A Moderated Mediation Model of Perceived E-Learning within the UAE Education Sector: A Practical Study

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Abstract:- **This study aims to investigate whether Perceived Usefulness and e-learning Effectiveness Influence and Continuance Use Intention are mediated by the Perceived Satisfaction of the Blackboard system in UAE higher education institutions. In addition, the moderating effect of gender on this mediating relationship was also studied. Using data from 341 respondents from Business School at Sharjah University, we found that the Perceived Usefulness and e-learning Effectiveness was positive and significant in influencing Continuance Use Intention. The Perceived Satisfaction was also found to mediate the direct relationships. In addition, gender was found to moderate the mediated relationship indicating that females have a larger impact on Continuance Use Intention than males.**

Keywords - Perceived Usefulness, e-learning Effectiveness Influence, continuance use intention, satisfaction, moderated mediation, PLS.

1. INTRODUCTION

Information technology (IT) presents an opportunity for transforming the means of learning and accessing information in distinct dimensions (Alhashmi et al., 2020; Al-Maroof et al., 2020; Alshurideh et al., 2019a; Habes et al., 2018; Zainal et al., 2020). According to Roca et al., (2006), IT enables people to increase the speed of their operations, become more flexible, efficient and offers increased access to all. Also, IT assists people in doing what would otherwise have been impossible in a unique manner. In the context of the education sector, Petkari, (2015), observed that the adoption of IT provides an increased opportunity for interaction, improved conceptual learning and harnessing the involvement in the teaching-learning practice. This view was equally affirmed by the study by Al-Hawari and Mouakket, (2010), which noted that Universities in the UAE had been increasingly adopting the reference of management systems for online courses, including, the Blackboard system for improving the relevance of outcomes of the education in the global and dynamic environment (Al-Emran et al., 2020; Alshurideh et al., 2019b; Salloum et al., 2019a; Salloum et al., 2020). The Blackboard system is identified to be an electronic learning environment (intranet) enabling educators and learners to design education content collaboratively. The relevance of the Blackboard system was affirmed by the study of Wang and Chiu, (2011), which observed internet Bulletin Board Systems as powerful and critical tools for enhancing educational communication, particularly for students, rather than participating in face-to-face classroom activities. Hence, the integration of the internet and technology is critical for providing a successful contemporary education system. In this case, it is instrumental to evaluate the best practices of the quality assessment of technology-aided learning and the overall influence of the gender issue. The issue of gender was affirmed by the study of Ong and Lai, (2006), which pointed out that women were significantly influenced by computer self-efficacies and the overall ease of using the process. Also, men's decisions were informed by usage decisions and their overall perceptions of the overall usefulness of the technology learning process. Additionally, Terzis and Economides, (2011), noted that e-learning usage in diverse contexts, such as universities, schools and organisations, identified that males had significantly higher positive perceptions pertaining to e-learning as opposed to females.

It is evident that e-learning has significantly altered the higher education pedagogical approach leading to significant changes from past learning concepts (AlHamad, 2020; AlHamad & AlHammadi, 2018; Al Hamad, 2016; Al-Maroof et al., 2019; Salloum et al., 2018). As a consequence, leveraging from a substantial appreciation of user acceptance processes and offering learners with an opportunity for successful adoption and implementation of an e-learning system. One of the approaches that can be adopted is that of total service quality, as proposed by Dominici and Palumbo, (2013), which identified customer's perceptions on the distinction of the projected service and the expected service. This introduces the concept of service quality as the prevailing difference between the expectation of a customer in terms of the encountered services and the overall received service. The SERVQUAL scale is used to measure service quality as the difference between the service expectations and perceptions of different customers.

SERVQUAL is a scale which is comprised of a total of twenty-two items that are divided into five primary dimensions, namely, tangible, reliable, responsive, assurance and empathy. This study employed a modified and improved SERVQUAL instrument that was aligned with the UAE education system. The study's focus evaluated the significant roles of the different dimensions of the learner's satisfaction and their future intentions in enrolling in online courses. As a consequence, the results of this current study may be instrumental in generating appropriate technological factors that offer realistic insights into the successful implementation of the systems embedded within technology learning.

The First objective of this study was to investigate the impact of Perceived Usefulness (PU) and e-learning Effectiveness (ELE) on the Continuance Use Intention (CUI). The second objective of this study was to test the mediating effect of the Perceived Satisfaction (SAT) between the Perceived Usefulness and e-learning Effectiveness with the Continuance Use Intention. And finally, the third objective of this study was to investigate the moderating effect of gender on the mediated relationship of the PU and ELE on the CUI.

2. LITERATURE REVIEW (12 BOLD)

2.1 Service Quality

Service is identified as an intangible product that is not owned or stored but is found to exist at a time and a place that meets or exceeds the customers' expectations (Wang et al., 2014; Alleman et al., 2010; Oliveira & Roth, 2012). The distinction in the quality of the service is identified by the extent and pathway of discrepancy or the prevailing gap between the customer's expectations and their perceptions of service. To substantiate this claim, Senthilkumar and Arulraj, (2011), examined the different measurements of service quality representing the degree and direction of discrepancy, or the existing gap between the customer's expectations and their perceptions of a particular service. Furthermore, the measurement of service quality has been illustrated to range from ideal quality to totally unacceptable quality, with some point between being representative of a satisfactory level of quality. This measurement is contrary to the study of Kuo et al., (2009), which pointed out that the position of customers' perceptions of service quality on the continuum is dependent on the discrepancy nature existing between the projected service and the one perceived by the client. Hence, customer's expectations may be higher than their perceptions, the perceived service quality may be less than satisfactory, thus, customer dissatisfaction may occur. Also, lower expectations than perceptions may lead to the perceived service quality being considered satisfactory. Taking this into consideration, it is essential to distinguish the best service quality tool that can be adopted to identify the level of satisfaction and success of a specific phenomenon, such as, the shift from traditional to contemporary learning systems.

