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Original Article

Factors Influencing University Student Satisfaction with Online Learning in Vietnam

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Abstract: Student satisfaction with online learning is critical for universities in developing countries. However, little is known about the impact of contextual and personal factors on the engagement and satisfaction of university students in developing countries with online learning. This study conducted a survey to explore the factors determining university student satisfaction with online leanring in Vietnam. It examines 427 undergraduate students at a leading multidisciplinary university who have experienced online learning for their university courses since early 2020. The structural equation modelling analyses using Smart PLS indicated that online learning service quality and student self-efficacy had significant relationships with student engagement, leading to student satisfaction. In the online education context of Vietnam, although online learning service quality and student self-efficacy affected both behavioural, cognitive, and emotional engagement, only behavioural and cognitive engagement had significant relationships with student satisfaction. The findings provides implications for educators in Vietnam to enhance the effectiveness of online learning.

Keywords: Online learning, service quality, student self-efficacy, student engagement, student satisfaction, Vietnam.

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1. Introduction

Online learning has been widely adopted in developing countries thanks to the rapid development of online education technologies and the recent COVID-19 pandemic [1-3]. Since then, researchers and educators in developing countries have paid much attention to exploring the factors determining the success and failure of online learning in which learner satisfaction was a critical aspect of online education success [2-7]. However, little research has focused on the interaction of various perception factors that affect learner satisfaction differently (e.g., online learning perceptions, student personal perceptions, online learning engagement and satisfaction). It is also argued that different countries' educational contexts may influence how students are satisfied with online learning [4, 6, 8].

Online learning of universities in developing countries remains in the initial stages of adoption with many obstacles regarding online learning system quality, technological infrastructure, and student readiness [6, 8-10]. Vietnam, as a fast-growing developing country in Southeast Asia with a population of nearly 100 million people, proposed online learning to universities many years ago but received very little attention although Vietnamese people have used internet services widely for their business and daily lives [11]. Before the COVID-19 pandemic, only 20 universities out of 278 higher education institutions offered 90 distance education programs for approximately 160 thousand students, accounting for 6 percent of the total university students in Vietnam [12]. By April 2020, the outbreak of COVID-19 in Vietnam forced more than 63 public and 42 non-pubic universities, in collaboration with the government and ICT providers, to adopt online learning for their education continuity [11]. The leading online learning adopted are live online learning integrating different real-time online teaching support tools such as Google Hangouts, Microsoft Teams, Zoom, Skype, email, and social networks [11, 13]. However, most Vietnamese universities were not ready for online learning. They did not had any online training activities before the COVID-19 pandemic or did not even had a learning management system [11]. Teachers and students were also Lunprepared for online teaching and learning [14, 15]. Research reported that Vietnamese teachers lacked digital pedagogical framework and proper training support while students found themselve stressed, anxious and difficult to interact with teachers and peers [14, 16]. These obstacles reduced the quality of online learning and student satisfaction towards online learning [9, 10, 15, 16]. However, with continuous improvement efforts from 'teachers and universities, students' attitudes towards online learning have gradually changed positively [14]. Many studies reported that students in developing countries are more confident and enjoy using live online for distance education in the post-COVID-19 period [17, 18]. However, little is known on how university students in developing countries are satisfied with online learning due to the differences in economic, technological and cultural backgrounds [19, 20]. Further research is required to enhance understanding of factors influencing student satisfaction with online learning in developing countries, e.g. Vietnam.

Prior studies highlighted the different determinants predicting student satisfaction with online learning such as characteristics of online learning that benefit students [2, 21], online learning service quality and student self-efficacy [4, 6], the situations of online learners [22, 23]. However, little research has studied the relationships among online learning service quality, online learning self-efficacy, and online student engagement and satisfaction [2, 5, 6]. By adopting the social cognitive theory [24] and a survey questionnaire taking undergraduate students at a leading multidisciplinary university in Hanoi, Vietnam, we constructed, verified, and validated a theoretical model of factors determining student engagement and satisfaction with online learning in Vietnam, a

developing country in Southeast Asia. More generally, the paper is organized in seven parts. After introducing the research background, we review the literature on online learning satisfaction, engagement, perceptions and their impact on online learning engagement, satisfaction in part two. The research model and hypotheses are developed in part three. Part four presents the variables and measures supporting data collection and analysis. In part five, the results of data analysis are presented, from which the discussion and conclusion of the study is drawn.

