Factors affecting learner's satisfaction towards online learning during COVID-19 pandemic: A case study of Vietnam

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Article Info	ABSTRACT
	Online learning is being considered a new model of knowledge exchange in modern education. In parallel with the incredible impacts of the global pandemic, this is considered an opportunity to promote the development of online learning globally. Therefore, this study proposed a research framework including four factors affecting learner satisfaction towards online learning during the COVID-19 pandemic at a university, which are system quality, service quality, transformational leadership, and self-efficacy. A questionnaire was conducted online to assess which 131 respondents were representative students from two large private universities in Da Nang: FPT University and Duy Tan University. The results from the regression analysis show that three factors have a positive impact on learner satisfaction during COVID-19. This study concludes that students at private universities in Da Nang prioritize system quality as the most significant factor in their satisfaction with the online learning system, followed by transformational leadership and the last one is self-efficacy. Therefore, it can be more strategic for private organizations, developers, software designers, or even transformation-trained trainers to be emphasized to build a system of processes for implementing online learning for students effectively.

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1. INTRODUCTION

There has been a longstanding impression that online education does not give the same level of quality as traditional classroom education. Meanwhile, in developed countries, the rapid expansion of information technology and the internet has resulted in various new opportunities and changes in people's lives, particularly in the education sector [1], [2]. Thus, this disparity has caused the educational process in developing countries to be changed and approached with new forms to keep up with the trend. With the impact of the global outbreak of the COVID-19 epidemic, the development and deployment of online learning has accelerated to ensure that education is not interrupted [3]. According to previous studies, this closure had not only a broad economic impact but also the uncertainty of both teachers and students on what they should do in the learning and teaching of the education sector [4], [5]. This is even more evident for private educational institutions when faced with this difficulty. Therefore, research on how to enhance the student's satisfaction with this new learning method being used has become more and more necessary.

The accessibility and availability of technological devices, the internet, and applications (e.g., Microsoft Teams, Google Meet, Zoom, and Skype) enabled teachers and learners to conduct and participate in virtual classrooms from everywhere in the world as long as they had access to e-devices and the internet [6]. Hence, online education has now become a trend in the education sector. Online learning is indeed a

technique that provides positive impacts, but in this time of pandemic, there are also a number of obstacles faced by teachers, students and stakeholders [7]. Therefore, comprehending the extent of distance-learning might provide good views by removing the boundaries of time and space for the education sector [8].

Contrary to public schools, which receive significant funding from the state or are state-owned, private institutions rely mostly on their main customers - students. Therefore, to maintain and enhance their competitive advantage in the market, private institutions have to focus on providing the best quality of educational services for their customers [9], [10] even in crisis situations like the global breakout COVID-19 epidemic [11]. The education sector in Vietnam is not immune to this context either [12]. Since the initial stage of the COVID-19 outbreak appeared in Vietnam, Da Nang has been one of the first cities to be severely impacted by the disease's unrestrained spread [13], which forced the Vietnamese government to take some harsh measures like shutting down all schools across the country to keep the virus from spreading [14]. Therefore, higher educational institutions are unexpectedly required to switch to online learning, which causes some initial lack of success in the implementation of this method [12].

Despite these difficulties, two of the private universities that are still maintaining their highly competitive quality of education at the top of their market in Vietnam are FPT University and Duy Tan University. With the mission of "providing global competitiveness for learners, contributing to the intellectual expansion of the nation", FPT Education is one of the units that quickly applied online learning for students before the pandemic situation [15]. Another private institution, Duy Tan University - an institution born in the 90s in Da Nang who are leading in training and research associated with science and technology, is also ready to apply online education to their students [16]. With a focus on applying technology and providing globalized education services to catch up with the trend of developed countries, these two private educational institutions in Da Nang, Vietnam, fully represent the study's purpose is to explore the factors that influence learners' satisfaction with the online learning system.

Moreover, since few articles provide timely information on the factors that are likely to affect learners' satisfaction when applying online learning at private universities in the COVID-19 outbreak period, the stability of the education sector has been hindered, especially in developing countries. Therefore, this study was conducted in a novel context to examine the main factors affecting learners' satisfaction with the online learning system during the COVID-19. The study also synthesized materials from previous studies to propose an advanced research model and measurement scale. From that, this study will try to answer the question: "What factors affect learners' satisfaction when using the online system during COVID-19?". The research must achieve the following research objectives: i) To explore the factors that have a significant and positive impact on learners' satisfaction when using the online learning system; ii) To evaluate the results of applying online learning in the context of COVID-19 at private universities in Da Nang, Vietnam; and iii) To propose recommendations to stakeholders to improve online learning performance and operations.

