Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 6 Issue 20 (March 2021) PP. 17-28
DOI: 10.35631/JISTM.620003

JOURNAL OF INFORMATION SYSTEM AND TECHNOLOGY MANAGEMENT (JISTM)
www.jistm.com

DIAGNOSIS AND EVALUATION OF E-LEARNING QUALITY DIMENSIONS: AN EXPLORATORY STUDY

Farsat Shaban[1], Dilgash Qadir M. Salih [2*], Waleed Al-Zaidi[3]

[1] Technical College of Administration, Duhok Polytechnic University, Duhok, Iraq.
Email: farsat.ali@dpu.edu.krd
[2] Amedi Technical Institute, Duhok Polytechnic University, Duhok, Iraq.
Email: dilgash.qadir@dpu.edu.krd
[3] Technical Institute of Baquba, Middle Technical University, Baghdad, Iraq.
Email: dr.waleedah19@mtu.edu.iq
[*] Corresponding Author

Article Info:

Article history:
Received date: 28.02.2021
Revised date: 15.03.2021
Accepted date: 28.03.2021
Published date: 31.03.2021

To cite this document:

Shaban, F., Salih, D. Q. M., & Al-Zaidi, W. (2021). Diagnosis and Evaluation of E-Learning Quality Dimensions: An Exploratory Study. Journal of Information System and Technology Management, 6 (20), 17-28.

DOI: 10.35631/JISTM.620003.

Abstract:

The aim of this study is to diagnose and evaluate e-learning quality dimensions (content, accessibility, quality of system used, evaluation, and feedback) from the students prospective in Iraqi institutes and universities after the e-learning system was implemented due to the emergence of the Corona pandemic (covid-19) at the beginning of 2020. The study is based on the following question: Are the dimensions of e-learning quality available in Iraq? Knowing the answer to this question is considered a contribution of the current study because there are no previous studies that addressed the topic. The theoretical part of the research relied on articles that have been published in high-quality journals. As for the data of the practical part, it was obtained through the electronic questionnaire. The number of received forms reached (1016) forms. The study reached a conclusion that the weak implementation of e-learning quality dimensions in Iraqi higher education institutions. The study recommended Iraqi higher education institutions pay more attention to all dimensions of e-learning.

Keywords:

E-Learning, Quality Dimensions, Higher Education Institutions

Introduction

During the previous years, the academic business environment all over the world faced huge challenges as a result of technological development and extreme competition (Shaban et al., 2015). This became a reality that e-learning has become a part of education methods which

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 6 Issue 20 (March 2021) PP. 17-28
DOI: 10.35631/JISTM.620003

cannot be dispensed with (Bauk, 2015). Numerous educational institutions have adopted the method of combining traditional education and electronic education, and it was actually recognized in (2002) (Graham et al., 2013). Since (2008) educational institutions in developed countries have been making great efforts to adapt with existing changes that happen in today's world, but developing countries need clear strategies to adapt to these changes (Elango et al., 2008). Developing countries have introduced e-learning systems to save costs and improve students' understanding (Al-Seef, 2005). Furthermore, it provides opportunities to enhance its learning development (Behera, 2013).

At the beginning of 2020, the whole world faced a big health problem which is the Coronavirus (Covid 19). Due to that, most countries adopted isolation and social distance procedures that affected all vital sectors, including education. This matter forced and motivated governments to move towards e-learning systems as a reality imposed by the circumstances and became compulsory as a temporary alternative to traditional education systems. Asynchronous e-learning has become applied in most countries, despite their different capabilities. The question that arises now is whether asynchronous e-learning applied in Iraq, applies to it some educational quality dimensions from the viewpoint of learners?

