



Investigating Factors of Transitioned-Online Courses on Satisfaction and Learning Effectiveness in Higher Education during the Era of the COVID-19

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Abstract

Purpose – This study explored factors of online education that affect student dissatisfaction and learning effectiveness in higher education during the COVID-19 pandemic.

Research design, data, and methodology – This study combined qualitative and quantitative designs. The qualitative part of this study involved in-depth interviews using a criteria-based purposive sampling technique. The quantitative part of this study consisted of an online survey.

Results – The qualitative results revealed that students faced significant problems related to online learning, including a lack of learning environment, interaction, and support from the school. The quantitative results indicated that the effects of transitioned-online courses on student dissatisfaction were higher with student support, the interaction between students and instructors, online learning environment, and course organization and evaluation based on the order, while the effects on learning effectiveness were higher with the online learning environment, interaction between students and instructors, course organization and evaluation, and student support based on the order.

Conclusion – The results implied that online learning in the era of the COVID 19 pandemic negatively affects student satisfaction and learning effectiveness. Policymakers and school leaders should improve students' satisfaction and learning effectiveness when confronted with the pandemic. Better policies should be adopted to improve better way of teaching in the era of COVID19.

Keywords: COVID-19, Online Learning, Policy Management, Satisfaction, Learning Effectiveness

JEL Classification Code: I20, I23, I28

1. Introduction

The COVID-19 pandemic has forced higher education institutions to suspend face-to-face classes and offer instructions through web-based training platforms (Baber, 2020). However, the sudden transition to online learning and teaching presented various obstacles for students, instructors, and school leaders, while education policies seem to lag far behind the current situation (World Bank, 2020). It is believed that a school shutdown is considered one of the most effective pioneering measures taken by governments in reducing the spread of the virus (Ajibo, 2020; Moosa, 2020). However, it has placed an enormous burden on the academic performance and mental health of instructors and students (Asim et al., 2021), particularly since many have never participated in online learning. Moreover, the learning crisis will have a long-term effect on learning innovation and teaching methods (Tseng & Chen, 2020). As a result, flexible and lasting plans to respond to the negative effects of the current crisis and possible interruptions in education must be considered. These plans should pay attention to the perceptions and concerns of relevant parties, especially students, based on their experiences during the pandemic (Zhang, Wang, Yang, & Wang, 2020). This raises a crucial question regarding education: How much did online learning affect student perception during the COVID-19 pandemic?

This study aimed to respond to this question. First, not all learners have the capacity to benefit from remote learning environments (Sangster, Stoner, & Flood, 2020), while others struggle to keep up with their studies and remain motivated and engaged. This abrupt transformation poses numerous challenges to online learning, including high levels of stress and anxiety, which result in a wide range of mental health issues (Asim et al., 2021). Unquestionably, school closures and remote education can affect millions of students nationwide, particularly if the exceptional situations are long-lasting. Second, little is known about the effects of online education (McPherson & Bacow, 2015). When closing campuses, school leaders had to figure out how to provide high-quality education without minimizing interaction, and online learning was the only feasible option (Ajibo, 2020; Moosa, 2020). Meanwhile, the pandemic has caused an unprecedented shift in the mode of education delivery, with online platforms hampering the teaching-learning process (De Villa & Manalo, 2020). This disruption in the education sector came unexpectedly with no strategic planning or preparation for its implementation (World Bank, 2020). As a result, it is vital to comprehend the teaching-learning process and take the required steps to ensure that the two-way process runs well. This also puts universities to the test in terms of their readiness to deal with an unforeseen crisis and necessitates suitable policies to enable efficient online learning while simultaneously altering rules to accommodate the abrupt educational shift (World Bank, 2020). Third, shifting instructions to various virtual settings caused many issues in the education system, especially with course satisfaction and communications between students and instructors (Tsang, So, Chong, Lam, & Chu, 2021). Furthermore, online learning aims to strengthen students' cognitive abilities and motivate them to participate actively in their studies (Baloran & Hernan, 2021). Unfortunately, some students' experiences with online learning are unsatisfactory due to a lack of communication between instructors and students and the system's ineffectiveness (Baloran & Hernan, 2021).

As an increasing number of higher education institutions are offering online courses, it becomes essential to consider aspects of online learning. Therefore, this study aimed to explore students' perceptions and policy implications of courses and educational programs that are required to utilize more effective electronic online modes. In addition, this study aimed to investigate significant lessons regarding the future of online classes that could be adapted to higher education. This is especially important because many higher education institutions will continue to operate online till when COVID-19 pandemic situation gets alleviated over the world. This study applied the following research questions: 1) What factors affect student dissatisfaction and learning effectiveness when studying online? and 2) What policies need to be developed to respond to students' needs during the COVID-19 pandemic?

