on the utilization of e-learning systems. As a result, universities should promote e-learning as a long-term educational strategy.

The research results of Toring et al (2023) entitled "Evaluation of students' satisfaction toward an adopted learning management system at Indiana Aerospace University: A structural equation modelling approach" revealed that sex is a moderating variable that influences the relationships between system content and instruction information with students' perceived usefulness of the LMS. Consequently, the results offer practical implications for practitioners in designing and increasing LMS satisfaction to create a more effective learning environment.

Yasohn and Yawson (2021) conducted a research entitled "gender diversity in e-learning essentials: Evidence from a multi-generational higher education group, that shows there are differences in the desirability of e-learning based on gender (Yamoah and Yawson, 2021).

Mehtadi Jafari et al.'s research was conducted with the aim of identifying the useful and effective features of the educational factor in the learning environment in a qualitative manner using the inductive qualitative content analysis method. The statistical population of this research was all faculty members, graduates and doctoral students in the field of educational technology at Allameh Tabatabai and Tarbiat Modares universities. Research data was collected using semi-structured interviews through targeted sampling with the participation of 14 members of the statistical community. Finally, four main categories including role, appearance, voice and gender were identified for the educational factor and the subcategories of each one (Mohtadi Jafari et al., 2021).

In Al Farihat et al.'s research (2019), the determining factors of e-learning are satisfaction, technical system quality, information quality, service quality, support system quality, learner quality, teacher quality, which together explain 71.4% of the variance of perceived satisfaction. .

Sideral et al. (2018) classified e-learning related studies from 2001 to 2016. It was found that

studies started in 2001 focusing on intention to use, acceptability, usability, course content and customization and later evolved to include satisfaction in 2007. More recently, since 2013, studies have focused on "the overall success of e-learning and how student characteristics affect communication" (Sideral et al. 2018). Recent research has focused more on the attitude and interaction of students and instructors, which play an important role in the success of e-learning (Cheng, 2011; Lia et al., 2007; Salim, 2007).

Rezaei et al. (2017) conducted a research entitled "Evaluation of the use of virtual social networks in learning and education from the perspective of professors and students of virtual social networks in education". This study was conducted using qualitative content analysis. 24 participants were selected through purposive sampling. Data were collected through individual, in-depth and semi-structured interviews. The use of social networks and virtual space in learning processes is accepted from the point of view of the stakeholders of this field, that is. professor and student.

In the research conducted by Navin Far et al. (2017) with a qualitative method, 49 samples were selected purposefully. The effective components of the curriculum of virtual universities were extracted and by analyzing them, a framework for providing virtual curriculum in virtual universities was presented. The results of the analysis showed that the most important effective components; the participation components included evaluation, logical and infrastructural components. 9 factors including participation efficiency components, group composition, technology, job assignments, group roles, processes and training, time, group skills training, prior knowledge were identified.

Jahian and Praveda (2013) conducted a research entitled evaluation of the virtual education situation in the electronic education centers of Tehran universities from the students' point of view, which was carried out in a descriptive and survey way. The statistical population of the research included all students participating in electronic education centers of national universities in Tehran in the academic year of 2019-2019, numbering 400 people. The statistical sample was 196 people. The findings showed that the students participating in the virtual education courses were satisfied with accessing the facilities and using the virtual education method; although, they did not have a positive attitude toward virtual training courses. Rahimi et al. (2013) presented a research titled quality analysis of virtual and face-to-face education. Amirkabir University In this descriptive-survey research, 200 students of Amirkabir University were selected in the academic year of 2018-2019 by stratified random sampling method. The components of reliability, security, access, communication, credibility, politeness and flexibility had a significant difference in virtual and face-to-face training, but this difference was not significant in other components.

Saad Mohammadi et al. (2013) conducted a research entitled studying the status of virtual higher education in terms of education services provided in Iran with documentary and survey methods. The statistical population in this research is all students, professors and experts in virtual higher education centers. The sample size was 60 people in the professors and experts section and 400 people in the student section.   The results showed that the quality status of virtual higher education in terms of teaching-learning method, content produced and access to content, access to professors is suitable, but from the students' point of view, the quality status of virtual higher education is unfavorable in terms of professors' educational services. According to the research findings, the quality of educational services in virtual education in the country is favorable.