2. Theoretical Background

2.1. Social Cognitive Theory

The social cognitive theory highlights student attitudes and behaviors under the impact of external environmental factors [24]. In the context of online learning in higher education, the online learning environment includes online learning platforms, instructors, students and support systems designed by universities. This environment has impacts on 'students' cognition and attitude leading to their engagement behaviours and satisfaction as the outcome [2, 21]. Therefore, social cognitive theory can be adopted to gain insights into the determinants of student engagement and satisfaction with online learning. Specifically, we will use social cognitive theory to explore how the environment impacts student perceptions of online learning leading to their engagement and satisfaction with online learning.

2.2. Student Satisfaction

Students' satisfaction with online learning is an important aspect of success for the students and the universities [2, 25]. Student satisfaction will lead to student learning motivation, performance, and loyalty with online education [4]. It is also an important measurement of online learning service quality that enables universities develop their online courses [4, 5]. Student satisfaction is however a complex multi-faceted concept. It can be defined as"the fulfillment of a student's need and perceptions of contentment with learner, instructor, course, program, and organizational related factors in the online learning environment" [25]. Evaluating students' satisfaction must therefore base on students' view of all aspects of the online courses [2]. Research indicated that outcomes and satisfaction with online learning learning can be predicted by student engagement with online courses [6]. It is therefore critical for universities to facilitating student engagement in online learning to ensure students' satisfaction.

2.3. Student Engagement and Satisfaction

Student engagement generally refers to the state of student psychological, cognitive, emotional and behavioural responses to achieve learning outcomes [26]. It includes emotional, cognitive and beharioural engagement [5, 27, 28]. When students engage in online learning they will put time, energy, thought, efforts, and, to some extent, feelings into their learning both within and outside of the online classes. Student engagement can be recognized through their responses to the contents, classmates, and instructors to achieve learning outcomes [6, 28]. Behavioural engagement refers to observable actions, such as attendance, activeness, and levels of participation. Emotional engagement is intangible feelings, interest, and emotions; cognitive engagement measures student effort [28]. A high degree of engagement will lead to online learning outcomes and satisfaction toward instructional style, learning contents and course structures, instructors and teaching assistants, discussion forums, group projects/examinations, and the overall online course [2, 5, 6].

2.4. Factors Influencing Student Engagement and Satisfaction with Online Learning

Online learning service quality perceived by students is one of the key factors influencing student engagement and satisfaction with online learning [4, 6]. A number of studies highlighted the attitude towards computer and the internet as an important factor for students to engage

and satisfy with online learning [2]. From the technology acceptance theory, students intended to use online Learning if they find it useful and easy to use [2, 6]. That means that students must perceive online learning as benefitial to their knowledge acquisition in terms of its flexibility, accessibility, interactivity, and ease of use to engage in learning and satisfy with it [2, 6]. From the perspective of education system service quality, Pham et al., (2019) argued that students' perceptions must be interpreted within three dimensions to cover all quality aspects of an online learning system: online learning system quality, online instructor quality and online learning support system quality. This view allowed to integrate both the perceptions of the computer and the internet, the instructors and support system and their relationships with student engagement and satisfaction with online learning, which are fragmented within the literature on online education [2, 5, 29].

The literature on online learning readiness highlighted that student internet and academic self-efficacy, developed when they studied online with other students, influences student engagement and satisfaction with online learning [5, 6]. Academic self efficacy refers to the confidence with their self-directed learningLearning, self-regulated learning, time management, and the abilities to cope with busy schedule, stress and mind-wandering [22, 23, 30]. Internet self-efficacy refers to computer, the internet, online communication skills [5, 31]. Students must develop these competences over time in order to engage effectively with online learning [5, 6, 32].

3. Research Model and Hypotheses

The literature review showed a lack of consistent results concerning the factors influencing student engagement and satisfaction with online learning. Past research focused on either some technological aspects, education system quality or student readiness as the predictors of student engagement and satisfaction. This study therefore expands the literature on online learning satisfaction by using the structural equation modelling analysis technique to investigate a more comprehensive relationship between online learning service quality, student self-efficacy, engagement and satisfaction with online learning. Figure 1 presents the research model of this study.