2. Literature Review

2.1. Adoption of Online Learning During the Era of the Pandemic

With the widespread use of mobile devices and numerous applications, online learning platforms for teaching and learning have proliferated in recent years (Paechter & Maier, 2010). An online learning environment gives students unrestricted time and space to learn virtually without physical contact and communication with peers (Wang et al., 2013). In this form of learning, the student-instructor interaction is controlled and facilitated by technologies and applications, while the design of learning environments is believed to significantly affect academic success (Wang et al., 2013). Indeed, online learning may provide learners with better access to coursework while also serving as a cost-effective form of instruction for universities (Bartley & Golek, 2004). However, some significant concerns with this form of learning. For example, school closure led to disruptive education, inadequate facilities, lack of motivation, and decreased interest in learning during the pandemic.

Besides, students' academic achievements and performances (e.g., course completion, course grades) are slightly lower in online settings than in traditional environments (Figlio et al., 2013).

Online learning during the era of the COVID-19 pandemic, on the other hand, differed from online learning before the pandemic. Offline classes switched to online classes with a lack of preparation time in many cases, and since some instructors and students had no prior experience teaching or learning online, they may not have been prepared for the unexpected transition; thus, they had to cope with rapid change (Tsang et al., 2021). Some educational institutions could quickly adapt to new technologies and platforms, while others faced numerous problems in reaction to the pandemic (Hodges et al., 2020). Undoubtedly, rapid switching of learning modes has been shown to affect learning performance and student satisfaction, although further research is needed (Tsang et al., 2021). Furthermore, students were unprepared for the online experience, and social issues and instructor issues affected student learning and effectiveness (Aboagye et al., 2021). Therefore, it is necessary to assess the effectiveness of online learning to build more efficient online teaching approaches and adapt to the rapid shift in learning modes (Bahasoan et al., 2020).

2.2. Educational Objectives and Student Responsibilities

A study by Didham and Ofei-Manu (2020) proposed four fundamental objectives that must be met – implementing a well-designed curriculum, enhancing the quality of teaching techniques, creating a secure and effective learning environment, and encouraging cooperative and transformational learning. Accordingly, switching to online learning requires careful instructional designs, long-term planning, and excellent teaching infrastructure (World Bank, 2020) to meet these objectives. In this context, it has been suggested that a sudden transition to online learning could harm the quality of education because instructors and learners have limited or no prior experiences (Hodges et al., 2020). Meanwhile, students are responsible for performing obligations related to academic performance and course completion (Bembenutty & White, 2013). They not only have to learn new skills and knowledge but are also expected to put these skills into practice (Tao & Hong, 2014). In addition, economically, paying for modified education services, including tuition and non-tuition fees, can be a burden for students. However, during the COVID-19 crisis, tuition adjustment of higher education online learning programs, Internet connection instability, and an uncondusive learning environment were considered problematic (Catyanadika & Isfianadewi, 2021). Students, understandably, desire high-quality learning experiences in online environments, just as they do in traditional settings (Heo et al., 2021).

2.3. Student Satisfaction

Student satisfaction plays a vital role in student learning (Green et al., 2015). It is described as the relationship between what students expect and what they get, referring to learners' attitudes, perceptions, and expectations of a specific type of learning (Wu et al., 2010). Studies performed during the COVID-19 pandemic measured student learning satisfaction (e.g., Baber, 2020); however, they used different approaches to investigate student satisfaction with online learning. Several factors, such as technology or course design, could contribute to student satisfaction (Arbaugh & Duray, 2002). Students are more likely to be satisfied when their learning environment, course design, or teaching practices meet their expectations (Huang & Wang, 2012). Besides, students are more likely to rate courses and instructors as satisfactory if they believe their instructors communicated and effectively showed interest in their performance and progress (Bangert, 2006).

Additionally, studies have compared face-to-face classes with online classes in student satisfaction. Some studies have found no difference in student satisfaction (e.g., Garratt-Reed, Roberts, & Heritage, 2016), while other studies have indicated that students are more satisfied with offline courses (e.g., Dinh & Nguyen, 2020). Therefore, when students are dissatisfied with online learning, it is critical to figure out which aspects contribute to their dissatisfaction.

