

Feelings of Students When Experience Online Learning During The Prevention Of Covid 19: Case In Vietnam

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Abstract: In the context of the prevention of the COVID-19 pandemic, domestic and foreign higher education institutions have implemented full-time online training to meet the learning needs of students. This study was conducted to assess students' perceptions of the form of full-time training at higher education institutions in Hanoi City when participating in online learning during the response to the epidemic. The survey was deployed through the Google Form, sent to full-time University students and collected 2230 responses. This study uses four components of Shee and Wang's web-based E-Learning system assessment structure [4], which includes: Learner Interface, Content, Personalization, Learning Community. Research results show that the level of student satisfaction about the above four components is above average, there is a difference in the level of student satisfaction about the above four components and there are eight types of birth difficulties. students most often when experiencing fully online learning. Simultaneously, the study uses a multivariate regression model to analyze the influence of student satisfaction on four structural components of the online learning system on student learning outcomes during the COVID-19 pandemic, the results show that as satisfaction increases, students' learning outcomes also increase.

Keywords: Feelings from learners, Technology, Covid-19, Online Learning, Regression model, Data Science.

1 Introduction

With the development of the internet and connection and display technologies, online learning is increasingly easier and opens up new opportunities for educational institutions, especially universities in Vietnam. During the COVID-19 pandemic prevention period in Vietnam and around the world, the benefits of this learning model have become increasingly clear when helping universities continue to maintain training activities and daily connections million classes for students and lecturers nationwide. Online learning provides a learning environment without limitations in time and space, while reducing training and social costs [6]. The application of technology in training activities is not inherently new. The development and application of new technologies in education has helped improve the quality and effectiveness of online learning. According to Connolly and Stansfield [3], technology application in training has gone through three main stages. The first phase was from 1994 to 1999, marked by the passive use of internet technology, traditional paper documents were converted to online format. The second period was from 2000 to 2003, marked by the development of high-bandwidth communication technology, increasing the efficiency and performance of connections, information transmission, and diverse transmission media, devices, and resources. Integers are increasingly growing. The virtual learning environment is formed with a combination of face-to-face and online forms. The third phase is currently underway, marked by the integration of social networks, wide-area connectivity, online simulation, and mobile learning. Many studies have been conducted to evaluate the role of technology in online learning, Rosenberg [16] asserts that platform-based online learning uses internet technologies to provide a series of solutions to help Improve knowledge and training performance. In Vietnam, online training has formed and developed since the late 2009 with the introduction of online distance learning degree programs from a number of schools. In the past 5 years, more and more schools have implemented fully online training programs that award bachelor's degrees in the form of distance learning and educational units offer short-term online courses. Before the COVID-19 pandemic, most universities only applied this training method as a supplement to regular university classes. In the formal training system, most universities apply online training at basic levels such as using the learning management system LMS (Learning Management System) to supplement the classroom learning process through Activities: posting documents, discussion

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forums, doing some exercises to accumulate points. A few universities are allowed by the Ministry of Education and Training to pilot the training model Blended learning at a rate of no more than 30% of the total learning volume of the entire training program. Actual implementation shows that students participating in online distance learning programs are completely required to commit to the ability to use information technology, ensuring they meet technical requirements such as learning equipment. file and connect to the internet. Some schools create and require students to take an online Study Skills course before starting other subjects. Students enrolled in these programs are well prepared to study online for a long time. Meanwhile, regular university students of the schools, although they may have been familiar with and partially studied on the LMS learning management system, are still only doing simple activities that do not have a major impact on their results. learning results. When schools were forced to deploy teaching and learning completely online to cope with the COVID-19 epidemic, many students encountered many difficulties in adapting and accepting the sudden change. This rapid change can lead to different feelings of students during their studies. Therefore, to learn and explore the feelings of full-time university students when experiencing completely online learning, the authors conducted this study. Research results show that students have different feelings about the process of adapting to completely online learning as a temporary solution to deal with the pandemic. At the same time, the author also found 08 groups of outstanding difficulties of students and proposed a number of solutions that contribute to improving the efficiency of universities when applying this learning method.

The article is organized as follows: section 2 introduces the theoretical basis of the research topic; Section 3 introduces research methods; Section 4 introduces research results and discussion. Finally, section 5 introduces the conclusion of the article.

2 Materials and Methods

2.1 Concepts

2.1.1. Covid-19 pandemic

The COVID-19 pandemic [20] is an infectious disease pandemic caused by the SARS-CoV-2 virus and its variants. Originating at the end of December 2019 with the first epidemic center in the city of Wuhan in Central China, originating from a group of people with pneumonia of unknown cause. Local health officials confirmed that they had previously been in contact, mainly with traders trading and working at the Huanan seafood wholesale market, China. Chinese scientists have conducted research and isolated a strain of coronavirus that the World Health Organization temporarily called 2019-nCoV, with a genetic sequence similar to the previous SARS-CoV with a high level of similarity. up to 79.5%.

Report on December 31, 2019 announced the first suspected cases appeared in Wuhan, China. On January 9, 2020, the first death occurred in Wuhan, China due to SARS-CoV-2. The first virus cases announced outside of China include two women in Thailand and a man in Japan. Human-to-human transmission of the virus was confirmed with the outbreak rate increasing in mid-January 2020. On January 23, 2020, the Chinese government decided to blockade Wuhan, the entire transportation system. Public transportation and import-export activities are suspended.