Service quality is a concept derived from customer satisfaction with customer satisfaction exerting a strong influence on purchasing intentions as compared to service quality. As noted by Wang et al., (2014), the concept of service quality should be approached from the perspective of a client, since values, groups of assessment and circumstances are significantly different. In this context Prentice, (2013), argued that customers perceive it to be more challenging to evaluate the quality of services as opposed to evaluating the quality of products. This was opposed by the study of Naik et al., (2010), which argued that service quality fails in integrating all of the final products and services but is significantly engaged in active production and the process of delivering, thus, ensuring that the involvement in the employment process is instrumental. In regard to total service quality, Kumar et al., (2010), identified it as the customer's perception of the prevailing differences between the projected service and the perceived service delivery. This narrative is actively supported by Kumar et al., (2012), the author of the Gap Analysis Model that demonstrated an integrated view of the consumer-company relationship. Additionally, the value-based model of service quality proposed by Naik et al., (2010), generated a suggestion on the adoption of the perceived ideal standard compared to the service experienced.

2.2 Continuous Use Intention in e-Learning

In contemporary e-learning systems implemented in the education sector, distinct models exist which are used to measure satisfaction and the Continuance Use Intention of the provided services (Salloum et al., 2019b; Salloum & Shaalan, 2018). As noted by de Melo Pereira et al., (2015), the relevance of the Continuance Use Intention is to guide institutions to depict the desire for the progressive establishment of employees, the dissemination process and training activities management, rationalizing and increased spending on training, the sufficiency of skills development of the employees and service delivery improvement. This was supported by the study of Roca et al., (2006), that described the Technology Acceptance Model which demonstrated behaviors on the attitudes, and a description of the overall positive or negative views, on specific behavior and subject norms that assess the overall social pressures of people tasked with performing, or not performing particular actions. According to this model, the primary drivers that determine technology acceptance include the perceived usefulness and the perceived ease of use. In this context, Palacios-Marques et al., (2013), noted that the perceived usefulness is identified as the degree to which an individual holds the belief of using a specific system that enhances their overall job performance with the perceived ease of use. This expresses the extent of an individual's belief that the adoption of distinct systems can be free from any form of interference from any physical and mental efforts. Hence, it can be argued that the entire perceived usefulness and their ease of use can be characterized by direct influences. Also, the ease of use has a direct influence on an individual's attitude of using a particular system with the determination of the behavioral intention that leads to actual system adoption. In the context of the UAE, Al-Hawari and

Mouakket, (2010), observed that the TAM model enhanced the satisfaction and user retention rates within the UAE education system. As such, instead of adopting regular quality factors, the use of the TAM model would positively contribute to an improved understanding of the best practice in building quality education. Nevertheless, there exists limited literature that has evaluated the adoption of TAM in the UAE education sector as the majority of the literature has been in the area of marketing. Prior literature is limited despite the increased demand for e-learning in the UAE education system and the need to utilise e-learning in complementing the traditional approaches of teaching in universities. This study aims to bridge the gap by developing a comprehensive model linking all the issues of the TAM model inclusive of all of the external issues related to the satisfaction of learners and the overall retention rates in the environment of blackboard systems.

Nevertheless, the results can, be more effective when integrated with the Student Management Teams (SMT) suggested by Petkari, (2015), as a strategy of establishing a continuous communication channel, with the aim of improving the learning experiences with the responsibility to enhance the process of learning which is distributed among the learners and educators. The model is in line with Cidral et al., (2018), the D & M Model comprised of the constructs of theory and was inclusive of factors such as the quality of the system, the quality of information, their ease of use, the satisfaction of the users, personal impacts and the impact to the organization. Furthermore, system quality significantly corresponded to the aspects of technological characteristics, issues of performance, usability levels and the system.

2.3 Gender and e-Learning Use and Experience in the Education Sector

From the reviewed studies, it is evident that women display increased computer anxieties with reduced levels, in terms of self-efficacies and computer self-efficacies, for the internet and computer accessories (Ong & Lai, 2006). In this regard, men are rated as more efficient than women in computer self-efficacy. In regard to the existing relationship between computer self-efficacy, they prevails the critical influence of self-efficacies on the expectations of distinct outcomes which have been empirically examined in past studies (Terzis & Economides, 2011). From an e-learning context, Navimipour and Zareie, (2015), argued that the Perceived Usefulness is a reflection of the individual beliefs or expectations on an outcome, and making a suggestion on the computer self-efficacy is a critical factor influencing the Perceived Usefulness. Additionally, Terzis and Economides, (2011), argued the existence of critical differences between men and women pertaining to the perceptions and effects on the relationships among the constructs. These constructs end up influencing the behavioral intentions of using computers and the e-learning results. This phenomenon exists despite the limited information on the gender gap towards the moderating effect of gender on the relationships between the existing variables that are critical on behavioral intentions and levels of acceptance. Therefore, it can be noted that there exists a direct relationship between the gender-based differences in decision-making behavior. In this since, there exists sufficient literature supporting the existence of gender-based differences in decision-making behavior. In recent research, Liaw and Huang, (2011), argued that the process and social factors increasingly motivate women more as opposed to their men counterparts. Hence, in the current research, an evaluation of the extent to which computer self-efficacy leads to an increase in the salience of perceptions of the usefulness and ease of use in an e-learning context. This is the primary area of the current study where the role of gender is examined in improving the e-learning self-efficacy in the UAE education sector.

Additionally, past studies have evaluated the issue of gender differences in the perception of the usefulness of computer technologies, the findings have noted that male college students evaluated computers as being more useful, as opposed to female students (Padilla-Meléndez et al., 2013; Tselios et al., 2011). Further, the study of Orfanou et al., (2015), found that men had a positive consideration on the Perceived Usefulness to a significant extent, as compared to women in decision making. This decision making, on account of the usefulness of the productivity-related issues of new technology, noted that men were identified as being more driven and influenced by instrumental factors as opposed to their female counterparts. Nevertheless, there is a lack of sufficient data in the context of the UAE education system, and this forms a critical area of this study where the influence of Perceived Usefulness on behavioral intentions is evaluated with the intention to use e-learning more strongly, for men as opposed to women. This also includes the focus on the behavioral intention to use e-learning as part of a computer-assisted learning process.