3. Hypotheses Development

3.1. Effects of Online Learning Environment on Student Satisfaction and Learning Effectiveness

The learning environment is vital for student satisfaction (Small, Dowell, & Simmons, 2012). Students desire a good learning environment (Beckers et al., 2015) or a quiet place at home when studying online (Alphonse et al., 2019). This plays a critical role in completing online courses (Holder, 2007). In some cases, students must negotiate a peaceful place in their homes (Selwyn, 2011) to join online courses. Online students require high-speed Internet and wireless connectivity, among other things (Hampton et al., 2010). However, Internet connections can be inconsistent and poor in some locations without wireless coverage, and in many rural areas,

high-speed Internet services are not accessible (Seneca, 2014). Furthermore, students enrolled in online courses have expressed feelings of isolation (Wheeler, 2002). Therefore, family members, friends, and coworkers' support are crucial for students when studying online (Lee & Choi, 2011). Accordingly, this study hypothesized:

H1a: The online learning environment negatively affects student satisfaction.

H1b: The online learning environment negatively affects learning effectiveness.

3.2. Effects of Course Organization on Student Satisfaction and Learning Effectiveness

Course organization includes creating and designing course resources, curricula, methodologies, and schedules and requires overall planning (Garrison, Anderson, & Archer, 2000). Its two primary components are course objectives and course infrastructure. The first refers to the workload required to complete assignments and participate in classes, while the second is concerned with the overall usability of the web-based platform and the organization of course materials (Eom & Ashill, 2016). These structural factors impact online learners' satisfaction and learning outcomes (Eom & Ashill, 2016). In other words, students are more satisfied with well-organized courses (Chen et al., 2016). When transitioning from offline to online learning, the evaluation of student learning outcomes has focused on ensuring fairness and preventing cheating in exams by using performance monitoring tools (Senel & Senel, 2021). Regardless of their backgrounds or preferences, all instructors have to modify their courses and teaching methods to meet online education demands (Garris & Fleck, 2020). Besides, students may evaluate instructors' and administrators' effectiveness during the pandemic, which can be used to improve instructors' instructional practices and evaluate academic performances (Spooren et al., 2013). Therefore, reflecting on student evaluations and improving student assessment results is a standard, evidence-based practice for teaching activities (Garris & Fleck, 2020). Accordingly, this study hypothesized:

H2a: Online course organization negatively affects student satisfaction.

H2b: Online course organization negatively affects learning effectiveness.

3.3. Effects of Interactivity on Student Satisfaction and Learning Effectiveness

Interactions between instructors and students have been regarded as a significant aspect in higher education. Instructors can express ideas and impart knowledge in several ways, including gestures, body language, and written words (Duta et al., 2015). Meanwhile, students are more interested and excited about learning and achieve better results when instructors create positive learning environments, show interest in students' perspectives, and foster positive relationships (Shan et al., 2014). Additionally, students are more likely to show high satisfaction levels when their instructors promote effective communications and course organizations (Tsang et al., 2021). Additionally, online learning cannot bring expected results for students in underdeveloped regions who cannot access the Internet (Adnan & Anwar, 2020). Other significant concerns include reduced interactivity and lack of instructor's nonverbal cues (Sugino, 2021). These issues were especially bothersome for new learners when studying online (Kear et al., 2010). High levels of learner-to-instructor engagement and an interactive teaching style are closely associated with high student satisfaction and academic performance (e.g., Swan, 2001). Therefore, this study hypothesized:

H3a: Lack of interactivity between instructor and student negatively affects student satisfaction.

H3b: Lack of interactivity between instructor and student negatively affects learning effectiveness.

3.4. Effects of Student Support on Student Satisfaction and Learning Effectiveness

Supporting students is critical for optimizing students' academic experiences when transitioning into the university in COVID-19 (Pownall et al., 2022). Besides, student support becomes one of the most important factors affecting student performance (Rovai & Downey, 2010). Therefore, it is essential to help students achieve their academic goals and objectives (Strage & Curley, 1996) by creating planned learning environments and supporting student learning (Lee et al., 2011). Furthermore, appropriate support strategies may improve students' learning and experience because students are more likely to be satisfied with an online course if they feel it supports their learning (Lee et al., 2011). Specifically, instructional support refers to addressing students' questions and providing clear directions and constructive comments on their exercises and performance (Lee et al., 2011), while technical support includes assisting students with any technical issues they may encounter (Song et al., 2004). Therefore, this study hypothesized:

H4a: Lack of student support negatively affects student satisfaction.

H_{4b}. Lack of student support negatively affects learning effectiveness.