E-learning implementation has become almost mandatory in all Iraqi institutes and universities after the emergence of the Corona pandemic (covid-19) (Ministry of Higher Education in Iraq, 2020). The problem arises when it is known that it lacks the necessary infrastructure for e-learning in addition to other critical problems (Khazraji and Ali, 2018). On the other hand, the lack of knowledge of the critical dimensions that affect the quality of e-learning and ignoring it may deepen the existing problem, and the education provided will burden students more than the benefit provided to them. The idea of the current study comes from this mentioned question and became the subject of this study. Based on the literature, the study posits the following hypotheses.

H1: E-learning quality dimensions are available in accredited e-learning in Iraqi institutes and universities.
H2: The implementation of e-learning quality dimensions varies from one dimension to another in the Iraqi institutes and universities.

Literature Review

E-learning Quality

E-learning is a form or system of education that encourages the use of information and communication technology (ICT) in teaching, reading, and the discussion process (Kimwise, 2019). It is learning that occurs through electronic means (Sugant, 2014). It is the use of Internet technologies to provide many solutions to enhance knowledge and performance, and it provides e-learning technologies to learners with time and content control (Jethro et al., 2012). It is an effective tool for overcoming distance that ensures the transfer of knowledge to any point or part of the world (Grifoll et al., 2010). There are huge differences between E-learning and traditional learning methods (Desai, et al., 2008). E-learning according to Zhang (2004) is divided into synchronous and asynchronous education. Synchronous e-learning is direct education and interaction occurs between the learner and the teacher and the meeting is usually scheduled, while the asynchronous is not direct, but the educational materials are applauded

Journal of Information System and Technology Management
EISSN: 0128-1666
JISTM
Volume 6 Issue 20 (March 2021) PP. 17-28
DOI: 10.35631/JISTM.620003

and followed by students whenever they want (Shahabadi & Uplane, 2015). Regarding e-learning quality, several studies indicated that quality will determine the future of e-learning (Ehlers, 2004). The main issues facing e-learning is the quality problem when compared to traditional education systems. Quality is a critical issue for education process and for e-learning as well (Ajmera & Dharamdasani, 2014). The integration of quality concept in e-learning places it within the context of ensuring the quality of developed education system (Grifoll et al., 2010). As e-learning has become more widespread, concerns about the quality of education service have increased (Arguelles et al., 2013). Because defining the dimensions of e-learning quality is a complicated task, due to its multiple dimensions and the difference of views of the participants in it (Jung, 2010). Its dimensions also differ according to the diversity of studies and institutions studied (Al-Otaibi, 2019). Because of its multiple dimensions, its application also requires the participation of a multidisciplinary team to ensure the achievement of quality in it (2009 Durao & Sarmento). The process of determining quality dimensions of e-learning is extremely important as it is linked to attain quality assurance in e-learning, and these dimensions are considered a set of rules, reference frameworks or items that are reliable for measurement (Al-Otaibi, 2019). E-learning quality dimensions mean those specifications and conditions that must be met in education system so that they lead to quality outputs that work to meet the needs of beneficiaries (Ahmed, 2012)

E-learning Quality Dimensions

Several studies have been conducted on e-learning quality in developed countries but there are a few studies on this topic in developing countries (Pham et al., 2019). Attempting to assess quality of services whether education or other services and finding suitable dimensions for them is not a new topic. The (SERVQUAL) model that has been presented by (Parasuraman et al., 1988) is one of the oldest models used to measure service quality in general. The model measures the quality of service through the gap between expected service and actual service performance, and this model was developed by many authors later. The dimensions of the model were reduced from ten dimensions to five (tangibility, reliability, responsiveness, assurance, and sympathy) (Shaban & Salih, 2020). A number of authors believe that this model is not appropriate for e-learning (Sugant, 2014). (Parasuraman et al., 2005) then presented the (E-S-QUAL) model to study electronic service quality. The study identified two scales. The first scale included four dimensions: efficiency, fulfillment, system availability and privacy.

And the second scale included three dimensions: response, compensation, and contact. Several studies have tried to determine e-learning quality dimensions from the viewpoint of students (the service recipient), and there are other studies that have identified these dimensions from the viewpoint of teachers (service provider) (Jung, 2010). We review some studies that have identified these dimensions from the viewpoint of students.

