EVALUATING ONLINE LEARNING AND TEACHING AT THE UNIVERSITY OF TECHNOLOGY AND EDUCATION HO CHI MINH CITY DURING CORONAVIRUS PANDEMIC

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ABSTRACT

Corona pandemic has a strong influence on almost all fields all over the world, especially in education. In Vietnam, in the case study of the University of Technology and Education Ho Chi Minh City (HCMUTE), most of the lecturers being responsible for theoretical subjects are required to teach their students online during the outbreak of COVID 19. It is a crucial issue that needs efficiency from online learning. This study aims to evaluate the status and efficiency of online learning at HCMUTE. Altogether 108 students and 25 lecturers participated in the study. The qualitative data collection tool was a questionnaire that has open and closed questions related to the learning environment, the interaction relationships, and learning outcomes. The results show that there is a synchronous learning environment and plenty of digital tools used by most lecturers. About 74 percent of students are satisfied and keen on continuing online learning; a large number of lecturers would like to continue with blended learning. Besides, the study also found out some difficulties that focus on two main issues such as technical issues, and decreasing students' activeness during online classes. The study also recommends three learning activities design stages that the lecturers can apply for their online teaching to encourage students to active learning. This research extends knowledge of pedagogy and orient the next online course design at UTEx.

Keywords: *Education 4.0; online teaching; E-learning; online learning; LMS; higher education;*

1. INTRODUCTION

Humans have suffered from a period of crisis in which many activities are disrupted because of the outbreak of COVID 19. The pandemic has impacted on all fields all over the world, especially in education. In Viet Nam, all of the universities were closed; people kept their social distance and carried out epidemic prevention solutions seriously. Therefore, the universities have had online courses instead of traditional face to face courses. The online courses have been considered not only as an efficient solution to assure students' learning schedule but also a chance to push lecturers to change their teaching methods and discover more about online teaching to keep up with education 4.0.

Education 4.0 has become a popular alternative to traditional education. It illustrates educational change to respond to the development of the Industrial Revolution 4.0. Vossen (2017) shows that there is an application of digital technology such as the Internet, teleconferencing, virtual realities, software, etc. in training that helps teaching and learning activities take place everywhere, every time and the students have opportunities to reach advanced technology in Education 4.0. Also, researchers find that online learning or blended learning can obtain good learning outcomes and develop collaboration and self-directed learning skills (Sriarunrasmee, Techataweewan, Mebusaya, 2015; Allen & Seaman, 2013; Curtis, 2001).

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However, it requires different preparation, infrastructure, technical support, and pedagogical design from traditional courses (Barber, Donnelly, Rizvi, & Summers, 2013; Ruhalahti, 2019). For that reason, to catch the trend of education 4.0, Ho Chi Minh University of Technology and Education (HCMUTE) has had many workshops to encourage lecturers to change their mindset. For an instant, some workshops like E/M learning 2013; E-Learning trends for 2014; The Industrial revolution 4.0 and switch of Higher education 2017 that shared and inspired about the development of electronic and mobile learning in Finland; E-learning trends in the future; online learning ecosystem; online learning platforms; and so on.

In 2015, HCMUTE also established a digital learning center, which has functions such as set up, organizes online courses and support lectures to build an online course or make a video, webinar, etc. Additionally, HCMUTE has built the virtual university (named UTEx) in 2019 and has had many policies and pedagogical guidelines to engage lecturers with online courses. Although HCMUTE's preparation for online courses is early-adopting, there are only about 40% of lecturers combined with face-to-face courses every academic year. Thus, the Corona pandemic really is a trigger for all of the lecturers who were asked to have online courses completely. Besides being aware of the necessity of change as well as the advantages of online learning during the breakout of COVID 19, the lecturers also got lots of challenges designing online courses because several lecturers were not familiar with or lack experience in online teaching. This has raised a key challenge question about the quality of learning design.