4. Research Methodology

4.1. Qualitative Method

4.1.1. Phenomenological Approach

Phenomenology is often described as the study of phenomena based on a detailed description of interviewees' experiences (Greene, 1997). The key feature of this approach is to understand the essence of personal experiences (Padilla-Díaz, 2015). Phenomenology may be effectively used in educational studies since it can help students or stakeholders who engage in phenomenon-based learning comprehend their own experiences (Symeonides & Childs, 2015). Phenomenological researchers frequently utilize in-depth communications, interviews, and face-to-face techniques to explore and examine interviewees' observations (Jackson, Vaughan, & Brown, 2017). This study applied a phenomenological theory to investigate Vietnamese students' experiences based on the analysis of meanings, understandings, and interpretations.

4.1.2. Interviewees

This study identified and selected interviewees who have taken online classes using purposive criterion sampling. It guarantees that the interviewees have had sufficient experiences, which enriches the data (Noon, 2018). Sixteen students from several universities in Vietnam, both autonomous and non-autonomous schools, participated in the study. They were made up of eight female and eight male students, all between 20 and 22 years old. To ensure anonymity, the interviewees were identified by codes ranging between I1 and I16. Before participating in the study, all interviewees were provided with enough information regarding the research background and objectives.

4.1.3. Research Design

This study conducted in-depth interviews with students who have taken online learning platforms due to COVID-19. Because of the high number of COVID-19 cases in Vietnam, government officials recommended limiting social contact and avoiding physical encounters. Therefore, in-depth interviews were conducted online. The semi-structured interviews were used to investigate interviewees' feelings about their issues with online learning. The interviews began with an overview of the interviewees' perceptions from the beginning of the school shutdown until the interview date.

Table 1: Sociodemographic of the Interviewees

No.	Name	Year born	Gender	School type	Living area
1	I1	2001	Male	non-autonomous	non-rural
2	I2	2001	Female	nonautonomous	rural
3	I3	2002	Male	nonautonomous	rural
4	I4	2002	Female	autonomous	rural
5	I5	2001	Male	autonomous	non-rural
6	I6	2001	Female	autonomous	non-rural
7	I7	2002	Male	nonautonomous	rural
8	I8	2002	Female	nonautonomous	non-rural
9	I9	2001	Female	nonautonomous	rural
10	I10	2000	Male	autonomous	rural
11	I11	2001	Male	autonomous	non-rural
12	I12	2001	Female	autonomous	rural

13	I13	2000	Male	autonomous	non-rural
14	I14	2000	Male	autonomous	non-rural
15	I15	2001	Female	nonautonomous	rural
16	I16	2001	Female	nonautonomous	non-rural

As shown in Table 1, semi-structured interviews were conducted with 16 respondents in January 2022. The questions were designed and classified into four distinct areas regarding online learning, including attitude and adaptation, course organization and evaluation, interactions, and student support. Table 2 summarizes the main interview questions for each area.

Table 2: Key guiding questions

Theme	Main interview questions
Students' attitudes and adaptation	How do you feel about studying online? How did online learning affect your study? How did you adapt to online courses?
Course organization and evaluation	Did you encounter any problems when studying online? Did your instructors make any adjustments to their courses regarding the amount of knowledge and approach?
Interactions	Did you face any difficulty communicating with your instructors and peers when studying online? Did you receive support from instructors if you had a question?
Student support	Did your universities support students or have any additional regulations when switching to online learning?

The interviews were conducted in Vietnamese because all the interviewees were Vietnamese. Each interview lasted from 45 minutes to an hour. Before the interview, each interviewee was given a one-page document that explained the purpose of the study.

4.1.4. Data Collection and Analysis

The interview transcripts were translated from Vietnamese to English. All data were then coded using the thematic analytical methodology for encoding and assessing qualitative data based on major themes (Boyatzis, 1998). Each interviewee's responses were tagged using keywords to avoid overlaps, especially in the first stage. We also double-checked the interview data to better understand Vietnam's current condition and make policy recommendations.

4.2. Quantitative Method

The quantitative part of the study used an online survey to collect the data. The survey was randomly distributed to students in Vietnam who had online learning experiences due to COVID-19. Before launching the survey, the appropriate revisions were performed. The survey was then distributed on some of the most popular social networks and channels of higher education institutions in Vietnam, including Facebook and email. The survey was sent to both types of universities, non-autonomous and autonomous universities in Vietnam. Before conducting the main study, this study conducted a pilot test (50 samples). The survey was sent to some experts who understand the research topic and read through our questionnaire before officially sending it to universities. The survey was collected anonymously and voluntarily, and the data was kept confidential. The results from the qualitative research were used to enhance the quantitative findings. Additionally, the conceptual model of this study was modified based on previous studies (e.g., Eom & Ashill, 2016; Alshare, Freeze, Lane, & Wen, 2011).