The study that has been conducted by (Elango et al., 2008) tried to identify the most important issues affecting the dimensions of e-learning quality, and identified six dimensions: content, effectiveness of the delivery method, teacher support and student commitment, online interaction, compliance and confidence in the course, the suitability of test tools, and the result of the study identified that the learners were satisfied with the curriculum and the method of presenting the study materials, but they were not satisfied with the approved contact method. Kn Durao & Sarmento (2009) suggested a model that takes into account the ethical dimension within the dimensions of e-learning and identified four dimensions: analysis, structure and

Journal of Information System and Technology Management
EISSN: 0128-1666
Volume 6 Issue 20 (March 2021) PP. 17-28
DOI: 10.35631/JISTM.620003

includes three sub-dimensions (technology, people and curriculum), implementation and evaluation. Jung (2010) identified seven dimensions of e-learning quality, namely: interaction, employee support, institutional quality assurance and institutional credibility, learner support, information, publicity, and learning tasks. The study indicated that determining e-learning quality dimensions is not an easy task, and the study stated that determining the dimensions of e-learning quality from the students' point of view is to get to know their opinions and to reinforce the strengths of the dimensions of the approved quality. Another study that has been conducted by (Martínez-Arguelles et al., 2013) developed a tool to measure the quality of e-learning service. The scale contains four dimensions that include 24 items: Basic tasks (teaching), facilitation or administrative services, support services, and user interface. The study concluded that basic tasks (teaching) is the most important dimension in determining the quality of e-learning service in general. Oun Alla (2013) identified four dimensions of system quality and its impact on e-learning: (ease of use, accessibility, reliability and stability), and from the findings of analysis of dimensions, the study found that ease of use is the strongest dimension that affects the quality of e-learning system. Sugant (2014) presented a model from the students' perspective and identified four dimensions that included (12) items: content, ease of use, technology, and response. The study stated that the institutions that provide e-learning have to take into account these dimensions. Ajmera & Dharamdasani (2014) identified four dimensions of e-learning quality mainly: delivery, evaluation, instructor efficiency, and learner service (customer). The study stated that the views of users should be taken into account when determining e-learning quality and should classify appropriate standards when determining the dimensions of e-learning quality. Arguelles et al, (2016) identified four dimensions of e-learning service quality, namely (teaching, administrative services, additional services and a virtual learning environment (user interface)). The study aimed to know its impact on the quality of perceived service among students and their satisfaction, and the results showed that teaching dimension was one of the most important dimensions. Finally, Pham et al., (2019) identified three dimensions of e-learning quality, which are: e-learning system quality, design and materials of e-learning, and management and support of the e-learning system. The study concluded that e-learning system quality dimension is one of the most important dimensions that have an impact on student satisfaction.

We note from the above studies that there are differences between the authors in previous studies about the number and what are the dimensions of e-learning quality and the reason is due to the fact that it is difficult to diagnose and evaluate services in general, including the educational service, as well as their implementation from one place to another may differ due to the possibilities and problems associated with implementation. The current study will be based on four dimensions which are: content, accessibility, quality of system used, and evaluation). These dimensions are the most suitable dimensions for the e-learning environment in Iraq, according to many experts (university professors) whose views were taken, in addition to the existence of studies that indicated the importance of these dimensions, including Reisetter et al., (2007) and Peltier et al., (2007) in their study considers that the content of the course is an important dimension in determining e-learning quality, and affects the course structure and content the extent of interaction between students and faculty staffs. (Yang et al., 2005) believes that accessibility is one of the most important dimensions in determining the quality of e-learning service. (Yusuf & Al-Banawi, 2013) considers that the advantages of technology used, and through effective access speed can achieve quality in e-learning. (Pham et al., 2019) shows that the quality of e-learning system is one of the most important dimensions. (Reisetter et al., 2007) found that the course content and feedback are among the

Journal of Information System and Technology Management
EISSN: 0128-1666
Volume 6 Issue 20 (March 2021) PP. 17-28
DOI: 10.35631/JISTM.620003

most important dimensions that affect the quality of e-learning services. (Martínez-Argüelles et al., 2014) illustrated the importance of feedback dimension in e-learning and showed that students give this dimension more importance than traditional education systems.

