

Conceptualizing the future of e-Learning: examining students' readiness, satisfaction, and intention to continue employing remote learning in higher education landscape

Nahla M. Moussa^{a, 1}

^aAmerican University in the Emirates, Dept. of Education – Dubai (United Arab Emirates)

(submitted: 9/1/2022; accepted: 8/8/2023; published: 28/8/2023)

Abstract

Online learning is a flexible education environment in which instructions and learning activities are delivered through the internet. This quantitative research study seeks to explore students' readiness to continue employing e-Learning whilst also measuring students' satisfaction with the e-Learning platform/system among higher education students in a Middle Eastern country, United Arab Emirates (UAE). Furthermore, the paper discovers the factors that predict students' intention to continue utilizing e-Learning in the future. Liaw's model (2008) was employed to report students' readiness, satisfaction with e-Learning system quality, multimedia integrated into instructions, interactive learning activities, and students' intention to continue using online learning. A sample consisting of 476 higher education students from multiple backgrounds and different majors volunteered to take part in the study. *Descriptive analysis* and *Multivariate analysis* techniques including *Correlation Coefficient*, and *Stepwise Linear Regression* were chosen to achieve the study objectives. Data analysis demonstrated that higher education students showed a high readiness level (82%) towards e-Learning and were found with a medium satisfaction level (77%) with the e-Learning system that they are using. Moreover, students' *satisfaction with e-Learning*, the *e-Learning system quality*, and *students' perceived usefulness* were found to be significant contributors to students' behavioral intention to keep on utilizing the e-Learning platform potentially. The findings recommend examining students' readiness for e-Learning at the beginning of each semester before starting teaching to set up academic plans that promote the effectiveness of e-Learning.

KEYWORDS: e-Learning, Students' Satisfaction, Self-efficacy, e-System Quality.

DOI

<https://doi.org/10.20368/1971-8829/1135619>

CITE AS

Nahla, M.N. (2023). Conceptualizing the future of e-Learning: examining students' readiness, satisfaction, and intention to continue employing remote learning in higher education landscape. *Journal of e-Learning and Knowledge Society*, 19 (2), 1-11. <https://doi.org/10.20368/1971-8829/1135619>

1. Introduction

At the beginning of spring 2020, the Coronavirus epidemic was announced by the World Health Organization (WHO) as a worldwide pandemic, hence, necessitating the initiation of a global task force to relieve this crisis. The increased prevalence of the Coronavirus disease mandated an immediate transition to e – lifestyle. One of the solutions that appeared as a relief to the pandemic was the closure of schools and

shifting to e-Learning as an alternative delivery method of learning where learners and educators are separated by physical distance, which obliged activating e-Learning through most grade levels worldwide. Although the advantages of e-Learning and its wide implications in many educational settings, some researchers (e.g., Wijaya et al., 2020; Farmer and West, 2019; Peytcheva-Forsyth et al., 2018; Ullah et al., 2017) discussed many issues and concerns related to e-Learning. These issues are associated with the students' e-self-efficacy, students' satisfaction with e-Learning, students' interaction during e-classes, and the quality of the e-system. Students were pushed to adapt to e-Learning to pursue their degrees. The inquiry now is related to the future of online learning, and the students' continuation to use it. Are students satisfied with it and intend to continue virtual learning even after the pandemic? The unanticipated transition to e-Learning required identifying the factors that could influence the dynamics of the e-Learning process. Furthermore,

1 corresponding author - email: nahla.moussa@ae.ac – address: Dubai Int. Academic City, PO Box: 503000, Dubai (UAE)

discovering the probability of e-Learning continuation as an existing alternate learning environment even after Coronavirus.

This research article proposes measuring some variables such as students' readiness, satisfaction, and intention to continue retaining learning remotely within higher education settings. Hence, measuring these factors will report on students' intent to continue utilizing e-learning.

Ever since the proclamation of the Coronavirus epidemic, the UAE, like many other countries, devotedly employed e-Learning not only as a learning environment but a reliable teaching method throughout the education sectors to provide a safe learning environment for both public and private education sectors. As the UAE is concerned about the success of e-Learning as a teaching platform, countless professional training sessions were offered for teachers and instructors to assist them to manage teaching duties and classroom management in their e-Learning environment (UAE gov, 2021). As e-Learning is still adopted by many universities all over the globe, there is a need to examine factors that could predict the continuation of embracing e-Learning. However, the research on the dynamics that affect e-Learning in the UAE has not been investigated furtherly. This makes it an essential goal to research it to fill this gap and determine these dynamics, and answer all concerns related to online learning as a teaching context.

The conclusions of this research paper will clarify the picture and explain several concerns associated with the dynamics of e-Learning in the UAE. Examining students' satisfaction with e-Learning is considered a measurement of the e-Learning structure's quality and effectiveness. Discovering students' behavioral intentions towards e-Learning will determine the students' willingness to continue pursuing their academic degrees through e-Learning. Thus, this research study will benefit the higher education sector in the UAE as well as the global readership in terms of discussing the future of embracing online learning as a parallel learning and teaching platform within a multicultural environment where people from more than 200 different nationalities live and educate (UAE gov, 2021).

2. Research questions

Achieving the study aims depends on answering the following proposed questions:

1. What is the readiness level of higher education students to adapt to e-Learning?
2. How satisfied are higher education students with e-Learning?
3. What is the behavioral intention toward e-Learning of higher education students?