According to Benson and Conrad, online learning is a more recent sort of distance learning that enables access to educational possibilities for unorthodox and underprivileged students [17], [18]. The potential of online learning has not just been highlighted in speed and accessibility but also in the connection, adaptability with online education, and the opportunity to construct a diverse variety of interactions multimedia models at a cost-effective price for the university [19]. Meanwhile, Al-Fraihat *et al.* suggest that students will indeed be satisfied if they believe the system promotes their learning performance and activities by allowing them to complete tasks more easily and seamlessly with less effort [20]. In the educational environment, the extent to which online learners are satisfied and how well they fulfill their expectations have been defined in several studies [21]–[23].

There has been minimal study regarding the satisfaction of learners in online learning contexts, despite the surge in online learning offerings [24], [25]. In addition, several studies have explored the relationship between learner satisfaction with online learning [26]–[29]. Research has identified factors that have a direct influence on the degree of online learners' satisfaction. This shows the result of interaction between the user and the online learning system, which can be a tool, platform, or technology device to help exchange information and knowledge more effectively. The findings of Hwang and Choi stated that when it comes to higher education if students are satisfied with the service given, then a significantly greater probability of a high retention rate along with insights for the institution to potential students preparing for enrolment [30]. When organizations have a thorough grasp of the aspects that influence online learner satisfaction, retention rates will certainly rise [25].

From the statements of the studies, online learning and student satisfaction are closely related, in which the results of online learning are influenced by many important factors affecting student satisfaction. Thus, the timely identification of factors affecting learners' satisfaction when applying online learning is a top priority for private educational institutions to raise educational standards. Based on the findings of the literature review, the authors suggest a four factors model in this study, including system quality, service quality, transformational leadership, and self-efficacy, to investigate that influenced learner satisfaction with online learning throughout the COVID-19 epidemic breakout at private universities in Da Nang, Vietnam.

System quality (SYQL) is described as how easy to learn, user-friendly, easy to connect to, and pleasant a system is to be used by system users [31]. It is one of the most important components to measure the quality of the online education service provided to students, which effectively impacts their satisfaction [24]. From this standpoint, system quality is measured with the user's accessible hardware and the numerous user-dependent software applications in the online learning system [32]. The prominent web platforms nowadays have created ever more hurdles and complicated information systems advance. This encourages researchers and developers both to increase the quality and functionality of new systems to take advantage of future growth prospects [33]. The quality of the system is the first factor in the effectiveness of users applying to an online learning system. It is understandable that the quality of the system as a way of providing consumers with efficient and enjoyable support influences user satisfaction. Previous research by Almaiah and Alismaiel found that system quality has a beneficial impact on service student satisfaction when it comes to online learning achievement [34]. Therefore, the quality of the system is hypothesized to have a positive and significant influence on student satisfaction with online learning in this study. System quality is positively impact on learner satisfaction towards online learning systems during the COVID-19 (H1).

Service quality (SERQ) attributes including tangible, reliability, responsiveness, assurance, and empathy are addressed to service quality [35]. According to Teeroovengadum et al., there is an influence of technical service quality on students in general [36]. The use of online learning is likewise similarly assessed. Quality of service is expressed in the flexibility of service and the capacity to provide learners with services everywhere, at any time. The online system is also guaranteed and reliable in the interaction of items. Tools, platforms, or electronic equipment supporting online learning can be called acceptable if users get the most effective service experience on the platform and continuously increase in time to satisfy user needs. Prior study has demonstrated that the quality of service has a significant impact on student satisfaction in an online learning environment [37]. As a result, in this paper, service quality is hypothesized to have a positive impact on learners' satisfaction with online learning. Service quality is positively impact on learner satisfaction towards online learning systems during the COVID-19 (H2).

The findings from Vesely et al. show a greater degree of satisfaction for online learners when interacting with instructors and students [38]. In the research of information system success and technology adoption, transformational leadership (TL) has grown more important [39]. University instructors can display a high degree of confidence by giving support, facility, and coaching in the area of information system (IS) achievement and, in particular, in online learning. The need for leadership to analyze the influence of the adoption and usage of new technologies has been increasingly agreed [40]. This perception confirms the considerable impact of leadership in influencing and promoting the usage of new technologies like online learning [41]. In fact, transformational leadership, in general, was reported to have a positive relationship with student satisfaction [42]. According to Rezvani et al., transformational leadership is assessed to have a positive relationship with user satisfaction when using the online learning system [43]. This study will therefore hypothesize a positive relationship to assess the impact of transformational leadership on learner satisfaction with online learning. Transformational leadership is positively impact on learner satisfaction towards online learning systems during the COVID-19 (H3).