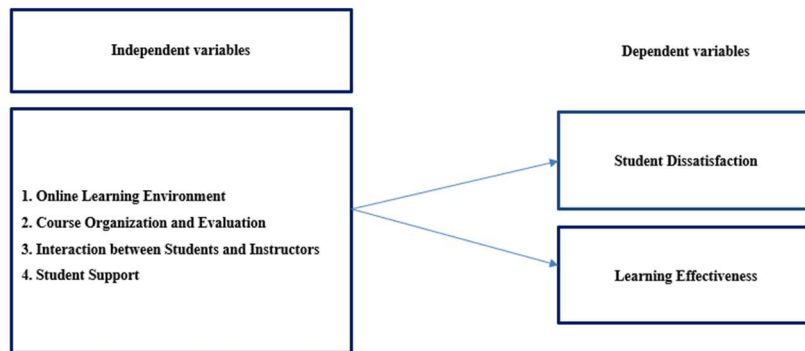


Figure 1: Conceptual Model of the Study

A total of 269 Vietnamese students completed the survey. The response rate was 2%. Among them, 18.2 % were male, 81.8 % were female, 24.2% were 18 years old, 29.4 % were 19 years old, 25.7 % were 20 years old, 11.9% were 21 years old, and 8.9% were 22 or older. In terms of living area, 66.5% of students were from urban areas, while 33.5% were from rural areas. In terms of online learning time, 21.9% of students studied online for less than 6 months, 55.4% of students studied online from 6 months to 12 months, 14.9% studied online from 12 months to 24 months, and 7.8% of students spent more than two years studying online (see Table 3).

Table 3: Summary of Demographics

Characteristics		Number	%
Gender	Male	49	18.2
	Female	220	81.8
Types of school	Autonomous	219	81.4
	Non-autonomous	50	18.6
Age	18	65	24.2
	19	79	29.4
	20	69	25.7
	21	32	11.9
	22 or older	24	8.9
Student	1 st year	113	42
	2 nd year	96	35.7
	3 rd year	35	13
	4 th year	19	7.1
	Others	6	2.2
Living area	Urban area	179	66.5
	Rural area	90	33.5
Online learning time	Less than 6 months	59	21.9
	6 – 12 months	149	55.4
	12 months – 24 months	40	14.9
	More than 24 months	21	7.8

Cronbach’s alpha values were calculated to determine the reliability of multi-item scales for major proposed variable (see Table 4).

Table 4: Results of Cronbach's Alpha for Proposed Variables

Factors	Value
Online Learning Environment	0.852
Course Organization and Evaluation	0.822
Interaction between Students and Instructors	0.815
Student Support	0.816
Student Dissatisfaction	0.768
Learning Effectiveness	0.780

5. Findings

5.1. Findings from Qualitative Research

5.1.1. Student's Perspectives on Transitioned-Online Courses

Students did not have other choices besides online education when courses transitioned from offline to online learning due to COVID-19, especially since no one knew when the pandemic would end. Students expressed different perspectives on the benefits and weaknesses of online learning during the COVID-19 pandemic; therefore, their opinions on the effectiveness of transitioned-online courses varied. For example, I1, a non-rural student, stated the following.

“After taking courses online for a while, I have become accustomed to remote learning. In this COVID-19 pandemic situation, it is the best choice to prevent the spread and transmission of the virus in the school setting. Over some time, I have also learned to take online courses effectively.”

While some students could keep up with the lessons, others believed that online education was inappropriate for long-term periods. Interviewee I2, a rural student, acknowledged that online courses are less effective than in-person classes, especially for an extended period. Like most students participating in this study, I2 shared the drawbacks of remote education, which caused significant learning challenges. Later, I2 added that students could be easily distracted and demotivated during online learning. Based on unpleasant experiences and challenges she had to overcome, she claimed that online learning should not be continuously applied in the coming semesters. She added the following.

“At first, I found that online learning has no serious problems. Nevertheless, so far, I have to study all subjects online. I feel that online courses are ineffective since I cannot directly interact with lecturers and classmates. Moreover, due to other circumstances, such as the internet or electricity, online learning can demotivate me to learn. It can make me easily distracted. When learning is interrupted, I feel uncomfortable.”

Interviewees I2 and I3, low-income rural students, felt alone in their studies and expressed extra burdens of studying at home. These students used only smartphones to engage in coursework instead of computers or laptops. The use of smartphones limits students' accessibility to course materials, such as course information and lectures. Interviewee I3 added that the school announced plans for individual classes several times but postponed them due to the effect of the pandemic. In this case, students, especially those living in rural areas, were often passive receivers of information delivered by the school. Interviewee I3 stated the following.

