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INVESTIGATING THE EXPERIENCES OF STUDENTS WITH DISABILITIES WITH E-LEARNING DURING THE COVID-19 PANDEMIC IN VIETNAMESE HIGHER EDUCATION

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Abstract

This study uses a mixed-methods approach to investigate the experiences of Vietnamese university students with disabilities (visual/mobility impairments) with e-learning as a consequence of emergency remote teaching during the COVID-19 pandemic. An analysis of the ideas of 20 surveyed students with disabilities at eight universities in Ho Chi Minh City and six students interviewed afterward shows that students can change their study habits to adapt to e-learning and to enjoy this model of learning. However, the participants revealed that they also want to experience face-to-face learning so that they can interact with their lecturers and peers more effectively and in more diverse ways, as well as assimilate lectures more easily. Furthermore, the research shows that various adjustments should be made by system designers, universities, and lecturers to make e-learning friendlier to disabled students. The recommended adjustments include designing easy-to-use learning tools and platforms, providing lecturers with the necessary tools and facilities to design lessons appropriate for all students, providing psychological and technical support for disabled students, choosing user-friendly learning applications and platforms, providing students with suitable learning resources, and modifying testing and assessment methods.

Keywords: COVID-19; E-learning; Higher education; Students with disabilities.

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1. INTRODUCTION

The outbreak of the coronavirus disease 2019 (COVID-19) occurred near the end of 2019. On March 11, 2020, the World Health Organization declared it a pandemic. To date, more than 200 countries and territories have been affected by this pandemic to varying degrees (Worldometer, 2021). The disease is expected to persist and mutate despite the reduced levels of transmission. No research has determined when it will end or diminish in severity. Almost every aspect of life has been affected by this pandemic, from the economy to education, due to the effects of the virus as well as the measures taken by countries in response, such as social distancing and border closures, which affect people's physical and mental health (Mofijur et al., 2021).

Traditional face-to-face learning in higher education in many countries was halted due to COVID-19. Teaching and learning activities at universities around the world have turned to e-learning under the regulations of their governments (Oladele et al., 2022). This learning model has almost become indispensable or mandatory for educational activities at other levels of education in many countries (United Nations News, 2020). E-learning is often used as a general term, comprising different types of online learning, web-based teaching, and technology-delivered instruction, and including both synchronous and asynchronous delivery (Murphy, 2021; Seale, 2014). The former term refers to a mode of delivering teaching in real-time, and the latter term denotes teaching and learning activities that students can access at their convenience–for instance, posting a recorded lecture on Moodle for students to review.

The COVID-19 pandemic necessitated a rapid transition from face-to-face learning to e-learning. This form of conversion due to contextual issues is often referred to as "emergency remote teaching" and understood as a "temporary shift of instructional delivery to an alternate delivery model due to crisis circumstances" (Hodges et al., 2020, p. 6). It is implemented to ensure learners' right to study and the possibility for staff members to perform ordinary teaching and research work (Marsico, 2018). Murphy (2021) emphasizes that there is no equivalence between e-learning and emergency remote learning. This is because the former often involves gradual preparation by institutions, while the latter is often the result of rapid, sudden, and imposed transitions. This raises an important point: research on e-learning in universities in the context of the pandemic needs to take note of whether there is an "emergency" factor and to what extent it exists at the universities selected for research. Some universities had switched to e-learning to varying degrees before the outbreak of the COVID-19 pandemic by implementing online learning or mixed (blended) teaching formats (Pursel et al., 2016). As a result, they have a certain level of preparation and familiarity with e-learning, unlike universities that mainly practice face-to-face teaching and learning.

In the case of Vietnam, the country recorded its first case of COVID-19 in early 2020 in Ho Chi Minh City. Until June 28, 2020, Vietnam ranked 156th of 215 countries and territories in the world in the number of COVID-19 cases and 6th out of 11 countries in Southeast Asia. Among 355 cases of COVID-19, Vietnam had recorded no deaths. However, by 2021, the pandemic had become widespread in Vietnam with the increasing

numbers of COVID-19 infections and deaths (General Department of Preventive Medicine, 2020). In March and April 2020, when the pandemic first broke out in the country, all educational establishments were forced to close, and all students had to stop their face-to-face learning by order of Government Directive No. 16/CT-TTg. In the context of preventing the spread of the COVID-19 pandemic, along with many countries around the world, schools and higher education institutions implemented full-time e-learning (Phan et al., 2020). In light of the national shift to this learning and teaching model, many studies have been carried out to understand e-learning among Vietnamese high school and university students. However, we have found no studies regarding university students with disabilities even though their academic challenges, which are greater than those of other students, maybe more diverse and complex when teaching and learning become e-learning (Herburger, 2020).