4. What are the predicting factors of students' behavioral intention to continue utilizing e-Learning?

2.1 Research Hypothesis/ Assumptions

This research paper proposes the following assumptions that are related to the study objectives.

H1: Higher education students have an upstanding level of readiness to adapt to e-Learning.

H2: Higher education students in the UAE are pleased with the e-Learning system.

H3: Higher education students in the UAE are expected to show positive behavioral intentions toward continuing to use the e-Learning system.

H4: Several variables are anticipated to affect students' intent to use e-Learning potentially such as students' e-self – efficacy, students' satisfaction with e-Learning, the perceived usefulness, e-Learning system feature, and effectiveness. In addition to interactive learning activities, and multimedia instruction.

2.2 Theoretical framework

This current study is implementing the theoretical framework suggested by Liaw and Huang (2006). Liaw and Huang proposed a four-component model that discussed the e-Learning environment. The model comprises the following:

1. *environmental characteristics*, which describes the characteristics of e-Learning, referring to the structure of the system and multimedia instruction, synchronous or asynchronous interaction to communicate effectively;
2. *environmental satisfaction*, which concerns about students' satisfaction about the e-Learning environment and the students' understandings of technological aspects that could boost their contribution to the learning activities;
3. *learning activities* refer to a set of educational tasks created to help students interact and engage in the e-Learning environment, boosting sharing knowledge between teachers and students;
4. *learners' characteristics* means learners' self-efficacy, the student's ability to utilize the e – system sufficiently.

Based on Liaw and Huang's (2006) proposal, learners who are identified with insufficient competency, or less self-confidence towards the e – environment, are anticipated to show less positive feelings towards e-Learning.

The current study is structured to adopt Liaw's model, hence, its framework is proposing to measure the following variables.

1. *Students' readiness: measured through* students' self-efficacy and experience in using the e-system.

2. *Students' satisfaction*: measured through students' perceived satisfaction and students' assessment of e-Learning system quality and e-Learning effectiveness.
3. *Predicting factors of students' behavioral intention*: measured through discovering the factors that are associated with students' behavioral intention and willingness to continue using the e-Learning after the pandemic as indicated in Liaw's model, the factors include the following: *students' self-efficacy, perceived satisfaction, perceived usefulness, e-Learning system quality, interactive learning activities, e-Learning effectiveness, and multimedia instruction*. All variables will be examined by Liaw (2008) model, which includes 8 domains.

3. Literature review

3.1 Online Learning During Coronavirus Pandemic

Distance learning and online learning present two common terms that describe the notion of e-Learning. The term e-Learning exemplifies the online educational environment where learners are disconnected from their educators by distancing. In addition, e-Learning describes teaching techniques and a platform to deliver the teaching content to students via e-platform. The proposal of McAndrew and Johnston suggested that "E-Learning and online learning adoption and implementation are no longer in question, as e-Learning is the platform for education in the coming era" (McAndrew & Johnston, 2012, p. 1475). Online learning was found as an advantageous platform that enables students to interact and communicate, nevertheless any geographical constraints. There is an argument among researchers regarding the effectiveness of e-Learning; Adnan and Anwar (2020) indicated that undeveloped countries face challenges in the online learning environment to achieve positive results, due to the lack of internet accessibility. Al Salman et al. (2021) conducted a research study in Jordan, it was revealed that Jordanian participants showed mild level of attitude towards virtual learning during

Coronavirus. A study was conducted by (Rouadi & Anouti, 2020) in Lebanon to explore the students' experience in online learning within young adolescents, middle and high school students during the epidemic. The results highlighted challenges of online learning such as weak interaction between students and instructors and lack of students' contribution to online class activities.

On the higher education settings, a research study by (Muftahu, 2020) investigated the consequences of the Coronavirus epidemic on students by distinguishing the faced problems and challenges in the academic programs in advancing universities from the African

perspective. The results demonstrated that the pandemic enabled higher education institutions to exceed their limits and develop an alternative mode of delivery to encourage students to pursue their education, by coping with the unforeseen transformation to online learning.

3.2 Attitudes and Satisfaction Towards Online learning

The embracement of e-Learning in many educational settings and the continuation of its use raises the demand for further investigation to focus on students' readiness and attitude towards online learning. In addition to examining students' satisfaction about the e-learning system's effectiveness. As a response, numerous research studies were conducted to examine this issue (Jogezai et al., 2021; Martin et al., 2020; Dong et al., 2020). In the UAE, researchers demonstrated their interest in studying issues related to the e-Learning before Coronavirus from different perspectives such as (Ati et al., 2010) and (Bawa'aneh, 2021 and Hussein et al., 2020) examined e-Learning post the current epidemic.

Investigating the literature on readiness levels towards using e-Learning among students discovered that readiness for e-Learning as a concept is well-known and recognizable that has been in use previously. The term readiness to e-Learning was suggested years ago in Australia when a group of educators (Warner et al., 1998) studied the vocational education and training division. A few decades ago, a group of researchers (Warner et al., 1998) proposed that students' readiness for using e-Learning can be explained by three facets: (1) students' predilections or preferences for the mode of material and instructional conveyance; (2) student self-confidence, competence in utilizing online for learning; and (3) students' capability to take part in a self-directed mode of learning.

Many issues related to e-Learning have been discussed in several research studies concerning students' satisfaction. On a large sample of 2196 students, Paechter et al., (2010) investigated students' academic achievement from 29 universities in Austria in addition to examining students' satisfaction with e-Learning. Paechter's work revealed an explicit correlation between instructors' experiences and academic achievements as well as students' satisfaction.

