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Factors Influencing Online Learner Performance During Coronavirus Disease Pandemic: A Case Study in Vietnamese Universities

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Abstract: Vietnam has a reputation for being a successful nation in preventing the Coronavirus disease (COVID-19) outbreak in 2020, with a lower number of illnesses than other ASEAN countries. However, to ensure that students are safe and informed about the coronavirus outbreak, Vietnamese higher education has developed online learning (OL). During the COVID-19 epidemic, this paper explores the relationship between elements such as learning readiness, learning strategies, and learning performance in the Vietnamese OL setting. Four hundred undergraduate students were randomly selected from Hong Duc universities, and Saigon University participated in this study in different zones. Analyzed data has applied structural equation modeling (SEM) using partial least squares (SmartPLS-SEM). The findings found that Vietnamese students were much more likely to believe in interaction in OL, to feel comfortable using a computer with their computer efficacy, and to have confidence in communicating in the digital environment, all of which were important variables in assuring the success of using OL. The factors of "motivation" and "test preparation" show a poor relationship with learning performance. Therefore, the OL process in Vietnamese, on the other hand, needs to be more inventive, with a greater focus on lecturers' awareness and practice of online teaching pedagogies such as motivation, techniques, and test arrangement. During OL, students' readiness in terms of learning control, self-directed learning, and engagement must be considered and supported.

Keywords: *Course satisfaction, learning achievement, learning strategies, readiness, online learning.*

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Introduction

Since 2010, the "Edunet" initiative in Vietnam has been using e-learning to support educational higher education to adapt to the fourth industrial revolution. However, the concept of online learning (OL) has recently gained popularity. However, past research has identified several advantages to online learning, including time savings, rapid updating, resource-rich learning progress monitoring, and ease. However, OL in Vietnam has experienced several challenges, including ineffectiveness, low satisfaction, low learner acceptability, low rate of learning performance, and OL being interrupted by technical or internet issues (Pham & Tran, 2018).

When the COVID-19 pandemic began in 2020, the Vietnamese government made OL policies public in universities to reduce overcrowding and prevent the spread of coronavirus. Students and professors are required to study and work from home, posing numerous obstacles to all parties involved. When you consider that Vietnam is one of ASEAN's low- and middle-income countries, online education remains new and demanding for both teachers and students, especially given the country's uneven access to wireless technology (Maheshwari, 2021). Previous research on OL in Vietnam during the COVID-19 pandemic has focused on a specific aspect of OL, such as student intention (Maheshwari, 2021) or student satisfaction (Dinh & Nguyen, 2020).

According to previous research, the internet's stability and speed, as well as a comfortable setting and instructor support, are all elements that influence OL (Maheshwari, 2021). Only a few research have identified multi-cross elements that influence online learning success in Vietnam. As a result, the primary goal of this research is to determine which factors influence student learning achievement in the OL. It will be difficult for any university to handle the OL system by switching from traditional teaching to OL in an emergency; this study aims to determine what factors are

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important in engaging students and having a significant impact on learning performance in OL at Vietnamese universities, to provide multi-benefits to OL stakeholders.

Literature Review

The necessity of OL in Education

With the rapid advancement of information technology in recent decades, the trend of industry revolution 4.0 has predicted that digital education will become more widely used around the world, bringing significant benefits to everybody. When the COVID-19 epidemic breaks out internationally, no one stops in any country, many regions of the world go into lockdown, and most schools and educational institutions deliver the course online as the only option to keep students continuing of education. Before the COVID-19 pandemic, teachers and students choose an online course based on their interests or own context as well as preparing for psychology and computer self-efficacy to reach their goals set with OL. However, during the COVID-19 pandemic, teachers, and students all must use the only option of an online course in an urgent case. As a result, it has become important for every educational institution to sustain their teaching standards as well as their student enrollments during this difficult and unpredictable time. Universities will find it difficult to fight the shift from traditional to online teaching at this time, or they will be unable to compete in this area. Without a doubt, not all schools or HEIs are properly prepared for a fully functional OL system that includes both facility buildings and OL pedagogies. Considering this, educational institutions must comprehend the factors that are important in attracting students and persuading them to continue taking online courses during the COVID-19 pandemic and in the future. To prepare for the unknowns, colleges in Vietnam and around the world must be better equipped, and they may need to start using online learning and integrate it into their curriculum permanently in the future.