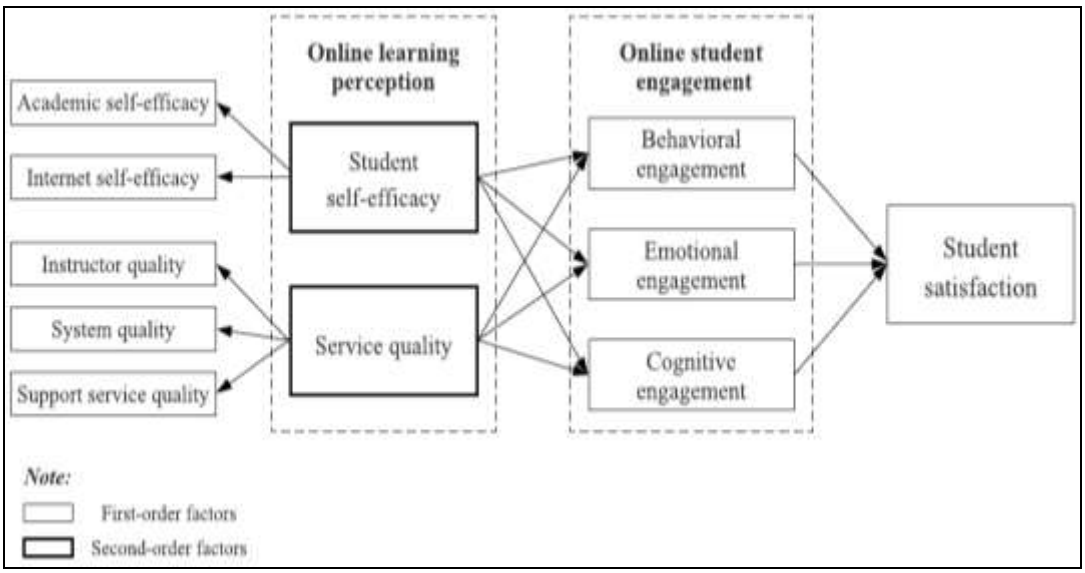

Figure 1. Research model.

This research model was used to test the following hypotheses:

H1. Online learning perception positively affects online student engagement;

H2. Online student engagement positively affects students satisfaction;

H3. Online student engagement mediates the relationship between online learning perception and student satisfaction.

4. Research Methodology

4.1. Measurement Development

Latent constructs were measured using instruments adapted from those developed by Martin et al., Dixson et al., Pham et al., and Wei & Chou [2, 28, 32]. The existing items were selected and categorized according to service quality and student self-efficacy (Table 1).

Except items measuring student self-efficacy through its lower-orders factors were evaluated by a five-point of confidence scale ranging from 1 "not confident at all" to 5 "extremely confident", the remaining items were recorded by a five-point Likert scale where 1 indicates "strongly disagree" and 5 indicates "strongly agree".

Table 1. Measurement source

Source	Constructs	Description	Items
Pham et al., (2019)	System quality	It is defined as the student's perception of the security, dependability, processing speed, responsiveness, usability, and design of the information technology system they are using.	10
	Instructor quality	It refers to students' perception of the teacher's lecturing skills, knowledge, interest in students, responsiveness, organizational ability, and the quality of exams, assignments, and course materials.	11
	Support service quality	It is defined as the administrative and support services offered by the help desk, advisers, administrative staff and university management.	7
Martin et al., (2020)	Academic self-efficacy	It refers to students' confidence on capacity for their self-regulated and self-directed learning along with managing the time well.	5
	Internet self-efficacy	It is the student's self-assurance in connecting and communicating with others via computer-mediated communication tools as well as confidence in assessing these resources.	5
Dixson et al., (2015)	Behavioral engagement	It is students' participation in academic activities.	5
	Emotional engagement	It relates to students' positive and negative attitude towards their online learning.	5
	Cognitive engagement	It is defined as students' investment in learning at a cognitive level to understand and mastering knowledge.	6
Wei & Chou (2020)	Student satisfaction	It is the student's contentment with the learning experience related to instructional style, learning contents, course structures, exam or assignment and overall program.	7

4.2. Sampling and Data Collection

This study utilized a random sampling approach where an email survey was sent to students from seven member colleges via their student unions, all of which are part of a large, multi-disciplinary university in Hanoi, Vietnam. The choice of this university was based on three primary reason. Firstly, this university is the leading university in Vietnam, with numerous member colleges and schools catering to over 40,000 students. Secondly, this university has been a pioneer in adopting online for educational activities since the outbreak of the COVID-19 pandemic in early 2020. All university students have used online learning since then.

The Google Form link of the questionnaire was distributed to students in December 2022 when students had experienced online learning for six continuous semesters. Two months after the initial mailings, a total of 427 valid responses were served for our analysis. This sample included 330 (77.3%) female and 97 (22.7%) male. Most student participants (72.4%) were in the second-year and third-year bachelor programs. The demographic of the sample are presented in Table 2.