Bates and Khasawneh demonstrated that self-efficacy (SE) is affected by four aspects of online learning: i) Prior online learning achievement; ii) Online training education; iii) Feedback from faculty; and iv) On online learning technological concerns [44]. This declaration depends on the sequence in which educational institutions use this new technique of knowledge exchange in schools when regarded in online learning. The preliminary impact on the success of the online study, the results of learners' expectations and the preparation of the essential instructions ensure that students have confidence in the new application. The favorable feedback of the trainers then boosts the motivation of students to make use of transformation leaders. From then, when you master online learning, people start to trust in their talents. Previous research has also found that self-efficacy and user satisfaction have a positively significant linkage [22], [45]. As a result, it is hypothesized in this study hypothesizes a positive relationship between self-efficacy factors and learners' satisfaction with towards the online learning system. Self-efficacy is positively impact on learner satisfaction towards online learning systems during the COVID-19 (H4). As the results, Figure 1 describes the proposed research model of the study.
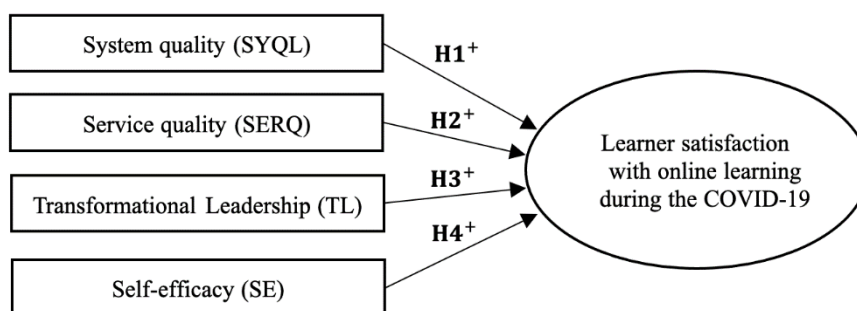
Figure 1. Research model proposed

2. RESEARCH METHOD

2.1. Data collection

A cross-sectional survey was created to obtain data through an online platform during the Spring semester of 2021 to students who have been using online learning at two private universities in Da Nang city, Vietnam. The legal basis of sample size proposed earlier by Bollen, the minimum sample is 100, and the best-observed ratio is 5:1 for applying EFA analysis [46]. The survey questionnaire cited by the author has a total of 16 observed variables, so the minimum sample will be $16 * 5 = 80$. In order to increase the reliability of the study, a total of 131 valid responses were obtained for quantitative analysis. Specifically, 98 valid samples were collected from students of various disciplines from FPT University Da Nang, and the remaining 33 valid samples were received from Duy Tan University.

2.2. Survey structure

The survey is divided into two parts: i) The first part includes the socio-demographic data of the participants; ii) The second part deals with items on factors affecting learner satisfaction in online learning systems during the COVID-19. The questions will be labeled on a 5-point Likert scale, with 1 indicating "strongly disagree" and 5 indicating "strongly agree."

2.3. Data analysis

The following methodologies have been evaluated and the results are based on analytical software, including: i) Descriptive statistical method: to identify respondent composition and characteristics, such as gender, university, school year, major and other individual parts; ii) Cronbach's alpha reliability and exploratory factor analysis (EFA): to examine the reliability of the scale and to find factors affecting the students' satisfaction towards online learning during COVID-19 pandemic; iii) A model of linear regression: to study the effect of factors on dependent variable - students' satisfaction with the online system during the COVID-19 pandemic in private universities.

3. RESULTS

3.1. Participants

Among the 131 respondents, there was not much difference between the genders of the participant; specifically, 52.7% were male, and 47.3% were female. All the respondents are undergraduate students. It cannot be denied that students at both private universities in Da Nang have had time to use tools for online learning when administrators have immediately applied this new form when the education was interrupted. Therefore, all respondents have had the experience of using an online platform before at least one semester accounting for 23.7%, followed by two semesters accounting for 37.4%, three semesters accounting for 31.4%, and over three semesters accounting for 7.6% as shown in Table 1.

Google Meet developed by Google and Zoom developed by Zoom video communications, are two popular online platforms being applied at private universities in Da Nang. The popularity of these two tools to help exchange information and knowledge is becoming widespread worldwide, not just in Vietnam. Therefore, as private organizations are at the forefront of transforming and maintaining the teaching process, these tools are quickly applied to schools as helpful tools. In this study, the number of students surveyed using Google Meet accounted for 74.8% and Zoom accounted for the remaining 25.2%. This ensures that the assessments in this study are timely and adequately analyze the present condition in the Vietnamese education sector during the COVID-19 pandemic's breakout.

Table 1. A description of the demographic information

Demographic item		Frequency	Percentage
Gender	Male	69	52.70%
	Female	62	47.30%
University	FPT	98	74.80%
	Duy Tan	33	25.20%
Major	Economics & Business	73	55.70%
	Information Technology	24	18.30%
	Languages	7	5.30%
	Medicine	11	8.40%
	Tourism	14	10.70%
	Graphic Design	2	1.50%
Platform	Google Meet	98	74.80%
	Zoom	33	25.20%
Previous experience	1 semester	31	23.70%
	2 semesters	49	37.40%
	3 semesters	41	31.30%
	More than 3 semesters	10	7.60%

3.2. The results of scale quality testing

All these factors demonstrated a high coefficient of reliability between 0.536 - 0.869 for Cronbach Alpha value. These factors are greater than 0.6, which qualifies for EFA. The overall correlation of the variables at scale, with the exception of the SYSQ1 observed variable, is more crucial than 0.3. This observed variable is therefore eliminated to meet the requirements and the high reliability as shown in Table 2.