2.4 Mediating Role of Perceived Satisfaction on Continuance Use Intention

Past studies have concluded that service quality has a direct influence on driving a customer's perceived value (Howat & Assaker, 2013; Yu et al., 2014). In the event that a customer spends fewer resources, time and energy as opposed to the service quality received, then, the customer will perceive a high value of service. This means that the higher the level of service offered to the customers, the higher the overall customer's perceived value. Perceived value is equally perceived as a critical predictor or elicitor of customer satisfaction. According to Ryu and Han, (2010), in the event that a customer receives a high value of service, the outcome of this is high satisfaction. Additionally, the perceived value is equally deduced as a mediating and moderating construct between the service quality and the level of customer satisfaction. Hence from the review of the literature, it can be concluded that the Perceived Satisfaction plays a critical role in the Continuance Use Intention.

On the basis of the theory of social exchange, it can be argued that users consistently gain specific benefits or value in a brand community, which holds, provided that there is a willingness of users in their operations. In this regard, Han et al., (2018), proposed that the user's experience and the

perception of individual's interests significantly influence the continuance of the intention, and the overall behavior of the consumption of purchasing which is identified as a user intention. The user of a specific commodity or service actively engages in distinct interactions which are aimed at making recognition on the benefits accrued from the consumption or purchase of a specific commodity. This view was supported by the study of Kruger et al. (2015), which focused on service recovery in the cell phone industry. The study observed that other than the significant positive relationships between the cell phone user's relationship intentions; the perceived service recovery played an instrumental mediating role in the relationship between intention and satisfaction.

3. METHODOLOGY

3.1 Sample Selection and Data Collection
The primary technique of collecting data was through a questionnaire survey which was distributed to full-time business students at the University of Sharjah, UAE. A total of 500 questionnaires were distributed and 350 students returned the questionnaire. Therefore a return rate of 70% was yielded. Nine of the questionnaires that were returned

were identified as not being completely answered and were therefore not usable. Thus, the actual total usable questionnaires numbered 341 which yielded a response rate of 68%.

3.2 Measurement Development
The study survey comprised two main sections. The first section requested demographic data from the respondents, such as gender, age, educational level, and nationality. While the second section referred to the main constructs of the study and was measured by closed questions whose responses were anchored on a five-point Likert-type scale ranging from, strongly agree (5) to strongly disagree (1). The variables of the study are described as follows:

The Perceived Usefulness construct was operationalized by using three items adopted from (Chou, 2014), the e-Learning Effectiveness construct was measured by using three items adopted from (Chou, 2014), The Perceived Satisfaction construct was measured by using four items adopted from (Chou, 2014) , and finally, the construct of Continuance Usage Intention was operationalized by using six items adopted from (Chang, 2010).
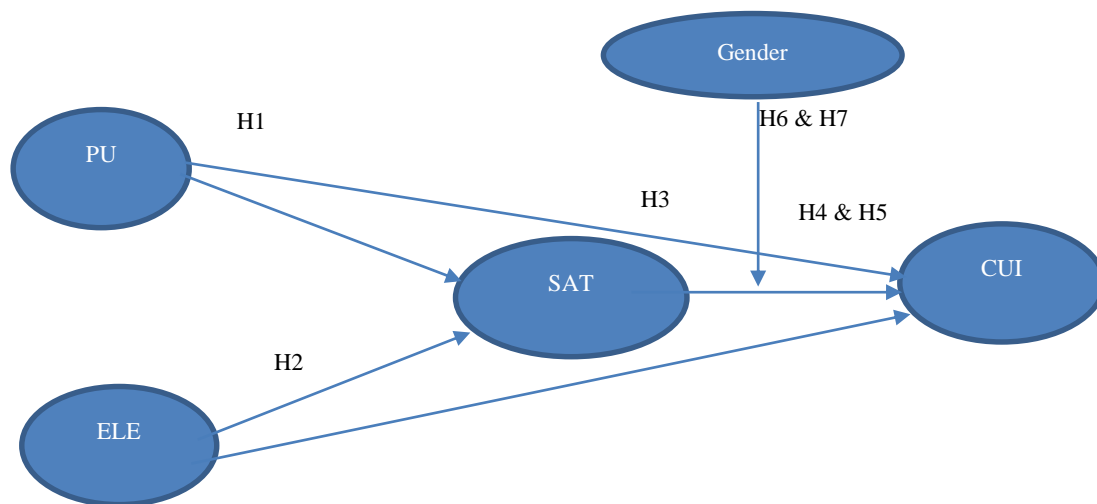

Figure 1, theoretical framework

The study framework, as shown in Fig. 1, tests the direct and indirect effects of the selected variables on the Continuance Use Intention. There are three direct effects and two indirect effects. These effects were tested simultaneously in a single model. The direct and indirect effects are represented in the following equations: -

$$CUI_i = \beta_0 + \beta_1 PU_i + \beta_2 ELE_i + \beta_3 SAT_i + u_i \quad (1)$$
$$CUI_i = \beta_0' + \beta_1' PU_i + \beta_2' ELE_i + \beta_3' SAT_i + v_i \quad (2)$$

where CUI is the Continuance Use Intention, PU is the Perceived Usefulness, ELE is the e-learning Effectiveness and SAT is the Perceived Satisfaction, $\beta_0 - \beta_5$ $\beta_1' - \beta_5'$ are the coefficients for the direct and indirect links respectively, and u_i and v_i are disturbance terms. Equation 1 shows the direct relationships between the independent variables and the Continuance Use Intention. Equation 2 shows the indirect effect of the two independent variables on the

Continuance Use Intention through the Perceived Satisfaction. Further, equation 2 was run to test whether gender moderated the indirect effects of the PU and ELE on the CUI through the SAT.

