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## Chapter

# Using Synchronous vs. Asynchronous Methods during the COVID-19 Pandemic in Malaysia: Preservice and In-Service Teachers' Perspectives

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## Abstract

The world witnessed the outbreak of the Coronavirus (2019-nCoV) with lockdowns that forced most schools and other educational institutions to close down. Alternative approaches in the form of synchronous and asynchronous methods were adopted to ensure continuity in teaching and learning in this new norm of providing emergency remote education. This chapter aims at presenting preservice and in-service teachers' views on using synchronous versus asynchronous teaching and learning methods during the COVID-19 pandemic in Malaysia. Data were elicited from three groups of preservice teachers and one group of in-service teachers from three different courses in one teacher education university in Malaysia. Implementation of the e-learning approaches including synchronous and asynchronous sessions was planned carefully based on the course learning outcomes. Important elements such as identification of the learning platform, delivering and conveying information to preservice teachers about the e-learning activities, assessment strategies, attendance, and students' reflection were taken into consideration.

**Keywords:** synchronous method, asynchronous method, preservice teachers, in-service teachers, COVID-19, Malaysia

## 1. Introduction

The world witnessed the outbreak of the Coronavirus (2019-nCoV) with lockdowns that forced most schools and other learning institutions to close down. Alternative approaches in the form of synchronous and asynchronous methods were adopted to ensure continuity in teaching and learning in this new norm of emergency remote education. The COVID-19 outbreak has led most educators to using the blended synchronous approach to cover teaching and learning in the

higher education context [1]. The blended synchronous approach promotes learning that allows students to engage online at their own pace at different locations in learning as they are unable to join traditional face-to-face classes at the universities. However, this barrier does not limit and constrain learning as sharing of knowledge and collaboration still take place [1]. Only a handful of studies have been carried out to show the positive results of the blended synchronous approach [2, 3]. More studies are needed to be carried out to explore how educators and students benefit from different kinds of blended synchronous approaches.

Access to ICT-supported teaching and learning was made possible for students in higher education institutions (HEIs) to study online despite the COVID-19 pandemic outbreak. This is supported by previous studies [4, 5]. Past studies focused on students' achievement and satisfaction in learning [6, 7], but the benefits of online real-time presentation learning and comparison studies focused on the effectiveness of online learning [6, 7]. Nevertheless, studies on asynchronous and synchronous learning in the context of higher learning institutions are scarce.

Students in HEIs embrace both face-to-face and offline teaching and learning modes. Due to the pandemic outbreak, face-to-face classes were replaced with asynchronous and synchronous online teaching and learning methods to ensure continuation in instruction. Synchronous learning is online learning that employs video conferencing and other multimedia techniques to allow lecturers and students to interact with each other at the same time even if they are not at the same place. It is, therefore, also referred to as "live" or real-time instruction. Asynchronous learning is offline teaching and learning that allow students to learn independently, as there is no real-time interaction with anyone. According to previous research [8, 9], students can benefit more when these face-to-face and online teaching and learning modes are blended together. Chen et al. [2] noted that blending face-to-face and offline teaching modes enable lecturers in the HEIs to come up with ground-breaking innovation in pedagogy to enhance educational learning experiences linking to ICT. However, many controversial issues arise from implementing both asynchronous learning and synchronous learning as compared with face-to-face lectures.

This study is guided by the Community of Inquiry (CoI) framework proposed by Garrison et al. [10]. The CoI framework represents students' experiences in asynchronous and synchronous online teaching and learning. Students are viewed as an educational CoI who continuously collaborate and engage in meaningful and purposeful critical discussion to reflect and construct mastery of learning. Meaningful educational experiences develop at the juncture of teaching, social, and cognitive occurrences. The CoI framework shows a process of developing constructive and meaningful learning experiences from the three main components namely social, cognitive, and teaching presence.

According to Garrison et al. [11], social presence refers to participants' ability to recognize and stay connected with the community (e.g., during the course of study), relay and communicate in a meaningful way in their surroundings, and develop positive relationships by exhibiting unique individual personalities. Teaching presence refers to the strategy, design, and simplification to promote cognitive and social processes for the need to ensure the realization of personal and meaningful processes engaging in the education context in order to achieve the learning outcomes [12]. Cognitive presence refers to learners' motivation to be able to create and confirm meaning through sustained reflection and communication [12].

## **1.1 Context of the study**

This chapter aims at presenting preservice and in-service teachers' views on using synchronous vs. asynchronous methods during the COVID-19 pandemic in

Malaysia. How did the students perceive the blended synchronous approach on attaining the planned learning outcomes? In this context, the term “educators” is used for both “preservice” and “in-service” teachers who were students at the university. The findings of this study highlight information regarding educators’ teaching and learning practices involving ICT. With regard to this aim, this study addressed the following two research questions:

- What are the experiences of the educators in synchronous learning situations?
- What are the experiences of the educators in asynchronous learning situations?

## 2. Methodology

This study employed a qualitative research design that reports the findings about the experiences of preservice and in-service teachers in asynchronous and synchronous learning mode during their teacher education program at the university. All the participants of the study are studying and have enrolled in the same teacher education university. This qualitative study explored and made sense of human views, perspectives, experiences, and communication that would permit searching further into the phenomenon being investigated from the participant perspectives [13].

### 2.1 Research participants and sampling

The research participants were selected based on purposeful sampling [13]. This sampling method allows the researchers to select information-rich cases related to the phenomenon of interest. In this case, the phenomenon of interest refers to participants who were exposed to the use of the asynchronous method.