In Saudi Arabia, a research study was conducted by Linjawi and Alfadda (2018) to assess some variables including students' readiness, attitudes, and satisfaction with the e-Learning approach. The conclusions indicated that Saudi students are highly satisfied with e-Learning and have high computer skills, which indicates students' satisfaction and readiness to use online learning (Linjawi and Alfadda, 2018). Students' perception of online learning in Indonesia was investigated by Bali and Liu (2018). Results disclosed that some students preferred e-Learning because they

feel more interactive and engaged in e-Learning. In the United States, Fortune et al., (2011) examined students' perception of online learning, the results uncovered students' satisfaction with e-Learning and readiness to use it.

3.3 Integrating Online Learning in the UAE

Following the Coronavirus occurrence in the UAE, the Ministry of Education (MoE) has established a solid infrastructure e-Learning system to encourage the continuation of distance education in case of continuing the usage of e-Learning. The MoE in the UAE has provided numerous educational resources and platforms to promote the utility of distance learning. After shifting to e-Learning, the UAE provides both synchronous and asynchronous to ensure the inclusion of all students in the e-Learning environment. According to Gilbert (2000), Synchronous online learning refers to a direct online learning environment led by the instructor where learners and teachers meet at the same time, which enables direct interaction. Synchronous classes operate like traditional face-to-face classes, it enables learners to take part in class learning activities and discussions with their classmates simultaneously. In the UAE, higher education institutions provide synchronous online learning including live-streamed sessions where students present virtually through MS Teams, Zoom, Blackboard channels, or any other convenient platform. Using the webcam and the microphone enables active participation and communication between learners and teachers. Synchronous online learning is a student-centered learning environment, which requires students to participate actively in all classwork.

Asynchronous online learning describes a learning experience where instructors and learners interact sporadically whilst time is flexible (Garrison and Henderson, 2003). While synchronous requires all participants to meet at the same time, asynchronous online learning enables a flexible schedule where students can access the class materials based on their convenient time. Asynchronous online learning enables instructors to post organized materials and discussion boards to keep students connected to the class, whilst students can share their responses as well. Whether the education system considers synchronous or asynchronous, learning preferences of students, personalities, and interests. In the UAE, online learning embraces both synchronous and asynchronous online learning classes. While synchronous in UAE operates in real-time, where instructors and students join classes at the same time regardless of any geographical separation, instructors record all sessions and post them to students. Recording the synchronous classes enables students to access them and retrieve any missed learning experiences.

Several research studies were published to discuss some issues related to online learning in the UAE (e.g.,

Elnour et al., 2023; Islam et al., 2023; Fidalgo et al., 2020; Ati et al., 2010). The study by Elnour et al., (2023), revealed that college students in the UAE supported utilizing e-Learning in pharmacy education, and showed their readiness for integrating technology in learning in the future. Islam and a group of researchers conducted a research study to examine students' perceptions and satisfaction with virtual classrooms in the UAE. Their results showed a positive perception of virtual classrooms. Fidalgo and a group of researchers (2020) studied undergraduate students' attitudes, intent, and perceptions to adopt e-Learning in the UAE. The results demonstrated that students' language competencies, motivations, and time management were the major matters that cause students' dissatisfaction. Malkawi's collaborative work examined the level of satisfaction and attitudes toward e-Learning among undergraduate students in the UAE during the Coronavirus epidemic. The findings showed a highly positive attitude and satisfaction with e-Learning (Malkawi et al., 2021).

The MoE does its best to provide training programs for teachers to ensure effective teaching and assessment. Thus, the education system in the UAE was recognized as a well-equipped structure to implement online learning environments, compared to other countries where students are faced with technical issues or financial issues (Adnan, 2020; Mailizar, 2020; Rose, 2020). The literature review about e-Learning in the UAE mainly focused on students' satisfaction with e-Learning and students' attitudes towards it; however, there is a gap in the research concerning students' intention to continue utilizing e-Learning as an alternative learning environment. Consequently, students' intent to continue learning virtually needs further investigation.

4. Methodology

4.1 Sample

The sample of this research study contains 476 undergraduate students distributed as ($n= 284$ (59.7%) females; $n= 192$ (40.3%) males) enrolled in different higher education institutions in the UAE (see Figure 1) and all of them are enrolled in e-Learning environments. The sample aged from 18 – 23 years with ($M= 19.67$, $Mode= 19$, $SD= 1.2786$) participants' age categories are shown in (Table 1).

The sample includes undergraduate students from varied education levels from undergraduate freshmen (first year) to undergraduate senior students (fourth year). Student's e-Learning experience was determined by participants' responses to a *Likert scale* designed to include 7 - points varying from 1 which indicates "no experience" to 7 which indicates "well experienced" (see Figure 2). The participants are a representative

sample of different backgrounds; however, the majority of participants are UAE locals as shown in (Table 2).

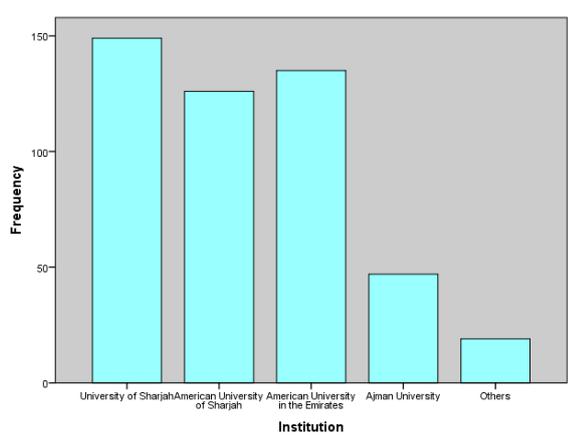


Figure 1 - Sample spreading by the institution.