A structural equation model was used to estimate the path coefficients hypothesized in Figure 1. To do so, this study used the Partial Least Squares (PLS) method to examine the theoretical model using Smart PLS software, version 3.0. This statistical tool was chosen as it has the capability to analyze a complex model, as suggested by Hair et al. (2013). In this study, a two-step method was used to analyze the data. The first step involved analyzing the measurement model while the second step assessed the direct and indirect relationships between the variables. Essentially, this statistical analysis technique was used to determine the

validity and reliability of the measures before examining the structural relationships of the theoretical model.

3.3 Results and Data Analysis

The aim of this paper was to study the impacts of Perceived Usefulness (PU) and e-learning Effectiveness (ELE) on the Continuance Use Intention (CUI) as well as studying the mediating effect of the Perceived Satisfaction (SAT) with the blackboard system between the PU and ELE on the CUI.

In addition, this study aimed to investigate this model under the impact of the moderating effect of gender. In this section of the study, the results of the analysis conducted are discussed.

Demographic Profile: Table 1 below shows the demographic profile of the respondents. The majority of the respondents were non-UAE citizens, females, aged between 18-20 years old, and between their third and fourth year of study. The demographic profile is representative of the UAE's population.

Table 1: Demographic Profile.

characteristic description	groups	frequency %
gender	female	74.5
	male	25.5
age	18-20	50.1
	21-26	48.7
	above 26	1.2
education	first year	9.4
	second year	22.6
	third year	37.8
	fourth year	30.2
nationality	uae	36.4
	non uae	63.6

Table 2 shows the mean, standard deviation, skewness and kurtosis for all of the variables used in this study. The mean scores of all of the variables approached 4 points on the designated 5-point Likert scale, as indicated in the methodology. This suggests that, on average, the majority of the students agreed with the statements. The standard deviation indicated that there was variability among the respondent's answers, which eliminated the possibility of inattentive respondents. The skewness and kurtosis suggest that the variables were within the limits of the assumed normal distribution. This indicated that the data were ready for the next level of the analysis.

Table 2: Descriptive Statistics.

variable	mean	standard deviation	skewness	kurtosis
pu	3.99	.94	1.54	-1.34
ele	3.81	.98	0.28	-0.81
sat	3.88	.97	0.70	-0.99
cui	3.94	.96	1.23	-1.25

Source: author's estimation.

This study measured the composite reliability in relation to internal validity and reliability. All of the factors had composite reliability values greater than 0.70. Individual item reliability with loading was greater than 0.70, as suggested by Hair et al., (2013). To measure the convergent validity, this study assessed the average variance extracted (AVE), which was above 0.50, indicating a satisfactory convergent validity. Henseler et al., (2009), postulated that the Cronbach's alpha value tends to underestimate the internal reliability. Hence, the Cronbach's alpha value for each construct was above 0.70, which signified the internal consistency of the study (Table 3). To assess the discriminant validity, the study considered the Fornell and Larcker, (1981), criterion; the square root of the AVE for each factor exceeded the inter-correlations of the factor with the other factors in the model (Table 4). The analysis ensured the discriminant validity of all of the constructs.

Table 3 is in Appendix 1.

Table 4: Discriminant Validity of Constructs

constructs	pu	ele	sat	cui
pu	0.94			
ele	0.83	0.93		
sat	0.86	0.74	0.92	
cui	0.87	0.81	0.85	0.87

Table 5 summarizes the results of the model tested. The results suggested that the PU, ELE and the SAT were positively and significantly related to the CUI. This supported the theory which proposed that the PU, ELE and the SAT influenced the CUI positively.
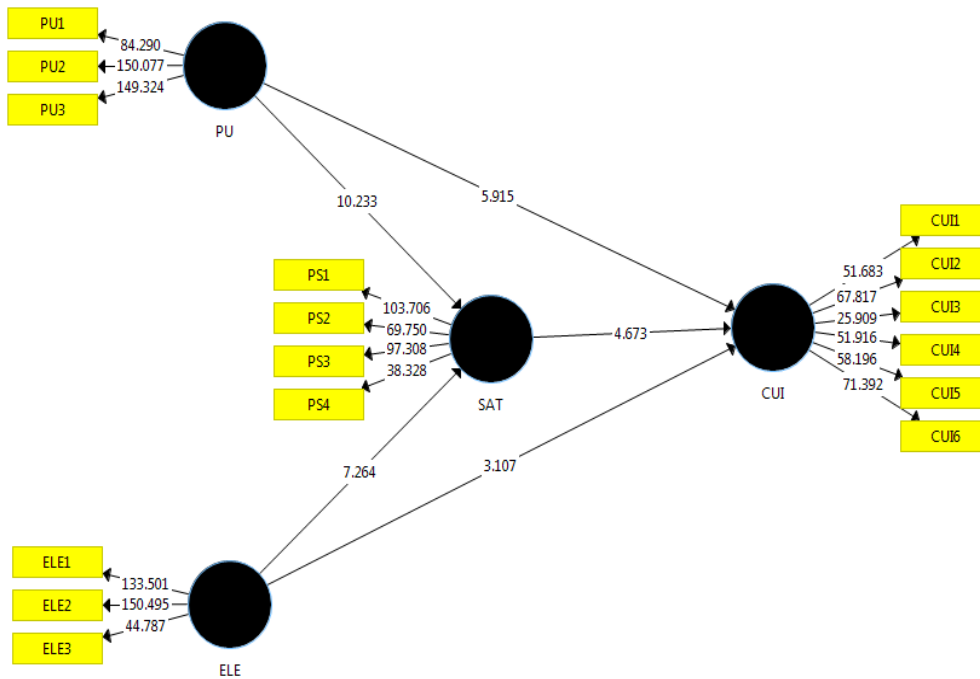
With regards to the mediating effect of the Perceived Satisfaction, it was apparent that the SAT mediated the positive link between both the PU and ELE with the CUI.

Table 5: Results of the PLS Regression.

hypothesis	relationship with sat	coefficient	t-value
	pu→sat	0.54*	10.98
	ele→sat	0.39*	7.70
	relationship with cui		
h1	pu→cui	0.44*	6.02
h2	ele→cui	0.17*	3.40
h3	sat→cui	0.33*	4.71
	mediating relationship through sat		
h4	pu→sat→cui	0.18*	4.63
h5	ele→sat→cui	0.13*	3.73

*significant at 1%.
Source: author's estimation.