Table 1. Scale quality result

Variables	Initially observed variable	Observed variables remaining	Cronbach's Alpha
System Quality (SYSQ)	3	2	0.636
Service Quality (SERQ)	3	3	0.762
Transformational Leadership (TL)	4	4	0.784
Self-efficacy (SE)	3	3	0.849
Learner Satisfaction (SAT)	3	3	0.869

3.3. The results of the interpretation of the variables in the model

The variables SERQ3 and TL4 from the result of the rotation matrix have a load factor under 0.5 and so have no load factor. Perform a second EFA factor test once two detected SERQ3, TL4 variables have been eliminated. With the research data set, the results of KMO and Bartlett's Test values=0.830 in the range of 0.5-1.0, factor analysis is accepted. In addition, the factor approach is well suited to Sig. Bartlett's Test=0.000 lower than 0.05. The outputs of the rotation factor matrix revealed that the initial four groups of factors were rearranged into four groups with varying factors as shown in Table 3.

Table 2. Rotated component matrix

Observed variables	Component			
	1	2	3	4
SE3	820			
SE2	803			
SE1	701			
SYSQ2		868		
SYSQ3		859		
TL3			801	
TL2			721	
TL1			673	
SERQ1				872
SERQ2				771
KMO and Bartlett's Test				
Kaiser-Meyer-Olkin measure of sampling adequacy				.830
		Approx. Chi-Square		557.704
Bartlett's Test of Sphericity		df		45
		Sig.		000

      Thus, the results have been restructured into four groups of variables represented from 13 initial variables (with the exception of three variables, SAT1, SAT2, and SAT3) and three low-reliability variables (SYSQ1, SERQ3, and TL4) to 10 observed variables. During the COVID-19 epidemic, these are the four factors affecting students' learning satisfaction with the online learning platform at private colleges.

3.4. The results of regression analysis

      The synthesis results show that the R^2=0.711 model (adjusted) shows that 71.1% of the dependent model can be explained by independent variables in the model, meaning that 71.1% of students' satisfaction with the online learning system is explained by four variables explored in the COVID-19 pandemic in private universities. The rest of the 29.9% is attributed to the non-model and random factors. Furthermore, in the range of 1.5-2.5, the value of Durbin-Warson=1.946 is thus not correlated between the residues. The model does not contradict the independent assumptions of the error as shown in Table 4.

Table 3. Model summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	848[a]	720	711	52963	1.946

a. Predictors: (Constant), SERQ, SYSQ, TL, SE
b. Dependent Variable: SAT

      In this study, the relationships between the five factors derived from the EFA analysis are examined using a linear regression model. The following is written in this analysis of the linear regression model as (1):

$$SAT = \beta1 * SYSQ + \beta2 * SERQ + \beta3 * TL + \beta4 * SE \tag{1}$$

Where:
SAT: the dependent variable
SYSQ, SERQ, TL, SE: independent variables
βi: the coefficient for each independent variable

      The model analysis showed that the SE, SYSQ, and TL have Sig.<0.05, except SERQ=0.138>0.05, so the SERQ coefficients were not significant. The independent factors thereby affect the satisfaction of learners, except that the SERQ factor has no effect on the satisfaction of students. The factors SE, SYSQ, and TL all have model significance and positively affect the satisfaction of the learners because they all have a positive sign on the regression coefficients. Besides, the VIF values of all four independent variables are less than 2, which means that multicollinearity does not occur in this current research. The detail is shown in Table 5.

Table 4. Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-592	245		-2.415	017		
SE	306	077	261	3.970	000	516	1.937
SYSQ	403	049	446	8.248	000	761	1.314
TL	322	063	291	5.137	000	695	1.439
SERQ	083	056	091	1.492	138	597	1.676

      The results prove that the adjusted R^2 does not suffer significantly when the SERQ variable has been removed from the linear regression model by reducing the contribution from the remaining three independent variables to 70.08%. Doubling the SERQ variable altogether can be eliminated if the influence of the model is not affected. A beta value is SYSQ (β1=0.457), TL (β3=0.302), and SE (β4=0.306) as the standardized regression coefficient. The order of the influence degree from strongest to weakest of the independent factors to the dependent SAT is SYSQ>SE>TL based on the size of the standard-basic regression coefficient beta. The regression function is rewritten from the results of the regression as (2):

$$SAT = 0.306 * SE + 0.457 * SYSQ + 0.302 * TL \tag{2}$$

4.   DISCUSSION

The discussion will be evaluated for its significance and support by past studies in light of the study's key findings. The upward trend of each variable chosen for the study is confirmed by preliminary research findings. The correlation between aspects of online learning and student satisfaction is 0.708, which indicates that it is stronger than average. According to the findings, the quality of service has little bearing on student satisfaction with online learning at private universities. This can be explained by the fact that most students who approach online learning do so with the intention of self-serving during their studies. Furthermore, the results of the linear regression clearly show that system quality has a significant positive impact on learner satisfaction.