Anari and Mohammadi's research (2012) was carried out under the title of organizational and program evaluation of electronic education with a descriptive-survey method. The statistical population of the research included the students of Amir Kabir, Shiraz, Isfahan University of Technology and Hadith Shahrari University of Science, 702 of whom were selected by stratified random sampling. The results showed that the universities have a better situation in the dimensions of "presentation environment design", "educational aspects", "management" and "organizational affairs" and in the dimensions of "evaluation", "technology", respectively.

"considerations". "Ethical services" and "support" are not very favorable compared to other dimensions.

Nakai Kay (2011) showed that factors such as: attitude toward electronic education, willingness to learn through virtual education, access to the facilities of this educational method, compulsion and obligation to use the virtual education method potentially affects the users of these courses.

The researchers built a hexagonal model based on quality factors (system quality, information quality, and service quality) and social issues (supportive factors, learner's perspective, and educators' attitudes). The relationship between the six dimensions and satisfaction with e-learning was significant and accounted for 76.9% of the variance of satisfaction with e-learning. The researchers concluded that this model should be considered as a basis for evaluating the effectiveness of e-learning and recommended the expansion of this model. Another study on blended e-learning system environments conducted by Wu et al. (2010).

McGarry (2003) has identified the important factors in the design of online courses in a research entitled the evaluation of the quality of online courses. He pointed out that flexibility, interaction and participation are important factors in designing online curricula. User satisfaction has also been used as a comprehensive factor or along with other factors in evaluating the success of e-learning systems.

Theoretical Framework
Mayer considers the concept of e-learning be active and intelligent learning, which along with the evolution of the teaching-learning process, will play a fundamental and central role in expanding, deepening and sustaining the culture of information and communication technology (Mayer, 2005 and Maslanjad et al., 2009). The development of information technology has led to the growth of online learning as a method in education. Clark and Mayer defined electronic learning as the method of presenting content through digital devices such as computers and mobile phones to improve learning (Sanaei and Salimian, 2013).

The dimensions and components of e-learning are divided into three general categories: the first and second categories are derived from the findings of e-learning experts, including Fallon and Brown (2003):

1- Dimensions that are physical, such as management software, content production software and standards, content files, databases, audio and video software….

2- Dimensions and components that are programmatic and conceptual, such as goals and headings, curriculum, content and lesson text, evaluation, resources and links.

3- The dimensions and components that are human and include attitudes, feelings, expectations, skills, motivational system and other aspects that are related to the relationship between man and his interaction with the machine (Abadi, 2008).

Anderson (2003) in an article entitled "A theory for e-learning", considers the computer network space as a unique cultural context that itself affects the nature of human relationships. students enter e-learning environments with formal and informal experiences, concepts and norms they have acquired from virtual space.

A review of the conducted research shows that the use of communication technologies in different dimensions, including learning, has created wider fields in the studies and planning of education and learning. The amount of access to the network, knowledge and information skills, the amount and type of Internet use and finally the pattern of Internet use as an interface variable for learning in the electronic environment are examples of them.

E-learning studies can focus on three main dimensions: users, technology and services. People interact with e-learning systems. E-learning services link all activities related to educational models and strategies (Aparicio et al., 2016).

Referring to the role of teachers, content and access to the network, Petro (2005) points to two

complementary streams for learning in cyberspace: one is "knowledge and skills about computers and the Internet" and the other is "the correct use of the Internet." (Patro, 2005, quoted by Ebrahimabadi, 2018).

Hadullo et al. (Hadullo 2017) point to a model for evaluating the quality of e-learning systems in higher education in developing countries that take into account the specific characteristics of development (Bowasiri et al., 2012; Mohammadi, 2015). E-learning resource availability, accessibility, infrastructure and social role of agents remain dominant (Ong and Khaing, 2016; Buasiri et al., 2012; Mohammadi, 2014 cited by Yasoun and Yamon, 2021).