Table 6 tested the moderated mediating hypothesis of gender in the proposed model. The results supported the hypothesis that gender had a moderating effect on the mediating effect of the SAT between the PU and ELE with the CUI. The impact of the PU and ELE was positive and significant on the CUI through the SAT and with the gender moderator. However, it was clear that the PU and ELE of female students had a greater impact on the CUI through the SAT when compared to male students.

To test the relationships between the constructs, the partial least squares technique was applied to evaluate the structural model. The nonparametric bootstrapping technique was applied with 5000 resamples to test the model (Figure 3). The significant effects were identified by the structural model using the bootstrapping technique. The results in Table 5 suggest that the PU, ELE and the SAT were positively and significantly related to the Continuance Use Intention (β_1=0.44, p<0.001, β_2=0.17, p<0.001, β_3=0.33, p<0.001). This result supports hypotheses H1, H2 and H3 since the coefficient is significant at less than the 1% level.

3.4 Mediating Results Analysis

With regard to the indirect relationship through the mediating variable, the results in Table 5 and Figures 2 and 3 are as follows. First, we found that once the Perceived Satisfaction was introduced as the mediator, both the Perceived Usefulness and e-learning Effectiveness appeared to be significant and had the correct sign (β_1'=0.18, p<0.001 and β_2'=0.13, p<0.001). This result supported hypotheses H4 and H5. This means that both the PU and ELE showed an increase in their effect on the CUI once the users were satisfied. Importantly, after obtaining satisfactory findings for the measurement model, the study subsequently assessed the structural model. Here, the predictive accuracy of the structural model was evaluated with regards to the portion of the variance explained. The statistical results revealed that the structural model was capable of explaining 0.79 of the variance in the Perceived Satisfaction and 80% of the Continuance Use Intention (Figure 2). This approach ensured the model's adequacy to predict the manifest indicators of the latent construct.
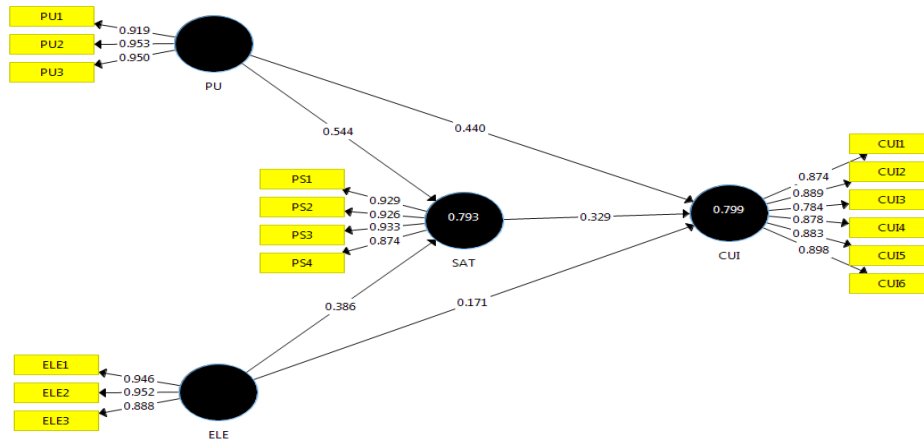
Figure 2: Structural Model

CUI is the Continuance Use Intention, PU is the Perceived Usefulness, ELE is e-learning Effectiveness and SAT is the Perceived Satisfaction. The numbers in the black circle indicate R-Squared. The numbers on the arrows connecting the variables represent the coefficients. The numbers on the arrows towards the yellow boxes represent the factor loadings. CUI is the Continuance Use Intention, PU is the Perceived Usefulness, ELE is e-learning Effectiveness and SAT is the Perceived Satisfaction. The numbers on the arrows connecting the variables on the arrows towards the yellow boxes represent the t-values.

Table 6 below reports the mediating effect on the SAT on the CUI using gender as a moderator. The results indicate that for the male students the PU and ELE have a lower influence on the CUI through the SAT (β_1'=0.16, p<0.001 and β_2'=0.11, p<0.001) compared to the female students (β_1'=0.22, p<0.001 and β_2'=0.18, p<0.001), therefore, both hypotheses H6a,b and H7a,b were supported.

Table 6: Results of the PLS Regression.

hypothesis	mediating relationship through sat (female)	coefficient	t-value
h6a	pu→sat→cui	0.22*	2.83
h6b	ele→sat→cui	0.18*	2.13
	mediating relationship through sat (male)		
h7a	pu→sat→cui	0.16*	3.90
h7b	ele→sat→cui	0.11*	3.60

*significant at 1%.
Source: author's estimation.

4. CONCLUSION AND RECOMMENDATIONS

This study focused on evaluating the impacts of the Perceived Usefulness (PU) and e-learning Effectiveness (ELE) on the Continuance Use Intention (CUI) as well as studying the mediating effect of the Perceived Satisfaction (SAT) with the blackboard system between the PU and ELE on the CUI. Also, the mediating role of gender was evaluated in this study. Despite the author only being able to capture data from a single group of respondents (business students

at Sharjah University), the study findings demonstrate that e-learning Effectiveness can be evaluated using the SERVQUAL (Service) dimension. In this study, it was noted that the PU and ELE have a direct implication on the CUI with the Perceived Satisfaction playing the role of a mediating effect of the Perceived Satisfaction between the PU and ELE and the CUI. These findings supported the findings of Senthilkumar and Arulraj, (2011), which indicated that the measurement of service quality represents the degree and direction of discrepancies or the gap that exists in the expectations of clients and the overall perceptions pertaining to a specific service provision.