Research Methodology

The study relied on organizing and writing the theoretical part of the research on articles that have been published in high quality journals that are indexed in clarivate analytics and Scopus databases related to the theoretical part of the topic. With regard to the practical part of the study, an electronic questionnaire was sent to students in institutes and universities in Iraq through various means of communication. The number of responses was (1016). The questionnaire form is considered the main means of data collection and the items of e-learning quality dimensions have been prepared on the opinions of the authors: (Pham et al., 2019); (Bauk, 2015); (Sugant, 2014) ;(Elango et al ., 2008).

The questionnaire included two parts:

The first part relates to characteristics of respondents (gender, and the certificate that the student will obtain).

The second part of the questionnaire focuses on e-learning quality dimensions, which are four dimensions, and each dimension includes four variables for each variable one question has been prepared for as follow:

The first dimension: Content (X1): It includes four variables, namely: (design of lectures V1, ideas and modernity of lectures V2, clarity of lectures V3, and completion V4).

The second dimension: Accessibility (X2): It includes four variables which are (Ease of Access V5, Interaction V6, Navigating V7, and Tracking V8).

The third dimension: The quality of system used (X3): It includes four variables (speed of system V9, reliability V10, support V11, and safety and privacy V12).
The fourth dimension: Evaluation and feedback (X4): It included four variables, which are: (assessments V13, evaluation methods V14, feedback V15, and interaction of instructors with students V16).

The Third-point Likert scale was used and the scale grades were arranged from (Not applicable, somewhat applicable, applicable) with weights (1, 2, 3), respectively, after which the direction of the scale ray was calculated by the hypothetical mean and according to Table (1).

Table 1: Hypothetical Mean According To The Three-Point Likert Scale

Scale	Mean
Not applicable	From 1 to 1.66
Somewhat applicable	From 1.67 to 2.33
Applicable	From 2.34 to 3

Source: (Pimentel, 2010)

Journal of Information System and Technology Management
EISSN: 0128-1666
JISTM
Volume 6 Issue 20 (March 2021) PP. 17-28
DOI: 10.35631/JISTM.620003

In order to attain accurate indicators about the relationships between research variables and what serves its objectives and hypothesis testing, the statistical program SPSS Ver 21) was used to conduct the required statistical tests, namely:

1. Validity tests of questionnaire data for statistical analysis (Validity, reliability, independence and variance).
2. Statistical description, which includes mean and standard deviations.
3. T test to determine the significance of dimensions.

Data Analysis

After the electronic questionnaire was distributed among students in different institutes and universities in various Iraqi governorates, 1016 forms were answered and received. The percentage of males was (54.9%), while female was (45.1%). while the proportion of institute students who participated in the study was (33.4%) and bachelor students (66.6%).

The content of this part of the study includes the statistical description (mean, standard deviation, and T-test) for the dimensions and variables of e-learning. As perceived by the study sample, based on the Three point Likert scale, to achieve this, the researcher used SPSS 21. In order to make sure that the data that has been collected through electronic questionnaire are appropriate for statistical analysis, the following tests have been conducted.

Validity and Reliability

Reliability refers to the ability of instruments to measure what is intended to measure (Campbell & Stanley ,1963). The best method to verify the reliability of the scale is to be accepted by a number of relevant experts (Rasul, 2015). Therefore, the researchers tested the reliability of the questionnaire before it was distributed by presenting it to a group of experts at the level of a professor.