On March 11, 2020, the World Health Organization (WHO) issued a statement calling "COVID-19". Countries around the world have launched responses to protect the health of people and community groups globally, including: travel restrictions, quarantine blockades, declaring a state of emergency, Use curfew, conduct social isolation, cancel crowded events, close schools and less important service and business establishments, encourage people to raise their awareness of disease prevention, Wear masks, limit going out when not necessary, and convert business, study, and work models from traditional to online. For example, lockdowns for total quarantine in Italy and China's Hubei province; different curfew measures in China and South Korea; screening methods at airports and train stations; Limit or cancel travel activities to areas, regions, and countries with high risk of disease infection. In addition, as of March 28, 2020, schools had to close nationwide or in some regions in more than 160 countries, affecting 87% of students worldwide.

The worldwide effects of the current COVID-19 pandemic include: loss of human life, economic and social instability, xenophobia and racism against people of Chinese descent and East Asia, the spread of online disinformation and biological weapons.

The COVID -19 pandemic has had a huge impact on education: As of March 14, 2020, more than 420 million children and adolescents were out of school because the government closed schools nationwide in an effort to slow down the spread of COVID-19; 13 countries have closed schools nationwide, including grades from elementary to high school; Nine more countries including India have implemented local school closures to contain or isolate COVID-19. Even if school closures are only temporary, the economic and social consequences will have to be paid. Learning disruptions affect every member of the community, especially disadvantaged children and families: interrupted learning, affected nutrition, child care problems, and economic consequences for families unable to work during the pandemic.

In response to school closures caused by COVID-19, UNESCO recommends implementing distance education programs,

using applications and open educational resources (OSR) platforms so that schools and educators can staff reach remote learners and limit educational interruptions.

In Vietnam, on January 23, 2020, the first case of COVID-19 caused by the SARS-CoV-2 virus was confirmed in Ho Chi Minh City, Vietnam. On April 1, 2020, the Vietnamese Government announced the COVID-19 epidemic nationwide. During the period from April 2020 to August 2021, the COVID -19 pandemic was still developing but under the control of the Vietnamese government. During the COVID -19 Pandemic, in order to prevent the pandemic, the Vietnamese Government issued Directive 16/CT-TTg with measures to implement social isolation, limit movement, Temporarily stop organizing mass gathering activities, including concentrated training activities at educational establishments. In order to ensure training plans, the Ministry of Education and Training of Vietnam has directed schools to deploy online training models to students nationwide.

2.1.2. Online Learning

Online learning has become a popular learning model in the world. Definitions of online learning are often associated with technology. According to Welsh et al. [19], online learning uses technology connecting computer networks on the internet to provide information and guidance to individuals in need. Rosenberg [16] shares a similar definition referring to e-learning as the use of internet technologies to provide different solutions to learners. Holmes and Gardner [8] defined e-learning providing us with access to resources that promote learning anywhere and anytime. Definitions of online learning can vary, but they all revolve around the basics of learning, technology, and connectivity. Research by Oliver and Towers [15] showed that without a connected environment and suitable and easily accessible equipment, it will be difficult or impossible to conduct online learning. As such, technology is an integral part of online learning assessment.

To deploy online learning, educational institutions must deploy online educational activities. Online education (also known as E-learning) is a method of learning through a networked device that stores electronic lectures and necessary software to help students learn online from their own space. me. With live virtual classroom technology, teachers can transmit images and sounds via broadband or wireless connections (WiFi, WiMAX), local area network (LAN) to carry out activities. teaching action. Today, based on a number of platforms provided by educational technology companies, individuals or organizations can create their own non-professional online learning program that still accepts training for students. Pay tuition and take tests.

Online education has the following advantages: First, online education allows training anytime, anywhere, imparting knowledge on demand, and responding quickly to information. Students can access courses anywhere such as the office, at home, at public Internet locations, 24 hours a day, 7 days a week; Second, online education saves costs: Helps reduce about 60% of costs including travel costs and venue organization costs. Students only pay for course registration and can register for as many courses as they need; Third, online education saves time: it helps reduce training time by 20-40% compared to traditional teaching methods by limiting distractions and travel time; Fourth, online education is flexible and flexible: Students can choose courses with instructions from online instructors or interactive self-paced courses, self-adjusting. Learning speed according to ability and ability to improve knowledge through online libraries; Fifth, online education is optimal: consistent content delivery. Institutions can simultaneously offer many different majors, courses and levels of study to help students easily choose; Sixth, online education is systematized: E-learning easily creates and allows students to participate in learning, easily monitors learning progress, and student learning results. With the ability to create assessments, managers can easily see which employees have taken courses, when they completed the course, how they performed and their level of development.

Besides, online education has some disadvantages such as: Emotional and space issues that create an impression on learners; Direct interaction with users is limited; Restrict certain users from using smartphones, computers, etc.

One of the ways to organize online education activities is to organize online learning for students by using the LMS system. LMS stands for Learning Management System, translated into Vietnamese means Online Learning Management System. In essence, this is an application software that allows the management and operation of the system of documents, instructions, monitoring, reporting and providing electronic education technologies for courses or training programs. create.

An LMS can be defined as a set of computer software tools specifically designed to manage the teaching and learning process. This system can allow organization, management, monitoring, assignment of content - teaching - learning activities, evaluation, summary reports, etc., towards overall management of the activities of a program. train. The value of the LMS system lies in its ability to create an online training environment, applying diverse and rich applications - online tools (Web 2.0) to serve teaching and learning purposes. of an organization (including schools, companies). This system is usually deployed on a computer network (LAN: unit-scale computer network or Internet: global-scale computer network), allowing multiple participants to use it at the same time without barriers. geographically and in time.