The analysis results confirmed hypotheses H1, H2, H3, H4 and H5 which included that the PU has a direct relationship with the CUI, that ELE influences the CUI, the SAT has a direct relationship with the CUI, and that the SAT plays a mediating role on the PU and the CUI with the SAT equally mediating ELE with the CUI. Accordingly, the reviewed respondents observed that they had high Perceived Usefulness in a stabilized, easy, in terms of ease of use, technology aided learning environment. Also, the sourced results identified that the students involved in online learning possessed a reduced expectation on the level of interaction during the e-learning process and were thus highly dependent on others for empathy.

Issues of reliability fail to influence the ELE and also the mediating role of the SAT and gender issues. An element of the e-learning Effectiveness has been identified as being the limitation of the successful recognition of the different influences of the student's perception. This is informed by the view that offering quality content and continuous development of the teaching approach ensures that students are comprehensively engaged and motivated in the learning process. Prompt feedback has been ranked as being the top priority by learners for appropriate academic experience.

The Perceived Usefulness is always improved when there is information that is general and nonspecific that brings added value to the e-learning course offered. Nevertheless, there are strategies that have been identified to improve the quality and design of the learning environment. These are aimed at

improving the e-learning quality and increasing the level of the learner's satisfaction as well as the overall outcomes. Part of this would include facilitating and motivating all of the involved students to play a contributory purpose in leveraging fresh competencies and new knowledge creation in an appropriate manner. Also, the learners could actively become involved in authentic learning processes and practices, thereby, encouraging an active learning process and developing the learners' overall capabilities instead of simply recalling concepts and information. This is shown by the high-level concepts that formed part of the current study which guided, to what extent the low placed success factors of the e-learning are directly involved in influencing the ELQ perception of the students and are inclusive of the level of the student's motivation and experiences.

In regard to policy recommendations, there is a need to create system support which is pervasive, since the majority of e-learners lack formal training on how to use a specific e-learning approach. This recommendation could be implemented by integrating more resources into the user-interface design or by training all of the users in order to enhance their Continuance Use Intention as this is influenced by their levels of satisfaction. Students should have greater exposure to e-learning systems which would elicit a positive influence, based on the computer self-efficacy levels of other users. This recommendation can be implemented flexibly by providing access to available resources and information when and where is most convenient to individual students rather for the educator or the institution. This could include enhanced access to teaching resources through online platforms, the adoption of communication tools, online assessment, classroom technologies and sourcing prompt feedback. These recommendations are based on the fact that e-learning has direct implications on supporting the view to continue the learning process and also transferring the learning process beyond the walls of an educational institution, and as such, evidencing the presence of an elaborate linkage between technology aided learning and individual learning which is critical for all of the stakeholders in the education sector.

Furthermore, this research recommends that UAE higher education institutions need to leverage sustainable e-learning opportunities which could enhance the satisfaction levels and Continuance Use Intentions of technology-aided learning for students. The primary areas of focus should include resource management which evaluates the cost of the e-learning process with multiple strategies and approaches being adopted by institutions to improve the level of cost-effectiveness, the efficacy of progress, the level of the economies of scale and the overall scope of operations. Also, the factor of educational attainment should also be considered as a separate domain, focusing on the different measures of learner achievement, the retention rates of the stakeholders and the level of skill acquisition. The process should also include the factors of individual development and evidence of benefits, quality perceptions, and the usability of modern technologies and the overall performance of the students. Finally, professional

development and the innovativeness segment need to be prioritized, in terms of the level of sustainability. This is an effective commitment towards the consistent improvement and the active adaptation of the change process, training and developing the educators, transforming the institutions and the level of educational leadership.

In terms of theoretical recommendations, there is a need to conduct a further study that expands on the group of respondents to include educators and other stakeholders. This would ensure that the sourced data has a broader context rather than just being one-dimensional (i.e., the single reference of the students). Also, future studies could adopt the use of real-time technology as part of their research model which could realistically enhance an increasingly comprehensive evaluation regarding the adaptability of e-learning opportunities despite the changing learning environment.

A conclusion section must be included and should indicate clearly the advantages, limitations, and possible applications of the paper. Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions.

5. REFERENCES

[1] Al-Emran, M., Arpaci, I., & Salloum, S. A. (2020). An empirical examination of continuous intention to use m-learning: An integrated model. *Education and Information Technologies*, 1-20

[2] Al-Hawari, M. A., & Mouakket, S., "The influence of technology acceptance model (TAM) factors on students' e-satisfaction and e-retention within the context of UAE e-learning," Education, Business and Society: Contemporary Middle Eastern Issues, Vol.3, no.4, pp. 299-314, 2010.

[3] AlHamad, A. Q. M. (2020). Acceptance of E-learning among university students in UAE: A practical study. *International Journal of Electrical & Computer Engineering (2088-8708)*, 10.

[4] AlHamad, A. Q. M., & AlHammadi, R. A. (2018, March). Students' perception of E-library system at Fujairah University. In *International Conference on Remote Engineering and Virtual Instrumentation* (pp. 659-670). Springer, Cham.

[5] Al Hamad, A. Q. (2016, February). Students' perception of implementing a Smart Learning System (SLS) based on Moodle at Fujairah College. In *2016 13th International Conference on Remote Engineering and Virtual Instrumentation (REV)* (pp. 315-318). IEEE.

[6] Alhashmi, S. F., Alshurideh, M., Al Kurdi, B., & Salloum, S. A. (2020, April). A Systematic Review of the Factors Affecting the Artificial Intelligence Implementation in the Health Care Sector. In *Joint European-US Workshop on Applications of Invariance in Computer Vision* (pp. 37-49). Springer, Cham.

[7] Al Kurdi, B., Alshurideh, M., Salloum, S. A., Obeidat, Z. M., & Al-dweeri, R. M. (2020). An Empirical Investigation into Examination of Factors Influencing University Students' Behavior towards Elearning Acceptance Using SEM Approach. *International Journal of Interactive Mobile Technologies (iJIM)*, *14*(02), 19-41.

[8] Al-Maroof, R. S., Salloum, S. A., AlHamadand, A. Q., & Shaalan, K. (2020). Understanding an Extension Technology Acceptance Model of Google Translation: A Multi-Cultural Study in United Arab Emirates. International Journal of Interactive Mobile Technologies (iJIM), 14(03), 157-178.