The usage of an online platform for education must ensure that learners can utilize it easily and that participants can engage with one another. Similar results were found in a prior study by Uddin *et al.* when assessing student satisfaction at public schools in Bangladesh [47]. Almarashdeh and Alsmadi discovered that the e-learning context in Saudi Arabia also reported similar findings [48]. Some consistent results were also found in other previous studies [33]–[35]. In addition, most students believe that the institute's faculty's transformational leadership in the use of online learning is critical.

The teaching capacity of the lecturers always governs problems and inquiries during the process of exchanging knowledge with new methods. Understandably, most students expect the attitude and organization of the content of the faculty to change positively when applying an online learning platform, especially during the period of closure of educational institutions throughout the pandemic. According to Rezvani *et al.*, in the study on promoting the continued application of information systems in businesses, there was also a similar finding when evaluating transformational leadership has a positive relationship when it comes to customer satisfaction [44]. This finding is consistent with prior studies on the role of transformational leadership [40], [42]. Finally, when proactively approaching new educational models, a modern university, as well as those following the global education trend, require defined and assured criteria. This indicates that the learners' efficacy will be enhanced as they gain confidence in and mastery of the new learning approach. As a result, learner satisfaction in online learning is fully determined by system quality, leadership transformation capacity, and self-efficacy. Similar results are found in the study of Prifti, showing that the self-efficacy of the learning management system (LMS) system has positive effects on students' satisfaction with their education [49]. In addition, corresponding with earlier studies show that the relationship between self-efficacy and some online learning outcomes is complex and has a significant impact on learner performance [22], [45], [46].

This study strengthens the theoretical foundation for studying the factors affecting online learning systems in the context of the COVID-19 pandemic outbreak in developing countries. The study results also provide a deeper understanding of the potentially influential factors at private educational institutions and provide useful recommendations for professionals, developers, and designers in the effective application of online learning systems. First of all, the management board of a private university needs to establish a process to train faculty and students to access the online learning system and assess the students' readiness for the qualities and applicability to social practice. Secondly, experts, developers, and designers managing online learning systems in private higher education institutions need to focus on the factors that play an influential role in improving student satisfaction with new education systems that will affect teaching performance and student effectiveness. This is necessary to keep up with global education trends, not just during a pandemic, and to prepare for future emergencies. Thirdly, the research results show that the system quality factors related to the popular platforms currently available in the world are applied to online learning students with the same level of effectiveness. Therefore, a culture of using an autonomous online learning system should be instilled in students. Hence, students' readiness for online learning systems must be tested and developed, and developers can better tailor them for global use. Fourth, training programs must be applied to improve students' understanding of the convenience and use of online learning. The systems will enhance the students' pleasant routine and, as a result, their behavior and attitude toward using the online learning system. Fifth, this study's empirical findings can be used to enlighten stakeholders, educational institutions who intend to apply online platforms or innovating teaching methods in making effective decisions regarding online learning mainly support the implementation of systems in the context of developing countries, where there is no habit of online learning instead of traditional methods during the outbreak of the pandemic and other similar contexts.

5.   CONCLUSION

This study takes the foundation from the synthesized theory of the online education system at private universities to determine the factors affecting learner satisfaction during the COVID-19 pandemic. In a familiar global setting, one of the most crucial variables is to use online learning approaches in developing

countries as judged by student satisfaction. Private universities must innovate, maintain teaching quality, and improve student satisfaction. In addition, the school also needs to create opportunities for all students to participate in accessing new learning environments and training necessary skills for the long term, not only for the transformational leadership of lecturers but also to increase the self-efficacy of learners in the future. Private schools are always aiming for the transformation of globalization. As the COVID-19 pandemic disrupts the education system, this is an opportunity to develop an online learning platform. Although not welcome in the education market of developing countries, this will be the first step for private organizations to evaluate their effectiveness and identify factors that have the potential to influence learners' satisfaction at the present time and the direction of future development.