Online course evaluation is one of the essential education components to improve the quality of online teaching and learning. But, research on the effectiveness of online courses is limited in HCMUTE. More research is needed to have a general picture regarding online courses during 9 weeks in the pandemic. As a result, this study objective is to evaluate the status of online teaching and learning, then recommend appropriate solutions in order to upgrade the efficiency of online courses. The findings will be beneficial to HCMUTE and all EMVITET partners in future online learning development.

Research model for evaluating online courses

In online education, there are crucial educational factors which set up learning processes: online learning environment, online learning activities, online teaching activities, and interaction relationships. The online courses have many differences from traditional classrooms, key differences are focused on learning environment and learning approaches, so these will lead to differences of teaching approaches (Chan, Chow, and Jia, 2003). It will be described in parts below.

Online learning environment

The online courses have applications of digital technology, an online learning environment is considered as a Web-based platform (Cook, 2007; Demian & Morrice, 2015). It supports different types of environments such as synchronous, asynchronous, or both. Synchronous learning is the kind of learning that can use a live chatting room, a live video conference (webinar) where lecturers and students interact with each other in real-time. And, there is an immediate response from the lecturer for students' questions in synchronous learning. In contrast, asynchronous learning is supported to be suitable for learner's schedules, lecturer will provide e-materials for reading, e-lectures, or videos for viewing, assignments for completing while the students can be offline. Asynchronous learning is with students' self-spaced learning. (Park, 2016). It can be realized that lecturers design online teaching based on the support of many digital tools. With online courses, student and lecturer communication is via information and

communication technologies (ICT). Tsai & Tsai (2003) indicate that students with high ICT skills have better information searching skills and learn better than others. Besides that, Lim (2001) shows that Internet experience has a positive correlation with student's satisfaction. These reveal the ICT skills are necessary for both lecturers and students, and they need to have good technology support to conduct learning and teaching activities.

Online learning activities

There is a lack of face to face contact in the online environment, and personalized learning is required. Therefore, students need to plan their own learning and take more responsibility for their learning. Whether online learning or offline learning, the nature of learning is self-directed study, learners must build their own knowledge. With online learning, according to Koohang (2009), students focus on three major activities: individual learning activities, collaborative learning activities, and assessment. Hence, it is essential that students need to have self-directed study skills, the ability to create self-motivation, communication skills, self-assessment skills, reflecting skills to succeed with online learning.

Online teaching activities

Lecturers have direct and important influences on the student's learning experience. Because of the difference in the online learning environment, the lecturers are required to have appropriate competences. Dennis et al. (2004) show that the key competencies which lecturers need to have with online courses are pedagogy, communication, discipline expertise, and technology. According to Kullaslahti (2011), teachers' competence in digital pedagogy is seen as a combination of professional or substantial, pedagogical and technological expertise.

Regarding online teaching, Salmon (2003) describes online lecturer's competences into five categories: understanding the online process; technical skills, online communication skills, content expertise, and personal characteristics. Similarly, Roddy, Amiet, Chung, Holt, Shaw, McKenzie, Garivaldis, Lodge, and Mundy (2017) reveal that some of the most important online lecturer competencies such as communication skills; technological competence; provision of informative feedback; administrative skills; responsiveness; monitoring learning; providing student support (Roddy et al., 2017). As a whole, these competencies are focused on factors: pedagogy, technology, communication, and personality. Besides that, the lecturer also plays multiple roles and responsibilities of teaching online such as facilitator, technologist, administrator, designer, etc. Overall, every instructional design of online learning always aims at encouraging students to have online learning activities. Hence, lecturers not only must pay attention to what they need to design, develop, and manage their online courses but also focus on communicating with students effectively and interaction (Albrahim, 2020). So, a successful online lecturer has to facilitate students' active communication, interaction, collaboration, and engagement. (Palloff & Pratt, 2011).