[9] Al-Maroof, R. S., Salloum, S. A., AlHamadand, A. Q. M., & Shaalan, K. (2019, October). A Unified Model for the Use and Acceptance of Stickers in Social Media Messaging. In International Conference on Advanced Intelligent Systems and Informatics (pp. 370-381). Springer, Cham.

[10] Alleman, J., Rappoport, P., & Banerjee, A., "Universal service: A new definition?," Telecommunications Policy, Vol. 34 , no.1-2, pp. 86-91, 2010.

[11] Alshurideh, M. T., Salloum, S. A., Al Kurdi, B., Monem, A. A., & Shaalan, K. (2019a). Understanding the quality determinants that influence the intention to use the mobile learning platforms: A practical study. *International Journal of Interactive Mobile Technologies (IJIM)*, 13(11), 157-183.

[12] Alshurideh, M., Al Kurdi, B., & Salloum, S. A. (2019b, October). Examining the main mobile learning system drivers' effects: A mix empirical examination of both the Expectation-Confirmation Model (ECM) and the Technology Acceptance Model (TAM). In *International Conference on Advanced Intelligent Systems and Informatics* (pp. 406-417). Springer, Cham.

[13] Chang, H. H., "Task-technology fit and user acceptance of online auction," International Journal of Human-Computer Studies, Vol. 68, no.1-2, pp. 69-89, 2010.

[14] Chou, T. C. R., "A Scale of University Students' Attitudes toward e-Learning on the Moodle System," International Journal of Online Pedagogy and Course Design, Vol. 4, no. 3, pp. 49-65, 2014.

[15] Cidral, W. A., Oliveira, T., Di Felice, M., & Aparicio, M., "E-learning success determinants: Brazilian empirical study," Computers & Education, Vol.122, pp. 273-290, 2018.

[16] de Melo Pereira, F. A., Ramos, A. S. M., Gouvêa, M. A., & da Costa, M. F., "Satisfaction and continuous use intention of e-learning service in Brazilian public organizations," Computers in Human Behavior, Vol. 46, pp. 139-148, 2015.

[17] Dominici, G., & Palumbo, F., "How to build an e-learning product: Factors for student/customer satisfaction," Business Horizons, Vol. 56, no. 1, pp. 87-96, 2013.

[18] Fornell, C., & Larcker, D. F., "Structural equation models with unobservable variables and measurement error: Algebra and statistics," 1981.

[19] Hair, J. F., Ringle, C. M., & Sarstedt, M., "Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance," Long range planning, Vol. 46, no. 1-2, pp. 1-12, 2013.

[20] Habes, M., Salloum, S. A., Alghizzawi, M., & Alshibly, M. S. (2018). The role of modern media technology in improving collaborative learning of students in Jordanian universities. International Journal of Information Technology and Language Studies, 2(3), 71-82.

[21] Han, M., Wu, J., Wang, Y., & Hong, M., "A Model and Empirical Study on the User's Continuance Intention in Online China Brand Communities Based on Customer-Perceived Benefits," Journal of Open Innovation: Technology, Market, and Complexity, Vol. 4, no. 4, pp. 46, 2018.

[22] Henseler, J., Ringle, C. M., & Sinkovics, R. R., "The use of partial least squares path modeling in international marketing," In New challenges to international marketing, pp. 277-319, 2009. Emerald Group Publishing Limited.

[23] Howat, G., & Assaker, G., "The hierarchical effects of perceived quality on perceived value, satisfaction, and loyalty: Empirical results from public, outdoor aquatic centres in Australia," Sport Management Review, Vol. 16, no. 3, pp. 268-284, 2013.

[24] Kruger, L. M., Mostert, P., & De Beer, L. T., "Relationship intention and satisfaction following service recovery: The mediating role of perceptions of service recovery in the cell phone industry," South African Journal of Economic and Management Sciences, Vol. 18, no. 4, pp. 608-628, 2015.

[25] Kumar, M. B., Wesche, S., & McGuire, C., "Trends in Metis-related health research (1980–2009): identification of research gaps," Canadian Journal of Public Health, Vol. 103, no. 1, pp. 23-28, 2012.

[26] Kumar, M., Tat Kee, F., & Charles, V., "Comparative evaluation of critical factors in delivering service quality of banks: An application of dominance analysis in modified SERVQUAL model," International Journal of Quality & Reliability Management, Vol. 27, no. 3, pp. 351-377, 2010.

[27] Kuo, Y. F., Wu, C. M., & Deng, W. J., "The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added services," Computers in human behaviour, Vol. 25, no. 4, pp. 887-896, 2009.

[28] Liaw, S. S., & Huang, H. M., "A study of investigating learners attitudes toward e-learning," Proc. 5th International Conference on Distance Learning and Education, Vol. 12, pp. 28-32, 2011.

[29] Naik, C. K., Gantasala, S. B., & Prabhakar, G. V., "Service quality (SERVQUAL) and its effect on customer satisfaction in retailing," European journal of social sciences, Vol. 16, no. 2, pp. 231-243, 2010.

[30] Navimipour, N. J., & Zareie, B., "A model for assessing the impact of e-learning systems on employees' satisfaction," Computers in Human Behavior, Vol. 53, pp. 475-485, 2015.

[31] Oliveira, P., & Roth, A. V., "Service orientation: the derivation of underlying constructs and measures," International Journal of Operations & Production Management, Vol. 32, no. 2, pp. 156-190, 2012.

[32] Ong, C. S., & Lai, J. Y., "Gender differences in perceptions and relationships among dominants of e-learning acceptance," Computers in human behavior, Vol. 22, no. 5, pp. 816-829, 2006.

[33] Orfanou, K., Tselios, N., & Katsanos, C., "Perceived usability evaluation of learning management systems: Empirical evaluation of the System Usability Scale," The International Review of Research in Open and Distributed Learning, Vol. 16, no. 2, pp. 227-246, 2015.

