Examining the Relationship Between Student Online Learning Readiness and Their Satisfaction on Distance Learning

Mardeya Alblooshi
Dubai Police Academy, United Arab Emirates

mardeya2002@hotmail.com

Abstract Assessing Student's Online Learning Readiness is among the critical factors that help higher education institutions to achieve their goals. However, majority of these studies were conducted in western countries. Thus, the current research aimed to examine the relationship between Student's Online Learning Readiness (SOLR) constructs and their satisfaction on distance learning in the higher education institutions in the United Arab Emirates (UAE) context. A quantitative research methodology was used to answer the research question. The questionnaire was distributed among 621 students. SPSS software was used to examine the preliminary data, while SmartPLS software was used for the measurement model and hypotheses. Statistical analysis indicated that there was a positive relationship between satisfaction on distance learning and the following constructs of Student Online Learning Readiness: 1) Technical competencies, 2) Communication competencies, and 3) Social competencies with instructor. While there was no relationship between satisfaction and the following constructs of Student Online Learning Readiness: 1) Social competencies with classmates, and 2) Self-directed learning. The findings extended both student e-learning readiness and satisfaction literature, and supported the applicability of western models such as the Student Online Learning Readiness model developed in the United States in higher education institutions in not often examined contexts such as the UAE. Furthermore, the achieved result extended Yu and Richardson's (2015) model by examining the impact of self-directed learning as additional construct to overcome the limitation of the used model. Concerning contextual contribution, this research is among the first studies to examine this relationship in the UAE context, which can help decision-makers to understand the significance of investment in student experience and the overall role of student's different competencies on achieving outputs such as their satisfaction with distance learning. With regards to managerial implications, this study confirms the need for implementing national level strategy to identify and enhance human capital required competencies and skills which could help students in the short and long term to achieve the required objectives.

Keywords: Student online learning, Readiness, Student satisfaction on distance learning, E-learning, Higher education institutions, The United Arab Emirates

1. Introduction

Maan and Malhotra (2024) suggested that there is a growing interest in studying student e-learning readiness. Thus, several authors (e.g. Hung, et al., 2010; Yu and Richardson, 2015; Alem et al., 2016) have developed scales for measuring student e-learning readiness.

According to Al-Juda (2017) higher education institutions should be keen to sustain a competitive advantage by delivering high-quality learning services by e-learning systems, as they consider student satisfaction on distance learning as one of the main elements in determining the quality of their programs (Topal, 2016). However, limited studies examined the relationship between student e-learning readiness and their satisfaction on distance learning (Wu, et al., 2023).

Context variations (Kuo, 2010) is among the factors that influence the relationship between student online e-learning readiness and their satisfaction on distance learning, which limits the generalizability of the existing literature and leads to a mix in results in the same studies that have been conducted in different contexts.

The United Arab Emirates (UAE) pays great attention to education since excellent education is among the four Pillars of UAE Centennial 2071 (The United Arab Emirates' Government portal, 2024). The majority of the higher education institutions in the UAE conduct face to face learning style, however after Covid 19 the UAE has introduced e-learning at all higher education institutions. Moreover, in order to increase the level of e-learning readiness the UAE has provided adequate e-learning requirements such as launching smart learning platforms, developing guidelines to manage students' behavior during e-learning and offering free home internet connection for families who lack internet (The United Arab Emirates' Government portal, 2024). In 2018 the Ministry of Education in the UAE launched its National Program for Advanced Skills**,** which targets both students and employees. The program comprises soft skills and technical skills to provide students and employees with adaptable skills appropriate among diverse professions and sectors. Communication and creativity are among the competencies that they must possess (The United Arab Emirates Government portal, 2024). Limited studies examined student e-learning readiness in one of the higher education institutes (e.g. Tubaishat and Lansari, 2011) and satisfaction towards e-learning (e.g. Malkawi, Bawaneh and Bawa'aneh, 2020) in the UAE context.

However, there is lack of studies that investigated the relationship between student e-learning readiness and their satisfaction on distance learning.