Interaction relationships

Interaction is necessary for both traditional education and Education 4.0. Moore (1993) shows that there are three key types of interaction, they are student-content interaction; student-lecturer interaction; student-student interaction. Hansen (1996) added a new element of the interaction is the interaction of both the lecturers and students with interfaces in the online environment. Lack of interaction is a reason for dissatisfaction (Cole, Shelley, & Swartz, 2014). Also, Strachota (2003) points out the interaction involved in students' satisfaction in which student-content interaction has a greater impact than student-instructor interaction and student-technology interaction. This is obvious because any student always wants to understand,

manipulate, and develop the content they have learned.

In fact, the three factors above are indispensable for the learning process. However, it is also necessary to consider outcomes when evaluating online courses. Divjak (2020) said that online learning and teaching quality are shown by three indicators: interaction; learning outcomes; and satisfaction, and motivation. Admittedly, interaction is a critical element in the learning process. Without interaction, the learning process comes to an end. Besides its process, the work is measured by outcomes, so a good learning outcome is an expectation for both lecturers and students. In addition to this, satisfaction is also an important psychological feature of success and is considered as an intermediate outcome of the learning process. Satisfaction has a positive impact on learning motivation, so, in addition to the achieved objectives, it is also necessary to get the student's satisfaction. In a good learning process, students have to get satisfaction with interaction relationships. The researchers showed that, with student-lecturer interaction, the lecturer is the main factor in student satisfaction. Student satisfaction is positively correlated with lecturers' specific instructions and feedback to learners must be quick. And. with learner-technology interaction, students' satisfaction is affected by Internet access. Moreover, information is presented clearly with an attractive design, easily when reading, and downloading documents does not take up a lot of time, which has a positive impact on student satisfaction. The students take understanding, applying knowledge, and engaging in a lesson involved in satisfaction with student-content interaction. The interaction between students is satisfied by tools to support interacting, discussing with the group that is made easy, and have immediate feedback (Bolliger & Trey, 2004).

In summary, the online learning process cannot be separated from its elements such as online learning environment, learning and teaching activities, interaction relationships, and outcomes. Therefore, to evaluating the status of online learning and teaching, the study focuses on the factors that are showed as the model below:

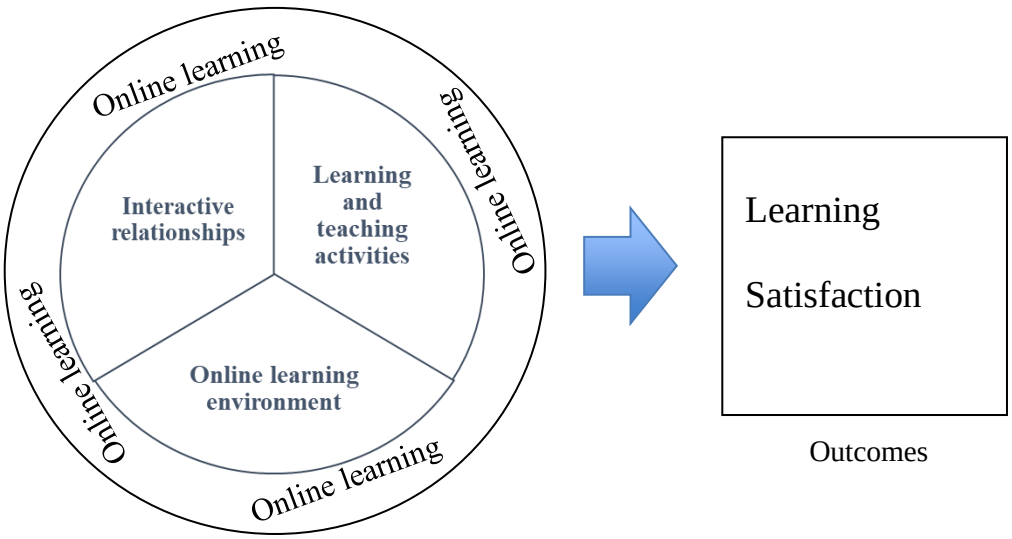

Fig 1. *The research model of evaluating the status of online learning*

Research questions

The aim of this study was to clarify the status of learning and teaching online at HCMUTE by utilising the research model. So, this study aimed to address the following research questions:

1) *How was the online learning environment that the lecturers and students have?*
2) *How was the interaction between student-student; student-content; student-lecturer in online courses?*
3) *How were the outcomes of online learning and teaching? Was it satisfied by students?*

2. METHODOLOGY

This is a qualitative case study (Yin, 2014) which aims to describe the status of learning and teaching at HCMUTE during the Covid-19 pandemic.