In the world today, there are many LMS systems from many suppliers, but at the core, these LMS systems are all aimed at

solving the interactive needs of the main actors in the e-learning system, that is the provider of e-learning content, the user of e-learning content, and the moderator and manager of e-learning interaction.

Structurally, an LMS is made up of two main components:

► The underlying technology component includes core functions such as creating, managing and delivering courses, authenticating users, providing data or making announcements, etc. This component is managed and controlled. controlled by programmers and system administrators.

► The second component is related to the user interface that runs in the background of web browsers (similar to Gmail/Facebook). This component is used by actors in the e-learning system such as administrators, instructors, and students.

By function, an LMS is a combination of the following core functions:

► Digital data storage management function:

This function allows subjects on the E-Learning system to post courses as well as related digital documents to support learners. The posted digital data is organized by file format, capacity, by time of posting, etc. and controlled for content.

► Security functions:

This is a very important function in the LMS system, it protects the data system of the subjects safely. Moreover, personal information related to subjects or financial related data is also protected.

► Responsive functions:

– Compatible with a variety of access devices: This function supports many technology devices accessing the LMS system such as desktop computers, laptops, mobile devices, or tablets, etc.

Bandwidth ensures user traffic access to the e-learning system.

Multi-subject function:

This feature supports an online classroom/training program with the simultaneous participation of many teachers and students, who come from many parts of the world.

► Multi-language function:

An LMS used for business purposes, operating on the Internet environment can reach any individual in any country in the world. Therefore, the ability to convert languages between or at least an international language needs to be integrated into the LMS system.

► Registration control:

The ability to control and customize the online enrollment process.

► Calendar:

This function sets up schedules for online learning programs such as class schedules, course deadlines, exam schedules, etc.

► Transaction management function:

This function allows the LMS system to control transactions arising when interacting with online courses of the following subjects: transactions between students and E-Learning service providers (tuition fees); Transactions between E-learning service providers and course authors (lecturer remuneration / course profit sharing) or deposit transactions in the form of e-wallets, etc.

► Interactive management function, support:

– Interaction between students: This function allows students to exchange information, exchange documents via chat system, email or SMS, etc. to interact and support learning.

– Interaction between students and the author: This function allows students and the course/training program author to exchange information or evaluate and comment on each other.

– Interaction between students, lecturers and system administrators: The function allows two subjects, who are the provider of course knowledge and the recipient of the course, to interact and exchange with the system administrator. Related interactive issues such as regulations, regimes, etc.

► Exam and test functions:

This function allows students to take part in a learning ability test or grading after going through the learning process. Common forms of exams and tests on the LMS system such as multiple choice, interactive tasks through games, etc.

► **Monitoring and control functions:**

This function allows learners or an intermediary to manage learners to control the learning process as well as the learner's ability through each stage.

2.2. *Student satisfaction when participating in online learning*

Online training is considered as a service based on information technology and students will be involved in the service delivery process [13]. In the process of using, the interaction between learners and information systems will shape experiences and will affect learners' satisfaction [12]. The process of forming users' satisfaction with an information system will begin with them forming their own expectations before coming into contact with the system. After the experience process, the user will evaluate the difference between the initial expectations and the actual results received, the evaluation results will lead to user satisfaction or dissatisfaction with the information system. In addition to their own expectations, learners also have a risk aversion when using online training technology. Usually, the reasons why online training systems fail are the lack of technical support, user advice, as well as the ease of use of the system [2]. On the other hand, factors such as learner anxiety about computers, faculty attitudes, system flexibility, content quality, ease of use, and diverse student assessment activities, all of which have an impact on student satisfaction when participating in online training [18]. The work of Lubna Ali Mohammed et al. [11] studies the factors affecting the satisfaction of graduate students in E-Learning in the COVID-19 crisis era. The work of Mahyiddin and Fakhurrizi M. Amin [14] research to explore students' satisfaction attitude towards online learning and the reasons for their attitude when implementing integrated technologies in online education at four Islamic State universities in Aceh. The work of Ra'ed Masa'deh et al. [17], used structural equations (SEM) to analyze the positive effects of E-learning on cognitive involvement. and E-Learning satisfaction on E-Learning achievement of students from universities in Jordan. Research by Jihyun Si [7] investigates important factors affecting e-learning quality; A model of student satisfaction in a Korean medical school with 5 factors: content, system, learners, lecturers and interaction has been proposed and tested experimentally.

2.3. *Evaluation model - WELS*

However, measuring user satisfaction is difficult, complex, and situation-dependent. In previous studies, Bailey and Pearson [1] built a scale to measure user satisfaction with an information system consisting of 39 factors but did not conduct classification. Meanwhile, Shee and Wang [6] propose an evaluation framework consisting of 4 main components to measure student satisfaction with the online training system, including: (1) Learner Interface, (2) Learning Community, (3) System Content and (4) Personalization. The user interface is judged on the following criteria: ease of use, user friendliness, ease of understanding and stability in operation. Learning communities include ease of discussion with faculty and other students, easy access to shared data, and ease of exchanging learning with other students. System content includes standards for content that is up-to-date, effective, and useful. Personalization is demonstrated through the ability to control the learning process and track learning performance. This study will use the results of Shee and Wang [6] on the factors affecting the satisfaction of online training learners. The reason for choosing this research framework is because this is a research result with a high citation index and inherited in many other research results such as: Kan [9], Gandolfo and Feredica [6], Francisco et al. [5], Lee et al. [10].