Although qualitative factors have been measured permanently and explicitly, there remain certain limitations. Firstly, the study's findings examine three major factors that have been identified as influencing online learning systems and student satisfaction, and they explain 70.08% of the variation in the degree of student satisfaction. As a result, in addition to the proposed research model, certain other factors may influence learner satisfaction. Second, because this study was undertaken during the COVID-19 pandemic, more investigations in developing and rare countries are required on a regular basis. Finally, we provide our findings in the context of two online learning platforms: Google Meet and Zoom. As a result, further study is needed in the future to give more validation and comparability across different types of online learning. In addition, future research directions, attractive solutions to improve service quality needs time to prepare and test the samples collected from the questionnaire satisfactorily. The content describes the cause or reason for satisfaction, combined with the analysis factor to clarify the basis and propose solutions.

REFERENCES

[1]   W. Bhuasiri, O. Xaymoungkhoun, H. Zo, J. J. Rho, and A. P. Ciganek, "Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty," *Computers and Education*, vol. 58, no. 2, pp. 843–855, 2012, doi: 10.1016/j.compedu.2011.10.010.

[2]   R. Altunisik, "The Role of Leadership In the Success of e-Learning Programs: The Case of Sakarya University e-MBA Program," *Procedia - Social and Behavioral Sciences*, vol. 55, pp. 539–546, 2012, doi: 10.1016/j.sbspro.2012.09.534.

[3]   K. Mukhtar, K. Javed, M. Arooj, and A. Sethi, "Advantages, limitations and recommendations for online learning during covid-19 pandemic era," *Pakistan Journal of Medical Sciences*, vol. 36, pp. S27–S31, 2020, doi: 10.12669/pjms.36.COVID19-S4.2785.

[4]   V. K. Long Nguyen *et al.*, "Exploring the impact of pandemic on global economy: Perspective from literature review," *Pertanika Journal of Social Sciences and Humanities*, vol. 29, no. 3, pp. 2033–2087, 2021, doi: 10.47836/pjssh.29.3.29.

[5]   T. Karakose, R. Yirci, and S. Papadakis, "Exploring the interrelationship between covid-19 phobia, work–family conflict, family–work conflict, and life satisfaction among school administrators for advancing sustainable management," *Sustainability (Switzerland)*, vol. 13, no. 15, 2021, doi: 10.3390/su13158654.

[6]   M. F. H. Sarker, R. Al Mahmud, M. S. Islam, and M. K. Islam, "Use of e-learning at higher educational institutions in Bangladesh: Opportunities and challenges," *Journal of Applied Research in Higher Education*, vol. 11, no. 2, pp. 210–223, 2019, doi: 10.1108/JARHE-06-2018-0099.

[7]   F. Ferri, P. Grifoni, and T. Guzzo, "Online Learning and Emergency Remote Teaching: Opportunities and Challenges in Emergency Situations," *Societies*, vol. 10, no. 4, pp. 1–18, 2020, doi: 10.3390/soc10040086.

[8]   I. El Khuluqo, A. R. A. Ghani, and A. Fatayan, "Postgraduate students' perspective on supporting 'learning from home' to solve the covid-19 pandemic," *International Journal of Evaluation and Research in Education (IJERE)*, vol. 10, no. 2, pp. 615–623, 2021, doi: 10.11591/ijere.v10i2.21240.

[9]   T. M. H. Le, V. K. L. Nguyen, T. S. Nguyen, T. H. Oanh Le, and T. N. M. Duong, "Assessment of Students' Satisfaction of Facility Service Quality in Private Universities," *Universal Journal of Educational Research*, vol. 9, no. 5, pp. 974–983, 2021, doi: 10.13189/ujer.2021.090510.

[10]   V. K. Long Nguyen, T. M. Hanh Le, T. M. Chau Tran, T. H. Le, T. T. Hien Le, and N. H. Vo, "Education Quality and Student Satisfaction in Private Universities: An Empirical Study of FPT University Da Nang, Vietnam," *Universal Journal of Educational Research*, vol. 9, no. 6, pp. 1148–1161, 2021, doi: 10.13189/ujer.2021.090604.

[11]   P. N. T. Nhan, N. M. Lan, T. H. Hien, N. T. T. Phuong, and N. T. N. Phi, "The Relationship between Online Learning and Student Satisfaction with Training Quality in Private Universities during the COVID-19 Pandemic," *Journal of Education and e-Learning Research*, vol. 9, no. 1, pp. 8–16, 2022, doi: 10.20448/JEELR.V9I1.3660.

[12]   L. P. Dinh and T. T. Nguyen, "Pandemic, social distancing, and social work education: students' satisfaction with online education in Vietnam," *Social Work Education*, vol. 39, no. 8, pp. 1074–1083, 2020, doi: 10.1080/02615479.2020.1823365.

[13]   R. Ratcliffe, "Vietnam detects first locally transmitted Covid-19 cases since April," the Guardian, Jul. 2020. [Online]. Available: https://www.theguardian.com/world/2020/jul/27/vietnam-evacuates-80000-tourists-amid-new-covid-19-cases-in-danang

[14]   V. K. L. Nguyen, T. M. H. Le, T. N. M. Duong, T. S. Nguyen, T. T. H. Le, and T. T. H. Nguyen, "Assessing student's adoption of e-learning: An integration of TAM and TPB framework," *Journal of Information Technology Education: Research*, vol. 21, pp. 297-335, 2022, doi: 10.28945/5000.