[34] Padilla-MeléNdez, A., Del Aguila-Obra, A. R., & Garrido-Moreno, A., "Perceived playfulness, gender differences and technology acceptance model in a blended learning scenario," Computers & Education, Vol. 63, pp. 306-317, 2013.

[35] Palacios-Marques, D., Cortes-Grao, R., & Carral, C. L., "Outstanding knowledge competences and web 2.0 practices for developing successful e-learning project management," International Journal of Project Management, Vol. 31, no. 1, pp. 14-21, 2013.

[36] Petkari, E., "Student Management Teams as a means of communication and learning experience satisfaction," Procedia-Social and Behavioral Sciences, Vol. 197, pp. 559-564, 2015.

[37] Prentice, C., "Service quality perceptions and customer loyalty in casinos," International Journal of Contemporary Hospitality Management, Vol. 25, no. 1, pp. 49-64, 2013.

[38] Roca, J. C., Chiu, C. M., & Martínez, F. J., "Understanding e-learning continuance intention: An extension of the Technology Acceptance Model," International Journal of human-computer studies, Vol. 64, no. 8, pp. 683-696, 2006.

[39] Ryu, K., & Han, H., "Influence of the quality of food, service, and physical environment on customer satisfaction and behavioral intention in quick-casual restaurants: Moderating role of perceived price," Journal of Hospitality & Tourism Research, Vol. 34, no. 3, pp. 310-329, 2010.

[40] Salloum, S. A., Alshurideh, M., Elnagar, A., & Shaalan, K. (2020, April). Mining in Educational Data: Review and Future Directions. In *Joint European-US Workshop on Applications of Invariance in Computer Vision* (pp. 92-102). Springer, Cham.

[41] Salloum, S. A., Alhamad, A. Q. M., Al-Emran, M., Monem, A. A., & Shaalan, K. (2019a). Exploring Students' Acceptance of E-Learning Through the Development of a Comprehensive Technology Acceptance Model. *IEEE Access*, 7, 128445-128462.

[42] Salloum, S. A., AlHamad, A. Q., Al-Emran, M., & Shaalan, K. (2018). A survey of Arabic text mining. In *Intelligent Natural Language Processing: Trends and Applications* (pp. 417-431). Springer, Cham.

[43] Salloum, S. A. S., & Shaalan, K. (2018). Investigating students' acceptance of E-learning system in Higher Educational Environments in the UAE: Applying the Extended Technology Acceptance Model (TAM). *The British University in Dubai*.

[44] Salloum, S. A., Al-Emran, M., Shaalan, K., & Tarhini, A. (2019b). Factors affecting the E-learning acceptance: A case study from UAE. *Education and Information Technologies*, 24(1), 509-530.

[45] Senthilkumar, N., & Arulraj, A., "SQM-HEI–determination of service quality measurement of higher education in India," Journal of Modelling in Management, Vol. 6, no. 1, pp. 60-78, 2011.

[46] Terzis, V., & Economides, A. A., "Computer based assessment: Gender differences in perceptions and acceptance," Computers in Human Behavior, Vol. 27, no. 6, pp. 2108-2122, 2011.

[47] Tselios, N., Daskalakis, S., & Papadopoulou, M., "Assessing the acceptance of a blended learning university course," Journal of Educational Technology & Society, Vol. 14, no. 2, pp. 224-235, 2011.

[48] Wang, H. C., & Chiu, Y. F., "Assessing e-learning 2.0 system success," Computers & Education, Vol. 57, no. 2, pp. 1790-1800, 2011

[49] Wang, S., Liu, Z., Sun, Q., Zou, H., & Yang, F., "Towards an accurate evaluation of quality of cloud service in service-oriented cloud computing," Journal of Intelligent Manufacturing, Vol. 25, no. 2, pp. 283-291, 2014.

[50] Yu, H. S., Zhang, J. J., Kim, D. H., Chen, K. K., Henderson, C., Min, S. D., & Huang, H., "Service quality, perceived value, customer satisfaction, and behavioral intention among fitness center members aged 60 years and over," Social Behavior and Personality: an international journal, Vol. 42, no. 5, pp. 757-767, 2014.

[51] Zainal, A. Y., Yousuf, H., & Salloum, S. A. (2020, April). Dimensions of Agility Capabilities Organizational Competitiveness in Sustaining. In *Joint European-US Workshop on Applications of Invariance in Computer Vision* (pp. 762-772). Springer, Cham.

Appendix 1

Table 3. Result of CFA for Measurement Model

Construct	Items	Convergent validity			Internal reliability
		Factor loading	Average variance extracted (AVE)	Composite reliability (CR)	Cronbach alpha
Continued Usage Intention	I intend to continue using the e-learning system (i.e. blackboard) for knowledge gathering	0.87	0.76	0.95	0.93
	I intend to continue using the e-learning system (i.e. blackboard) for knowledge construction	0.89			
	I intend to continue using the e-learning system (i.e. blackboard) for knowledge sharing	0.78			
	I will frequently use the e-learning system (i.e. blackboard) in the next semesters	0.88			
	I intend to continue using e-learning system (i.e. blackboard) for my coursework in this semester	0.88			
	Overall, I intend to continue using the e-learning system (i.e. blackboard)	0.90			
Perceived Satisfaction	I am satisfied with using e-learning (i.e. blackboard) as a learning assisted tool	0.93	0.84	0.95	0.94
	I am satisfied with using e-learning (i.e. blackboard) functions	0.93			
	I am satisfied with e-learning (i.e. blackboard) contents	0.93			
	I am satisfied with multimedia instruction	0.87			
Perceived Usefulness	I believe e-learning (i.e. blackboard) contents are informative	0.92	0.88	0.96	0.93
	I believe e-learning (i.e. blackboard) is a useful learning tool	0.95			
	I believe e-learning (i.e. blackboard) contents are useful	0.95			
E-Learning Effectiveness	I believe e-learning (i.e. blackboard) can assist learning efficiency	0.95	0.86	0.95	0.92
	I believe e-learning (i.e. blackboard) can assist learning performance	0.95			
	I believe e-learning (i.e. blackboard) can assist learning motivation	0.89			