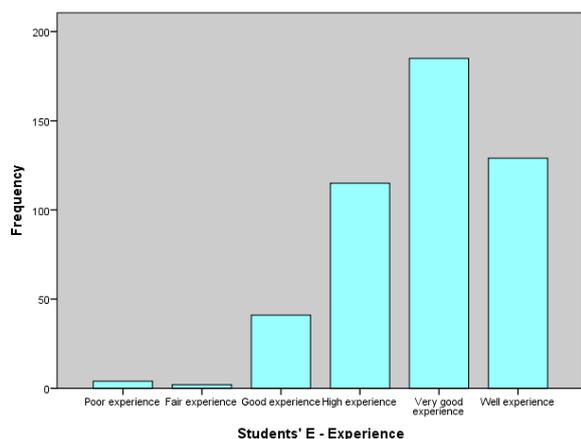


Figure 2 - Sample description by e-experience.

Table 1 - Sample's spreading by age category.

	Frequency	Percent	Valid Percent	Cumulative Percent
18.00	64	13.4	13.4	13.4
19.00	184	38.7	38.7	52.1
20.00	150	31.5	31.5	83.6
21.00	35	7.4	7.4	91.0
22.00	7	1.5	1.5	92.4
23.00	36	7.6	7.6	100.0
Total	476	100.0	100.0	

Table 2 - Distribution of participants by nationality

	Frequency	Percent	Valid Percent	Cumulative Percent
UAE	222	46.6	46.6	46.6
Iraq	15	3.2	3.2	49.8
Egypt	50	10.5	10.5	60.3
Syria	16	3.4	3.4	63.7
Jordan	53	11.1	11.1	74.8
KSA	20	4.2	4.2	79.0
Algeria	18	3.8	3.8	82.8
USA	13	2.7	2.7	85.5
India	21	4.4	4.4	89.9
Pakistan	10	2.1	2.1	92.0
Sudan	14	2.9	2.9	95.0
Iran	8	1.7	1.7	96.6
Others	16	3.4	3.4	100.0
Total	476	100.0	100.0	

4.2 Instrumentation

Liaw's (2008) model contains 26 questions disseminated over 8 domains including *Perceived self-efficacy* (3 questions), *Perceived satisfaction* (4 questions), *Perceived usefulness* (3 questions), *Behavioral intention* (3 questions), *e-Learning system quality* (4 questions), *Interactive learning activities* (3 questions), *E-Learning effectiveness* (3 questions), and *Multimedia instruction* (3 questions). Liaw's model's domains are measured by a 7 – point Likert scale indicating students preferred responses vary from *strongly disagree =1* to *strongly agree =7*. The scores of each individual domain represent students' perception of the corresponding domain and of the e-Learning system. Determining the sum of each domain simply can be achieved by computing the sum of each domain and then calculating the mean score for that domain. Since the scale is a 7 – point Likert scale, a score higher than 4 informs a positive attitude. As English is the common language of teaching and communication in higher education institutions in the UAE, the survey was delivered to participants in English for more accurate responses.

4.3 Results

Based on the study of Liaw (2008), the model with its 8 domains showed high reliability, exemplified by Cronbach's $\alpha = 0.97$ for the model entirely and α varied between 0.57 to 0.80 for the model's items, which suggests satisfactory reliability of the measurement scales. Analysis was conducted for the current study to discover the internal consistency of the scale. The internal consistency was assessed by calculating *Cronbach's α* . Findings suggested high reliability as α ranged from .653 to .897 for the scale domains and the reliability for the entire scale $\alpha = .926$. According to Nunnally (1978), achieving α values that exceed 0.7 signifies a satisfactory level of reliability (see Table 3). Regarding the validity of the scale, the instrument was sent to a panel of experts in assessment

and measurement in addition to experts in online learning to ensure its validity for use within the higher education settings in the UAE. The scale obtained experts' acceptance for use.

Table 3 - The internal consistency of the scale.

Item	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Perceived self-efficacy	.897	.899	3
Perceived satisfaction	.855	.855	4
Perceived usefulness	.791	.796	3
Behavioral intention	.856	.857	3
e-Learning system quality	.768	.773	4
Interactive learning activities	.653	.647	3
E-Learning effectiveness	.771	.775	3
Multimedia instruction	.783	.784	3
Entire scale	.926	.930	26

4.4 Data Collection

A year after the transition to e-Learning, early in Spring 2021, the researcher started the data collection process. The data collection process continued for 8 weeks. Liaw's Questionnaire was modelled on *Google forms* including e-consent informed and a detailed explanation of the study goals and objectives. Participants were reached via their instructors. On a Zoom channel, the study took place. Students were allowed 45 minutes: 15 mins for explaining the study and getting them to sign the consent form and 30 mins for responding to the questionnaire. As the study was achieved synchrony, the researcher was available during administrating the study for any further help. All data were collected anonymously and uploaded to SPSS version 24.0 for analysis and to portray the conclusion.