Given these circumstances, this study examines the e-learning experiences of university students with disabilities in Vietnam during the COVID-19 pandemic. From the collected information, we provide suggestions for relevant stakeholders to improve the learning efficiency of students with disabilities in e-learning.

2. LITERATURE REVIEW

2.1. E-learning for university students with disabilities: Pros and cons

In studies on e-learning and students with disabilities, researchers find that, generally, the majority of students feel satisfied with this model of learning. Some students with special needs even wish to continue their education using this model instead of face-to-face learning because e-learning offers various benefits for them (Aljaber, 2018; Carpinelli et al., 2021; Pearson & Koppi, 2002; Zhang et al., 2020). With the aid of various types of software, for example, students can record lectures to review in the future. Students participating in e-learning also often receive learning resources concerning the lecture before it starts. In addition, students with disabilities can use computers to support their learning and avoid the stress of commuting to the classroom, which requires personal support in some cases (Carpinelli et al., 2021; Oladele et al., 2022). According to Pearson and Koppi (2002) and Zhang et al. (2020), because many students with disabilities are afraid of direct contact with people, e-learning also benefits them in that it can reduce the need for disclosure and increase anonymity.

However, several barriers for students with disabilities are still present in e-learning, especially during the COVID-19 pandemic, resulting from various factors. Naumova et al. (2017) suggest that students with disabilities may not be able to use technology well enough to exploit its functions for effective e-learning. In addition, students have to bear the financial burden of acquiring the facilities necessary for e-learning (Mohammed, 2021; Murphy, 2021). Ribeiro (2020) also believes that universities' movement toward digitalization in their teaching and learning methods is not only related to logistical changes but also changes in learners' attitudes. These are also associated with learning challenges. Regarding this dimension, Gin et al. (2021) suggest that studying at home can cause mental and psychological challenges for students

with disabilities. Conversely, this mentality has a negative impact on their learning. Some disabled students also cite the matter of privacy and reveal that they feel embarrassed when others staying with them hear them speak or their accommodations are seen by others, as they must turn the camera on while studying (Carpinelli et al., 2021). According to Goegan et al. (2022), Lightfoot et al. (2018), and Tonks et al. (2021), students with disabilities can find it hard to get help from their lecturers in e-learning because these staff members lack expertise and experience in online teaching or in supporting students with disabilities. For example, their responses may be delayed or they may fail to provide students with appropriate materials. Additionally, research by Carpinelli et al. (2021) emphasizes the fact that disabled students lack physical relationships with their lecturers and peers when they have to study online and even shows that this is one of the greatest problems they face. They may, for instance, face challenges in completing group work due to a lack of technological skills, which may lead to difficulty accessing chat functions or break-out rooms (Goegan et al., 2022; Lightfoot et al., 2018). Lecturers' efforts are further hampered by students' lack of learning resources and facilities, which are mainly available on their university campuses (Mohammed, 2021). The security of systems and information also causes trouble for students with disabilities in accessing learning resources and/or personal online accounts. They must remember passwords and other identifying information, which is often a challenge for them. Students with disabilities also mention their struggle with Wi-Fi connections and access to the Internet (Carpinelli et al., 2021; Murphy, 2021).

2.2. E-learning in the Vietnamese context

At higher education levels, there are generally fewer Vietnamese with disabilities. While more than half of the people with disabilities have attended primary school, only about 0.1% have completed university education (Nguyễn, 2018; Trần, 2014). According to the Ministry of Education and Training of Vietnam (2018), Vietnamese universities have the responsibility to accept and teach people with disabilities who can participate in this level of study. In addition, there are regulations regarding financial support (monthly allowances and tuition fee waivers) for students with disabilities from poor or near-poor families (Ministry of Education and Training of Vietnam et al., 2013). However, according to Nguyễn (2018), support for students with disabilities in Vietnam is still limited and a significant gap between theory and reality still exists. Specific key issues include a lack of accurate and reliable data on the part of the state and universities, a lack of investment in university campus facilities and infrastructure to create an inclusive learning environment, and a lack of knowledge and skills among lecturers and staff members in communicating, interacting, and helping students with disabilities. Due to these issues, students with disabilities at Vietnamese universities face various challenges in academic and social life.