Reliability refers to the ability of the scale to give the same results in different circumstances. Reliability is related to internal consistency. The most common method of measuring internal consistency is the Cronbach's alpha method (Drost, 2011). Robinson (2017) finds that many researchers believe that the lowest acceptable level of the scale in human studies is ($\alpha \geq 0.70$). From the results of Table (2), we find that the value of Cronbach's alpha is ($\alpha \geq 0.70$), thus we can prove the reliability and we can rely on the obtained data.

Table 2: The Value of Cronbach's Alpha.

Scale and factors	items	Cronbach's alpha
Over all	16	0.944
X1	4	0.790
X2	4	0.826
X3	4	0.829
X4	4	0.830

Source: Prepared By Authors Using SPSS Program

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 6 Issue 20 (March 2021) PP. 17-28
DOI: 10.35631/JISTM.620003

Independence Test

It indicates the extent of the existence of the phenomenon of multi-collinearity between the dimensions of the study. To identify the existence of multi-collinearity, Variance Inflation

Factors (VIF) and Tolerance tests have been applied for each dimension.
In order to confirm the (VIF) test, its value should not be greater than the standard value (3), given that the study data is of a descriptive type. And Tolerance values must be greater than the significance level (0.05). From the results of the independence analysis in Table (3), it was found that the values of (VIF) for all dimensions of the independent variables are less than (3). The values of Tolerance test are all greater than (0.05), this means that a condition of independence is present in current study data and therefore this allows to conduct statistical tests.

Table 3: Collinearity Statistics

Dimensions	VIF	The standers value of VIF	Tolerance	The standers value of Tolerance
X1	0.411	greater than the significance level (0.05)	2.434	The value should not be greater than the standard value (3)
X2	0.358		2.976	
X3	0.358		2.829	
X4	0.352		2.837	

Source: Prepared By Authors Using SPSS Program

Variance Test

To verify the homogeneity condition for the study dimensions, the data were subjected to (Levene) test, and the results of the (Levene) test presented in Table (4) indicated that the condition of homogeneity of variance was fulfilled, because the values of calculated (P.value) are smaller than the default significance level which is (0.05).

Table 4: Test of Homogeneity of Variances (Levene's)

Dimensions	Levane statistics	P.Value
Over all	25.718	0.000
X1	14.023	0.000
X2	20.306	0.000
X3	13.998	0.000
X4	20.574	0.000

Source: Prepared By Authors Using SPSS Program

Based on the results of the previous test, it is clear that the data obtained through the electronic questionnaire are valid for statistical analysis. To verify the study hypotheses, the statistical tests illustrated in table (5) were conducted.

Journal of Information System and Technology Management
EISSN: 0128-1666
Volume 6 Issue 20 (March 2021) PP. 17-28
DOI: 10.35631/JISTM.620003

Table 5: Statistical Tests For E-learning Quality Dimensions And Its Variables.

e-learning quality dimensions	Variables	Frequencies percentage based on Likert scale			Mean	Standard deviation	T-test	Sig. (2-tailed)
		Not Applicable	Applicable to some extent	Applicable				
Content X1	V1	71.1	22	6.1	1.358	0.607	71.115	.000
	V2	61.5	32.1	6.4	1.448	0.613	75.13	.000
	V3	65.4	25.8	8.7	1.432	0.647	70.34	.000
	V4	54.9	44.3	11.9	1.569	0.694	71.83	.000
Average X1		63.22	31.05	8.27	1.452	0.641	104.59	.000
Accessibility X2	V5	67.3	24.9	7.8	1.406	0.630	70.93	.000
	V6	70.7	23.5	5.8	1.352	0.589	73.02	.000
	V7	65.8	27.2	6.9	1.411	0.617	72.74	.000
	V8	69.4	24.1	6.5	1.371	0.603	72.28	.000
Average X2		68.3	24.92	6.75	1.385	0.519	84.87	.000
The quality of system used X3	V9	64.3	27.4	8.3	1.439	0.642	71.28	.000
	V10	66.1	26.1	7.8	1.416	0.630	71.44	.000
	V11	58.1	33	8.9	1.506	0.654	73.25	.000
	V12	51.4	37.5	11.1	1.598	0.681	74.66	.000
Average X3		59.97	31	9.02	1.490	0.531	89.22	.000
Evaluation and feedback X3	V13	64.2	28.1	7.7	1.435	0.632	72.18	.000
	V14	58.7	33.1	8.2	1.495	0.643	73.88	.000
	V15	65.8	28.2	6	1.400	0.599	74.34	.000
	V16	69.9	21.2	8.9	1.389	0.645	68.52	.000
Average X4		64.65	27.65	7.7	1.430	0.535	84.98	.000
Overall average		64.03	28.54	7.43	1.439	0.449	101.79	.000