5. Results

Answering *RQ 1* and finding out the student's *readiness* for the e-Learning system (students' readiness for the e-Learning system is measured by the mean score of *self-efficacy* and *e-experience domains/subscales* – *Liaw's model*), the descriptive

analysis revealed a medium to high self-efficacy level among students ($M= 5.72, SD= 1.040$) and the results from the e-experience scale showed that most of the students have high scores in e-experience, which ranges between "very good" and "well experience" as shown in (Figure 2 and Table 4).

Table 4 - The sample distribution by experience in the e-Learning management system.

	Frequency	Percent	Valid Percent	Cumulative Percent
Poor experience	4	.8	.8	.8
Fair experience	2	.4	.4	1.3
Good experience	41	8.6	8.6	9.9
High experience	115	24.2	24.2	34.0
Very good experience	185	38.9	38.9	72.9
Well experienced	129	27.1	27.1	100.0
Total	476	100.0	100.0	

Regarding *RQ 2*, high satisfaction with e-Learning among students was found in the descriptive analysis, which indicated by Liaw's domain *perceived satisfaction* ($M= 5.367, SD = 1.083$).

For *RQ 3*, to discover students' intention to continue utilizing e-Learning, Liaw's domain of *Behavioral Intention*, students declared a positive intention to continue the usage of e-Learning ($M= 5.417, SD = 1.1035$). The mean score of students and the standard deviation of the rest of the domains are shown in Table 5.

Table 5 - Mean and standard deviation of Liaw's model domains.

Item	M	SD	Percentage
Perceived self-efficacy	5.721	1.0404	81.73%
Perceived satisfaction	5.367	1.0832	76.67%
Perceived usefulness	5.193	1.2002	74.19%
Behavioral intention	5.417	1.1035	77.39%
e-Learning system quality	5.116	1.0879	73.09%
Interactive learning activities	4.962	1.1893	70.89%
E-Learning effectiveness	4.980	1.3353	71.14%
Multimedia instruction	4.978	1.2214	71.11%

To answer *RQ 4* and discover the factors that predict students' intention to keep on utilizing online learning, the statistical analysis *Stepwise Multiple Regression* was selected to indicate only the "significant" predictors in the regression model. The researcher

performed the *Stepwise* analysis to assess the effect of 7 domains from Liaw’s model on students’ behavioral intention. The 7 domains included *self-efficacy, satisfaction, perceived usefulness, e-Learning effectiveness, multimedia instruction, interactive learning activities,* and *e-Learning system quality*. Data analysis indicated the existence of four significant variables that can predict students’ behavioral intention to continue using e-Learning. The domains are *perceived satisfaction, e-Learning system quality, perceived usefulness, and interactive activity*. A significant regression equation was found as follows: Model 1 showed ($F(1, 474) = 377.020, p < .001$), associated with R^2 of .443. For model 2 ($F(2, 473) = 259.594, p < .001$), and R^2 of .523. ($F(3, 472) = 200.934, p < .001$), with an R^2 of .561 revealed by model 3. Model 4 showed ($F(4, 471) = 154.055, p < .001$), with an R^2 of .567 (see Table 7 – a comparison of the four models resulting from the regression with coefficient b, significance, F, and R2.)

The regression model generated from the results is as follows:

$$Y' = \beta_0 + \beta_1 * x_1 + \beta_2 * x_2 + \beta_3 * x_3 + \beta_4 * x_4 + e$$

$$\text{Behavioral Intention} = 0.845 + 0.280 * \text{Satisfaction} + 0.278 * \text{E-Systems Quality} + 0.238 * \text{Usefulness} + 0.082 * \text{Interactive Activity}$$

The majority of the independent variables were found to be significant predictors of behavioral intention. The output of Table 6 shows that students’ *satisfaction, e-Learning system quality,* and *perceived usefulness* are highly correlated with behavioral intention, whereas *self-efficacy* and *e-Learning effectiveness* showed a medium correlation with behavioral intention. Moreover, two variables; *e-Learning effectiveness* and *multimedia instructions* report a weak correlation with the dependent variable (behavioral intention). Based on the *Stepwise* results, multicollinearity does not form a problem as VIF was found < 5 . Figure 4 shows the scatterplot with predicted values (behavioral intention) on the x-axis and residuals on the y-axis. From Figures 3 and 4 (Q – Q plot), there are no violations of the independence, homoscedasticity, and linearity assumption.

6. Discussion

The present research paper discusses the UAE’s higher education students’ satisfaction with, their readiness for e-Learning practices, and their intention to remain to utilize e-Learning in the future. Outcomes indicated that higher education students showed high readiness levels to learn and continue studying in an e-Learning environment. These findings could be interpreted as

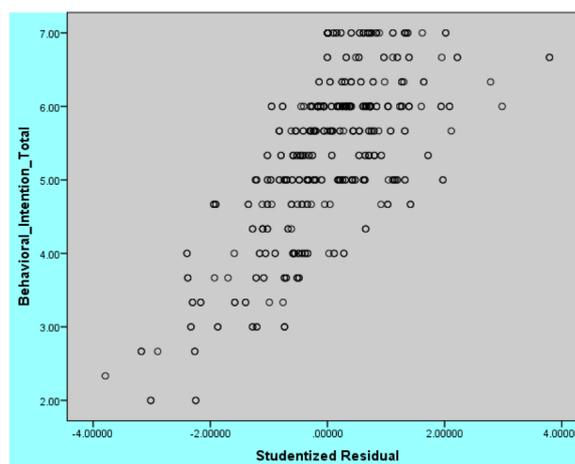


Figure 3 - The Relationship between predictors and behavioral intention.