E-learning in Vietnam has formed and developed as a type of distance learning since the 1990s with the introduction of distance degrees by some universities. However, very few higher education institutions developed such distance training programs. Among those that could do so were Hanoi Open University and Ho Chi Minh City Open University (Đặng, 2020; George, 2010). On October 17, 2000, the Central Committee of

the Communist Party of Vietnam issued Directive 58-CT/TW "on accelerating the application and development of information technology to serve the industrialization and modernization of the country" (Ban Chấp hành Trung ương, 2000). Accordingly, several guidelines and recommendations for the development and application of information technology in all fields were introduced. Then, from 2003 to 2004, many studies on e-learning, including theses and dissertations, were conducted. The application of e-learning was developed but mainly related to the use of Moodle. After that, many seminars on e-learning were held to discuss the possibility of widely applying this model in education and training in Vietnam. More universities started to implement e-learning and a series of online learning websites were launched and operated, such as Violet.vn, Hocmai.vn, Topica, Onluyen.vn, and Speakup.vn (Đỗ & Hoàng, 2020). In 2013, Vietnam even ranked 4th in the world in terms of the speed of e-learning development (Ngô & Hoàng, 2020).

However, e-learning is mainly used by various educational organizations to provide short courses on foreign languages, life skills, and topics related to high school curricula. Meanwhile, the application of e-teaching at universities is not as prominent (Ngô & Hoàng, 2020). Before the COVID-19 pandemic occurred, the online training method was only used to supplement regular university classes. Besides, only a few universities have been approved by the Ministry of Education and Training of Vietnam to pilot a combined training model. In addition, of all the regulations on forms of training, only the Regulation on Distance Learning and Circular 12 from the Ministry of Education and Training of Vietnam on the application of information technology in the management and organization of e-learning refer to this model. The current regulations on e-learning, in particular, and the application of information technology, in general, in Vietnamese higher education are still quite modest. They are not sufficient to create a legal corridor for developing e-learning in this sector (Ministry of Education and Training of Vietnam, 2016, 2017; Ngô & Hoàng, 2020; Phan et al., 2020).

Although e-learning was uncommon in higher education institutions, it was adopted nationwide due to the impact of COVID-19. This gave Vietnamese university students, including those with disabilities, the chance to experience various aspects of e-learning. Several studies have been conducted to investigate the experiences of university students in Vietnam with e-learning during the COVID-19 period, such as those by Bùi et al. (2021) and Phan et al. (2020). The limitations and advantages of e-learning for Vietnamese students found in these studies are similar to those found in many other countries around the world. They revolve around issues related to the learners themselves (such as knowledge background and psychology) and the influence of their universities, lecturers, friends, and learning environments. In general, Vietnamese students face many difficulties in e-learning due to both subjective and objective factors. Improvements from stakeholders are required to help universities effectively implement e-learning.

3. RESEARCH METHODOLOGY

This study identified and adopted various aspects of other studies related to e-learning and its relationship to students with disabilities. Specifically, the research

explores students' preparation for e-learning and their experiences with the process of e-learning in terms of technology, learning equipment, learning resources, and the activities/roles of universities, lecturers, and classmates. In addition, a number of items are used to survey students' overall perceptions of their experience.

The research examined the participants' experiences with e-learning during the COVID-19 pandemic, from September 2020 to the end of 2021. The academic year in Vietnam normally has two semesters: Semester 1 usually starts in September and ends in December, and Semester 2 usually runs from January to the end of May. Although the nationwide transition to e-learning began around April 2020, students mainly took their exams online at that time because it was near the end of the academic year. After that, students had their summer break (although some could participate in a summer semester if their university organized it), and the new academic year started in September 2020 using the e-learning model.

This study used a mixed-methods approach to reveal the thoughts of students with disabilities about their e-learning experiences during the COVID-19 period. Accordingly, a quantitative approach was used first to obtain general information about their e-learning experiences by asking them to answer survey questions. After obtaining their responses, the study continued with a qualitative approach, namely, in-depth interviews to compare and clarify the information gained from the survey.