Participants

The participants of this study were 108 undergraduate students, 23 were female and 85 male; and 25 lecturers, 8 were male and 17 female at HCMUTE. The students who participated were freshmen, sophomore, junior and came from Electrical and Electronic faculty; Environmental Technology faculty; Information Technology faculty; and Foreign Language faculty. The lecturers who participated in this study came from the Institute of technical education; Electrical and Electronic faculty, Chemical Technology and Foods faculty. The samples who were chosen by convenience understood the research purpose and shared voluntarily about online learning and teaching.

Data collection

The online questionnaire was designed in the light of background theories that illuminate the research questions. These were used to form questions to inquire about phenomena, understanding and outcomes during the online learning process. The questionnaire included 06 multiple-choice questions about the online learning environment that students and lecturers had and used online applications, as well as their experiences related to such use. And, 07 questions with 5 levels Likert scale assess about interaction relationships. In addition, 14 open-ended questions were used to inquire into the reason and the challenges of interaction relationships and the outcomes that were experienced by the students and lecturers during the online learning process.

The participants received the questionnaire by email and answered the whole questions related to the status of online learning and teaching, and online learning and teaching experience.

The questionnaire was checked for reliability by considering clarity of the questions, participants' consistency, and implementing a pilot of the questionnaire as well.

Data analyses

Data were analyzed by descriptive statistics and qualitative methods. Specifically, data were coded to evaluate the percentage and level of agreement about indicators that were involved in the online learning environment, interaction relationships. The deductive analysis of qualitative data is to find out the factors that impact interaction relationships and online learning outcomes.

3. RESULTS AND DISCUSSION

Description and Analysis of the online learning environment

The first research question of this study was to find out the online learning environment that the lecturers and students have. Therefore, exploring the online learning environment, the study shows that online courses were designed by basing on LMS (Learning manage system) platform (with Moodle) and FHQ-LMS platform (with Dashboard). The lecturers have used the learning environment; and digital tools in online courses such as synchronous,

asynchronous; and video, chat group, Zoom, Google meet, Zalo, Facebook, etc. Also, students have used personal computer (PC), laptop, Ipad, smartphone, and computer at an internet shop. These results are described in the following charts (Fig2, Fig.3, Fig.4):

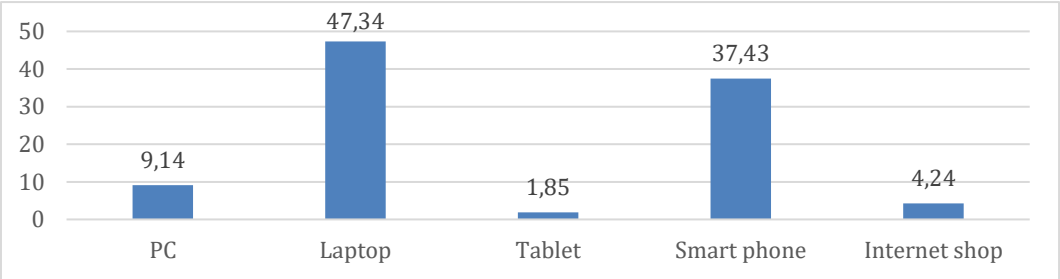

***Fig.2**. The percent of students using e-equipment to access the online courses*

(Resource: Quality Assurance Office, HCMUTE)