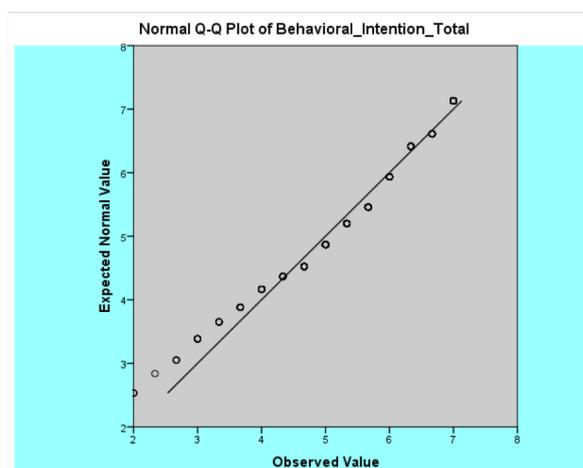


Figure 4 - Normal Q – Q Plot (Predictor factors and behavioral intention).

students’ high technical abilities and skills increase their readiness levels towards the e-Learning platforms. Regarding students’ readiness, this can be explained as undergraduate students with ages ranging from 18 – 24, meaning they are digital natives (Prensky, 2001) who are expected to show high readiness toward e-Learning systems. Moreover, students demonstrated a positive moderate level of satisfaction with the e-Learning environment; this needs to be increased. This result can be interpreted as students have some demands regarding the e-Learning system that need to be integrated to increase their acceptance and satisfaction. These findings are consistent with (Liaw, 2008; Linjawi and Alfadda, 2018; Elnour et al., 2023; Islam et al., 2023), who revealed that college students are recognized with positive attitudes towards online learning and are satisfied with e-Learning, which could be practically implemented by offering hybrid courses even after reverting to classrooms physically. The result of behavioral intention (77%) explains students’ willingness to embrace e-Learning in the future as an

alternate learning platform. The findings related to the predicting factors indicated that students' satisfaction, perception of usefulness, e-Learning structure quality, and multimedia instruction can significantly predict students' intention to continue using e-Learning. However, these significant predictors were found to range from 71% - 77% as scored by students' responses, indicating that there is a need to increase students' attitudes towards these factors as they predict students' behavioral intention. The other factors that showed weak predicting of behavioral intention such as multimedia instruction and e-Learning effectiveness, showed medium acceptance from students. These findings can be interpreted as students continuing learning remotely; however, the multimedia instruction does not keep students engaged effectively, so further research is needed here to discover the meaningful multimedia aspect that could enhance students'

behavioral intention. Moreover, e-Learning effectiveness as a weak predictor of variable behavioral intention can be explained in relation to learning quality, so students do not identify the effectiveness of the e-Learning, or students distinguish it as it needs improvement to reach the maximum level of student satisfaction, which is expected relatively to the medium level of satisfaction. E-effectiveness as a weak predictor of students' intention may be explained as students' weak commitment to the e-Learning activities causes them to perceive it as a weak factor that could impact their future intention. This result coincides with (Robinson & Hullinger, 2008), who revealed that students show limited engagement in online activity compared to their engagement in on-campus learning. Nevertheless, perceived usefulness showed a higher level of significance that could be interpreted as

		Behavioral_Intention	Self_efficacy	Perceived_satisfaction	ELearning_SysQuality	ELearning_Effectiveness	Interactive_Activity	Multimed i	Perceived Usefulness
Pearson Correlation	Behavioral_Intention	1.000	.445	.666	.663	.318	.418	.331	.637
	Self_efficacy	.445	1.000	.614	.454	.219	.300	.243	.441
	PerceivedSatisfaction	.666	.614	1.000	.686	.287	.375	.357	.653
	ELearning_SysQuality	.663	.454	.686	1.000	.407	.484	.349	.605
	ELearning_Effectiveness	.318	.219	.287	.407	1.000	.672	.403	.259
	Interactive_Activity	.418	.300	.375	.484	.672	1.000	.446	.362
	Multimed i	.331	.243	.357	.349	.403	.446	1.000	.276
	PerceivedUsefulness	.637	.441	.653	.605	.259	.362	.276	1.000
Sig. (1-tailed)	Behavioral_Intention	.	.000	.000	.000	.000	.000	.000	.000
	Self_efficacy	.000	.	.000	.000	.000	.000	.000	.000
	PerceivedSatisfaction	.000	.000	.	.000	.000	.000	.000	.000
	ELearning_SysQuality	.000	.000	.000	.	.000	.000	.000	.000
	ELearning_Effectiveness	.000	.000	.000	.000	.	.000	.000	.000
	Interactive_Activity	.000	.000	.000	.000	.000	.	.000	.000
	Multimed i	.000	.000	.000	.000	.000	.000	.	.000
	PerceivedUsefulness	.000	.000	.000	.000	.000	.000	.000	.

Table 6 - The Correlation between the independent variables and the dependent variable _RQ 4.

Model Summary ^c										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.666 ^a	.443	.442	.82438	.443	377.020	1	474	.000	
2	.723 ^b	.523	.521	.76349	.080	79.628	1	473	.000	
3	.749 ^c	.561	.558	.73356	.038	40.384	1	472	.000	
4	.753 ^d	.567	.563	.72936	.006	6.453	1	471	.011	1.996

Table 7 - A Comparison between the four models with significance F.

students' perception of the importance and benefits of e-Learning plays a crucial part in indicating the students' intent to adapt to the online learning environment. These results are supported with (Paechter et al., 2010).