The research team purposefully selected students with disabilities for surveys and interviews from universities in Ho Chi Minh City, which has approximately 60 of the 240 universities in Vietnam, not counting those in the security and defense sectors (Ministry of Education and Training of Vietnam, 2021). Given that the few students with disabilities are spread among several universities, the research team used its personal network to contact organizations and individuals for assistance. These include the Disability Research and Capacity Development Center, the Audio Books for the Blind Charity Fund, the Huong Duong Talking Book Library, and a group of students with disabilities at one of the universities (University 1). Snowball sampling was also used to identify suitable research participants. The research team managed to contact 23 students with disabilities at eight universities in Ho Chi Minh City. However, only 20 students (10 students with visual impairments and 10 students with mobility impairments) were asked to share their opinions. The three remaining students were excluded because they have other types of disabilities, requiring the survey questions to be designed differently to effectively investigate their experiences with e-learning.

After obtaining information from suitable individuals during the survey preparation stage, the research team contacted them to introduce the purpose of the research via email, phone, Zalo, and Messenger. Eventually, the research group decided to only contact students with visual or mobility impairments. Due to this, the concepts and findings about students with disabilities in this research are mainly related to these individuals. To help the visually-impaired participants complete the surveys, especially those with very poor vision and/or who had difficulty filling out the survey questions, the research team offered support by calling and guiding them through selecting the options.

Some information about the survey participants is provided in Table 1. The majority of students were from University 1 because it offers a bachelor's program in special education, which attracts many students with disabilities. It is, however, important to note that this disparity in the data needs to be considered when the results of this study are used.

Table 1. Profile information on the survey participants

Personal information		Number
Type of disability	Visual impairment	10
	Mobility impairment	10
Year	1	1
	2	5
	3	5
	4	9
Birth year	2001	9
	2002	5
	2003	5
	2004	1
Gender	Male	7
	Female	13
University	University 1	12
	University 2	1
	University 3	1
	University 4	1
	University 5	1
	University 6	1
	University 7	1
	University 8	2

To measure the degree to which students agreed with statements about vairous aspects of e-learning, the study used a 5-point Likert scale, in which 1 meant not understanding/disagreeing and 5 meant completely understanding/agreeing. The discrete values were transformed into ranks as follows: 1.00–1.80: completely disagree; 1.81–2.60: disagree; 2.61–3.40: partially agree; 3.41–4.20: agree; 4.21–5.00: completely agree. This calculation was made based on the following formula: (maximum–minimum)/n = (5–1)/5 = 0.8 (Malhotra & Birks, 2007). Given the small number of participants, only descriptive analysis was used for the survey data. Also, because of the limited number of participants, testing reliability and internal consistency of the instrument was performed using the interview method mentioned above. Accordingly, the interview questions were designed both for comparison with the survey information and for a deeper understanding

of the surveyed contents. Mixed methods have the advantage of guaranteeing triangulation, "which expresses the belief that the convergence of evidence stemming from two or more methods can enhance the strength and validity of research findings" (Arthur et al., 2012, p. 147).

In addition, the research team also conducted interviews with students with disabilities about their experiences with e-learning. The interviews were conducted after the surveys to obtain information that could be compared with the survey results. This approach was also aimed at generating new content and/or exploring deeper information that the closed-ended questions in the questionnaire could not cover or explore.

The interview participants were selected from among those who agreed to participate in the survey. Each student was sent another email (previously used to send the survey link) explaining the purposes of the interview and asking for their consent to participate. Due to the pandemic, all of the interviews occurred online. All interviews were recorded with the permission of the participants and with the assurance of confidentiality. Some personal information about the interviewees is provided in the following table.

Table 2. Profile information on the interviewees

Alias	Form of disability	Birth Year	Year	Gender	University
Interviewee 1	Visual impairment	2003	2	Female	University 1
Interviewee 2	Mobility impairment	2001	4	Female	University 1
Interviewee 3	Visual impairment	2004	1	Male	University 1
Interviewee 4	Mobility impairment	2002	3	Female	University 1
Interviewee 5	Visual impairment	2002	3	Female	University 2
Interviewee 6	Visual impairment	2003	2	Male	University 3

4. RESULTS

4.1. Students' preparation for e-learning

In general, as shown in Table 3, the participants were sufficiently prepared for many aspects of e-learning, including the learning environment, learning equipment, knowledge, and skills. However, in terms of psychology, the survey results show that the participants were not yet prepared. Some students also indicated this in the interviews: "I was not mentally prepared, so I was confused at first" (Interviewee 4).