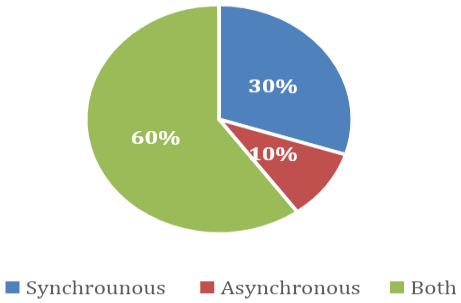

***Fig.3.** The percent of lecturers using online learning environment*

(Resource: ……)

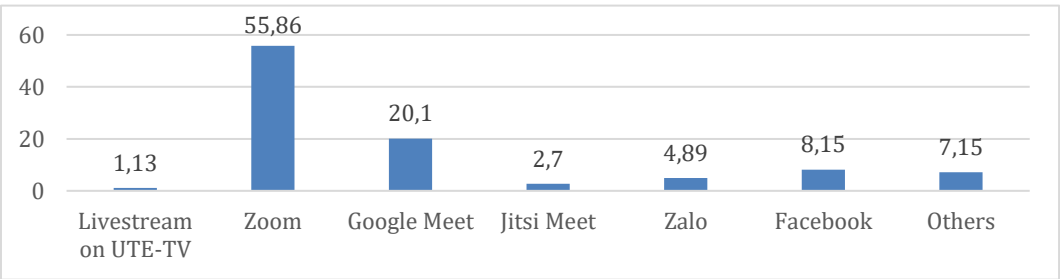

***Fig.4.** The percent of lecturers using e-equipment to teach with the online courses*

(Resource: Quality Assurance Office, HCMUTE)

The above results show that there are a variety of digital tools and conditions to support learning for online teaching and learning at HCMUTE.

Interaction relationships

The second research question of this study was to figure out how the interaction between learner-learner; learner-content; learner-lecturer in online courses was.

The analysis of interface – student interaction

Regarding technology support, a large number of students agreed that lecturers have an attractive and clear lecture design, which helps them to get information easily and be more interested in learning. Students also revealed that it is not difficult to access the classroom as well as download documents,

however, they sometimes get out during class hours because of transmission problems. It is easy to understand that some students stay in their home country, which is very far from the center and has low Wifi speed, so it is hard for them to get live classes. Additionally, another reason is a few lecturers use the free version of Zoom so it is occasionally unstable of transmission quality.

These results are described statistically as the chart below:

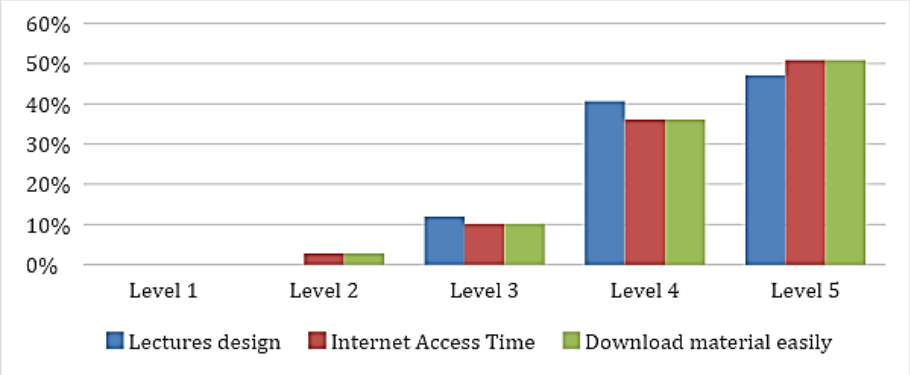

Fig.5. *The percent of students evaluating technology supporting with 5 levels*

The analysis of learner – content interaction

Most of the lecturers always want students to be engaged in their classes. Being engaged means asking questions, contributing to discussions, and providing an answer, etc. Therefore, attending class and active learning are always criteria for students' learning assessment.

This study found that there are about 80% of students attending the full classes (excluding those who withdraw subjects), the rest attended inadequate classes due to reasons such as missing class information, missing class hours, overlapping with another subject, poor Wifi transmission, or household chores. Students shared that the majority of students' families live in the countryside and online learning time is in the harvest season, so they have to help their parents. And, the reason for coinciding with other subjects is that some lecturers do not classify the class according to schedule but according to the lecturers' convenience.