The Concept of Online Learning

Online learning is a term used to describe learning that takes place "wholly online" and takes place outside of the classroom. It is similar to distance learning but uses online platforms (Oblinger & Oblinger, 2005). For students learning online, the online delivery mode can provide efficient and convenient approaches to attain learning outcomes (Junco et al., 2013). The concept of online learning (OL) became popular in Vietnam recently, when educational institutions shifted OL to substitute face-to-face instruction to avoid the hazardous COVID-19-pandemic outbreak. Learning outside of the classroom is referred to as OL, and it is comparable to distance learning but uses online platforms. In conclusion, this is concerned with convenient ways for students to move information and knowledge to reach learning outcomes more flexibly and save money (Ferri et al., 2020)

Vietnamese Higher Education Policies in Online Learning during COVID-19

In Vietnam, the Educational Ministry responds by promulgating rules to direct OL in Higher Education Institutions (HEIs) as a result of the COVID-19 outbreak. Which HEIs are permitted to hold online classes if the technological system meets the required standards for assuring learning outcomes. Students are assessed in each module by at least two component tests; for courses with less than 02 credits, only one exam evaluation may be used. Universities were encouraged to use online assessments to ensure impartiality, honesty, and fairness. In Vietnam, however, no more than 50% of course score weights are reviewed online. Furthermore, project and thesis defense and evaluation have been conducted online, with the conditions of a secure online form and assessment agreed upon by learners and board members, as well as at least three examiners. The online security session's progress is fully documented, preserved, and archived (document number 08/2021/TT-BGDDT dated March 18, 2021).

During the COVID-19 pandemic in 2020, certain Vietnamese colleges produced an OL model that fits with the existing facilities. For example, Hong Duc University established an online teaching policy, employing Zoom software to teach and communicate with students directly. 1) Prepare lectures (PDF or Word format, Powerpoint presentation files), exercises (multiple choice/essay), discussion questions, other learning tasks, other reference materials (video/audio, etc.) to provide learners (through online teaching support software) as soon as they begin teaching the course. 2) Creating groups and courses utilizing the lecturer's Zoom account; organizing and controlling learners' activities and successes. Furthermore, professors in Vietnam are permitted to use a variety of social media platforms for discussion, including Office 365, Zalo, Facebook, and email groups. 3) Multi-activity instructional activities, such as exercises, discussions, tests, and model goods, are encouraged. Generally, online assessment entails verifying, grading, and returning incomplete student papers while adhering to regulations (document No. 39/H-QLT; No.1580/QD-HH).

Saigon University is also a participant in this research. During the COVID-19 epidemic, Saigon University issued several materials to help with the deployment of online teaching using Microsoft Teams. The final exam online has instructed in detail, similar to Hong Duc University, to ensure the successful execution of the learning assessment. (TB-HSG Notice No. 1150). In Vietnam, a very few number studies review the characteristics of factors influencing OL, this study will fill this gap.

Factors Influencing Online Learning

Several kinds of research have looked into what elements improve OL In the Scopus database, for example, more than 1000 papers connected to OL, sub-topics of preparedness, learning strategy, and learning performance will be discussed.