Table 2. Sample characteristics (n = 427)

Characteristic	Frequency	Percent (%)
Gender		
Male	97	22.7
Female	330	77.3
Level in the bachelor program		
1st year	32	7.5
2nd year	187	43.8
3rd year	122	28.6
4th year	86	20.1

4.3. Analytical Method

The present study utilized the Partial Least Squares (PLS) method using Structural Equation Modeling (SEM) to analyze the collected data. PLS-SEM has been emphasized on prediction orientation and its capability of handling complex models with minimal demand on sample sizes [34]. In this study, the conceptual model was empirically checked by SmartPLS version 4.0.9.5 to identify empirical data based on prior papers then the following step-by-step data analysis performed to determine the significance level of proposed hypotheses. According to Anderson and Gerbing [33], validity of measurement model was estimated before testing the relationships outlined in structural model.

5. Data Analysis and Results

5.1. Measurement Model

PLS analysis showed that the sets of factor loadings were above the recommended 0.6 level [34, 35]; thus, the measurement model identified all of the items as strong enough to carry with construct without removing any single items.

The reliability score of measurement model was considered adequate as the value of Cronbach's Alpha (CA) and Composite Reliability (CR) which exceed the recommended cut-off of 0.70 [37], thus confirming the internal consistency in the scale categories as shown in Table 2.

The convergent and discriminant validity were confirmed by the score of average

variance extracted (AVE) and square root of the AVE. The AVE values are well above 0.5 except for the AVE's service quality (0.474) which is slightly lower than this threshold (Table 3). As shown in Table 3, the diagonal scores were the square root of AVEs which were significantly higher than the levels of corellations involving the contruct [36].

Jointly, the measurement model showed an adequate convergent and discriminant validity which were precursor to running further analysis.

Table 3. Reliability and validity of the constructs

First-order Constructs	CA	CR	AVE	1	2	3	4	5	6
Behavioral engagement.	0.856	0.897	0.635	0.797					
Cognitive engagement.	0.883	0.912	0.634	0.637	0.796				
Emotional engagement.	0.865	0.903	0.651	0.713	0.780	0.807			
Student self-efficacy.	0.900	0.918	0.527	0.674	0.718	0.667	0.726		
Service quality.	0.958	0.962	0.474	0.574	0.674	0.618	0.679	0.738	
Student satisfaction.	0.927	0.942	0.698	0.610	0.642	0.608	0.708	0.688	0.836
Note(s): Italic diagonal values depict the square root of AVE.									

Since student self-efficacy and service quality are reflective second-order factors, thus their validity are depicted by the path weights of their corresponding first-order factors. Figure 2 interprets the weights of the first-order factors on the designated second-order factors ($p < 0.01$). The weights of system quality, instructor quality, and support service quality are 0.906, 0,911 and 0.883 respectively suggesting that the second-order construct of service quality significantly determines them. Student self-efficacy is the second-order construct with two significant first-order dimensions: academic self-efficacy (0.927) and internet self-efficacy (0.915).

In addition to validity assessment, multicollinearity was also checked due to the relatively high correlations among variables (e.g., a correlation of 0.637 between cognitive engagement and behavioral engagement). The variance inflation factor (VIF) values inteprted in Table 4 for all of the constructs are acceptable ranging between 1.855 and 3.197 which all lower than acceptable threshold of 0.50, thus confirming the uncritical of level of collinearity between variables [37].

5.2. Stuctural Model

Figure 2 depicts the structural testing results along with Table 4 which showing most of relationships are supported as exceeding the minimum t-value (1.96) to get the significant association at p-value 0.000 (<0.01).

Student self-efficacy signifianctly affects behavioral engagement (b = 0.528, t = 11.279), as is service quality (b = 0.215, t = 4.292). These two factors account for nearly 48% of variance in behavioral engagement. Emotional engagement is significant affected by student self-efficacy (b = 0.460, t = 9.209) and service quality (b = 0.305, t = 6.117) which account for about 50% variance of emotional engagement. Cognitive engagement is found to be significantly influenced by student self-efficacy (b = 0.483, t = 8.326) and service quality (b = 0.346, t= 6.246) which account for nearly 60% variance of cognitive engagement.