[15]   T. V. Anh, H. T. T. Nguyen, and N. T. M. Linh, "Digital Transformation: A Digital Learning Case Study," *Proceedings of the 2019 The World Symposium on Software Engineering (WSSE 2019)*, 2019, pp. 119-124, doi: 10.1145/3362125.3362135.

[16]   T. V. Truong, B. D. Ha, and B. N. Le, "The effects of industry 4.0 on teaching and learning CDIO project at Duy Tan University," *Proceedings of the 15th International CDIO Conference*, 2019, pp. 534-548.

[17]   A. D. Benson, "Using Online Learning To Meet Workforce Demand: A Case Study of Stakeholder Influence," *Quarterly Review of Distance Education*, vol. 3, no. 4, pp. 443–452, 2002.

[18]   D. L. E. Conrad, "Community, social presence and engagement in online learning," ProQuest Dissertations and Theses, 2002.

[19]   J. Paul and F. Jefferson, "A Comparative Analysis of Student Performance in an Online vs. Face-to-Face Environmental Science Course From 2009 to 2016," *Frontiers in Computer Science*, vol. 1, 2019, doi: 10.3389/fcomp.2019.00007.

[20]   D. Al-Fraihat, M. Joy, R. Masa'deh, and J. Sinclair, "Evaluating E-learning systems success: An empirical study," *Computers in Human Behavior*, vol. 102, pp. 67–86, 2020, doi: 10.1016/j.chb.2019.08.004.
[21]   K. Regmi and L. Jones, "A systematic review of the factors - Enablers and barriers - Affecting e-learning in health sciences education," *BMC Medical Education*, vol. 20, no. 1, 2020, doi: 10.1186/s12909-020-02007-6.
[22]   E. Alqurashi, "Predicting student satisfaction and perceived learning within online learning environments," *Distance Education*, vol. 40, no. 1, 2019.
[23]   I. M. S. Weerasinghe and R. L. Fernando, "Students' satisfaction in higher education," *American Journal of Educational Research*, vol. 5, no. 5, pp. 533–539, 2017.
[24]   L. Pham, Y. B. Limbu, T. K. Bui, H. T. Nguyen, and H. T. Pham, "Does e-learning service quality influence e-learning student satisfaction and loyalty? Evidence from Vietnam," *International Journal of Educational Technology in Higher Education*, vol. 16, no. 1, 2019, doi: 10.1186/s41239-019-0136-3.
[25]   J. C. Andersen, J. H. Lampley, and D. W. Good, "Learner Satisfaction in Online Learning: an Analysis of the Perceived Impact Oflearner-Social Media and Learner-Instructor Interaction," *Review of Higher Education & Self-Learning*, vol. 6, no. 21, pp. 81–96, 2013.
[26]   H. Baber, "Determinants of Students' Perceived Learning Outcome and Satisfaction in Online Learning during the Pandemic of COVID-19," *Journal of Education and e-Learning Research*, vol. 7, no. 3, pp. 285-292, 2020.
[27]   N. M. Almusharraf and S. H. Khahro, "Students' Satisfaction with Online Learning Experiences during the COVID-19 Pandemic," *International Journal of Emerging Technologies in Learning*, vol. 15, no. 21, pp. 246–267, 2020, doi: 10.3991/ijet.v15i21.15647.
[28]   S. Kim and D. J. Kim, "Structural relationship of key factors for student satisfaction and achievement in asynchronous online learning," *Sustainability (Switzerland)*, vol. 13, no. 12, 2021, doi: 10.3390/su13126734.
[29]   M. Maqableh and M. Alia, "Evaluation online learning of undergraduate students under lockdown amidst COVID-19 Pandemic: The online learning experience and students' satisfaction," *Children and Youth Services Review*, vol. 128, 2021, doi: 10.1016/j.childyouth.2021.106160.
[30]   Y.-S. Hwang and Y. K. Choi, "Higher education service quality and student satisfaction, institutional image, and behavioral intention," *Social Behavior and Personality: an International Journal*, vol. 47, no. 2, pp. 1–12, 2019, doi: 10.2224/sbp.7622.
[31]   S. Petter and E. R. McLean, "A meta-analytic assessment of the DeLone and McLean IS success model: An examination of IS success at the individual level," *Information and Management*, vol. 46, no. 3, pp. 159–166, 2009, doi: 10.1016/j.im.2008.12.006.
[32]   Y. Yosep, "Analysis of Relationship between Three Dimensions of Quality, User Satisfaction, and E-Learning Usage of Binus Online Learning," *CommIT (Communication and Information Technology) Journal*, vol. 9, no. 2, p. 67, 2015, doi: 10.21512/commit.v9i2.1648.