Furthermore, one problem that both teachers and students are interested in is how much students can understand and apply what they have learned? These results are described statistically as the chart below:

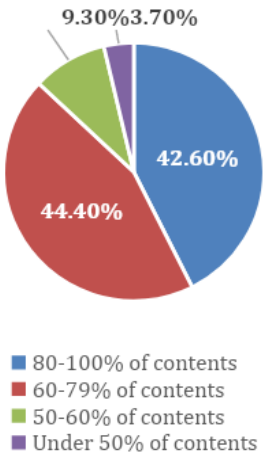

Fig.6. *The percent of students are able to understand and apply what they learned with online classes*

It can be realized that there is still 13% of students who do not understand the lesson completely (from 50% or less of content) and 44,4% of students can only understand two-thirds of the lesson content. For this problem, students explained that there are some reasons: First, students cannot focus on online lessons because there is a lack of separate study space at home, or because of studying at the internet shop where there are many people making noise. Second, students are sometimes disconnected due to the quality of Wifi transmission so they cannot

listen to the lecturers continuously. Third, students rarely discuss with teachers and group members in the live class. This is also admitted by lecturers that only a small number of students often ask questions, the rest do not. Moreover, lectures also rarely create groups for students to work during the live class. Students also feel that there is indirect interaction, and passive habits, afraid to ask questions for lecturers. Fourth, students just prepare computers and wait for the coming class hours, they hardly prepare materials before class. So, these have led to students not understanding the lesson. Generally, the data shows that students participate in online classes quite fully, but the number of students who fully understand the lesson is limited by the above four reasons which belong to two main issues: technology and initiative learning.

The analysis of learner – lecturer interaction

Regarding the learner-lecturer interaction, most students who were asked about the guidance, feedback, and response time of teachers for their learning activities chose level 4, level 5. Students shared that lecturers have specific instructions, feedback within a week, and detailed comments through live classes or digital tools such as Chatbox, Gmail, Zalo, or Facebook. The results show that there is a quite good interaction between learner and lecturer.

These results are described as the following chart:

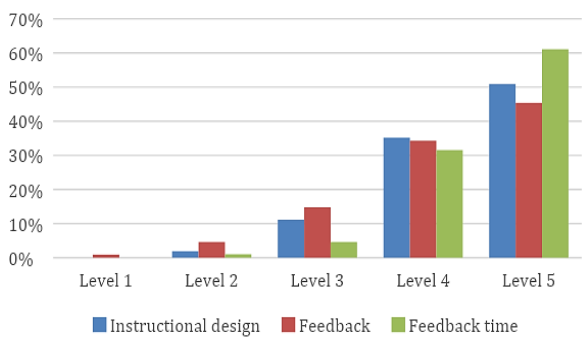

Fig.7. *The percent of students evaluating lecturer's activities*

The analysis of learner – learner interaction

Students revealed that they often join group activities after classes by using tools like Zoom, Google Meet, Messenger, Facebook, Zalo, Kanban, Trello, etc. They can connect with others easily, and it is clear that the technology ability of students is good. However, there are still some students who are passive in their group activities just want to cope with lecturers' requirements.

The analysis of outcomes of online learning and teaching

*The third research question of this study was to evaluate h*ow were the outcomes of online learning and teaching, and student's satisfaction in online courses. So, evaluating the completion of the exercises, about 80% of students said that they completed their assignments on time because they were afraid of getting low scores, about 20% of the rest missed some assignments because of forgetting. Admittedly, online learning certainly requires a high level of initiative from students to succeed.