Source: Prepared By Authors

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 6 Issue 20 (March 2021) PP. 17-28
DOI: 10.35631/JISTM.620003

Based on the results of Table (5), the hypotheses of the study will be tested as follow:

1- First hypotheses test:
The results indicate that the answers of the respondents about e-learning quality dimensions through its variables (V1-V16), the results show that the applicable rate of e-learning quality dimensions was (7.43%), which is a very small and unexpected percentage according to the opinion of the respondents. While the overall average for a non-applicable rate was (64.03%) and this is a high percentage, these results support the value of the general mean (1.439) which is less than the value of the hypothetical average approved in this study. This is logical to prevail over non-conformity. The standard deviation value was (0.449), which is an acceptable percentage that shows that the respondents' answers are not dispersed. These results support calculated T value, which is (101.79) that is significant at the significance level (0.05).

Based on these results, the first hypothesis of the study which states (e-learning quality dimensions are available in accredited e-learning in Iraqi institutes and universities) will be rejected. As for what are the reasons for the lack of these dimensions, researchers have not been able to confirm them, despite the existence of a few studies about this in Iraq, which indicated that there are obstacles in adopting e-learning in Iraq. This is due to the lack of the necessary e-learning infrastructure.

2- Second hypotheses test:
The results indicate that there is a variance in agreement about the extent of implementing e-learning quality dimensions (X1, X2, X3, X4) in higher education institutions in Iraq. Dimension X3 came first that means it is the most implemented dimension, and secondly X1 and then X4 third, and finally the X2 dimension. These results show that the X3 dimension, which indicates the system used, has the most quality ingredients, despite the generally low implementation rate. Among its variables, the most contributed to the high percentage of use is (V12) which indicates safety and privacy. As for the ease of access X2 is the least applicable among the dimensions, and variable (V6) reduced the implementation rate of this dimension, which indicates the interaction.

Based on these results, the first hypothesis of the study which states (The implementation of e-learning quality dimensions varies from one dimension to another in the Iraqi institutes and universities) will be accepted. Although the implementation rate for these dimensions is low, according to the respondents' opinion. However, it varies from one dimension to another. As for what are the reasons for the variance in these dimensions, the researchers could not confirm them, and there were no studies on this subject in Iraq, according to the knowledge of the researchers

Conclusion and Recommendations

E-learning has become a reality after the emergence of Corona pandemic (covid-19) all over the world, including Iraq, due to the implementation of e-learning as a temporary alternative to traditional education system. Then more attention was paid to its quality by determining the quality dimensions in e-learning. There are many studies on e-learning and its obstacles in Iraq, but we could not find any study on the quality of e-learning and evaluating its dimensions in Iraq from the students' perspective. Thus, this study will be a new contribution in this field. Previous studies did not specify what are the dimensions of e-learning quality that can be used to evaluate e-learning anywhere. The current study depended on dimensions (content,

Journal of Information System and Technology Management
EISSN: 0128-1666
JISTM
Volume 6 Issue 20 (March 2021) PP. 17-28
DOI: 10.35631/JISTM.620003

accessibility, quality of user evaluation, and evaluation and feedback). It was extracted from the results of previous studies that suitable the nature of electronic study in Iraq. The results of the current study indicate that these dimensions somehow are absence in e-learning in Iraqi higher education institutions and varies from one dimension to another. Accessibility dimension was the least applied and after it the evaluation and feedback. This means that students really suffer from access to e-learning, especially the interaction with presented lectures. Likewise, evaluation and feedback dimension are not carried out in a manner that meets the needs and interests of students, and this is according to their opinion, especially working on the opinions and suggestions of students derived from the process of feedback.