Table 3. Students' technological backgrounds and preparation for e-learning

Item	Number	Mean score	Standard deviation	Rank
Psychologically prepared	20	3.15	0.587	Partially agree
Have a location prepared (house, dormitory, hostel, etc.)	20	3.30	0.571	Agree

Table 3. Students' technological backgrounds and preparation for e-learning (cont.)

Item	Number	Mean score	Standard deviation	Rank
Have materials prepared (computers, headphones, audio aids, speakers, Wi-Fi, etc.)	20	3.30	0.657	Agree
Prepared with relevant skills and operations (using online learning equipment, applications, platforms, etc.)	20	3.30	0.470	Agree
Prepared with knowledge	20	3.35	0.671	Agree

4.2. Student experiences with learning equipment and technology

Regarding the equipment and technology used for e-learning, the participants communicated through the surveys that some basic software intended to support students with disabilities in e-learning is useful and error-free. The participants also agreed that they had a stable Internet connection. This is a different result from many studies on e-learning among Vietnamese postsecondary students, in which the Internet connection was considered a problem that students often face.

Although there were not many obstacles in terms of equipment and technology, including the Internet, the students who participated in the surveys found that a problem they faced was the stability of e-learning applications/platforms such as Microsoft Teams or Zoom. The interviewees attributed this instability, in part, to the lack of compatibility of these applications with their computers or phones.

Table 4. Student experiences with learning equipment and technology

Item	Number	Mean score	Standard deviation	Rank
E-learning support software for disabled students (screen reading software for the visually impaired, etc.) has no errors	20	3.65	0.988	Agree
E-learning support software for disabled students (screen reading software for the visually impaired, etc.) proves useful for e-learning	20	3.65	0.988	Agree
E-learning applications/platforms (Microsoft Teams, Zoom, etc.) are prone to breaking down	20	4.10	0.852	Agree
The Internet connection (Wi-Fi, 3G, etc.) is stable	20	3.95	0.759	Agree

One thing to note is that, although the students participating in the surveys agreed that some features of the e-learning support software for disabled students were useful, those who participated in the interviews stated that this does not mean they can easily use the features because the operations are difficult or time-consuming.

The function of the software for enlarging the screen only helps to see the documents and lectures, but operational problems are still there since it is not easy to turn on the microphone to ask questions while you are using this support software. (Interviewee 1)

I use screen reader software to support my reading, and at the same time I zoom the screen to about 400% or 500% to make it legible (…). However, there is a disadvantage that when using the reader, the screen will turn off, taking time to reopen to see it again. (Interviewee 3)

4.3. Student experiences with learning resources

The survey results show that the students considered the learning resources sufficient, diverse, and convenient for reviewing (Table 5). Those who participated in the interviews made this clearer: "Easy access to materials. Also, the materials are digitized, so it is easy to use with a screen reader program for students with visual impairments" (Interviewee 3). However, some interviewed students mentioned limitations of these materials: "There are too many materials provided, so it is easy to get confused. Some information is hard to find from so many documents" (Interviewee 6).

Table 5. Student experiences with learning resources

Item	Number	Mean score	Standard deviation	Rank
Learning resources provided for the course are sufficient and diverse	20	4.00	0.725	Agree
Learning resources for the course are useful for e-learning	20	4.10	0.852	Agree
Online lectures can be reviewed easily	20	4.45	0.686	Completely agree

4.4. Student experiences with the roles and activities of their universities, lecturers, and classmates

Regarding the items that addressed the roles and activities of different stakeholders in relation to the e-learning process of students with disabilities, the students who participated in the surveys and interviews agreed that their lecturers put in the effort to make teaching and learning in the e-learning model effective. Their lecturers and classmates also assisted them in various aspects of learning. Nonetheless, there were two items directly concerning the universities that the survey participants only partially agreed with. Thus, compared to the support they receive from their lecturers and classmates, they are not fully satisfied with the support they receive from their universities. The details are provided in Table 6.