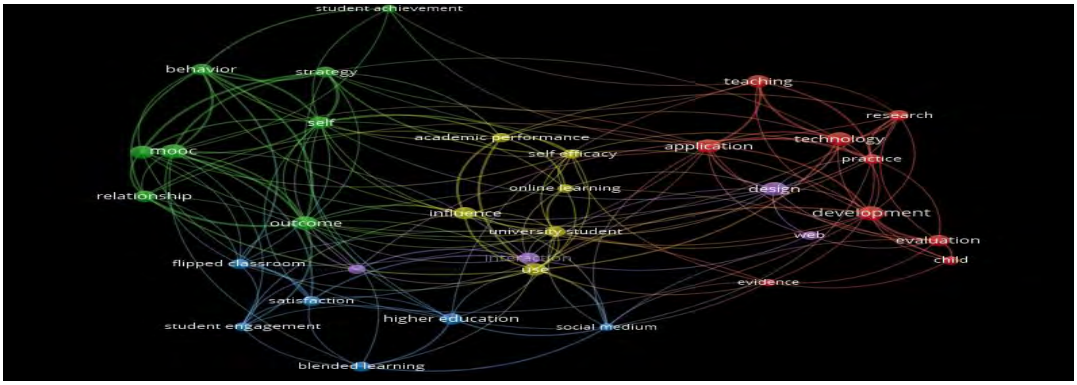

Figure 1. Factors Influencing Online Learning – Bibliometric Analysis

Due to the recent adoption of digital technology in higher education, research has shown that when lecturers in higher education gain a better understanding of students' readiness and learning strategies for online courses, they can better design and guide students toward success in OL experiences, thereby assisting students in meeting their goals (M.-Ling Hung et al., 2010). Students who are guided and given learning strategies in an online course are more likely to self-manage their online studies and be satisfied with their online courses (Demir Kaymak & Horzum, 2013; Dray et al., 2011; Kim et al., 2021). In contrast, "readiness" refers to activities that universities support students with before the start of online courses, "online strategies" refers to what oriented activities students use during the course to demonstrate good performance, and "course performance" refers to the course expectation of student achievement and satisfaction.

Readiness

Warner et al. (1998) divided OL preparedness into three basic characteristics: first, the ability to adapt to online knowledge delivery. Second, to be comfortable using a computer and communicating digitally, and third, to engage in self-directed learning. In addition, Martin et al. (2020) indicated readiness as comfort with e-learning and learning self-management. In this study, preparation is measured by highlighting the essential components that help students prepare for online courses, such as belief, motivation/engagement, digital technology, and online communication (Demir Kaymak & Horzum, 2013; Ryan & Deci, 2000)

Review shows that "belief" or "mindset" of learners can study through OL system that significantly correlates with how they set a goal and make a plan to action and manage their study activities. according to Mustafa and Chaiken (2001), alters learners' attitudes and beliefs about specific topics and situations. This can explain some learners accepted and may learn quickly in a digital e environment and others face many barriers to technology perception for the learning process. The second readinenss's element component in OL is motivation. Motivation is important in learning orientation (intrinsic or extrinsic) since it supports students' positive thinking and optimistic outlook on the study (Kim & Frick, 2011). The fundamental motivation is important for cognitive, communal, and physical development, according to studies. This component is also associated with a lower failure rate, greater excellence awareness, healthier learning approaches, and greater enjoyment of the university environment (Hung et al., 2010; S. Lee et al., 2011). In OL, students feel much boring or lonely studying than in a face-to-face class. Therefore extrinsic motivation is usually high in these people (Kotera et al., 2021). According to studies, compelling motivation has insufficient effects on students' learning outcomes (Chen & Jang, 2010; Van et al., 2016, 2018,2019; Van der Meij et al., 2020), the interaction of motivational and cognitive variables accelerates the learning process (Anderson, 2004; Keengwe & Kidd, 2010). The next element of the readiness component in OL includes improving "*Self-efficacy"* for students. Learners' apparent confidence in their ability to regulate their surroundings and activities is referred to as computer self-efficacy (Pogue, 2019). Learners believe in their ability to employ computer-related abilities effectively (Tu, 2002). For perceptive learning content in online contexts, they have digital literacy and computer self-efficacy. According to Chang and Tung (2008), digital literacy is an effective technique in which technology is used for more than only learning purposes, and search for accurate facts in a systematic manner (Pogue, 2019). Last but not least, OL communication ability has been concerned an important element when preparing for students to join OL. Moore and Kearsley (2011) claim that the teachers must keep learners actively connected to the class through practical discussion to encourage students in integrating computer-mediated communication in OL. Learners' self-assurance allows them to fully comprehend the lesson (Song et al., 2004). Communication allows students to collaborate with others in more advanced ways, while also providing support and feedback to keep them motivated. However, not all students like to communicate using the internet.

Participants in Yang and Park's (2012) study lacked confidence in using digital technologies in communication and lacked computer self-efficacy competencies (Gillett-Swan, 2017). The student-teacher practice interactions are critical. This may encourage learners to become more involved and give them a sense of belonging in the online class requirements (Song et al., 2004).

Online Learning Strategy

Learning strategies are "processes" that organize task ratios and enable accomplishments to be achieved (Çebi & Güyer, 2020). During the COVID-19 pandemic, online courses were widely implemented all across the world urgently. Universities might quickly provide OL learning strategies for students to adapt to OL to reach goal achievement. This study discussed main OL strategies as reviews following summaries.