2.4. *Research Methods*

The study was conducted at four Universities of Economics that have implemented training on LMS in Hanoi City of Vietnam in the academic year 2020-2021 when these universities apply online teaching entirely during the COVID-19 pandemic. In the context of the time to prevent the COVID-19 pandemic, all students of the regular training system at the universities are arranged to study online on the University's LMS. Survey participants were full-time students who attended and studied on the LMS system. The questionnaire has been divided into three parts: Part one includes personal information of learners such as ID, email, current majors, main study locations, main connection devices when studying; Part two consists of 19 questions referring to the content to measure learners' perceptions of four components: Content, Personalization of the learning process (Personalization); Learning Support (Community) and User Interface (Learner Interface). 5-point Likert scale (with 1: Completely dissatisfied; 2: Dissatisfied; 3: Normal; 4: Satisfied and 5: Completely satisfied) was used in the second part of the questionnaire. Finally, Part 3 of the questionnaire is an open-ended question to collect learners' feedback on difficulties in online learning on the LMS system. Data from the open-ended questions after synthesis will be classified into 4 groups: Group 1 (General, normal or no comments/comments); Group 2 (The comments did not specify difficulty or desire to quit teaching online or change current teaching methods); Group 3 (Comments outlining difficulties encountered by learners, possibly accompanied by suggestions for improvement); Group 4 (Positive comments about the system). The grouping based on the content of the feedback will help identify the groups of common perceptions of the learners about the LMS. On that

basis, we can analyze the main difficulties that students face in the process of online learning.

Students receive questionnaires via personal email. The number of emails sent is 9560; email response and valid questionnaire is 2230 (accounting for 23.3%). Student feedback participation rates differentiated between Faculties are shown in Table 1.

Table 1. Feedback from students of different majors

Major	Number of students surveyed	% students participated in the survey
Students of high-quality programs	108	4.84%
Students of Economics	810	36.32%
Students of Business Administration	422	18.92%
Students of Banking and Finance	215	9.64%
Students of Law	103	4.62%
Students of Languages	310	13.91%
Students of Accounting and Auditing	262	11.75%
Total	2230	100%

Source: Calculated by the author

In addition to the analysis using descriptive statistics, using the learning results looking up from the IDs of the students in the academic year 2020-2021, the article uses a multivariate regression model to analyze the impact of student satisfaction with the academic results of that school year:

$$KQ_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + U_i \tag{1}$$

where,

KQ_i is the average score of the school year 2020-2021 of student i (scale of 10);

X_{1i} is the satisfaction of the system content components of the ith student (point scale 5);

X_{2i} is the satisfaction of the personalization components of the ith student (point scale 5);

X_{3i} is the level of satisfaction with the support of the learning community for student i (point scale 5);

X_{4i} is the satisfaction of the user interface components of the LMS system for the ith student (point scale 5);

U_i is a random component.

3 Results and Conclusion

3.1. Research results and discussion

3.1.1. Basic statistical analysis

3.1.1.1. The device students use most often to study

Descriptive statistics show that students usually study at home/boarding room the most (96.4%). Devices most often used by students during online learning are: Laptop (1502 users, accounting for 67%); smartphones (610 users, accounting for 27%), desktop users (82 users, accounting for 4%) and tablet users (36 users, accounting for 2%) (Figure 1).

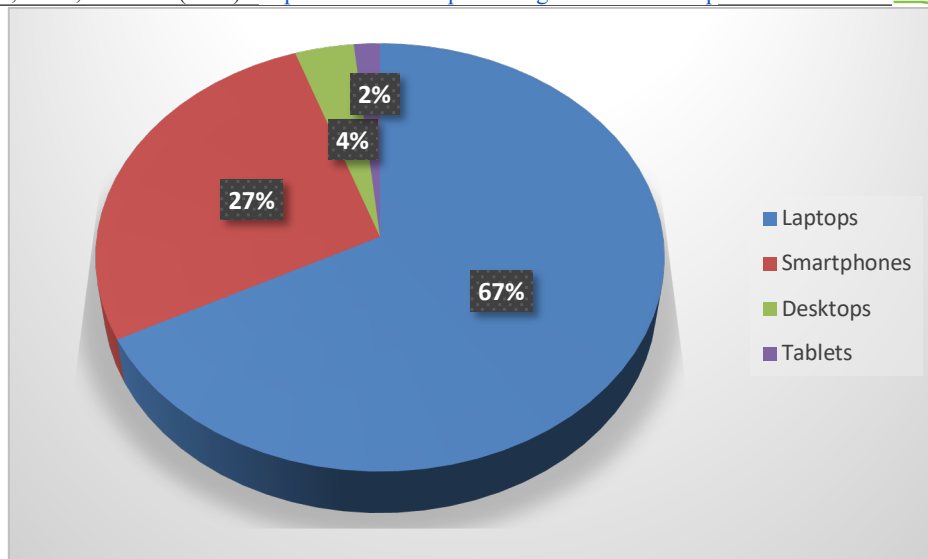


Fig. 1. The device students use most often to study

Source: Calculated by the author

For the components of the Content scale, students almost have an above average perception, the lowest value is 3.59 (about course information and instructions) and the highest is 3.96 (Slide and Script of the course). Thus, students' satisfaction with Slide and Script content is the highest. A value of standard deviation greater than 1 indicates that there is a large difference in the perception of students in the sample about the content issues of the course provided on the LMS system given by the table:

Table 1. Perception of system content components

	Course information and study schedule	Testing and evaluation activities	Slide and Script	Lecture Video	Instructional information and support
Average	3.68	3.62	3.96	3.78	3.59
Standard deviation	1.2	1.06	1.05	1.07	1.06

Source: Calculated by the author

3.1.1.2. Perception of system content components

The perceived values of the system content components are shown in Figure 2 below:

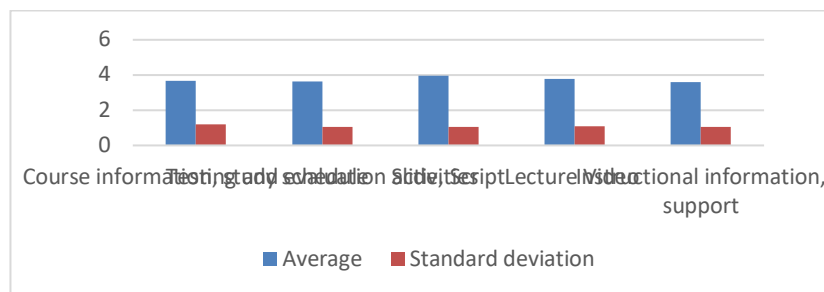


Fig.2. Perception of system content components

Source: Calculated by the author

The average results of the components in the evaluation scale of the Personalization component in the learning process show that the lowest perceived value is 3.4 and the largest is 3.63 (Table 2). The value expressing the student's satisfaction about the level of initiative in the learning process on the LMS is close to 3.6 (above the average threshold).

Table 2. Perceptions of components of personalization

	Technical problems that do not occur frequently and do not affect learning	I can easily find the information I need on the LMS	I easily learn the function of the online learning system and can do what allows	LMS is a good tool and helps with my online learning
Average	3.40	3.68	3.62	3.67
Standard deviation	1.05	0.96	0.94	0.93

Source: Calculated by the author

3.1.1.3. Perception of the components of personalization

Perceived values of the components of personalization are shown in Figure 3 below:

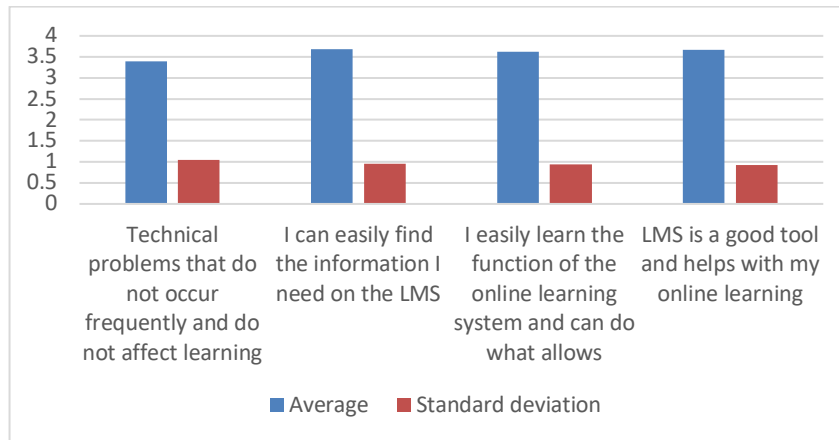


Fig.3. Perception of the components of personalization

Source: Calculated by the author

Regarding the student's perception of the learning community (Table 3), the scales have an average perceived value ranges from 3.26 to 3.68. In which, the scale of students who are provided with full information about the course is the highest rated (Mean is 3.68).

Table 3. Perceptions of learning community components

	I encountered an error/difficulty in using the system, I can get timely support by email or internal phone	When I have trouble using the system, I can easily find support information/handling instructions by myself.	I am provided with full information about courses through LMS
Average	3.28	3.32	3.68
Standard deviation	0.91	0.94	0.96

Source: Calculated by the author

3.1.1.4. Perceptions of learning community components

Perceived values of learning community components are shown in Figure 4 below:

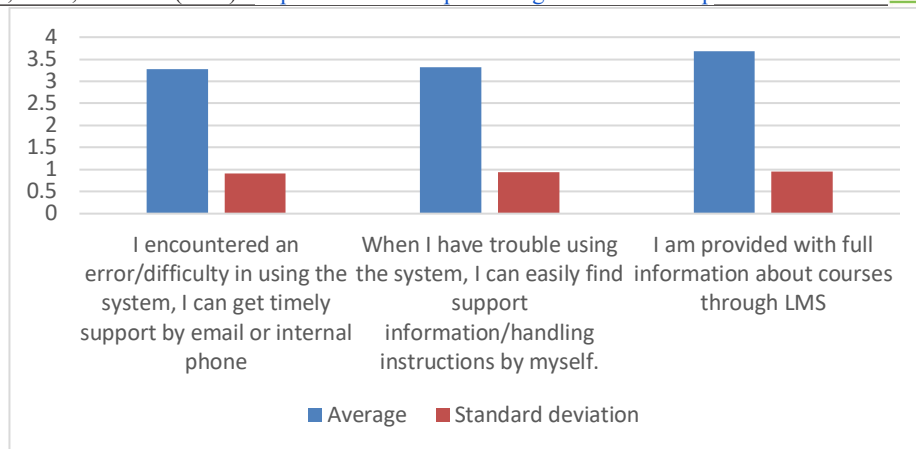


Fig. 4. Perceptions of learning community components

Source: Calculated by the author

The results of measuring students' perception of the user interface in the LMS are shown in Table 4, the results show that the factors highly appreciated by students are user interface (Mean is 3.96), control panel (Mean is 3.82), activity tracking schedule (Mean is 3.74). Other functions have lower results but not much difference, the average value ranges from 3.52 to 3.96. However, the standard deviation results are asymptotically close to 1 or greater than 1, indicating that there is a big difference in students' perception of technology components on the LMS.