For many theorists, the interaction between student and teacher and student with student in the online environment that enhances learning (Mayer et al., 2004).

Salmon has developed a five-step model of e-learning in which online courses have been used (Salmon, 2005). The first step is individual access and students' ability to use technology. The second step is for students to create an online identity. Online socialization is an important element of the e-learning process in this model. In the third stage, students give and share information related to the course. The interaction and cooperation between students is central in the fourth stage. The fifth step in Salmon's model, students seek the benefits of the system and use external resources to enhance their learning. In all these cases, the professor plays the role of supervisor of inspiration, acting as a facilitator of student learning.

Benson Song and others (2001) in a research by enumerating 5 components in e-learning stated that e-learning is a system in which all components must have a proper function for its success. By studying 538 students, he stated the critical success factors of electronic education in the form of 4 major groups: "Teacher", "Learner", "Information Technology" and "University Support". to evaluate e-learning, factors such as "the learner's fear of subsidies", "the teacher's lack of mastery of technology", "the teacher's attitude toward the virtual learner" and... Strategies and policies based on information technology, "access and infrastructure of information technology", "manpower" and "use of information and communication technology in universities" were introduced.

Sun et al.'s model (2008) considered six dimensions - learners, instructors, course, technology, design and environment - as important and influential dimensions on learner satisfaction. Thirteen factors were hypothesized under these six dimensions, and among them, computer anxiety, instructor's attitude toward e-learning, course quality, flexibility, perceived usefulness, perceived ease, and diversity in evaluation, received empirical support. The results showed that improving user satisfaction through these factors leads to a successful e-learning system.

Research hypotheses

First hypothesis: There is a difference between the desirability of the quality of e-learning indicators based on gender.

Second hypothesis: There is a difference between the priorities of education quality indicators.

The third hypothesis: Pedagogical (educational) indicators have quality desirability.

Conceptual model of research

Based on background investigation and theoretical views, the following model was designed:
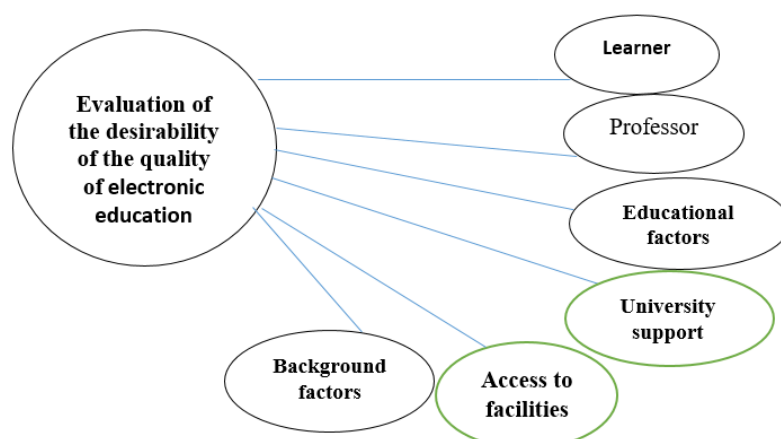
Figure 1. Conceptual model of research

Research method

The method of data collection in this research is the survey. The research tool was the Uselearn questionnaire. The statistical population includes all the students who studied at Payam Noor University through electronic education in the 2023. The statistical population for the evaluation of the quality of e-learning were the Bachelor's degree and Master's degree students of Payam Noor University's ISFAHAN LMS Center. The random sampling method is simple. The sample size was 384 students.

The questionnaire was sent to the students participating in the virtual class of Payam Noor University through e-mail and notification in the LMS system. The answers to the questions related to the indicators affecting the quality of electronic education were considered based on the Likert scale.

To evaluate the standard framework for the production and presentation of electronic lessons for universities based on the UNESCO report (Hamidian, Abbaspour and Sepehri, 2015: 25), the standard criteria of electronic education were obtained from the website of the National Learning Association that has been implemented in the form of a questionnaire. Measures:

Access: e-learning is the use of information and communication technology in the education process, and thus the growth of e-learning directly depends on the level of access to information and communication technology.