The study suggests serious attention to the studied dimensions by Iraqi institutes and universities by focusing on the variables of each dimension specified in this study or other variables as well. And work to provide it in e-learning delivered, especially accessibility, evaluation and feedback dimensions. And determining the real reasons that led to the non-implementation of these dimensions in e-learning and let students' opinions be the starting point for achieving this goal. The study also suggests conducting further studies on the topic to determine the real reasons for not implementing these dimensions and knowing whether they are related to the problems and obstacles of implementing e-learning, or to the problems of students or instructors.

References

Ahmeed , Reham. (2012). Using E-learning to achieve quality standards in the educational process, *The Arab Journal for Quality Assurance of E-Learning*, Vol.9. No.2

Ajmera, R., Dharamdasani, D. (2014). E-Learning Quality Criteria and Aspects. *IJCTT*, Vol.12. No. 2.

Al-Otaibi, Abdal Majeed. (2019). Quality standards in e-learning systems, *The Arab Journal of Literature and Humanities.* Vol.7. No. 3

Al-Saif (2005), 'The motivating and inhibiting factors affecting the use of Web-Based Instructionat the University of Qassim in Saudi Arabia', ETD Collection for Wayne State University.

Bauk , Sanja .(2015). Assessing Students' Perception Of E-Learning In Blended Environment: An Experimental Study, Procedia - *Social and Behavioral Sciences* 191 (2015) 323 – 329.

Behera, Santosh Kumar.(2013). E- and m-learning: a comparative study, *International Journal on New Trends in Education and Their Implications*, Vol.4. No. 3.

Campbell, T. & Stanley C. (1963). Experimental and quasi-experimental designs for research, Boston, Houghton Mifflin

Ehlers, Ulf- Denial. (2004). Quality in E-learning the learner as a key quality assurance Category, *European Journal, Vocational training* No.29.

Elango , Rengasamy., Gudep , Vijaya & Selvam . M. (2008). Quality of e-Learning: An Analysis Based on e-Learners' Perception of e-Learning, *Electronic Journal e-Learning*, Volume 6 Issue 1 (31-44).

Graham, C.R., Woodfield, W. and Harrison, J.B. (2013). "A framework for institutional adoption and implementation of blended learning in higher education", *Internet and Higher Education*, Vol. 18 No. 3.

Grifoll, Joseph., Huertas, Esther., Prades, Anna., Rodrguez, Sebastin.,Rubin, Yuri., Mulder, Fred & Ossiannilsson, Ebba. (2010). *Quality ssurance of E-learning*. http://www.enqa.eu/pubs.lasso

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 6 Issue 20 (March 2021) PP. 17-28
DOI: 10.35631/JISTM.620003

Jethro et al,. (2012). E-Learning and Its Effects on Teaching and Learning in a Global Age, *International Journal of Academic Research in Business and Social Sciences*, Vol. 2, No. 1.

Jung, I. and Latchem, C. (2012), Quality Assurance and Accreditation in Distance Education: Models, Policies and Research, Routledge, New York, NY.

Jung, Insung. (2010).The dimensions of e-learning quality: from the learner's Perspective, *Education Tech Research* Vol. 59, No. 2.

Kimwise et al,. (2019). Barriers and Motivators to Implementation of an E-Learning and Multimedia Technology towards Improving School Education Standards in Mathematics and Health Education in Nakivale Refugee Settlement, Uganda, *International Journal of Trend in Scientific Research and Development*. Vol. 3. No. 6.