Table 4. Hypotheses testing results

Hypotheses	Beta	t-value	p-value	CI	Decision	VIF
Direct efects						
Student self-efficacy → Behavioral engagement	0.528	11.279	0.000		Supported	1.855
Student self-efficacy → Emotional engagement	0.460	9.209	0.000		Supported	1.855
Student self-efficacy → Cognitive engagement	0.483	8.326	0.000		Supported	1.855
Service quality → Behavioral engagement	0.215	4.292	0.000		Supported	1.855
Service quality → Emotional engagement	0.305	6.117	0.000		Supported	1.855
Service quality → Cognitive engagement	0.346	6.246	0.000		Supported	1.855
Behavioral engagement → Student satisfaction	0.299	5.220	0.000		Supported	2.107
Emotional engagement → Student satisfaction	0.108	1.621	0.105		Not supported	3.197
Cognitive engagement → Student satisfaction	0.367	5.667	0.000		Supported	2.641
Indirect effects						
Student self-efficacy → Behavioral engagement → Student satisfaction	0.158	4.891	0.000	(0.097, 0.223)	Mediated	
Service quality → Behavioral engagement → Student satisfaction	0.064	2.935	0.003	(0.027, 0.110)	Mediated	
Student self-efficacy → Emotional engagement → Student satisfaction	0.050	1.586	0.113	(-0.011, 0.113)	Not mediated	
Service quality → Emotional engagement → Student satisfaction	0.033	1.491	0.136	(-0.007, 0.080)	Not mediated	
Student self-efficacy → Cognitive engagement → Student satisfaction	0.177	4.447	0.000	(0.106, 0.262)	Mediated	
Service quality → Cognitive engagement → Student satisfaction	0.127	4.018	0.000	(0.071, 0.194)	Mediated	
Note(s): CI = Confidence interval, VIF = Variance inflation factor						

Figure 2 reveals that behavioral engagement and cognitive engagement have significant impact on student satisfaction with (b = 0.299, t = 5.220) and (b = 0.367, t = 5.667) respectively. About 49% variance in student satisfaction can be explained by behavioral engagement and cognitive engagement. The variable of emotional engagement does not have impact on student satisfaction (b = 0.108, t = 1.621, p = 0.105 > 0.05). In short, strutural model testing results with specific relationships gave supporting to direct effect of online learning perception on online student engagement. Except for emotional engagement, have no impact on student satisfaction, the remaining types of online student engagement have a significant effect on student satisfaction.

The testing indirect effects involving mediation was adressed by method of [38] that obtaining confidence interval (CI - do not include zero) to confirm mediation effects. Table 4 depicts that except for emotional engagement which have no mediating role on the relationship of student self-efficacy and service quality and student satisfaction, behavioral engagement and cognitive engagement meadiate the link of student self-efficacy with student satisfaction and service quality with student satisfaction as exceeding the minimum t-value (1.96) to get the significant corellation at level of 0.01. Furthermore, the bootstrapping confidence interval results of these shows the absence of zero, thus supporting the mediating role of behavioral and cognitive engagement on the relationship between online learning perception and student satisfaction.