Therefore, this research aims to fill in these theoretical and conceptual gaps by investigating the following research question: What is the relationship between the following Student Online Learning Readiness (SOLR) constructs: 1) Technical competencies, 2) Social competencies with classmates, 3) Communication competencies, 4) Social competencies with instructor, 5) Self-directed learning, on their satisfaction on distance learning in the UAE higher education institutions?

The following sections outline the literature review, theoretical background and hypotheses development, methodology, results, discussion, as well as limitations and future directions.

This study would inform the practitioners and the decision makers about the significance of Student's Online Learning Readiness constructs to enhance their satisfaction on distance learning in the higher education institutions.

2. Literature Review

2.1 Student e-Learning Readiness

According to Al-Juda (2017: p. 325) e-learning is "a system which utilizes technology in the form of computers, multimedia devices, and the internet to improve the traditional classroom interactions between students and teachers". Several authors (e.g Uddin, 2013; Bledsoe, 2013) mentioned that the following term ;online, e-learning and distance learning are used interchangeably. Maan and Malhotra, (2024: p. 27) defined e-Learning readiness as "the extent to which an institution and its students are prepared to implement e-Learning".

Maan and Malhotra (2024) clarified that there is a strong emphasis with regards to higher education institutions' student e-learning readiness over time, since student possession of e-learning readiness is an indicator of e-learning success (Maan and Malhotra, 2024), and crucial for student to be engaged in such context (Alem, et al. 2016).

Thus, several authors (e.g. Hung, et al., 2010; Yu and Richardson, 2015 ; Martin, Stamper and Flowers 2020) developed instruments to predict constructs of e-learning readiness. Martin, Stamper and Flowers (2020) clarified that these instruments concentrate on eliciting student e-learning readiness competencies like self-directed learning and communication competencies. However, it was noticed that the majority of these studies were conducted in specific countries such as United States (Yu and Richardson, 2015; Martin, Stamper and Flowers 2020), China (Hung et al., 2010) and United States, Australia, Malaysia and Taiwan (Maan and Malhotra, 2024).

Küsel, Martin and Markic (2020) argued that cross-cultural differences in the culture of teaching and learning is among the factors that influence the student e-learning readiness. Consequently, it is difficult to generalize the achieved result in other different contexts. Thus, a recent study conducted by Küsel, Martin and Markic (2020) showed student e-learning readiness is different between German students and United States students. Therefore, there is a need for further studies to examine student e-learning readiness in order to generalize the findings of Tubaishat and Lansari's (2011) study which targeted students in only one university in the UAE context and to compare to what extent the existing literature in different contexts are applicable to other countries.

2.2 Student Satisfaction on Distance Learning

Satisfaction on distance learning is "student's perception related to learning experiences and perceived value of a distance course" (Kuo, 2010:p. 11).

According to Al-Juda (2017) e-learning enhances the student's degree of satisfaction, because various interactive graphics, sounds, aesthetics, texts and videos greatly attract the student. Indeed, student's satisfaction on distance learning plays a significant role in the assessment of e-courses by both institution leaders and instructors (Topal, 2016); it is both a crucial indicator to examine student's online experience (Wu et al., 2023) and also related to their academic achievement (Yavuzalp and Bahcivan, 2021). However, Kuo (2010) stated that relatively little is known about student satisfaction when participating in e-learning, including what contributes to or enhances satisfaction on distance learning.

Thus, further empirical studies are needed to examine factors related to student satisfaction on distance learning which could help to fill in this gap and both improve the student e-learning environment and achieve better outputs.

2.3 Student e-Learning Readiness and Their Satisfaction on Distance Learning

Khong (2023) elaborated that student e-learning readiness constructs facilitate their satisfaction which, in turn, influence their retention. Though Wu et al., (2023) demonstrated that there is a lack of studies that examine student e-learning readiness in addition to satisfaction on distance learning.

To fill in this gap, limited studies (e.g. Yilmaz, 2017 ;Yavuzalp and Bahcivan, 2021; Khong, 2023) have focused on examining which student e-learning readiness constructs are related to satisfaction on distance learning. That's why, as a direction for future research, Alem et al., (2016) recommended to examine the influence of student e-learning readiness instruments on both satisfaction on distance learning and performance.