Self-directed learning is always required as a necessary learning technique in OL. To self-direct their studies, they should evaluate the learner's learning context, such as age, employment and family, and previous educational experiences, as well as the learner's success in this environment (Lemmetty & Collin, 2020; Song & Hill, 2007). Four crucial concepts of self-directed learning were time, technology, initiative, and, finally, learning content (Curtis & Lawson, 2001; Lai, 2011; Lasfeto, 2020). Furthermore, students must develop higher-order thinking abilities, such as online collaborative learning, online creative and critical thinking, online social presence, and online problem-solving abilities. That can effectively let them to self-directed learning (Gabrielle et al., 2006; Van et al., 2018). The second element is “Interaction". The review shows that the level of contact has a major impact on learners' pleasure and achievement in OL (Swan, 2002; Tu & McIsaac, 2002). Michael G. Moore (1989) proposed an OL interaction model that included three types of interactions: learner-content, learner-instructor, and learner-learner. Interaction and concern have been identified by several academics as key aspects of an effective learning experience (Abuhassna & Yahaya, 2018; Dennen et al., 2007; Garrison & Cleveland-Innes, 2005; Muirhead, 2005). Hussin et al. (2019) said that conversation in OL is an excellent way to encourage knowledge development. Most learners increase their thinking skills by viewing online debate and concern as a new opportunity to learn new things, according to Cheong and Cheung (2008). The next factor component is the "learning control" strategy. In OL, learners have greater flexibility and independence with the educational system, which allows them to choose from a wider range of study resources while still having fun (S. W. Chou & Liu, 2005; Coomey & Stephenson, 2001; Lin & Hsieh, 2001). Therefore Students with poor learning control may become lost in substantial database resources as a result of not devoting enough time to their studies (Anderson, 2004) or paying insufficient attention to the contents (Taipjutorus et al., 2012). Learners are unable to achieve their targeted targets or learning objectives in such conditions (Lin & Hsieh, 2001). Song and Hill (2007) also mentioned that effective OL students must be able to control their education and adhere to topic standards that are beneficial to their learning. One important factor of Learning strategy in this study discussed was test preparation (Hong & Peng, 2008; Im & Kang, 2019; Smith, 1991). Reviews show that when students self-regulate their practice test preparation and have lower levels of test anxiety than their peers, they perform at their highest level (M. H. Chou, 2019; Kitsantas, 2002). Learners who did not adequately prepare for their tests were frequently concerned about performing well and did not achieve their objectives (Im & Kang, 2019). Students who received test preparation education, such as changing notes, asking for help, planning, revising, creating goals, and organizing, performed considerably better than students who did not prepare properly for the test (Lai & Waltman, 2008). In the OL test, the high technology of the learning system and the integrity of learners impact the learning assessment to get accurate information on learner performance (Maheshwari, 2021).

Learner Performance

In HE institutions, teaching and learning domains are undergoing tremendous innovation, with OL perspectives and practices being quickly adopted. Online courses provided convenience without the need for transportation, flexibility with engaging content, and the possibility to collaborate in worldwide classes (Ally, 2004; Appana, 2008; Kim et al., 2005). Researchers have highlighted the growing competition in online courses, which necessitates the measurement of variances related to learning outcomes or performance (Panigrahi et al., 2018).

According to previous research, while evaluating online courses, both achievement and satisfaction should be taken into account (Baber, 2020). Similarly, multiple studies have found that learners are satisfied with their online course completion and achievement as a result of their OL involvement (Kim et al., 2005; Nortvig et al., 2018; Panigrahi et al., 2018). When students achieve their targeted course objectives, adapt to their course curriculum design, and subsequently teach the same course to others, their happiness with the course can be measured. At the same time, the learner's attendance time, assignment process quality, competence, and confidence in communicating and implementing this new knowledge in diverse situations are frequently used to assess the course's success (Baber, 2020).

Despite the fact that the review underlined the importance of each element as discussed above, there are few studies that establish a framework of relationship between these criteria as a model for contributing to the review and using in practise. Instructors and learners must understand how effectively they should prepare in advance of implementing OL,

what components they should focus on during the OL process, and how to assess learner performance using which elements. The findings of this investigation are intended to give the necessary knowledge.

Methodology

Research Design

The researchers used a quantitative method to investigate students' perceptions of factors influencing learner performance in the OL environment. The quantitative data collection method includes an online survey of 40 items. The ten factors that can affect student performance were structured effectively in the survey to measure students' perspectives correctly.