“I wish to go back to offline school life without the distance. For me, online learning indeed makes us become autonomous learners and cannot replace offline class environments. I am still waiting for a return-to-normal school year across the country as soon as possible.”

Many students participating in this interview shared their opinion, wishing to return to an offline environment. Yet, these students expressed concerns over back-to-school policies and re-opening procedures.

5.1.2. Online Course Organization and Evaluation

During the interviews, students stated how much they were satisfied or dissatisfied with online learning provided by instructors during the pandemic. Some students were satisfied when instructors were good at adapting to the students' expectations and organizing many activities regarding online teaching. One interviewee, I4, said that he was grateful for being able to study and attend online classes even after universities closed their campuses. However, the student expressed that it would be great if some instructors knew how to use digital devices to ensure that all lectures run smoothly without technical problems. This may be especially serious for courses requiring specialized software or typically employing laboratories as part of the face-to-face experiences. Interviewee I4 also said the following.

“Instructors and school leaders have tried to provide possible materials for students in many ways, such as sending documents or uploading online lectures. As a result, I can review all documents and watch some video lectures, which helps me enhance my knowledge and understanding, especially when much information requires my attention. In addition, some instructors understand the inconveniences and circumstances of students, so they are more flexible in teaching and communication methods.”

Keeping up with online learning during the COVID-19 pandemic is not easy. Interviews with students revealed that instructors adopt different teaching methods. I4 said that some instructors were not sufficiently prepared to teach online; therefore, they only focused on their responsibilities according to the school's regulations while ignoring the demands and difficulties of students learning online. Interviewees I5 and I6 stated that their instructors did not allow students to record lectures, nor did they provide any videos because of confidentiality issues, which may make catching up on missed lessons difficult. Interviewees I5 and I6 stated the following:

“My instructors only answer questions but do not allow us to record lectures because of confidentiality issues. Many instructors in other schools send video lectures to students, while our instructors do not allow us to record. A considerable amount of knowledge in each class is quite difficult and new to us, so watching recorded lectures after class would be helpful and highly effective for any missed and some specific concepts. (I5) I have some problems with my instructors' teaching methods. I think some instructors are not ready to teach online classes. Consequently, some students fall behind in class and cannot keep pace with them well. (I6)”

One of the most noticeable challenges in studying online is the ability of students to grasp what they are taught; therefore, re-watching recorded lectures would help them understand lectures. All interviewees agreed that schools should enhance online courses by providing access to recorded videos or supplemental materials. In terms of learning evaluation, many students said that exams were conducted smoothly and fairly. However, since teaching and testing were conducted online in 2020 due to the COVID-19 pandemic, the issue of cheating has come into sharper focus. Instead of in-class exams, many instructors asked their students to submit essays, papers, or final reports. An interviewee, I10, mentioned the following:

“The assessment of instructors is quite fair. Most exams are rigorously tested and evaluated. In addition, many exams require a handwritten exam, so cheating is reduced. However, I feel that instructors often request students to submit reports and papers because they believe there may be some technical problems when conducting online exams.”

Although cheating in education is not a new phenomenon, it has emerged as a severe issue in online education, as exams are conducted from a distance. An Interviewee, I16, shared a different opinion.

“Sometimes, cheating is easier when conducting exams online because my instructors give us more time; some students can discuss it with their classmates. In addition, some questions can be easily found on the Internet.”

Regarding this issue, other forms of assessment have been added. As mentioned above, instructors required students to submit research papers or essays for the midterm or final exams instead of online exams. However, overuse of these forms may fail to evaluate student academic performance or nurture higher-order cognitive skills.

5.1.3. Interactions between Students and Instructors

Most students felt a lack of communication with instructors and friends during online learning. Concerning the lack of face-to-face interactions, interviewee I7 stated that some students refuse to participate and get involved in their learning processes; therefore, on-campus training may be essential for students, especially those who want to develop communication skills or professional skills. Interviewee I7 stated the following.

“Communicating via phones and computer screens is inconvenient because some questions are not answered promptly. I expect to receive timely feedback from my instructors regarding homework, tests, and other assignments. It usually took a day or several days to wait for feedback from my instructors. Additionally, some students who do not prefer to communicate through a camera do not want to be in the face of others, so it can be difficult for us to practice speaking skills or group discussions.”