Kuo (2010) stated that context is among the factors that lead to differences in results of limited studies that investigate the relationship between student e-leaning readiness constructs and satisfaction on distance learning. For instance, the results of studies that examined the relationship between self-directed learning - as an e-learning readiness construct - with student satisfaction on distance learning were positive in Turkey (Yilmaz, 2017) while they were negative in Malaysia (Khong, 2023). This leads to additional studies to understand this relationship in specific context.

With regards to student e-learning readiness in the UAE context, the findings of limited studies showed that the student is ready for this type of learning (Tubaishat and Lansari, 2011) and another few studies (e.g. Malkawi, Bawaneh and Bawa'aneh 2020) concluded that they are satisfied with e-learning. However, no prior studies have examined the relationship between student e-learning readiness and satisfaction on distance learning.

3. Theoretical Background and Hypotheses Development

3.1 The Student Online Learning Readiness (SOLR) Model

According to Martin, Stamper and Flowers (2020) student e-learning readiness reflects their possessed competencies. Yu and Richardson (2015: p. 122) defined competencies as "individual's perception of his or her ability or capability".

Yu and Richardson (2015) developed their SOLR model and instrument in the United States to be examined by the following four competencies: 1) Technical competencies, 2) Social competencies with classmates, 3) Communication competencies and 4) Social competencies with instructor. The authors clarified that these competencies are positivity related to student learning outcomes or satisfaction on distance learning.

Lin and Dai (2022) mentioned that SOLR have been conducted in different countries where e-learning is well-developed. In spite of that, limited studies (Khong, 2023) have examined the relationship between the SOLR constructs and satisfaction on distance learning.

Additionally, Yu and Richardson (2015) recommended to examine additional constructs that would influence SOLR and impact successful learning outcomes or satisfaction on distance learning. In order to fill in this gap, self-directed learning has been added as an additional construct to the current model. The justification for selecting self-directed learning is that it is considered among the main constructs that reflect student e-learning readiness (Martin, Stamper and Flowers, 2020).

3.2 Hypotheses Development

Based on the literature review, it was expected that these five student e-learning readiness constructs impact positively on satisfaction on distance learning, as follows:

First, Heo (2011: p. 61) defined technical competencies as "self-efficacy in technology". Ilgaz and Gülbahar (2015) clarified that the student should be ready and qualified to use the Internet for learning. Khong (2023) stated that possessing technical competencies make student feels more relaxed and confident to best use these competencies to access course materials which lead to high satisfaction on distance learning.

H1: Technical competencies positively affect satisfaction on distance learning.

Second, social competencies with classmates are "skills, competencies, and the feeling of control essential for managing social situations and building and maintaining relationships with classmates" (Yu and Richardson, 2015: p. 125). Jevtić, Đorić and Milošević (2019) explained that a student is more satisfied if they have a good relationship with their peers. Supporting this argument, Alqurashi (2019) demonstrated that student interaction with other learners is among the factors that represent both their satisfaction and perceived learning.

H2: Social competencies with classmates positively affect satisfaction on distance learning.

Third, communication competencies are defined as "the ability to demonstrate knowledge of the socially appropriate communicative behavior in a given situation" (Myllylä and Torp, 2010: p. 24). Martin, Stamper and Flowers (2020) mentioned that communication competencies are among the basic skills that a student should possess, particularly those who receive distance education, and they are one of the important factors for the student's e-learning readiness. Khong (2023) elaborated that if the student can efficiently communicate with others during e-learning, they could have optimistic learning practice, which leads to increased satisfaction level with learning.

H3: Communication competencies positively affect satisfaction on distance learning.

Fourth, according to Yu and Richardson (2015: p. 125) student social competencies with instructor are defined as "skills, competencies, and the feeling of control essential for managing social situations and building and maintaining relationships with the instructor". Khong (2023) mentioned that using the social competencies while interacting online with the instructor helps the student to freely discuss activities or share issues related to their e-learning progress, which supports the relationship between instructor and student and makes them more satisfied.