Support: Waller and Wilson (2001), believe that: "e-learning is an effective learning process that combines electronic delivery of content, services and support".

- Practice and homework: e-learning courses are mostly offline; thus, individual and group activities are defined for students. Practice and homework are important tools that create a relationship between professor and student. In this way, the professor can find out about the student's ability in the topic under discussion and give him the appropriate feedback.

Information resources: includes course summary, electronic information resources and list of websites relevant to the course.

Presentation of the lesson: important parts of an electronic education system is the presentation of the lesson. Because that these courses are implemented online, the presentation should be done in a way that attracts users to the system.

Electronic content: It forms the main body of an electronic training course. Electronic such as: sound, image, animation and video can increase the amount of learning and memorization of learners to a considerable amount.

- User interface: an intermediary between a human and a machine (device) that enable humans to use it. The user interface is the visible and tangible part of a tool that the user directly deals with.

Table 1. Cronbach's alpha test results.

Cronbach's alpha	component	Index
0.754	Electronic interaction of student interaction with other students. Student-teacher interaction Interaction of professors with students and... Communication connection factors	
0.72	Ease of use of the electronic education system The possibility of electronic communication Management, organization and careful protection of electronic data exams Practice Electronic facilities Clear instructions for using e-learning components Education environment	Technology Information
	Internet quality Electronic education system, pages, attractive design System training for users (teachers, students and staff) Appropriate use of information technology	
0.73	The teacher how to present the lesson The professor's expertise in the field of teaching Frequent and constructive response and feedback to students Motivation and commitment (commitment and self-confidence) of the teacher Discipline Content production Encouraging students to use electronic class Use of diverse learning styles Motivate students Encouraging interaction between students	Teacher Professor
0.85	Student's attitude to electronic education Students' motivation to learn Goals Student expectations Attributes Student's personal and professional skills Using the class recording file during the semester	Learner
0.73	Ability to record learning performance University evaluation Students' skills Ability to use the recorded class file during the semester	Educational factors
0.81	Support and support of the University of strict protection of electronic data Online support Access to expert support Availability (24 hours a day, seven days a week)	Technical and educational support
0.84·	Facilities Access to the library	Access to site access facilities and electronic

The reliability of the questionnaire was determined using Cronbach's alpha test. As shown in Table 1, almost all factors are at an acceptable level. In this research, two methods of content validity and factor validity were used to evaluate the validity of the model. The validity of the questions was used with factorial validity. Factor validity is a type of construct validity obtained through factor analysis.

Research findings

According to the findings of this research, the average age of 384 responding students is 30.78 year. Out of 384 responding students, 66.7% were female and the rest were male. 64% of the responding students are single, 32% are married, 2.4% are divorced and 1.6% did not answer. The highest percentage of responding students with about 60% were unemployed and 38% were employed.

The average grade point average of the responding students was 16.8. According to the findings of this research, the largest percentage, 47% of the 384 responding students participate in the electronic class and the rest do not. Out of 384 responding students, 45% do not attend class at all. According to Table 2, the highest percentage, that is. more than half of the students, 51.8%, are not satisfied with e-learning. According to the table of research findings, 49.5% of the responding students are not satisfied with access to the professor. About 41 percent are not satisfied with the teacher. About 42 percent are not satisfied with the score of electronic courses.