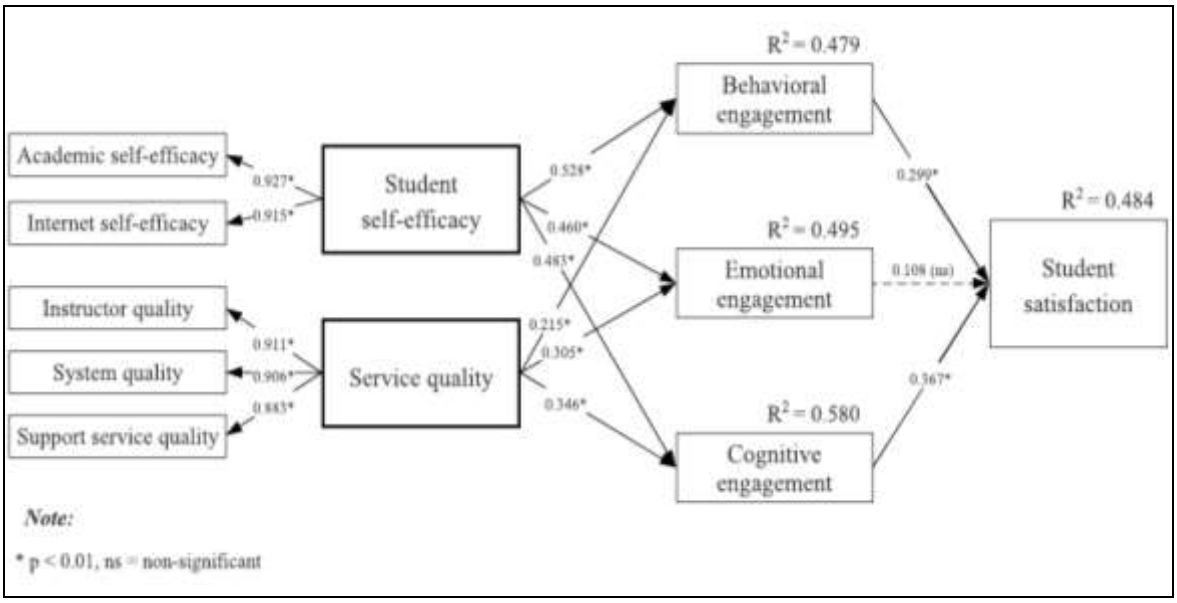

Figure 2. Model testing results.

6. Discussion

This study confirms the previous studies by indicating the significant relationships between online learning service quality, student self-efficacy, student engagement behaviours and satisfaction with online learning [5-7]. However, it enrichs the literature on online learning satisfaction by clarifying a more comprehensive interaction of various factors leading to online student satisfaction. First, the model highlights the impact of both academic and internet self-efficacy on behavioural, emotional, and cognitive engagement

($\beta = 0.528, 0.460, 0.483$; $p < 0.01$). Secondly, it indicated that different aspects of service quality, including system quality andsystem quality, instructor quality and support service quality, have significant relationships with behavioural, emotional and cognitive engagement ($\beta = 0.215, 0.305, 0.346$; $p < 0.01$). Behavioural and cognitive engagement are the impact factors determining online student satisfaction ($\beta = 0.299, 0.367$; $p < 0.01$).

Furthermore, this study offers some findings relating to online student engagement and satisfaction in Vietnam, a Southeast Asian developing country. In Vietnam online education, emotional engagement might not be an indicator of student satisfaction ($\beta = 0.108$; non-significant). This result differs from previous studiediffers' findings from previous studies' findings in other countries (e.g. [5, 6]). Online learning in Vietnam might remain in the initial stages, lack of online pedagogical framework as well as proper support training service for the teachers [14]. The 'students' learnng styles might be passive while online Learning requires active learning styles. This finding offers new insights of Vietnamese undergraduate student engagement and satisfaction with online learning and implications for future research on online student engagement and satisfaction by investigating the impact of educational contexts on engagement in addition to student perceptions.

In addition to the above theoretical contributions, the empirical results of this study suggest a few implications to improve online student engagement and satisfaction in the Vietnam education context. First, Vietnamese universities adopting online learning for distance education should focus on training students with online communication and time management skills, improving online learning system quality and online learning support service quality to facilitate their behavioural engagement. Secondly, they should improve online instructor quality and online learning support service quality, and train students self-directed learning and learning control skills to promote student emotional engagement. Finally, in order to facilitate student cognitive engagement, students need to be trained self-directed learning, technical and control skills in addition to enhancing instructor quality and online learning system quality. In short, although the covid-19 pandemic ended, there are many opportunities for Vietnamese university to adopt online learning for their courses to enhance student learning experiences and utilize the benefits of online learning for student learning performance and outcomes.

7. Conclusions

The model developed in this study offers a more comprehensive understanding of how Vietnamese university students engage and satisfy with online learning. It expands the prior studies by identifying and integrating more factors explaining student engagement, providing a more comprehensive understanding of student satisfaction with online learning. The empirical data analysis in a Vietnamese university verifies the model and confirms the relationships between student self-efficacy, service quality and satisfaction [5-7]. It also provides implications for Vietnamese educators and universities in developing countries to develop their online learning systems and prepare their students for online learning to ensure student satisfaction.

This study, however has some limitations. First, the empirical findings of this study are only applied to the Vietnam education context. Other countries may have different research results due to the differences in terms of economic, technological and cultural backgrounds [5-7]. Thus, this model must be tested in other contexts to verify its validity and explore its variation. Secondly, although the constructs in this study provide a reasonable structural model to advance the understanding of student perceptions, engagement and satisfaction with online learning, the scales of these variables might still have room to develop further. Future research can revise and propose a better measurement model. Thirdly, this study

focused mainly on student perceptions as the predictors of student engagement and satisfaction. Future research can explore other factors such as teaching and learning styles, education cultures, and education technologies to further understanding of student engagement and satisfaction with online learning. Finally, this is an exploratory research using quantitative data and a structural equation modelling approach. Future research can consider other qualitative methods to collect richer data to reduce bias and possible measurement errors.