H4: Social competencies with instructor positively affect satisfaction on distance learning.

Finally, Knowles (1975) defined self-directed learning as "a process in which individuals take the initiative in understanding their learning needs, establishing learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes". Hung et al., (2010) argued that self-directed learning is among student's e-learning readiness constructs. Yilmaz (2017) explained that availability of student self-directed learning skills increases satisfaction and motivation.

H5: Self-directed learning positively affects satisfaction on distance learning.

4. Methodology

4.1 Data and Sample

The study employed quantitative methodology to address the research question.

Data were collected through an online questionnaire sent to the students who have experienced online learning, studying at different higher education institutions in the UAE.

The sample size was 621 students from different universities who participated voluntarily and were selected randomly. Most respondents were female (70.5 %), most of them (87 %) were of UAE Nationality. Concerning the type of university, most respondents (66.3%) were studying in Government higher education institutions.

4.2 Instrument

The questionnaire used was divided into three main sections. First, demographic information including the following three items; gender, nationality, type of university (government or private). Second, SOLR was measured by the instrument developed by Yu and Richardson (2015) used in this study, consisting of 66 items with the following four constructs: technical competencies (6 items), social competencies with classmates (5 items), communication competencies (4 items), social competencies with instructor (5 items) and self-directed learning (4 items) developed by Hung et. al, (2010). Finally, satisfaction on distance learning (5 items) developed by Kuo (2010).

A five-point Likert scale ranging from 1 = never to 5 = always was used for each item.

4.3 Data Analysis

SPSS (version 25) was used to examine the preliminary examination of data. The measurement model and hypotheses were tested using structural equation modelling (SEM) by performing partial least squares (PLS) approach. In order to conduct the analysis SmartPLS software (version 3.2.9) was used.

4.3.1 Descriptive statistics and normality

The results of mean scores for all of the items across the study indicate the mean value is above average. Moreover, the results of the skewness and kurtosis reveals that the values of observed variables in the proposed models had skewness and kurtosis within the acceptable level (+2 and -2) (George and Mallery, 2010). It should be noted that the kurtosis of only one item (SCI5) was higher than (2.052) the acceptable level. These results indicate that the data was distributed normally.

4.3.2 Evaluating the validity and reliability of measurement model

The Factor loadings were greater than 0.70 for all constructs at all points of measurement as recommended by Hair et al., (2011). The Cronbach's Alpha results are higher than 0.7 range, which exceeded the recommended levels of acceptance (Hair et al., 2011). The values of rho_A were in the range of 0.927–0.972, which is beyond the recommended value of 0.7. (Dijkstra and Henseler, 2015). All the Composite Reliability values in this study are greater than 0.7 which is considered the minimum value that supports the reliability of the measures (Bagozzi and Yi, 1988). Results showed that the convergent validity is supported since the average variance extracted (AVE) is larger than 0.50 (Hair et al., 2011)

4.3.3 Discriminant validity

According to Fornell and Larcker (1981), to establish the discriminant validity, the square root of average variance extracted (AVE) of each latent variable should be higher than the any other latent construct. The results showed that no correlations were equal to or greater than the square root of the AVE, indicating there was discriminant validity; thus, discriminants are deemed to be valid when the diagonal elements (square root AVE) are greater than the off-diagonal elements in the corresponding rows and columns.

In addition, the result showed that the HTMT ratios of correlation of each construct is below 0.9, which means the discriminant validity has been established based on (Henseler, Ringle and Sarstedt, 2015) suggestion.

4.3.4 Structural model assessment and hypotheses testing

After obtaining the sufficient quality measurement model, we proceed to assessment of the structural model. According to Hair et al., (2016), the structural model evaluation consisted of the following steps: assessment of the structural relationship in the model for multicollinearity assessment, coefficient of determination (R^2), f2 effect size and Q2 predictive relevance and estimation of path coefficients. A detailed list of the R2, f2, VIF and Q2 are presented in Table 1 outlines the results deemed sufficient in the study.