According to Interviewee I7’s response, students’ engagement in the online chat box does not provide valuable and constructive feedback. Interviewee I8 mentioned that many students expected to get rid of a boring class and stated that studying with web-based applications is ineffective, such as breakout rooms. They believed that the time allotted for group discussion was insufficient, particularly if technical issues emerged. I7 and I9 added the following:

“I feel uncomfortable asking questions via zoom or discussing with my classmates when working in a group. I try to raise my hand during online classes, but I feel lost and empty due to a lack of response. According to one student, most students have a basic need for connecting with others.”

5.1.4. Student Support

Most students interviewed in this study stated that they did not receive any financial or technical support when switching from offline to online learning. This problem became even more severe at autonomous universities with higher tuition fees than other universities. For example, I11, a student from an autonomous university, stated:

“We have studied online from spring 2020 until now. During the study, the tuition remained unchanged; the school even plans to increase the tuition fee by 10% per year, even though the school’s autonomous tuition fee is higher than other schools. However, I feel that the school should reduce our tuition fees because we do not use the school’s equipment when studying online.”

I11 further added that the tuition fee was very high while courses were taught online. I12, a student from a rural area studying at an autonomous university, said that charging the same fees for online courses was unfair. Interviewee I12 stated:

“Schools should consider reducing tuition fees for students when they cannot come to school since they do not have enough access to materials and equipment.”

She said students living in rural areas have many difficulties studying online, especially those less fortunate without access to laptops, wi-fi, computer equipment, broadband access, or space to work. Meanwhile, I15, a student from a non-autonomous university, added that tuition at her university is acceptable because it was significantly lower than other universities. This implies that students are not particularly concerned with tuition in non-autonomous universities, but it is a severe problem for those studying in autonomous universities. However, other students, I13 and I14, said that their universities also have student support policies, such as tuition reduction and computer support, for some poor students, but the procedure is quite complicated.

“The school supports students by providing online learning accounts and techniques during the exam. The school has a support policy to reduce tuition fees during online learning. When switching to online learning, the school has technical support for students in difficult circumstances to borrow devices such as laptops for online learning. There is a program to borrow a laptop, but the conditions are too strict, and the procedure is cumbersome.”

Although this type of support has limitations, it helped some students during the pandemic. Supporting thousands of students across the country is critical for alleviating the effects of school closures, adapting learning to the uncertainties of the crisis, and strengthening the education system’s resilience.

5.2. Findings from Quantitative Research

5.2.1 Factor Analysis

This study validated the major variables, including the online learning environment, course organization and evaluation, the interaction between students and instructors, and student support using the principal component analysis as the extraction method and Varimax rotation with Kaiser Normalization. Table 5 summarizes the results of factor analysis with Eigenvalues greater than 1.00.

Table 5: Results of Factor Analysis for Independent Variables

Items	Factor loading			
	1	2	3	4
IN5	.765			
IN2	.753			
IN4	.665			
IN3	.664			
IN1	.634			
CO1		.807		
CO3		.797		
CO2		.746		
OL1			.834	
OL2			.787	
OL3			.755	
SS3				.823
SS2				.790
SS1				.686

*IN: Interaction between Students and Instructors; CO: Course Organization and Evaluation; OL: Online Learning Environment; SS: Student Support

This study also conducted another factor analysis for dependent variables. Table 6 summarizes the results of factor analysis with Eigenvalues greater than 1.00.

Table 6: Results of Factor Analysis for Student Dissatisfaction and Learning Effectiveness

Items	Component	
SD1	.844	
SD2	.836	
SD3	.799	
LE2		.848
LE3		.830
LE1		.826

*SD: Student Dissatisfaction; LE: Learning Effectiveness

5.2.2. Regression Analysis

Regression analysis was applied to test the hypotheses of this study using factor scores. Overall, the results of ANOVA revealed that the models are significant at a .01 level, with $F = 72.754$ ($r\text{-square} = .524$, $adjusted\ r\text{-square} = .517$), supporting H_{1a} , H_{2a} , H_{3a} , and H_{4a} (see Table 7). In terms of effect size, the effect of student support on student dissatisfaction was highest, followed by interaction between students and instructors, online learning environment, and course organization and evaluation.

Table 7: Effects of Online Learning Environment, Course Organization and Evaluation, Interaction between Students and Instructors, and Student Support on Student Dissatisfaction

Variables (Independent → Dependent)	Standardized Coefficient (t-value)
Online Learning Environment → Student Dissatisfaction	.154 (2.739 ***)
Course Organization and Evaluation → Student Dissatisfaction	.159 (2.901 ***)
Interaction between Students and Instructors → Student Dissatisfaction	.262 (4.592 ***)

Student Support → Student Dissatisfaction	.305 (5.297 ***)
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*** Significant at 1%

Regarding the effect of the online learning environment, course organization and evaluation, the interaction between students and instructors, and student support on learning effectiveness, the results of ANOVA revealed that the models are significant at a .01 level, with $F = 69.002$ ($r\text{-square} = .511$, $adjusted\ R\ square = .504$), supporting H_{1b} , H_{2b} , H_{3b} , and H_{4b} (see Table 8). In terms of effect size, the effect of online learning environment on learning effectiveness was highest, followed by interaction between students and instructors, course organization and evaluation, and student support.