References

[1] M. Anshari, Y. Alas, N. P. H. Sabtu, M. S. A. Hamid, Online Learning: Trends, Issues and Challenges in the Big Data Era, Journal of E-learning and Knowledge Society, Vol. 12, No. 1, 2016.

[2] H. C. Wei, C. Chou, Online Learning Performance and Satisfaction: Do Perceptions and Readiness Matter?, Distance Education, Vol. 41, No. 1, 2020, pp. 48-69.

[3] M. A. Fauzi, E-learning in Higher Education Institutions during COVID-19 Pandemic: Current and Future Trends through Bibliometric Analysis, Heliyon, 2022.

[4] L. Pham, Y. B. Limbu, T. K. Bui, H. T. Nguyen, 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, pp. 1-26.

[5] R. Panigrahi, P. R. Srivastava, P. K. Panigrahi, Effectiveness of E-learning: The Mediating Role of Student Engagement on Perceived Learning Effectiveness, Information Technology and People, Vol. 34, No. 7, 2021, pp. 1840-1862.

[6] G. E. Sayad, N. H. Md Saad, R. Thurasamy, How Higher Education Students in Egypt Perceived Online Learning Engagement and Satisfaction during the COVID-19 Pandemic, Journal of Computers in Education, Vol. 8, No. 4, 2021, pp. 527-550.

[7] L. She, L. Ma, A. Jan, H. Sharif Nia, P. Rahmatpour, Online Learning Satisfaction during COVID-19 Pandemic among Chinese University Students: The Serial Mediation Model, Frontiers in Psychology, Vol. 12, 2021, pp. 743936.

[8] D. J. Lemay, P. Bazelais, T. Doleck, Transition to Online Learning during the COVID-19 Pandemic, Computers in Human Behavior Reports, Vol. 4, 2021, pp. 100130.

[9] M. Angelova, Students' Attitudes to the Online University Course of Management in the Context of COVID-19, International Journal of Technology in Education and Science, Vol. 4, No. 4, 2020, pp. 283-292.

[10] P. Chakraborty, P. Mittal, M. S. Gupta, S. Yadav, A. Arora, Opinion of Students on Online Education during the COVID-19 Pandemic, Human Behavior and Emerging Technologies, Vol. 3, No. 3, 2021, pp. 357-365.

[11] H. Nguyen, T. Pham, Is COVID-19 an Opportunity to Strengthen Online Teaching, University World News, Vol. 16, 2020.

[12] H. C. Nguyen, P. Le My, Quality Assurance and Accreditation of Distance Education Programs in Vietnam: Rationale and Future Directions, VNU Journal of Science: Education Research, Vol. 35, No. 1, 2018.

[13] Y. M. Tang, P. C. Chen, K. M. Law, C. H. Wu, Y. Y. Lau, J. Guan, G. T. Ho, Comparative Analysis of Student's Live Online Learning Readiness during the Coronavirus (COVID-19) Pandemic in the Higher Education Sector, Computers and Education, Vol. 168, 2021, pp. 104211.

[14] A. Herbert, S. Nykvist, B. T. H. Man, M. H. T. Thi, L. D. T. Thuy, T. T. A. Truong, Shifting Identities and Changing Mindsets: A Case of Lecturers Adopting Digital Pedagogies in Vietnam. Impacts of COVID-19 Pandemic's Distance Learning on Students and Teachers in Schools and in Higher Education: International Perspectives, 2022, pp. 445-467.

[15] T. N. Tran, Readiness, Preparation and Effectiveness of Online Teaching and Learning in Vietnam Tertiary Education, Proceedings of the AsiaCALL International Conference, Vol. 621, 2021, pp. 157-167.

[16] D. Bui, P. Nguyen, N. Truong, Difficulties of Vietnamese Students in Studying Online in the Context of COVID-19 Pandemic, 2020.

[17] X. Chen, S. Chen, X. Wang, Y. Huang, I was Afraid, but Now I Enjoy being a Streamer! Understanding the Challenges and Prospects of Using Live Streaming for Online Education, Proceedings of the ACM on Human-Computer Interaction, Vol. 4, No. CSCW3, 2021, pp. 1-32.

[18] S. P. L. Sim, H. P. K. Sim, C. S. Quah, Online Learning: A Post COVID-19 Alternative Pedagogy for University Students, Asian Journal

of University Education, Vol. 16, No. 4, 2021, pp. 137-151.