With learning online, students are always motivated to learn by teachers giving the meaning /goal of the content, bonus points as well as teachers' positive attitude. The evidence from this reveal that students' satisfaction is in high level, the results is described as the following chart:

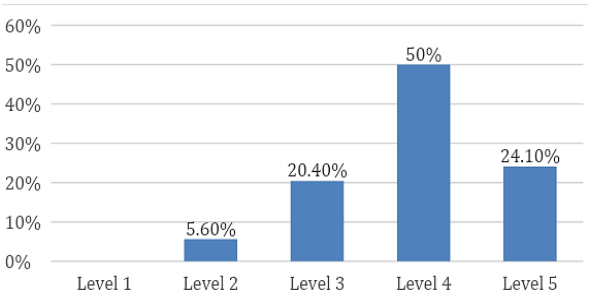

Fig.8. *The percent of students satisfying with online courses*

From the chart of Fig.6 and above analysed interactions between: Lecturer-Student-Content-Technology show that most students are satisfied with their online class.

The lecturers also agree with this idea. They both have the same desire to continue with online learning, specifically with blended learning.

The most interesting finding was that students have got a positive feeling when studying online because they felt like being taken care of, being learned individually with lecturers. Also, students can listen to other students' opinions clearly, ask questions with less embarrassment via digital tools, so these make them more interested in learning online. It is easy to realize that this new point has met the psychological element that everyone always wants to be noticed and express themselves, so these have created a good feeling for students. This result can be considered the first step of success especially that is of students' feelings. Because when there are positive emotions and attitudes, it will lead to a positive learning action. However, this positive emotion and attitude are lessened by the difficulties that both teachers and students focus on two main issues:

- First, it is a technology issue: low Wifi transmission; low Audio and Video supporting; some technical problems such as failure to create groups, share screen, share video, etc.

Second, it is the lack of paying attention to the lesson or active learning of students. Students are interested in learning online but a concentration and active learning hardly are maintained during the online class. This makes students feel passive, bored, and hard to understand the lesson.

Taken together, these results suggest that there are two issues related to the quality of online learning at HCMUTE: technology and active learning. Regarding the technological issue, HCMUTE has also been investing in online learning and teaching: upgrading the Wifi transmission, promoting the functions of the digital learning center, investing in the lighting room, etc. It is also necessary for lecturers to be more proactive to improve information technology skills to make efficient use of digital tools. However, the more important thing is the pedagogical factor, so teachers have to redesign the lectures, and have a better learning scaffolding, encouraging students to study actively. Indeed, online learning requires a high level of the initiative of students, but this depends a lot on the role of the teacher.

Regarding active online learning, Koohang, Smith, Yerby & Floyd (2012) found that to engage students in active learning, learning has to be conducted with three stages that lecturers can be applied for their teaching:

- The first stage is to build a learning base, it is a stage where the lecturer plays crucial roles in designing learning activities. This phase begins the learning process and builds the foundation for knowledge construction that forces learners to become active learners. For this reason, lecturers have to create learning activities that implicate exploration, higher-order thinking skills and scaffolding.

- The second is an ownership stage. This stage encourages students to own their learning. Empowering students to be more confident and be able to control their learning.

- The third is an engaging stage that follows the ownership stage. The lecturers engage the students in giving their opinion, analysis, synthesis, evaluation of multiple perspectives, and students collaboratively assessing each other.

4. CONCLUSION

The study set out to determine the status of online courses. Online learning and teaching are rated as effective solutions during the epidemic season at HCMUTE when the results have shown that students' satisfaction is high. However, the study figures out two difficulties in online courses such as technology issues and the reduction of positive learning. The finding of this study suggests that lectures need to be better prepared in terms of technology, especially in

terms of pedagogy and collaboration to online learning and teaching more effectively. In Education 4.0, lectures' need new competencies, but the solution for these difficulties are not found only from individual lecturer level (Kunnari, Ho, & Nguyen, 2019). Lecturers need a new kind of teamwork and collaboration to build the capacity to develop online education. It is also essential to change the role of students and voice into account, so that they can take full responsibility for their own learning.

This case study describes the status of online learning and teaching from the point of view of one university, while rapidly developing them. To some extent, the findings of this study help other universities to recognize important factors to take into account when developing online education. However, it is good to recognise that the sample size is small, so a further study could be with a wider sample and from different contexts.

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