Table 8: Effects of Online Learning Environment, Course Organization and Evaluation, Interaction between Students and Instructors, and Student Support on Student Learning Effectiveness

Variables (Independent → Dependent)	Standardized Coefficient (t-value)
Online Learning Environment → Learning Effectiveness	.331 (5.799 ***)
Course Organization and Evaluation → Learning Effectiveness	.154 (2.755 ***)
Interaction between Students and Instructors → Learning Effectiveness	.228 (3.947 ***)
Student Support → Learning Effectiveness	.158 (2.706 ***)

*** Significant at 1%

6. Conclusions

6.1. Summary

This study aimed to investigate the effects of online learning on student dissatisfaction and learning effectiveness during the COVID-19 pandemic. After conducting in-depth interviews, the study also developed a conceptual model to explore the effects of online learning on learning effectiveness and student dissatisfaction with the online learning environment, course organization and evaluation, the interaction between students and instructors, and student support by institutions of higher education. In-depth interviews and an online survey revealed several particularly intriguing and notable findings. The results from qualitative research found that students faced significant problems related to online learning, such as a lack of learning environment, lack of interaction with instructors and their peers, and lack of support from the school. Some issues were more difficult to deal with in autonomous universities (e.g., financial burden) or rural areas (e.g., Internet connection). The quantitative research results showed significant effects of the online learning environment, course organization and evaluation, interaction between students and instructors, and student support on student dissatisfaction and learning effectiveness.

6.2. Managerial and Policy Implication

By understanding the effects of factors on student dissatisfaction and learning effectiveness, the results of this study implied that student support is the most significant indicator to improve student satisfaction and online learning environment is the most important indicator to enhance learning effectiveness during the pandemic. The results of qualitative research found that concerns among students associated with online environment were lack of social interactions, feelings of isolation, lack of motivation, and internet access. Therefore, educators and policymakers should consider supporting policies, adjusting education, and training services to avoid conflicts caused by online education. The results of quantitative research implied that other factors such as online learning environment, course organization and evaluation, and interaction with students are significant factors to improve satisfaction, while course organization and evaluation, interaction, and student support are important factors to enhance learning effectiveness. As interactivity has been regarded as one of key factors in the case of Internet-enabled transactions, the results of this study proved that the effects of interaction on dissatisfaction and learning effectiveness played a key role in online education. Besides the proposed factors, other aspects in online environment should be applied in higher education help improve satisfaction and effectiveness of learning. The results of this study also implied that other approaches, such as a hybrid class, where some students attend face-to-face classes while others join the class virtually could be adopted. In some cases, students might show their concerns over policy and procedure for them to return to school, while these concerns still centered on designing back-to-school policies and developing school reopening procedures, especially for those living in remote areas. The results of this study also implied that educators should also consider offering programs to students on how to

adjust the way of teaching to the new environment. For example, schools should enhance their courses by giving students easy access to pre-recorded videos and supplemental materials. In addition, students may have trouble managing their learning activities in remote learning conditions; therefore, it is essential to understand the needs and backgrounds of each student. Additionally, different forms of assessments could be used to evaluate students; however, ensuring fairness and appropriateness in assessing students' abilities is essential to maintain the quality of higher education. Since online learning is different from offline learning, different policies should be adopted to improve student learning effectiveness and satisfaction.

In conclusion, learning activities should be assessed, and alternative options for delivering learning programs remotely should be designed and provided with the participation of instructors, education communities, students, and families. These changes necessitate improvements in instructional methodologies, technology preparedness to adopt online learning, and support and motivation of all stakeholders. Despite enormous anticipation that things will return to normal soon, curricula must be changed to promote flexibility, and technology readiness must be increased in the interim.

6.3. Limitations and Suggestions for Future Research

The current study investigated students' perceptions of online education in Vietnam. This study had some limitations. It included students from only some universities; therefore, future studies should expand the generalizability of this study by recruiting students from a larger pool of universities. Additionally, although the COVID-19 pandemic affected the teaching and learning process, school opening may be delayed, resulting in a shift in student perceptions of online learning. Follow-up surveys and interviews should be conducted to fill the gaps in future studies.

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