Table 4. Perception of interface elements

	Calendar	Control panel	Video conference feature	Communication and exchange function	Interface	LMS Guaranteed connection	LMS fast connection
Average	3.74	3.82	3.52	3.64	3.96	3.64	3.45
Standard deviation	1.12	1.06	1.08	1.02	1.12	0.98	0.96

Source: Calculated by the author

3.1.1.5. Perception of interface elements

The perceived values of the interface components are shown in Figure 5 below:

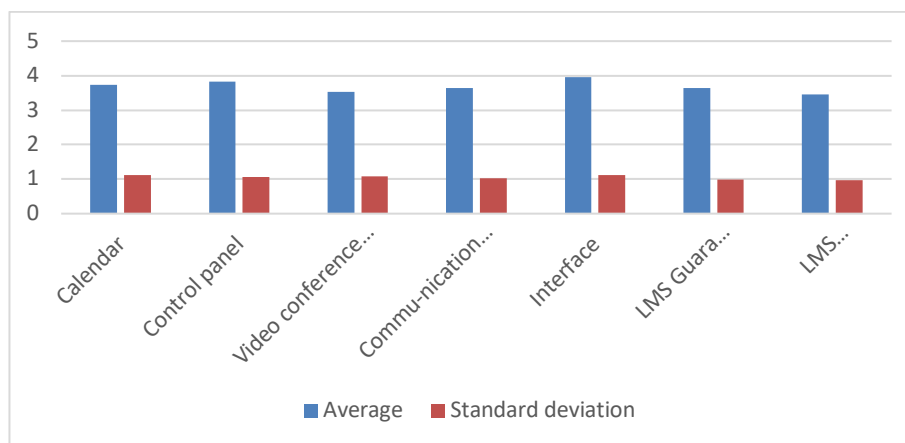


Fig.5. Perception of interface elements

Source: Calculated by the author

In addition to descriptive statistics, the survey data also includes student feedback results from the open-ended question "Please share your difficulties you face when learning online" which is aggregated and classified into 4 group of opinions (Table 5).

Table 5. Students' feedbacks to open-ended questions

Group	Students' feedbacks	Number of Students	Percentage(%)
1	General, normal or no comments/comments	252	11%
2	The comments did not specify difficulty or desire to quit teaching online or change current teaching methods	68	3%
3	Comments outlining difficulties encountered by learners, possibly accompanied by suggestions for improvement	1882	84%
4	Positive comments about the system	28	1%
	Total feedbacks	2230	100%

Source: Calculated by the author

3.1.1.6. Student responses to the open-ended question

The results of students' responses to open-ended questions are shown in Figure 6 below:

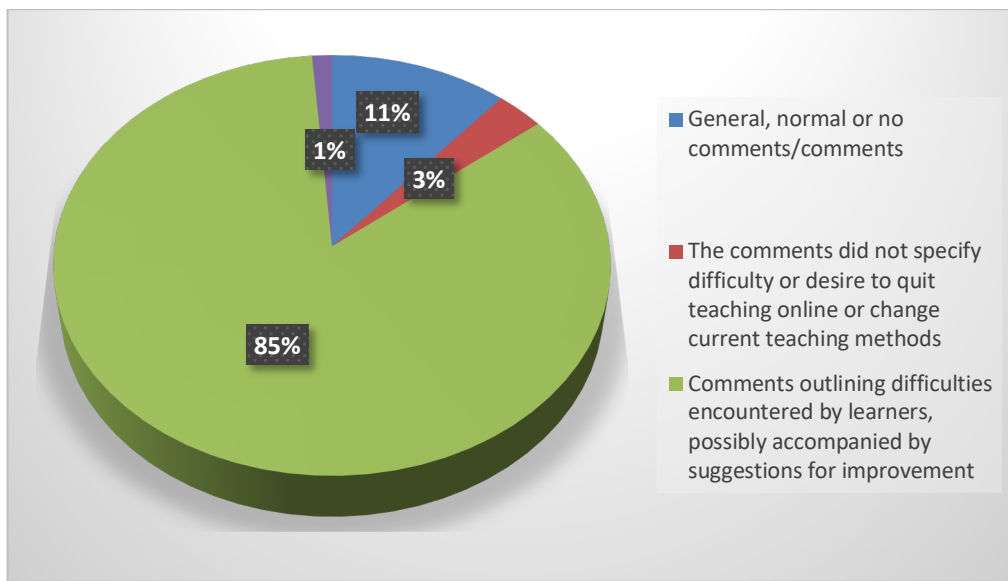


Fig. 6. Student responses to the open-ended question

Source: Calculated by the author

Out of a total of 2230 student responses, the statistical results show that the majority of students (1882 students, accounting for 85%) clearly stated at least one difficulty they encountered during online learning.

Some of the feedback also mentioned ideas to improve the system, this group is considered to accept the online learning method because in the response results they did not mention ideas such as: stopping online learning, just wanting to go to school, demanding make-up lessons when being back to school, etc.. Next is the group that feedback without difficulties or general comments such as normal system, acceptable learning, no comments, etc. (252 students, accounting for 11%). The remaining two groups account for the least but are completely opposite with 3% of students stating their desire to quit teaching online because they think that online learning is not effective, and 1% of students see efficiency and certain benefits when learning online. Thus, in general, most students have an attitude of accepting the online learning model on LMS. The number of responses about difficulties in online learning was aggregated and classified into groups with similar content. With 2230 students participating in the survey, having opinions about difficulties in online learning, this result is divided into 8 main groups of difficulties (Table 6).