Limitations underlie the nature of the stepwise multiple regression which could include *bias in parameter estimation* and *discrepancies* among model selection algorithms, as well as any latent elements that could impact students' responses to the questionnaire.

7. Conclusion and recommendation

This research paper was achieved to explore students' readiness, satisfaction about e-Learning, and the predicting factors of students' behavioral intention within higher education institutions in the UAE. Higher education students in the UAE were ready for implementing e-Learning in the future, which reflects their adequate technical skills. Furthermore, students showed moderate satisfaction about e-Learning system implemented in their institutions, which indicates the need for improving e-Learning structure in the UAE over higher education to increase students' satisfaction. Higher education students are willing to endure utilizing e-Learning in the forthcoming if it is an alternative education mode; however, their intention is influenced by some variables such as their perception of the e-Learning usefulness, the multimedia instruction, and their overall satisfaction with the e-Learning platform.

The outcomes of the present paper suggest the following recommendations to educators, higher education policymakers, stakeholders, and decision-makers to consider when offering e-Learning as an alternative learning environment.

1. Assessing students' readiness to e-Learning by using robust measurement tools at the beginning of each semester or academic year.
2. Integrating up-to-date Web 2.0 aspects to improve the e-Learning effectiveness
3. Offering pre-distance learning sessions and training based on the student's feedback and concerns.
4. Organizing different learning activities to train and develop students' skills to overcome distance learning difficulties in terms of engagement, motivation, and time management.

Future research should concentrate on examining the factors that promote e-Learning efficiency and examining the influence of integrating meaningful multimedia instruction to increase the efficiency of e-Learning. In addition, more research is needed to discover new aspects that could be integrated into e-Learning to keep students engaged.

Acknowledgements

This work was conducted by the author following the research ethical codes and there was no funding source for this research study or any other contributors.

References

- Adnan, M., & Anwar, K. (2020). Online Learning amid the COVID-19 Pandemic: Students' Perspectives. *Online Submission*, 2(1), 45-51. <https://doi.org/10.33902/JPSP.2020261309>
- Almanthari, A., Maulina, S., & Bruce, S. (2020). Secondary school mathematics teachers' views on e-Learning implementation barriers during the COVID-19 pandemic: The case of Indonesia. *Eurasia Journal of Mathematics, Science and Technology Education*, 16(7), p.em1860. <https://doi.org/10.29333/ejmste/8240>
- Alsaman, A., Assi, L.N., Ghotbi, S., Ghahari, S., & Shubbar, A. (2021). Users, planners, and governments perspectives: A public survey on autonomous vehicles future advancements. *Transportation Engineering*, 3, p.100044.
- Ati, M., Guessoum, N., Demiray, L.V.U., Sahin, M.C., Kurubacak, G., Lounaskorpi, P.T., & Rao, S.R. (2010). E-Learning in United Arab Emirates. E-Learning practices. Cases on challenges facing e-Learning and national development: Institutional studies and practices, 2, pp.1009-1028.
- Bali, S., & Liu, M.C. (2018, November). Students' perceptions toward online learning and face-to-face learning courses. In *Journal of Physics: Conference Series*, 1108 (1), p. 012094. IOP Publishing.
- Bawa'aneh, M.S. (2021). Distance Learning during COVID-19 Pandemic in UAE Public Schools: Student Satisfaction, Attitudes and Challenges. *Contemporary Educational Technology*, 13(3). <https://doi.org/10.30935/cedtech/10872>
- Dong, C., Cao, S., & Li, H. (2020). Young children's online learning during COVID-19 pandemic: Chinese parents' beliefs and attitudes. *Children and youth services review*, 118, p.105440.
- Elnour, A., Abou Hajal, A., Goaddar, R., Elsharkawy, N., Mousa, S., Dabbagh, N., & Sadeq, A. (2023). Exploring the pharmacy students' perspectives on off-campus online learning experiences amid COVID-19 crises: A cross-sectional survey. *Saudi Pharmaceutical Journal*, 31(7), 1339-1350. <https://doi.org/10.1016/j.jsps.2023.05.024>