Table 2. Descriptive findings of education quality indicators

Total	No answer	High	Medium	Low	Express your opinion about the electronics lesson.
100	5·/	2/9	39	51.8	The degree of satisfaction with the electronic course
١··	8·/	10.7	47.4	40.9	The level of satisfaction with the professor and electronic teaching
١··	·/٥	9.9	41.7	47.9	The level of satisfaction with electronic facilities
١··	5·/	11.5	38.5	49.5	The level of satisfaction with the access to the teacher of electronics course
١··	1	14.6	44	7/41	The degree of satisfaction with the Electronic lesson score
١··	1	14.6	41.4	43	How do you evaluate your e-learning learning level?
١··	5·/	27.1	35.7	36.7	How do you evaluate the learning level of your face-to-face training?
١··	3·/	14.1	42.7	43	Ease of use of electronic education system
١··	3·/	11.7	44.8	41.1	Clear instructions for using electronic education components
١··	8·/	12	39.8	47.1	Electronic communication (student interaction with other students, student interaction with professors, professor interaction with students, etc.)
١··	8·/	7.3	43.5	48.4	Availability of electronic education system (24 hours a week)
١··	1	10.4	40.9	47.7	Media factors (use of learning media such as photos, diagrams, graphics, animations, etc.)
١··	3·/	12.8	40.6	46.4	Communication connecting factors
١··	8·	12	43.2	44	Encouraging interaction between students
١··	3·/	15.9	43.8	39.6	Teacher's interest and friendly behavior toward all students
١··	3·/	12.5	38.8	48.2	Inviting students to use electronic education
١··	8·/	8.9	45.1	45.1	Frequent and constructive response and feedback to students
١··	1	29.9	34.1	34.9	Home Internet access
١··	5·/	14.1	38.5	48.9	Students' motivation for e-learning
١··	3·/	9.9	41.9	47.7	Access to the central library website and physical library resources
١··	5·/	12	40.6	46.9	Technical and educational support....

According to Table 2, about 48% were not informed by the university to use e-learning. About 35% do not have access to the Internet at home. According to the findings of this research, 47%

of students are not satisfied with technical and educational support.

About 44 percent are satisfied with the teacher's interest and friendly behavior toward all students. About 43% are satisfied with encouraging electronic interaction among students.

Hypothesis test

The first hypothesis: There is a difference between the evaluations of the desirability of the quality of e-learning indicators based on gender.

Table 3. Independent Samples Test results e-learning and gender

		Levene's Test for Equality of Variances				Sig. (2-tailed)
e-learning	Equal variances assumed	.259	.611	2.014	378	.045
	Equal variances not assumed			2.030	251.646	.043

Based on Levene's Test for Equality of Variances in the table 3, there is a condition of equality of variance for parametric test.

There is a difference in the quality of e-learning indicators from the point of view of male and female students according to the significance level (sig=/045) of the t-test of two independent groups. In other words, the quality of e-learning indicators has not been evaluated equally.

The second hypothesis: there is a difference in the evaluation of the priority of education quality indicators.

Based on the average ratings of the indicators, interpretation of priority and ranking has been done.

Table 4. Average index ranks

mean ranks	Variables
5/1	Electronic interaction
3/75	Information technology
82/3	Professor
3/65	Student
3/50	Educational factors
2/9	Background factors
3/85	University support and support

The results of this test can be seen in Table 4. The average values of the ratings showed that the indicators of "learning style", "professor", information technology and "university support" had the highest average and the most importance, and the index of "background factors" had the least importance.

The third hypothesis: Pedagogical (educational) indicators have quality desirability.

Based on the five-point Likert scale in the questionnaire, for the ratio test, less than 3 dissatisfaction and more than 3 satisfaction have been evaluated.

Table 5. results of ratio test

Result	the significance coefficient	the observed ratio	Variables
Satisfaction	0.05	0.59	Electronic interaction
average satisfaction	0.02	0.50	Information technology
Satisfaction	0.000	0.61	Professor
Satisfaction	0.00	0.25	Student
average satisfaction	0.04	0.51	Educational factors
average satisfaction	0.05	0.50	Background factors
Low satisfaction	0.00	.43	University support
Average satisfaction	0.01	0.53	Access to facilities

According to the coefficient and the success ratio of the indicators in Table 5, "teacher", "electronic interaction" and "access to facilities" are desirable factors, and "university support" is a low-valued utility. Also, the background factor variable has been evaluated at the moderate level of desirability.

Multivariate regression analysis
Among the independent variables that entered the equation, the results show that the coefficient of determination in this study is equal to 0.734. This means that the variables entered into the equation have been able to explain 73% of the variance of changes related to the dependent variable.

Table 6. results of regression analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.857[a]	.734	.283	.67602

Based on Multivariate regression analysis, the results show that among the independent variables entered into the equation, the Electronic lesson score, the teacher's interest and friendly behavior toward all students, inviting students to use electronic education, Evaluation of face-to-face training and Ease of use of electronic education system have the greatest impact on evaluating the desirability of electronic education.