Table 6. Summary of difficulties when learning online on LMS

	Internet	Using the system, receiving information	Can't understand the course content	About teaching/assessment methods	About the lecture content	Exercise, Deadlines, the amount of knowledge is too much	Sound is not good	Connector
Number of response	932	458	420	208	164	118	108	86

Source: Calculated by the author

The group of students facing difficulties had the highest number of responses related to the Internet (932 comments) including results on: unstable connection during the learning process, power outage, poor connection speed, no wifi (having to use 3G Connection), bearing the high cost.

This is the main reason that makes online learning more difficult and is also one of the reasons why students lose grades because when the teacher takes attendance, students lose connection from the class. The second reason is about the problem of using the system and receiving information, 458 of the students said that this was their difficulty. Problems of the system in terms of user interface, inactivity of some notification functions, such as the function of notifying students when the teacher has updated new information, missing some learning activities. Graded exercises make students feel confused during online learning. Due to the unexpected epidemic, some lecturers still use Google Drive and email as their main teaching tools, rather than using LMS. This makes some students feel confused during the learning process. The next group of reasons is about the problem of not grasping the course content when learning online (with 420 opinions), students think that online learning is not effective, not easy to absorb, as well as difficult to systematize knowledge, while learning. The cause of this difficulty may be because students have not yet adapted to the new learning method when there is a sudden change or because students are not familiar with self-study and self-study through devices.

The fourth group of causes is about the lack of interaction with teachers or inappropriate teaching methods. This is the reason why there were 208 suggestions from students about finding it difficult in the learning process. Some lecturers have little interaction with students through channels, do not answer students' questions in a timely manner, grade essays with insufficient details, and do not follow students' learning progress, leading to students not keeping up with the lesson. Next, 164 students commented that the content of the lecture had some problems such as inappropriate, unattractive, many errors, no specific examples, etc. The sixth group of reasons, 118 students commented that they could not keep up with the online learning program due to too much knowledge and exercises; they have thought that the amount of homework was more than when learning directly in class. The eighth group of causes, the sound in the learning process (mainly via video conference) is not good, listed with 108 suggestions from students. Finally, 86 comments on the issue that students do not have enough auxiliary devices (laptops, textbooks) or devices that are not sufficient for learning (laptops without webcams/ no mic).

Research results show that students at the surveyed universities have a near or above average perception of the online learning experience on the LMS system. Specifically, factors related to the user interface and learning content are rated higher by students than the two components of personalization and learning support. This proves that despite having to react quickly due to objective reasons (COVID-19 pandemic), universities have invested in building and implementing training content on the LMS online system. However, due to the urgent implementation, the schools still do not have a specific training program and guidance for students systematically, helping them to adapt and achieve the highest learning efficiency on the LMS system.

The results of the above descriptive statistics also show that the problems related to the quality of the Internet and the function of the LMS are the main reasons why learners have difficulty in the online learning process. In addition, students' study habits also have a significant influence on the perception of technology effectiveness in online learning, students are used to traditional learning methods, but because of the objective cause of the COVID-19 pandemic forced them to adapt to the new form. This is not easy because learning has not been psychologically prepared as well as fully trained in online learning methods and skills in using the LMS system.

3.1.2. Model estimation results and discussion

3.1.2.1. Description of variables

With the data sample of 2230 observations, we use the ID of the *i*th student to collect the 2020-2021 school year mean score

of the *i*th student is KQ_i ;

With X_{1i} variable. Notation: the score on “subject information and study schedule of student i” is X_{11i} ; the score on “testing and evaluation activities of student i” is X_{12i} ; the score on “Slide and Script of Student i” is X_{13i} ; the score on “Video lecture by student i” is X_{14i} ; The score on “instruction and support information of student i” is X_{15i} . Then X_{1i} define the following:

$$X_{1i} = \frac{1}{5} \sum_{j=1}^5 X_{1ji}.$$

With X_{2i} variable. Notation: the score on "Technical problems do not occur frequently and do not affect student i's learning" is X_{21i} ; the score about “I can easily find the information I need on student i's LMS system page” is X_{22i} ; the score on “I can easily learn the functionality of the online learning system and can do what allows student i” is X_{23i} ; The score about “LMS is a good tool and helpful for my online learning process of student i” is X_{24i} . Then, X_{2i} determined as follows:

$$X_{2i} = \frac{1}{4} \sum_{j=1}^4 X_{2ji}.$$

With X_{3i} variable. Notation: the score about “I encountered an error/difficulty in using the system, I can get timely support by email or student i's internal phone” is X_{31i} ; the score about “When I have difficulties in using the system, I can easily find support information/handling instructions from student i myself” is X_{32i} ; The score of “I am provided with complete information about courses through student i's LMS” is X_{33i} . Then, X_{3i} determined as follows:

$$X_{3i} = \frac{1}{3} \sum_{j=1}^3 X_{3ji}.$$

With X_{4i} variable. Notation: the score on “Academic calendar for student i” is X_{41i} ; the score on “Control Panel for Student i” is X_{42i} ; the score about "Video conference function for student i" is X_{43i} ; the score on “Communication and exchange function for student i” is X_{44i} ; the score on “The interface of the system for student i” is X_{45i} ; the score on “LMS ensures connection for student i” is X_{46i} ; The score of “LMS connects quickly for the i-th student” is X_{47i} . Then, X_{4i} determined as follows:

$$X_{4i} = \frac{1}{7} \sum_{j=1}^7 X_{4ji}.$$

3.1.2.2. Model estimation and discussion

Using EVIEWS 10 software to estimate the model (1), the results are given by the following table 7:

Table 7. Model (1) Estimates

Independent variables	Coefficients	t
Constant	8.565	246.57***
X_{1i}	0.124	27.522***
X_{2i}	0.083	22.327***
X_{3i}	0.072	17.740***

X_{4i}	0.094	24.236***
R- squared	0.8684	
Adj. R-squared	0.8682	
F-statistics (prob)	3670.574***	
White Test		
Obs * R- squared	439.945***	

Source: Calculated by the author

Note: ***indicates significant at 1%level of significance

Based on the results of Table 7, estimating model (1) obtains the equation:

$$KQ_i = 8.565 + 0.124X_{1i} + 0.083X_{2i} + 0.072X_{3i} + 0.094X_{4i} \tag{2}$$

From the estimation results, we see that the regression coefficients are all statistically significant at 1% significance level and have positive signs. Thus, the level of student satisfaction expressed in increasing variables will increase student learning outcomes. This result is meaningful: When increasing the student's satisfaction with the group of system content components by 1 the average score of students increases by 0.124; When increasing students' satisfaction with personalized components by 1, the average score of students increases to 0.083; When increasing the satisfaction of the support of the learning community for students by 1, the student's average score increased by 0.072; When increasing the satisfaction of the user interface components of the LMS system for students by 1, the average score of students increased by 0.094.

The coefficient $\beta_1 = 0.124$ is the largest value of all the estimated coefficients, which shows that when increasing the satisfaction level of students with the group of system content components, the student's learning results increase maximum.

And the coefficient $\beta_3 = 0.072$ is the smallest value among all the estimated coefficients, this shows that when increasing the level of student satisfaction with the group of students in the learning community, the student's learning results increase minimum.

The results in Table 7 show that the F-statistics has a value of 3670,574, which proves that model (1) is consistent with the 1% significance level. Using White's test, it is shown that model (1) does not have the phenomenon of variance of error at 1% significance level.

It is observed that the two variables claim amount and report lag exists a positive dependence. This was illustrated by the correlation measures; Pearson's correlation coefficient, Kendall's tau and spearman's rho. In addition to the correlation measures being positive; it was also noted that the magnitude of the measures was significantly small. This implied existence of weak dependence.

And a comparison of the AIC values of each of the copulas was conducted. The frank copula had the smallest AIC value while the clayton copula had the largest AIC value. This result implied that according to the comparisons of the AIC values for the different copulas, the frank is the best option in modeling dependence between the variables report delay and claim amount. Finally, it is concluded that there is weak dependence between report lag and claim amounts in property and casualty insurance company.

4 Conclusion

This study was conducted to assess the satisfaction of regular students when experiencing online learning on LMS. Learning on the system in parallel with the use of the existing LMS for combined training is mandatory during the recent Covid-19 epidemic prevention and control period. With the number of 2230 students participating in the survey, the research results also partly reflect the students' feelings during the academic year 2020-2021.

- Analytical results based on basic descriptive statistics have shown that students do not have a high level of satisfaction in the process of online learning purely as a situational solution. However, this result can be understood because the implementation of online learning has been urgently implemented for regular university students due to the COVID-19 pandemic, thus creating a great success for this activity. Education and training activities of universities when using the LMS system to organize the teaching process to adapt to the COVID-19 pandemic. The main influencing factors are psychological unpreparedness, internet connection and timely support of lecturers and service staff. In addition, the traditional teaching and learning habits of faculty and students have also affected the effectiveness of learning in a fully

online environment. Therefore, to implement fully online learning for students requires preparation not only in terms of LMS system, technical infrastructure but also investment in readiness for learners and teachers. The difficulties raised by the students contribute to the University in checking, evaluating and improving the training quality and most importantly, being able to establish a long-term strategy and development plan for online learning when applying on all training systems of the University. In summary, implementing online learning completely for students requires preparation not only in terms of technology and technical infrastructure, but also in communication, propaganda, and training lecturers and students so as to effectively use LMS in teaching and learning. In addition, to be able to deploy a successful online training program, it is not simply organizing online learning sessions through popular tools such as Zoom, Hangout Meeting (Google), Microsoft Team, etc. It is also necessary to implement a series of other activities to ensure the training quality of this method compared to the traditional method. According to experience in the world, universities need to follow a specific set of quality standards for online training because this will help them successfully deploy training programs to learners.

- Quantitative analysis results all show that the variables represent the level of satisfaction, satisfaction of system content components, satisfaction of students' personalization components, satisfaction of students. Regarding the support of the learning community, the satisfaction of the user interface components of the LMS system has a positive impact on student learning outcomes. Thus, universities need to improve the LMS system as well as enhance the capacity to support the community to improve student satisfaction, thereby helping to improve student learning.
- The above analysis shows that the preparation factors of the school affect the learning quality of students, so for teachers and universities, it is necessary to implement the following solutions to implement teaching in the classroom of LMS system is:
 - Teachers must prepare a complete and elaborate system of lectures and study materials.
 - Universities need to organize better communication and training on the use of LMS system.
 - Universities need to build a community to support students when students participate in learning on the LMS system.
 - Teachers need to prepare a quality internet connection to ensure a good connection to students when teaching on the LMS system.
- The limitation of this study is that it only surveys universities in Hanoi and applies the analytical framework of Shee and Wang [4] because it wants to focus on the learner's perception of applied technology. on LMS. This leads to the incomplete analysis of aspects of the feelings of regular students in the online learning environment. The results of this study can be the basis for a more general study if it is carried out with a complete analytical framework and with the participation of many universities in other localities. The quantitative model used for analysis only stops at the multivariable regression model, the research directions need to expand this model to fully consider the factors affecting the learning outcomes of students.

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