- Farmer, T., & West, R., 2019. Exploring the concerns of online K-12 teachers. *Journal of online learning research*, 5(1), 97-118.
- Fidalgo, P., Thormann, J., Kulyk, O., & Lencastre, J.A. (2020). Students' perceptions on distance education: A multinational study. *International Journal of Educational Technology in Higher Education*, 17, 1-18. <https://doi.org/10.1186/s41239-020-00194-2>
- Fortune, M.F., Spielman, M., & Pangelinan, D.T. (2011). Students' perceptions of online or face-to-face learning and social media in hospitality, recreation and tourism. *MERLOT Journal of Online Learning and Teaching*, 7(1).
- Garrison, D.R. (2011). *E-Learning in the 21st century: A framework for research and practice*. Routledge.
- Gilbert, S.W. (2000). A new vision worth working toward: Connected education and collaborative change. on-line] at <http://www.tltgroup.org/images/gilbert/NewVWWT2000/^NewVwwt2000--2-14-00.htm>
- Hussein, E., Daoud, S., Alrabaiah, H., & Badawi, R. (2020). Exploring undergraduate students' attitudes towards emergency online learning during COVID-19: A case from the UAE. *Children and youth services review*, 119, p.105699. <https://doi.org/10.1016/j.childyouth.2020.105699>
- Islam, M., Mazlan, N. H., Al Murshidi, G., Hoque, M, Karthiga, V., & Reza, M. (2023). UAE university students' experiences of virtual classroom learning during Covid 19. *Smart Learning Environments*, 10(1), 5. <https://doi.org/10.1186/s40561-023-00225-1>
- Jogezai, N.A., Baloch, F.A., Jaffar, M., Shah, T., Khilji, G.K., & Bashir, S. (2021). Teachers' attitudes towards social media (SM) use in online learning amid the COVID-19 pandemic: the effects of SM use by teachers and religious scholars during physical distancing. *Heliyon*, 7(4), p.e06781. <https://doi.org/10.1016/j.heliyon.2021.e06781>
- Liaw, S.S., & Huang, H.M. (2006, May). Developing a collaborative e-Learning system based on users' perceptions. In *International Conference on Computer Supported Cooperative Work in Design* (pp. 751-759). Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-540-72863-4_76
- Liaw, S.S. (2008). Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-Learning: A case study of the Blackboard system. *Computers and education*, 51(2), 864-873. <https://doi.org/10.1016/j.compedu.2007.09.005>
- Liaw, S.S., Huang, H.M., & Chen, G.D. (2007). An activity-theoretical approach to investigate learners' factors toward e-Learning systems. *Computers in Human Behavior*, 23(4), 1906-1920. <https://doi.org/10.1016/j.chb.2006.02.002>
- Linjawi, A.I., & Alfadda, L.S. (2018). Students' perception, attitudes, and readiness toward online learning in dental education in Saudi Arabia: a cohort study. *Advances in medical education and practice*, 9, p.855. doi: 10.2147/AMEP.S175395
- Malkawi, E., Bawaneh, A.K., & Bawa'aneh, M.S. (2020). Campus Off, Education On: UAEU Students' Satisfaction and Attitudes Towards E-Learning and Virtual Classes During COVID-19 Pandemic. *Contemporary Educational Technology*, 13(1), pp.ep283.. <https://doi.org/10.30935/cedtech/8708>
- Martin, F., Stamper, B., & Flowers, C. (2020). Examining Student Perception of Readiness for Online Learning: Importance and Confidence. *Online Learning*, 24(2), pp.38-58. <https://doi.org/10.24059/olj.v24i2.2053>
- McAndrew, M., & Johnston, A.E. (2012). The role of social media in dental education. *Journal of dental education*, 76(11), 1474-1481. <https://doi.org/10.1002/j.0022-0337.2012.76.11.tb05409.x>
- Muftahu, M. (2020). Higher education and Covid-19 pandemic: matters arising and the challenges of sustaining academic programs in developing African universities. *International Journal of Educational Research Review*, 5(4), 417-423. <https://doi.org/10.24331/ijere.776470>
- Nunnally, J.C. (1978). *Psychometric Theory* (2nd ed.). New York: McGraw-Hill. <http://hdl.handle.net/123456789/11061>
- Paechter, M., Maier, B., & Macher, D. (2010). Students' expectations of, and experiences in e-Learning: Their relation to learning achievements and course satisfaction. *Computers and Education*, 54(1), 222-229. <https://doi.org/10.1016/j.compedu.2009.08.005>
- Peytcheva-Forsyth, R., Yovkova, B., & Aleksieva, L. (2018, December). Factors affecting students' attitudes towards online learning-The case of Sofia University. In *AIP conference proceedings* (Vol. 2048, No. 1, p. 020025). AIP Publishing LLC. <https://doi.org/10.1063/1.5082043>
- Prensky, M. (2001). Digital natives, digital immigrants part 2: Do they really think differently?. *On the horizon*. DOI: 10.1108/10748120110424843
- Robinson, C.C., & Hullinger, H. (2008). New benchmarks in higher education: Student

- engagement in online learning. *Journal of Education for Business*, 84(2), 101-109.
<https://doi.org/10.3200/JOEB.84.2.101-109>
- Rose, S. (2020). Medical student education in the time of COVID-19. *Journal of American Medical Association*, 323(21), 2131-2132.
<https://doi.org/10.1001/jama.2020.5227>
- Rouadi, N.E., & Anouti, M.F. (2020). The online learning experiment in the intermediate and secondary schools in Lebanon during the coronavirus (COVID-19) crisis. *Online learning*, 7(7), 14466-14485.
- UAE gov (2021). Fact sheet. [online] available at:
<https://u.ae/en/about-the-uae/fact-sheet><https://u.ae/en/information-and-services/education/distance-Learning-in-times-of-covid-19> [Accessed 10 November 2021]
- Ullah, O., Khan, W., & Khan, A. (2017). Students' attitude towards online learning at tertiary level. *PUTAJ–Humanities and Social Sciences*, 25(1-2), pp.63-82.
- Warner, D., Christie, G., & Choy, S. (1998). *Readiness of VET clients for flexible delivery including on-line learning*. Brisbane: Australian National Training Authority.
<http://hdl.voced.edu.au/10707/33256>
- Wijaya, T.T., Zhou, Y., Purnama, A., & Hermita, N. (2020). Indonesian students' learning attitude towards online learning during the coronavirus pandemic. *Psychology, Evaluation, and Technology in Educational Research*, 3(1), 17-25.
<http://petier.org/index.php/PETIER/article/view/56/27>