Table 7. results of regression analysis

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Inviting students to use electronic education	.342	.159	.304	2.152	.041
Teacher's interest and friendly behavior toward all students	-.324	.153	-.290	-2.113	.044
Ease of use of electronic education system	.285	.148	.269	1.933	.05
Evaluation of face-to-face training	.301	.127	.278	2.361	.026
Electronic lesson score	.404	.136	.362	2.978	.006

In Discussion

This research was conducted with the aim of investigating the desirability of Payam Noor University's e-learning quality indicators using a survey method.

According to the findings of this research, the average age of 384 responding students is 30.78 year. Out of 384 responding students, 66.7% were female and the rest were male. 64% of the responding students are single, 32% are married, 2.4% are divorced and 1.6% did not answer. The highest percentage of responding students with about 60% were unemployed and 38% were employed.

The average grade point average of the responding students was 16.8. According to the findings of this research, the largest percentage, 47% of the 384 responding students participate in the electronic class and the rest do not. Out of 384 responding students, 45% do not attend class at all. The highest percentage, that is. more than half of the students, are not satisfied with e-learning. According to the research findings, 49.5% of the responding students are not satisfied with access to the professor. About 41 percent are not satisfied with the teacher. About 42 percent are not satisfied with the score of electronic courses.

Based on the findings of this research, there is a significant difference between the evaluations of the quality of e-learning indicators based on gender. In other words, the quality of e-learning indicators has not been evaluated equally. There is a significant difference in evaluating the quality of e-learning indicators from the point of view of male and female students. The results of this research are consistent with the research of Yamoah and Yawson (Yamoah and Yawson, 2021).

The average values of the ratings showed that the indices of "Professor", Information Technology" and "University Support" have the highest average and the most importance, and the index of "Contextual Factors" has the least importance. The results of the research with the research of Ghasemi and Shahriari the person is aligned in the indicators of "master", information technology and background factors.

Based on the ratio test, "teacher ", "electronic interaction" and "Access to facilities" are desirable factors. "University support and support" has been evaluated as a low desirability, which is in line with the results of Anari and Mohammadi's research (2013). Also, the background factors variable has been evaluated at an average level of desirability.

Multivariate regression analysis showed that among the variables included in the equation, the variables of listening to recorded classes during the semester, degree and access to the library,

could explain 87% of the variance of changes related to the dependent variable. The results of this research are in line with the research of Al-Farihat et al. (2019), Jahanian and Praveda (2013), Rahimi et al. (2013) and Kay Kay (2011) based on satisfaction in accessing the facilities of virtual education centers.

Also, a notable percentage of students with 45% do not participate in class at all.

In the research of Benson Song and others (2001) by listing 5 components in e-learning, they stated that e-learning is a system in which all components must have a proper function for its success. By studying 538 students, he stated the critical success factors of e-learning in the form of 4 main groups: "Teacher", "Instructor", "Information Technology" and "Academic Support". They have raised its basis.

Considering that the evaluation of success factors in e-learning differs in terms of importance based on the context, must to adopt different strategies to recognize these factors.

For success, a comprehensive model of success is needed (Aum and Achille, 2018). Considering that the e-learning system is an information system that integrates human (students and professors) and non-human (such as learning management systems), must examine the different dimensions of success in relation to both entities.

Based on multivariate regression analysis, among the independent variables included in the equation, the grade of the electronic course, the interest and friendly behavior of the teacher (electronic interaction) with all students, inviting students to use electronic education (electronic interaction), face-to-face evaluation Face training and the ease of use of the electronic training system have the greatest effect in evaluating the desirability of electronic training, which is in accordance with the results of Syaf (2023) in electronic interaction.

The results of some research in the field of e-learning have increased our understanding of the important factors of e-learning such as system quality, information quality, service quality, satisfaction and usefulness. But must conduct different research with qualitative and mixed methods to help discover and identify quality improvement factors along with quantitative research.

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