Table 6. Student experiences with the roles and activities of universities, lecturers, and classmates in e-learning

Item	Number	Mean score	Standard deviation	Rank
The university has technical support for students with disabilities in difficult circumstances (providing learning equipment, installing Wi-Fi, etc.)	20	3.40	0.995	Partially agree
The university organizes sessions to share information to assist students with disabilities in e-learning (how to use online learning facilities and applications/platforms, etc.)	20	3.25	1.372	Partially agree
Teaching methods of lecturers are appropriate	20	3.85	0.745	Agree
Lecturers make the lecture suitable for visually impaired students (enlarging words, using verbal descriptions of content, etc.)	20	3.95	0.826	Agree
Interactions between lecturers and students go smoothly when learning online	20	3.95	0.999	Agree
Students are always supported and questions/ideas are responded to during and outside of class hours through forums, social networks, emails, etc.	20	3.80	0.616	Agree
Online exercises and tasks are suitable for learners	20	3.60	0.995	Agree
The assessment of the learning process and examinations are still limited (registration, grading, checking for cheating, etc.)	20	3.65	0.875	Agree
The interaction between classmates is smooth	20	3.80	1.152	Agree
Classmates help students with disabilities use online platforms	20	3.80	0.951	Agree
Classmates help students with disabilities with the content of lessons and documents	20	4.00	0.725	Agree

Although the survey respondents affirmed that there were not many obstacles in their relationships with their lecturers and classmates in the e-learning process, a certain degree of difficulty still exists, as described by an interviewee:

> The lecturers are enthusiastic, but it is impossible to make eye contact with students. Sometimes it is hard to interact with each other because of the weak Internet connection. (Interviewee 4)

Another thing to note is that there are still problems related to assessment. The students participating in the surveys and interviews all said that student assessment is ineffective in almost every relevant aspect. This stems from the excessive amount of knowledge that needs to be reviewed for online examinations, the greater number of

questions on online examinations than traditional ones, the limited time for online examinations, and the complicated submission procedures. In addition, some forms of assessment are not suitable for students with disabilities.

> Lots of information. Lots of review materials. Hence, it is easy to get confused. The allotted time for online examinations is shorter than that of face-to-face ones, but there are so many questions on the online examinations. Thus, I did not manage to finish the examinations in time. The submission process also has many stages. Hence, it is difficult to manipulate. Many times, I was out of the class while taking the examinations, and the lecturers thought that I did it intentionally. I have also encountered many other unexpected problems. Consequently, the results were not as expected. I prefer face-to-face examinations. (Interviewee 1)

> For essays, there is no problem. However, recording video clips for some courses, such as sign language and teaching methods, is problematic since it is hard to adjust the camera to have good views and to perform multiple operations at the same time. It takes time and is awkward (…). The results of e-learning are not good and my results might have been higher if I had studied face-to-face (…). I wish to have more time since every step in the examination takes time, including typing, adjusting the file, and converting the Microsoft Word document to a PDF. Moreover, it poses the risk of submitting the wrong file when the student is in a hurry due to lack of time. (Interviewee 2)

> The online examination format is not very familiar and the questions are a bit difficult. In addition, the time is a bit short and, at the same time, there are many operations required before submitting the assignment, including doing the examination on A4 paper, taking a photo of the answers, converting the photo to a PDF, and then submitting the PDF. (Interviewee 5)

4.5. Students' overall perceptions

The survey results show that students with disabilities can switch to e-learning and that they want to continue using it, as shown in Table 7.

Table 7. Students' overall perceptions of their experiences with e-learning

Items	Number	Mean score	Standard deviation	Rank
I can change my learning habits from face-to-face to e-learning easily	20	3.85	0.988	Agree
I can continue using e-learning	20	4.10	0.788	Agree
I would like to continue using e-learning	20	3.70	1.174	Agree

To complement the survey results, the data from the interviews confirm that the students can adapt to e-learning and learn in this form. However, they do not expect this to be the only model of learning in the future. If given a choice, the participants would

like to have both models of learning: e-learning and face-to-face learning. This is because, although there are benefits to e-learning, traditional face-to-face learning can offer students advantages that are weaknesses of the e-learning model, such as easier interaction with lecturers and classmates and a better understanding of lectures.