Table 1: Results of hypotheses testing

H	Direct path	Beta	T value	P Value	f2	VIF	Result
H1	Technical Competencies -> Satisfaction on distance learning	0.343	6.360	0.000	0.166	2.462	Accepted
H2	Social Competencies with classmates -> Satisfaction on distance learning	0.095	1.540	0.124	0.094	3.598	Rejected
H3	Communication Competencies -> Satisfaction on distance learning	0.149	2.075	0.038	0.020	3.829	Accepted
H4	Social Competencies with instructor -> Satisfaction on distance learning	0.323	4.681	0.000	0.094	3.867	Accepted
H5	Self-directed learning -> Satisfaction on distance learning	0.034	0.609	0.543	0.009	3.091	Rejected
	R2 (Satisfaction on distance learning) = 0.712						
	Q2 (Satisfaction on distance learning) = 0.606						

5. Results

After validating the structural model assessment, path analysis to test the study hypotheses was proceed. The consistent PLS bootstrapping resampling procedure using 5,000 subsamples and the default settings (i.e. parallel processing, no sign changes) was used to assess the path coefficients and their significance levels.

As shown in table 1, the results confirm H1 predicted a positive effect of technical competencies on satisfaction on distance learning (H1:β = 0.343, t =6.360, p< 0.000), but the positive effect of social competencies with classmates on satisfaction on distance learning (H2: β=0.095, t= 1.540, p > 0.05) is rejected. The anticipated positive relationship between communication competencies and satisfaction on distance learning (H3:β =0.149, t = 2.075, p < 0.038) is accepted. Also, the direct effect of social competencies with instructor on satisfaction on distance learning (H4: β= 0.232, t= 4.681, p > 0.00) is accepted, but the positive effect of self-directed learning on satisfaction on distance learning (H5: β= 0.034, t= 0.609, p > 0.05) is rejected.

6. Discussion

Five hypotheses were formed to address the research question and aim of the study, the results are discussed as follows:

First, technical competencies - which is among SOLR constructs - was found to be significantly related to satisfaction on distance learning. Topal (2016) argued that student technical competencies, which are related to their ability to use technology and develop activities that enhance their motivation and use it repeatedly throughout learning, has a positive relationship with satisfaction on distance learning. Consistent with prior limited studies (e.g. Kirmizi, 2015; Yavuzalp and Bahcivan, 2021; Khong, 2023) the results of this study have confirmed that possessing technical competencies is positively related to student satisfaction on distance learning. The findings provide a better understanding for focus of the UAE's National Program for Advanced Skills on student technical skills to achieve the goals such as satisfaction on distance learning. Moreover, this result is a message to decision makers in higher education institutions in all countries (e.g. the UAE) to include technology subjects as a general compulsory subject due to its positive impact in enhancing e-Learning readiness and satisfaction on distance learning, which could have also long-term impact and make student ready and satisfied to adopt remote working after graduation from the higher education institution.

Second, the result clarified that the student's social competencies while interacting with classmates did not lead to satisfaction on distance learning. Although few limited studies (e.g. Khong, 2023) showed that there was a positive relationship between the two variables, this result is aligned with those few studies (e.g. Alqurashi, 2019; Wu et al., 2023) that showed that during e-learning the relationship between learner-learner interaction and satisfaction on distance learning were not significant. Wu et al., (2023) justified this result that the e-learning classes might not be designed with sufficient learner-learner interaction activities. Thus, there is a need to redesign some group activities that enhance relationships between classmates which leads to satisfaction on distance learning. Moreover, this result calls for the need for further studies to identify the mediating variables that may affect the relationship between student social competencies with classmates and satisfaction on distance learning.