Sample and Data Collection

In the current research study, 400 undergraduate students (42% females and 58% males); cover year 1: 22%; year 2: 35%; year 3: 27%; year 4: 16%; studying any subjects were selected from Hong Duc universities and Saigon University, who were learning in an online environment during the COVID-19 pandemic employing Stratify Random Sampling strategy.

The 40-item survey used a 5-point Likert-type scale adapted and derived from the previous research to measure students' perceptions of 10 factors that were mentioned in the part of the literature review, that to predict their impact on learners' performance in the OL environment developed by study conducted by (Hamdan & Nguyen, 2021). First, two experts reviewed the questionnaire, and they made specific changes to the language to suit the Vietnamese student context. After that, a pilot study was conducted on 30 respondents to determine the reliability and validity before the actual data collection.

Table 1. Pilot Study Data Analysis

No	Sub-Constructs	Learning Readiness	Learning Strategies	Learning Performance
1.	Test Reliability	0.91	0.90	0.85
2.	Point Measurement Correlation	0.51-0.69	0.44-0.68	0.41-0.76
3.	Variance Explained by Measure	48.1%	37.7%	60.9%

Analyzing of Data

This model has ten constructs with 24 hypotheses and complex relationships; the researchers employed the Partial Least Squares (PLS) structural equation model (SEM) using the Smart PLS software version 3.2.8 (Hair et al., 2013). With the research objective of investigating large and complex path models, the software Smart PLS was used for data analysis to adapt to the current research study. The proposed measurement and structural model were examined and reported distributed by the advantage of accommodating a small sample size without data normality assumption (Chin *et al.*, 2003). Furthermore, the latent variable component scores using the weighted sum of indicators (Chin et al., 2003). Moreover, the values of latent variables, predictive purposes, and minimizing the variance of all dependent variables were obtained determined by the Smart PLS goals.

Findings / Results

Measurement Model—Reliability and Validity

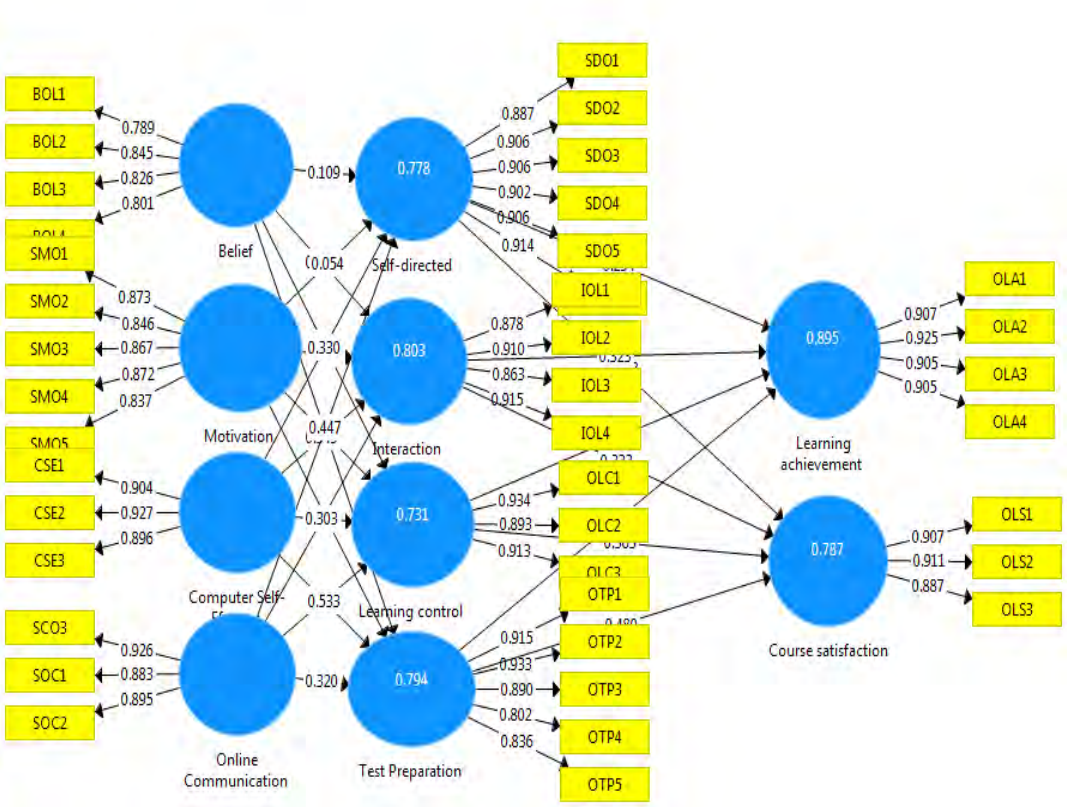

Figure 2. Data Analysis of Smart PLS-SEM

All items loading >0.7 (very good)