> When teaching face-to-face, it seems that lecturers will explain more enthusiastically and interact with students more easily; hence, they will be more interested in teaching. With e-learning, even turning on and off the microphone to share ideas and ask questions is time-consuming, and sometimes it is hard to hear the lecturer due to a weak Internet connection. (Interviewee 3)

> In face-to-face learning, it is easy for students to understand the lessons and interact with lecturers, resulting in better learning outcomes. (Interviewee 4)

> Assimilating lectures through different interactions is also easier than through gazing mainly at the computer screen. (Interviewee 5)

> It is easy to discuss with lecturers and understand the lesson thanks to the information illustrated and summarized on the blackboard–a teaching technique often used by lecturers in face-to-face learning. (Interviewee 6)

5. DISCUSSION

5.1. Is e-learning for students with disabilities already smooth?

Vietnamese higher education institutions have not had much experience implementing e-learning, especially full-time e-learning. The e-learning model was fully implemented at universities across the country due to the requirements of the state in the context of the COVID-19 pandemic. However, the survey results show that students with disabilities–who often have more difficulties with learning than others—agreed that e-learning has brought them a wide range of benefits. This is different from many studies of e-learning among Vietnamese students during the COVID-19 pandemic, such as those conducted by Bùi et al. (2021) and Phạm et al. (2021), who stated that most students find it difficult to switch to e-learning because of the teaching methods of the lecturers, the learning facilities, and other reasons. However, this research has reached findings similar to those of some studies elsewhere in the world on the same subject, such as the studies by Carpinelli et al. (2021) of students at the University of Salerno in Italy and by Zhang et al. (2020) of students at the University of Washington in the United States. This may be because the majority of students with disabilities are familiar with using computers and specific software to support their learning. With the conventional form of learning, students with disabilities often record lectures to review them later and keep up with their classmates. Visually impaired students also read digital documents that are integrated with support software to review lessons. It is also worth considering that students with disabilities are not inherently involved in aspects of face-to-face learning that other students find beneficial–or have difficulty taking advantage of them–such as accessing facilities that serve various functions, from canteens to gymnasiums.

Although the students agreed that there are various benefits to e-learning, further improvements are needed to make e-learning more effective for students with disabilities. System designers need to pay more attention to designing learning tools/applications/platforms that are convenient for students with disabilities, who usually have different ways of working with these systems than other students. Gierdowski and Galanek (2020) and Seale (2014) also emphasize this, and find that e-learning can even be seen as more inclusive than face-to-face learning when the learning tools/applications/platforms are designed to allow for student accessibility and ease of use. If these principles are followed, students with disabilities can overcome technical obstacles. They will be able to complete their studies more effectively because certain problems related to physical and social matters are rarely present in the model of e-learning.

For universities, it is important to guarantee that lecturers are provided with the necessary tools and facilities to design lessons that are appropriate for all students, including those with disabilities. In addition, there should be training for lecturers, if necessary, on teaching students with disabilities with e-learning, as mentioned by Collins (2020) and Zimmer et al. (2021). Furthermore, given that the technical and psychological support provided by universities for students with disabilities in difficult circumstances is not yet effective, as shared by the research participants, institutions of higher learning need to pay more attention to this dimension, such as by organizing sessions for students with disabilities to share information about e-learning. As e-learning applications/platforms (e.g., Microsoft Teams, Zoom, Google Meet) are prone to breaking down, universities need to take measures to minimize this problem, such as distributing class sizes appropriately to prevent the learning systems from being overloaded and choosing user-friendly applications.

The information obtained from the surveys shows that lecturers tried to change their teaching methods to use e-learning effectively and provide necessary student support. However, it is also necessary to pay attention to the selection of learning resources so that learners do not feel overwhelmed and have difficulty synthesizing information. In particular, improvements to testing and assessment should be taken into urgent consideration. It is necessary to provide forms of assessment that are suitable for students with disabilities and to pay attention to the duration and content of online examinations, which often take longer to complete, are more complicated, or are not as successful as expected.