Martinez-Arguelles, J. M., Callejo, B. M., & Farrero, M. C. J. (2013). Dimensions of perceived service quality in higher education virtual learning environments. *Universities and Knowledge Society Journal*, Vol. 10. No.1.

Martínez-Arguelles, M., Plana, D., Hintzmann, C., Batalla- Busquets, J & Badia, Marc. (2014). Usefulness of feedback in E-learning from the students' perspective, *IC journal*, Vol. 11. No.4.

Ministry of Higher Education and Scientific Research on Iraq . (2020), E-learning application instructions. http://mohesr.gov.iq/en/ .

Oun Alla , Majed. (2013). The Impact of System Quality in E-learning System, *Journal of Computer Science and Information Technology*, Vol. 1. No. 2.

Parasuraman, A., Zeithaml, V.A., & Malhotra, A. (2005). E-S-QUAL: A multiple-item scale for assessing electronic service quality. *Journal of Service Research*, Vol.7. No.3.

Peltier, W. J., Schibrowsky, A. J., & Drago, W. (2007). The interdependence of the factors influencing the perceived quality of the online learning experience: A causal model. *Journal of Marketing Education*, Vol.29. No. 2.

Pham , Long ., Limbu, Yam ., Bui, Trung., Nguyen, Hien & Pham , Huong. (2019). Does e-learning service quality influence e-learning student satisfaction and loyalty? Evidence from Vietnam, *International Journal of Educational Technology in Higher Education*, Vol. 16 No.7.

Pimentel, Jonald.(2010). A note on the usage of Likert Scaling for research data analysis, USM R & D, Vol.18. No .2. . ISSN 0302-7937 .

Rasul, A. (2015). The role of positive thinking on the perception of students: a case study at the Salahddin University, Doctoral thesis , Salahddin University.

Reisetter, M., LaPointe, L., & Korcuska, J. (2007). The impact of altered realities: Implications of online delivery for learners interactions, expectations, and learning skills, *International Journal on E-Learning*, Vol. 1. No. 6.

Sarmento, Manuela & Durão, Diamantino.(2009). Ethics dimension in E-Learning, *Revista de Administração FACES Journal*, Vol. 8, No. 2.

Sugant , R. (2014). A Framework for Measuring Service Quality of E-Learning Services , *Proceedings of the Third International Conference on Global Business, Economics, Finance and Social Sciences (GB14Mumbai Conference) Mumbai, India.* 19-21 December 2014.

Shaban, Farsat A & Salih , Dilgash Q.(2020). The role of logistics service quality dimensions on marketing flexibility: An empirical study in Dairy factories in Duhok governorate, *Uncertain Supply Chain Management Journal*, Vol.8. No. 2.

Shaban, A., Salih, M. Q. D., & Al-Zaidi, H. A. W. (2015). The impact of creativity elements on educational service quality dimensions–an exploratory study of academic staff

Journal of Information System and Technology Management
EISSN: 0128-1666
JISTM
Volume 6 Issue 20 (March 2021) PP. 17-28
DOI: 10.35631/JISTM.620003

perceptions in Duhok Polytechnic University, *the 5TH International conference on Management*, Godollo, Hungary.

Shahabadi, Mehdi Mehri &, Megha, Uplane . (2015). Synchronous and asynchronous e-learning styles and academic performance of e-learners, *Procedia - Social and Behavioral Sciences* Vol.176.

Yang, Z., Cai, S., & Zhou, N. (2005). Development and validation of an instrument to measure user perceived service quality of information presenting web portals. *Information & Management*,Vol. 42. No.4.

Yusuf, Nadia & Al-Banawi, Nisreen. (2013). The Impact Of Changing Technology: The Case Of E-Learning, Contemporary *Issues In Education Research*, Vol. 6. No. 2.

Zhang, D. (2004). Virtual mentor and the lab system – Toward building an interactive, personalized, and intelligent e-learning environment, *Journal of Computer Information Systems*, pp. 35–43.