Table 2. The Remaining Item Loadings, Construct Reliability, and Validity

Construct	Items	Factor loading	Cronbach's Alpha	Composite Reliability	Average Variance Extract
Belief	BOL1	0.789	.892	.925	.756
	BOL2	0.845			
	BOL3	0.826			
	BOL4	0.801			
Motivation	SMO1	0.873	.934	.949	.790
	SMO2	0.864			
	SMO3	0.867			
	SMO4	0.872			
	SM05	0.837			
Computer-self efficacy	SEC1	0.904	.939	.961	.891
	SEC2	0.927			
	SEC3	0.896			
OL Communication	SOC1	0.926	.916	.947	.856
	SOC2	0.883			
	SOC3	0.895			
Self-directed learning	SDO1	0.887	.958	.966	.827
	SDO2	0.906			
	SDO3	0.906			
	SDO4	0.902			
	SDO4	0.906			
	SDO5	0.914			

Table 2. Continued

Construct	Items	Factor loading	Cronbach's Alpha	Composite Reliability	Average Variance Extract
Interaction	ILO1	0.878	.949	.963	.867
	ILO2	0.910			
	ILO3	0.863			
	ILO4	0.915			
Learning control	OLC1	0.934	.934	.958	.884
	OLC2	0.893			
	OLC3	0.913			
Test Preparation	OTP1	0.915	.953	.964	.843
	OTP2	0.933			
	OTP3	0.890			
	OTP4	0.802			
	OTP5	0.836			
Learning achievement	OLA1	0.907	.948	.962	.865
	OLA2	0.925			
	OLA3	0.905			
	OLA4	0.905			
Course satisfaction	OLS1	0.907	.961	.974	.927
	OLS2	0.911			
	OLS3	0.887			

As shown in Table 2, all the indicator loadings are above 0.7, ranging from 0.789 to 0.933; the Cronbach's alpha values are more significant than 0.7, ranging from 0.892 to 0.958; the Composite Reliability values are superior to 0.7, range from 0,925 to 0.974; and the AVE values are more significant than 0.5 ranges from 0.756 to 0.927. All three conditions for reliability and convergent validity of the measures thus hold Hair et al. (1998) and Ramayah et al. (2018). The measurement model test results above confirmed the significantly healthy indicators loading on the theoretically determined construct.

Discriminant Validity

Table 3. Findings of Discriminant Validity Analysis

		1	2	3	4	5	6	7	8	9	10
1	Belief	.815									
2	Computer efficacy	.766	.909								
3	Learning control	.753	.756	.902							
4	Interaction	.803	.851	.828	.892						
5	Motivation	.742	.826	.814	.908	.910					
6	Achievements	.714	.797	.849	.874	.877	.913				
7	Satisfaction	.803	.752	.780	.751	.739	.704	.859			
8	Self- direction	.768	.865	.803	.845	.817	.839	.740	.902		
9	Test – preparation	.747	.845	.788	.905	.910	.903	.719	.855	.904	
10	Communication	.740	.854	.864	.875	.913	.911	.777	.840	.890	.877

Finally, to evaluate discriminant validity, the average variance extracted from each construct was calculated, and it should be greater than the squares of the correlations between the construct and all other constructs (Fornell & Larcker, 1981). Equally important, the correlations between the constructs should be lower than the square root of the average variance extracted, as shown in Table 3. Likewise, the average variance extracted square root is greater than the correlations between the constructs.

Structure Equation Model

To test the significance of the data, the structural model using a 5000-sample re-sample bootstrapping procedure was reported through the analysis of the structural model. The reason to employ bootstrapping was to test structure model reliability and whether coefficients such as outer weights, out loadings and path coefficients, are significant by estimating standard errors for the estimates (Ramayah *et al.*, 2018). This was done by examining the construct path loadings to identify significance using computed t-statistics.