5.2. Is everything identified by the students sufficiently clear?

The survey results show that students think their Internet connections are stable and sufficient for their studies. This suggests that they have no difficulty in this respect. However, many e-learning studies around the world and in Vietnam refer to issues related to Internet connections. Phan et al. (2020) stated that all 945 students participating in the study had problems with the Internet, such as unstable connections, power outages, and poor connection speeds. Similarly, Bùi et al. (2021) found that an unstable Internet connection was a difficulty for 65% of the students participating in their survey. The

interview results partly shed light on the findings of the survey. For example, to have a stable Internet connection, students had to "find all kinds of ways by ourselves, such as buying expensive 3G packages" (Interviewee 6). This is similar to what Phan et al. (2020) revealed in their research: to cope with Internet connection problems and a lack of Wi-Fi, some students had to spend significant amounts of money on 3G or 4G. Moreover, the survey results show that students have enough learning devices, such as laptops, speakers, and webcams, but the interviewed students stated that they bought this learning equipment themselves. Along with the cost of 3G or 4G, acquiring these learning devices can be considered another burden for students. Perhaps it is because of this very situation that students participating in the survey only partially agreed that the university had supported them in e-learning during the COVID-19 period. The financial burden of acquiring the necessary facilities for e-learning was also found in studies in other countries, as mentioned by Mohammed (2021) and Murphy (2021).

Another point worthy of attention is that although most students agreed that there are benefits to e-learning, believed that they could adjust their learning methods to suit it, thought that they could continue to use it, and liked it, they still need face-to-face learning for various benefits, which are seen as the limitations of e-learning. This is because they can have more diverse and effective interactions with their lecturers and classmates, complete exams more smoothly, and assimilate lectures more easily in traditional classes. Therefore, in the process of digital transformation, universities need to pay attention to the needs of students with disabilities. These students may be just trying to adapt to and accept full e-learning during a temporary emergency period such as the COVID-19 pandemic. Thus, universities should carefully consider whether it is appropriate to see e-learning as the only or main form of learning in the future.

6. CONCLUSION

From the results of the preceding analysis, it can be seen that the research participants mainly expressed their agreement and complete agreement with the many benefits of e-learning. These individuals also demonstrated the ability to change their study habits to suit this learning model and indicated that they can and want to continue e-learning. However, there are certain barriers that the students with disabilities have faced in using e-learning during the COVID-19 pandemic that need to be resolved for their academic advancement.

In general, although students still face problems in the e-learning process, the use of e-learning is believed to be on the rise at Vietnamese universities. This is not only because of the influence of the COVID-19 pandemic or other incidents that can disrupt the face-to-face learning process or the benefits of e-learning. It is also because the use of technology in teaching is associated with the needs and characteristics of today's students, whose growth is intertwined with technology (Mohammed, 2021). Therefore, the continuous improvement of this model of teaching and learning is indispensable in the operation of higher education institutions to ensure that they effectively meet the needs of various learners, including students with disabilities. Nonetheless, the inclusion of e-learning as the main or only model of learning should be considered in light of the

fact that students with disabilities still find face-to-face learning convenient and useful for them to some extent.

The research results also show that an effective transition to e-learning requires system designers to pay more attention to designing learning tools/applications/platforms that are convenient for students with disabilities. In addition, implementing policies and taking actions to support relevant stakeholders during the digital transformation of the university are integral to the successful employment of e-learning. Specifically, universities need to equip lecturers with tools and facilities to design lessons that are appropriate for various learners, including students with disabilities. Lecturers also need to be trained in teaching these students in the model of e-learning. Moreover, it is important that universities provide technical and psychological support for students with disabilities. Measures to limit the breakdown of e-learning applications/platforms should also be put in place. Lecturers need to select learning resources that can alleviate the problem that learners feel overwhelmed and face difficulty synthesizing information due to the sheer volume of material. Apart from that, there ought to be adjustments in the duration and content of online examinations and in forms of assessment to make them suitable for students with disabilities.

Due to the small number of university students with disabilities and the difficulty in approaching these students, who study at different universities and rarely use popular means of communication, this study could only obtain opinions from a few individuals. As a result, this limits testing the reliability and internal consistency of the instrument and hinders more in-depth statistics, such as comparing the opinions of students with different types of disabilities or from different institutions, and leaves room for further research. The opinions of students with disabilities other than visual and mobility impairments, as well as those at other universities, especially ones outside Ho Chi Minh City, should also be collected in similar future studies.

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