[33]   W. T. Wang and Y. J. Lai, "Examining the adoption of KMS in organizations from an integrated perspective of technology, individual, and organization," *Computers in Human Behavior*, vol. 38, pp. 55–67, 2014, doi: 10.1016/j.chb.2014.05.013.
[34]   M. A. Almaiah and O. A. Alismaiel, "Examination of factors influencing the use of mobile learning system: An empirical study," *Education and Information Technologies*, vol. 24, no. 1, pp. 885–909, 2019, doi: 10.1007/s10639-018-9810-7.
[35]   A. Parasuraman, V. A. Zeithaml, and L. L. Berry, "SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality," *Journal of Retailing*, vol. 64, no. 1, pp. 12–40, 1988.
[36]   V. Teeroovengadum, R. Nunkoo, C. Gronroos, T. J. Kamalanabhan, and A. K. Seebaluck, "Higher education service quality, student satisfaction and loyalty: Validating the HESQUAL scale and testing an improved structural model," *Quality Assurance in Education*, vol. 27, no. 4, pp. 427–445, 2019, doi: 10.1108/QAE-01-2019-0003.
[37]   N. Gorla and T. M. Somers, "The impact of IT outsourcing on information systems success," *Information and Management*, vol. 51, no. 3, pp. 320–335, 2014, doi: 10.1016/j.im.2013.12.002.
[38]   P. Vesely, L. Bloom, and J. Sherlock, "Key elements of building online community: Comparing faculty and student perceptions," *MERLOT Journal of Online Learning and Teaching*, vol. 3, no. 3, pp. 234–246, 2007.
[39]   L. Alos-Simo, A. J. Verdu-Jover, and J. M. Gomez-Gras, "How transformational leadership facilitates e-business adoption," *Industrial Management and Data Systems*, vol. 117, no. 2, pp. 382–397, 2017, doi: 10.1108/IMDS-01-2016-0038.
[40]   M. Ali and P. Chin-Hong, "Transformational leadership, organizational commitment and innovative success," *Market Forces*, vol. XIII, no. 1, pp. 42–55, 2017.
[41]   A. Aldholay, Z. Abdullah, O. Isaac, and A. M. Mutahar, "Perspective of Yemeni students on use of online learning: Extending the information systems success model with transformational leadership and compatibility," *Information Technology and People*, vol. 33, no. 1, pp. 106–128, 2020, doi: 10.1108/ITP-02-2018-0095.
[42]   J. Tanuwijaya, D. Aseanty, and A. W. Gunawan, "Analysis the Effect of Transformational Leadership on Student Satisfaction and Its Impact on Motivation to Learn on Higher Education," *Proceedings of the 4th International Conference on Research of Educational Administration and Management (ICREAM 2020)*, vol. 526, 2021, doi: 10.2991/assehr.k.210212.094.
[43]   A. Rezvani, L. Dong, and P. Khosravi, "Promoting the continuing usage of strategic information systems: The role of supervisory leadership in the successful implementation of enterprise systems," *International Journal of Information Management*, vol. 37, no. 5, pp. 417–430, 2017, doi: 10.1016/j.ijinfomgt.2017.04.008.
[44]   R. Bates and S. Khasawneh, "Self-efficacy and college students' perceptions and use of online learning systems," *Computers in Human Behavior*, vol. 23, no. 1, pp. 175–191, 2007, doi: 10.1016/j.chb.2004.04.004.
[45]   J. C. Hong, M. Y. Hwang, E. Szeto, C. R. Tsai, Y. C. Kuo, and W. Y. Hsu, "Internet cognitive failure relevant to self-efficacy, learning interest, and satisfaction with social media learning," *Computers in Human Behavior*, vol. 55, pp. 214–222, 2016, doi: 10.1016/j.chb.2015.09.010.
[46]   K. A. Bollen, "Overall fit in covariance structure models: Two types of sample size effects," *Psychological Bulletin*, vol. 107, no. 2, pp. 256–259, 1990, doi: 10.1037//0033-2909.107.2.256.
[47]   M. M. Uddin, A. Ghosh, and O. Isaac, "Impact of the System, Information, and Service Quality of Online Learning on User Satisfaction among Public Universities Students in Bangladesh," *International Journal of Management and Human Science (IJMHS)*, vol. 3, no. 2, pp. 1–10, 2019.
[48]   I. Almarashdeh and M. Alsmadi, "Investigating the acceptance of technology in distance learning program," *2016 International Conference on Information Science and Communications Technologies, ICISCT 2016*, 2016, doi: 10.1109/ICISCT.2016.7777404.
[49]   R. Prifti, "Self–efficacy and student satisfaction in the context of blended learning courses," *Open Learning*, vol. 37, no. 2, pp. 111–125, 2022, doi: 10.1080/02680513.2020.1755642.

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