The structural model is considered significant when t -value is greater than 1.96, and the p-value must be smaller than 0.05. (Hair, Risher, et al., 2019; Hair, Sarstedt & Ringle, 2019)

The data analysis is shown in Table 4 below. This table shows the path coefficients, standard deviation, standard error, t statistic and p value. These values were used to evaluate of the relationships between structural variations.

Table 4. Presents the Path Coefficients and Significance for the Structural Model.

H_0	Path Coefficients	Standard deviation	Standard error	t Statistics	p Values
H_1	Test preparation -> OL achievement	0.687	0.105	6.537	0.000
H_2	Test preparation -> Courses Satisfy	0.562	0.184	3.219	0.001
H_3	Motivation -> Test preparation	0.109	0.131	**0.962**	**0.337**
H_4	Motivation -> Self- directed OL	-0.103	0.119	**0.854**	**0.393**
H_5	Motivation -> Learning Control	-0.13	0.131	**0.178**	**0.858**
H_6	Motivation -> Interaction	0.020	0.138	**0.148**	**0.883**
H_7	Self-directed -> Learning achievement	0.089	0.124	**0.687**	**0.492**
H_8	Self-directed -> Courses Satisfaction	-0.320	0.159	2.101	0.036
H_9	Communication -> Test preparation	0.514	0.145	3.476	0.001
H_{10}	Communication -> Self-directed OL	0.604	0.125	2.570	0.001
H_{11}	Communication -> Learning Control	0.655	0.120	5.474	0.000
H_{12}	Communication -> Interaction	0.355	0.168	2.014	0.045
H_{13}	Learning Control -> OL achievement	-0.41	0.107	**0.332**	**0.740**
H_{14}	Learning Control -> Courses Satisfy	0.334	0.200	**1.818**	**0.070**
H_{15}	Interaction -> Learning achievement	0.086	0.170	**0.486**	**0.627**
H_{16}	Interaction -> Courses Satisfaction	0.275	0.190	**1.363**	**0.173**
H_{17}	Computer Self-efficacy -> Test preparation	0.157	0.143	**1.082**	**0.280**
H_{18}	Computer Self-efficacy -> Self-directed	0.225	0.129	**1.770**	**0.077**
H_{19}	Computer Self-efficacy -> Learning Control	-0.012	0.138	**0.095**	**0.925**
H_{20}	Computer Self-efficacy -> Interaction	0.347	0.109	0.320	0.001
H_{21}	Belief -> Test preparation	-0.007	0.082	**0.112**	**0.911**
H_{22}	Belief -> Self-directed OL	0.113	0.088	**1.238**	**0.216**
H_{23}	Belief -> Learning Control	0.060	0.104	**0.599**	**0.550**
H_{24}	Belief -> Interaction	0.260	0.091	2.284	0.005

All the p-values are less than recommended 0.05; All the t-values are more significant than the recommended level of 1.96.

As shown in Table 4, the factors of readiness that show less impact in online strategies were Motivation (see H3,4,5,6) and Belief (see H21, 22, 23). Factors of OL strategies that were weak in influencing learning performance were interaction (see H15,16) and computer efficacy (see H17,18,19). Otherwise, communication and test –preparation significantly impacted learning performance (H9,10,11,12) and (H1,2).

Discussion

This research presents the OL integrative framework for increasing student satisfaction and achievement. The findings revealed that when students have strengths in OL readiness, such as belief in interaction in OL, comfort using a computer with their computer efficacy, and confidence in communication in a digital environment, their learning achievements and student satisfaction will be significantly impacted. This is highly supported by prior research that highlighted preparation as a critical factor in student achievement in the OL setting (Adnan & Anwar, 2020; Palloff & Pratt, 2007). Student belief in learning occurs in a digital platform, was driven by the instructor and engaging materials; confidently communicating through digital technologies are all part of OL's preparation. Stakeholders in OL will benefit from these tactics.