[19] M. A. Nasa'h, F. M. A. Awwad, I. Ahmad, Estimating Students' Online Learning Satisfaction during COVID-19: A Discriminant Analysis, Heliyon, Vol. 7, No. 12, 2021.

[20] H. Jiang, A. A. Islam, X. Gu, J. M. Spector, Online Learning Satisfaction in Higher Education during the COVID-19 Pandemic: A Regional Comparison between Eastern and Western Chinese Universities, Education and Information Technologies, 2021, pp. 1-23.

[21] P. C. Sun, R. J. Tsai, G. Finger, Y. Y. Chen, D. Yeh, What Drives a Successful E-Learning? An Empirical Investigation of the Critical Factors Influencing Learner Satisfaction, Computers and Education, Vol. 50, No. 4, 2008, pp. 1183-1202.

[22] D. McFarland, D. Hamilton, Factors Affecting Student Performance and Satisfaction: Online Versus Traditional Course Delivery, Journal of Computer Information Systems, Vol. 46, No. 2, 2005, pp. 25-32.

[23] V. Cofini, E. Perilli, A. Moretti, V. Bianchini, M. Perazzini, M. Muselli, S. Necozione, E-learning Satisfaction, Stress, Quality of Life, and Coping: A Cross-sectional Study in Italian University Students a Year After the COVID-19 Pandemic Began, International Journal of Environmental Research and Public Health, Vol. 19, No. 13, 2022, pp. 8214.

[24] A. Bandura, Social Foundations of Thought and Action, Englewood Cliffs, NJ, 1986, pp. 23-28.

[25] F. Martin, D. U. Bolliger, Developing an Online Learner Satisfaction Framework in Higher Education through a Systematic Review of Research, International Journal of Educational Technology in Higher Education, Vol. 19, No. 1, 2022, pp. 1-21.

[26] S. Gunuc, A. Kuzu, Student Engagement Scale: Development, Reliability and Validity, Assessment and Evaluation in Higher Education, Vol. 40, No. 4, 2015, pp. 587-610.

[27] P. Redmond, L. Abawi, A. Brown, R. Henderson, A. Heffernan, An Online Engagement Framework for Higher Education, Online Learning Journal, Vol. 22, No. 1, 2018, pp. 183-204.

[28] M. D. Dixson, Measuring Student Engagement in the online Course: The Online Student Engagement Scale (OSE), Online Learning, Vol. 19, No. 4, 2015.

[29] G. Maimaiti, C. Jia, K. F. Hew, Student Disengagement in Web-based Videoconferencing Supported Online Learning: An Activity Theory Perspective, Interactive Learning Environments, 2021, pp. 1-20.

[30] J. T. Wong, A. Mesghina, E. Chen, N. A. Yeung, B. S. Lerner, L. E. Richland, Zooming in or Zoning Out: Examining Undergraduate Learning Experiences with Zoom and the Role of Mind-wandering, Computers and Education Open, Vol. 4, 2023, pp. 100118.

[31] T. M. Wut, J. Xu, S. W. Lee, D. Lee, University Student Readiness and its Effect on Intention to Participate in the Flipped Classroom Setting of Hybrid Learning, Education Sciences, Vol. 12, No. 7, 2022, pp. 442.

[32] F. Martin, B. Stamper, C. Flowers, Examining Student Perception of Readiness for Online Learning: Importance and Confidence, Online Learning, Vol. 24, No. 2, 2020, pp. 38-58.

[33] J. C. Anderson, D. W. Gerbing, Structural Equation Modeling in Practice: A Review and Recommended Two-step Approach, Psychological Bulletin, Vol. 103, No. 3, 1988, pp. 411.

[34] W. W. Chin, The Partial Least Squares Approach to Structural Equation Modeling, Modern Methods for Business Research, Vol. 295, No. 2, 1998, pp. 295-336.

[35] R. B. Kline, Principles and Practice of Structural Equation Modeling, Fourth ed., Guilford Publications, 2015.

[36] C. Fornell, D. F. Larcker, Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics, 1981.

[37] J. F. Hair Jr, G. T. M. Hult, C. M. Ringle, M. Sarstedt, A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), Sage Publications, 2017.

[38] K. J. Preacher, A. F. Hayes, Asymptotic and Resampling Strategies for Assessing and Comparing Indirect Effects in Multiple Mediator Models, Behavior Research Methods, Vol. 40, No. 3, 2008, pp. 879-891.