Third, the findings indicated that when the student employs communication competencies - as a construct of SOLR – this results in an increase in satisfaction on distance learning. Gunawardena and Duphorne (2001) explained that when learning approaches involved a high comfort level, the student utilizes their communication competencies while participating in discussions and dealing with others which will help in increasing the level of satisfaction in the e-learning. The findings are supported by some studies (e.g. Gunawardena and Duphorne, 2001; Yilmaz, 2017; Yavuzalp and Bahcivan, 2021; Khong, 2023). Although this is beyond the focus of the research, this result showed the effectiveness of adapting national level strategies to enhance student competencies and skills such as the National Program for Advanced Skills which has been implemented in the UAE context. As communication, for example, was among the highlighted competencies in National Program for Advanced Skills required for student and employee to positively engage with the environment, this adaptation – as per the achieved result - helps to fulfil goals such as satisfaction on distance learning.

Fourth, the result reveals that while interacting online with the instructor, student uses effectively their social competencies – as one of the SOLR constructs - to get further clarifications during learning which leads to satisfaction on distance learning. Kuo (2010) stated that interaction with instructor is among the strongest predictors of student satisfaction on distance learning. However, there was a mixed result as limited studies showed that there was no positive relationship between the variables (e.g. Wu et al., 2023). The obtained result is aligned with a few studies (Kuo, 2010; Khong, 2023) that showed a positive relationship between both variables. Since the student values their instructor, this result encourages key decision makers to involve instructors in change management initiatives to convince the student about changes and reduce resistance to change.

Finally, self-directed learning was negatively related to student satisfaction on distance learning. Kirmizi (2015) clarified that self-directed learning is among student e-learning readiness -which represents the way they could carry out their own study plan and have a high degree of expectation from learning – that is positively related to satisfaction on distance learning. However, there is inconsistency in the existing literature; the achieved result is against those few studies (e.g Kirmizi, 2015; Yilmaz, 2017) that showed that there was positive relationship between self-directed learning and student satisfaction on distance learning. The result was supported by limited studies (e.g. Yavuzalp and Bahcivan, 2021) that showed a negative relationship between student self-directed learning and satisfaction on distance learning.

7. Conclusion

This study aimed to investigate the relationship between SOLR and satisfaction on distance learning in higher education institutions in the UAE.

The results showed that there is a positive relationship between student satisfaction on distance learning and the following SOLR constructs: technical competencies, communication competencies and social competencies with instructor; while social competencies with classmates and self-directed learning were not positively related to satisfaction on distance learning.

The findings make a theoretical contribution as follows; it has extended Yu and Richardson's (2015) model by examining the impact of self-directed learning as an additional construct to the SOLR. Furthermore, the finding confirmed the applicability of the SOLR model which has been developed in United States in the UAE context. Third, this study answered the call of Alem et al., (2016) for further research to investigate the relationship between student's e-learning readiness constructs and satisfaction on distance learning, which helped to fill this gap in the literature.

Also, this study has contextual implications since no prior studies examined the relationship between SOLR and satisfaction on distance learning in the UAE higher education institutions. Thus, this study has helped in filling this gap. Moreover, this study generalized the findings of Tubaishat and Lansari's (2011) which confirmed student e-learning readiness in one of the UAE higher education institutions. Though cross-cultural differences influence student e-learning readiness (Küsel, Martin and Markic, 2020) and the variation in context (Kuo, 2010) impact the relationship between SOLR and satisfaction on distance learning, this result showed that there are other factors that would influence this relationship. For example, the launching of government policies such as National Program for Advanced Skills and increasing the level of e-learning readiness in higher education institutions by providing students with required tools as in the UAE context (The United Arab Emirates' Government portal, 2024) are other factors that should be taken into consideration in this field.

Finally, this study provided useful managerial implications by emphasizing one of the core policies of Ministry of Education to identify effectively the required skills and competencies to achieve the required outputs by adopting best practices and analyzing the market's needs to fill existing gaps in the market. Thus, creating student competencies management and development strategies could be one of the solutions.

8. Limitations and Future Directions

First, this research discussed only student readiness for e-learning, however according to Topal (2016) there are several types of e-learning readiness including the student, the teacher, and the institution readiness. Therefore, there is a need for future research to examine both teachers and educational institutions in the UAE context. Second, this study focused on student satisfaction on distance learning as an output, thus there is a need for additional studies to examine academic achievement (Yavuzalp and Bahcivan, 2021) as an output.

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