Respondents in this survey discovered that when students do well in self-directed study, they are more content with the course and communicate more with friends and lecturers during studying and exam preparation, resulting in better learning outcomes. This research is highly supported by the literature, which states that most students will not like to learn online if there is no connection between lecturers and students (Arbaugh & Benbunan-Fich, 2007; Besser et al., 2020; S. W. Chou & Liu, 2005)

Most prior research has found that students had high confidence when practicing test preparation for the final exam (M. H. Chou, 2019; Kitsantas, 2002; Lai & Waltman, 2008); nevertheless, respondents in this study have low confidence in the COVID-19 online test. This research is unsurprising because many students and teachers were unsure whether

online learning would be as beneficial as face-to-face learning. Previous research had backed up these findings, claiming that an innovative evaluation in OL uses a variety of assessments to maintain equality and encourage students to use more critical thinking abilities in their learning and assessment (Adedoyin & Soykan, 2020; Gillett-Swan, 2017)

Otherwise, data research in Vietnam reveals various weak correlations between lecture motivation and student satisfaction in online learning. This finding echoed Maheshwari's (2021) suggestion that Vietnamese professors be encouraged to employ videos, audio, and instant messaging to enable students to enjoy online learning. Furthermore, before COVID-19, students in Vietnam used e-learning platforms to acquire English or soft skill courses and lectures on topics they were not interested in, and universities, academics, and students in Vietnam did not share their passion. This is why it's important to describe how lecturers plan and deliver good online teaching sessions.

Conclusion

To summarise, this research proposes and tests an OL integrative framework. This solution creates an online structure framework that may be used and discussed further. Learner readiness (belief, motivation, communication) and learning strategy (self-directed, learning control, interaction) have a beneficial impact on learner performance, learning attainment, and course satisfaction, according to the findings. Although Vietnamese students believed in interaction in OL and were confident in communicating in the digital environment due to their computer efficacy, students still felt less receive motivation by instructors. Therefore the OL process in Vietnamese needs to be innovative in facilities and put more effort into enhancing OL pedagogies competence for lecturers, especially, motivation and strategies. Besides that, test preparation in an online system needs to be well prepared, concerned, and supported for students' satisfaction.

Recommendations

Many Vietnamese universities face issues as a result of the lower level of student motivation and assessment in existing OL. According to the findings, Vietnamese lecturers should have techniques or pedagogies in place to warm up or engage students before beginning classes and to prepare for online preparation. Students will be more satisfied and obtain greater results if they interact during OL Students were concerned about the online test's inequity and lack of honesty when it came to the online evaluation. As a result, the online test must be concerned with and carefully prepared in a variety of formats to promote equality and integration among students (Chen & Jang, 2010; Cheong & Cheung, 2008). This study highlighted the need for learning control; in digital lines, students are easily distracted by commercial programs. As a result, students should practice mastering control by focusing on one thing at a time.

This study highlighted the need for learning control; in digital lines, pupils are easily distracted by commercial programs. As a result, students should practice learning control by focusing on the knowledge and abilities needed to meet the curriculum's objectives. Student satisfaction with OL was still poor, and this has to change in the future.

The introduction of COVID-19 may provide an opportunity for Vietnamese educational institutions to examine and invest in their online learning and training capabilities. For decades, Vietnam's higher education system has grown dramatically as a result of increased government investment in both public and private institutions. This study shows that Vietnam's online teaching and learning needs to be restructured and improved in terms of both conversation and practices. Apart from improving the facility, for example, by lightening up the learning technology system with industrial revolution 4.0, one of the ways for lecturers and students to set up the mindset in belief and begin to plan actions to help student learning achievements improve is to follow factors in the framework for studying and practice.

To summarise, the findings of this study can be used to increase learning achievement in Vietnam by incorporating the following contributions into the online learning framework. This study focuses on internal motivation; future research might look into extrinsic motivation, such as internet access speed, ICT, and course satisfaction, as well as innovative exams to provide further ways for improving OL

Limitations

Even though this survey included institutions from three distinct regions of Vietnam, the number of respondents is still insufficient when compared to the large number of students in the population. The OL courses have been briefly implemented in Vietnamese institutions as a result of the COVID-19 pandemic, which has resulted in a long-term absence of permanent investment. As a result, all pupils have no choice in terms of learning styles. When opposed to research focusing on distance learning, where students make OL judgments depending on their circumstances, this conclusion is limited in online readiness.

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Authorship Contribution Statement

H. H. Nguyen: Concept, design, data collection and final approval. Tuong: Data collection and materials support, critical revision of manuscripts. Hoang-Thi: Data acquisition and materials support. T. V. Nguyen: Writing, reviews, data analysis, editing.

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