There are three groups of research participants who participated in this study. The first group consists of 26 preservice teachers enrolled in the English Grammar course and the second group consists of 67 preservice teachers from the Final Year project who were taught and exposed to the asynchronous method. Among the preservice teachers, only seven were agreed to share their reflections on the use of the asynchronous method. The third group consists of six postgraduate students who were exposed to the synchronous learning method. Out of the six postgraduate students from the third group who have registered for the current trends in English language teaching (ELT) course, only four submitted their reflections on the use of the synchronous method. Only one lecturer participated in the study and this lecturer taught all the three groups using both the synchronous and asynchronous methods.

### 2.2 Data collection

#### 2.2.1 Synchronous learning

Synchronous learning is possible when the students have good access and connection to the Internet. All the teaching and learning materials were prepared based on the course Proforma, an official document that contains all the important details of the course synopsis, course learning outcomes, detailed assessment activities, assignments to be completed within the stipulated time of the study in a semester. Each semester consists of 14 weeks of lectures.

The lecturer is allowed to be flexible in terms of teaching and learning whereby after the teaching session ends, the lecturer can incorporate games in the form of Kahoot quizzes to assess student understanding and mastery of the topics taught.

Lecturer-student engagement and student–student engagement are allowed for idea exchange after the lecture. For synchronous learning, both the lecturer and students have to be online at the same time. This means the lectures, students’ presentations, assessments, and discussions would take place at a specified time given by the lecturer. When students are online, they are allowed to participate and interact with other students at the time set by the lecturer. For this study, the students are aware of their lecture schedule that have been fixed on every Saturday. For this purpose, the students would spend some time to do revision based on the topic assigned for discussion before they attend the lecture.

As for the postgraduate class, the lecturer taught the students synchronized online teaching and learning for 2 h. During the session with the postgraduate students, they were allowed to interrupt the lecture to pose questions related to the topics taught. Students were allowed to interact with one another after the lecture session ended. Students were asked to share their views on topics discussed.

### *2.2.2 Asynchronous learning*

Asynchronous learning was designed to fulfill the learning needs of students who could not access or have poor Internet connection due to their location or remoteness. The lecturer recorded the lesson on a weekly basis via the Zoom platform. Then, the video-recorded lesson of the week would be saved and transferred into an MP4 file to be shared with the students through WhatsApp. In other words, students in the asynchronous learning group would listen to the video-recorded lesson at their own pace and time. The lecturer gives the student a time frame for mastering and understanding the video lesson. As for asynchronous learning, the lecturer followed the course Proforma. Students were allowed to text their lecturer to seek assistance if they encountered problems in understanding the video content.

## **3. Data analysis**

Data obtained from the students’ personal reflective notes were analyzed thematically [13]. The themes were derived from the students’ reflective notes. The selected excerpts from the students’ personal reflective notes were coded and analyzed thematically and then categorized into themes and sub-themes as shown in **Table 1**. The end of every excerpt is attached with a [Tn], where n indicates the participant. Hence, as shown in **Table 1**, two major themes were identified in relation to using synchronous vs. asynchronous methods through qualitative thematic analysis of the open-ended question.

The themes are divided based on the two research questions. The themes that emerged under the “What are the experiences of the educators in synchronous learning situation?” are divided into perceived advantages and perceived challenges in synchronous learning situations. Under the main theme of perceived advantages, the sub-themes include opportunities for digital collaboration ideas, opportunities to engage students for learning, and opportunities for collaboration. As for the perceived challenges, only one sub-theme emerged lack of information to align technology with teaching objectives.

As for the second research question, “What are the experiences of the educators in asynchronous learning situation?” two main themes namely perceived advantages and perceived challenges emerged for the asynchronous learning situation. Under the main theme of perceived advantages, five sub-themes emerged namely opportunities to access learning materials, opportunities for Community of inquiry, opportunities to collaborate with peers, opportunities for self-directed learning,

Themes	Sub-themes	Selected excerpts
<b>Question: What are the experiences of the educators in synchronous learning situations?</b>		
Perceived advantages	Opportunities for digital collaboration ideas	Her lecturer decided to start by sharing simpler digital collaboration ideas, recorded YouTube channels, and game-based learning platforms such as Kahoot [A1] Educators need to start learning and using technology in the classroom, and parents need to be onboard by supporting schools in utilizing digital education tools [D1]
	Opportunities to engage students for learning	Engaging students as much as possible in discussions and providing guidance (with the aid of technologies [B1] Synchronous learning allows the lecturer to still control the class and give instant feedback to the students on [C1] Students get excited to learn through online and are very engaged [D1]
	Opportunities for collaboration	According to Student D1, he and his classmates love to collaborate and be involved in class discussions [D1]
Perceived challenges	Lack of information to align technology with teaching objectives	The main concern should be how to better combine information technologies with teaching objectives [B1]
<b>Question: What are the experiences of the educators in asynchronous learning situations?</b>		
Perceived advantages	Opportunities for learning	The asynchronous learning allowed him to access the learning materials anytime [SA] Asynchronous learning can provide students with opportunities and advantages for learning [SA] Asynchronous learning gives students the freedom to access it whenever they want, there is a possibility that students might not view the recorded lessons or the uploaded materials [SE] She expressed that she could choose whenever she wanted to study the subject or topic [SF] I find asynchronous learning has provided students with the privilege of learning independently without having to worry about Internet accessibility [SG]
	Opportunities for Community of inquiry	He further shared that he was able to discuss and create a community of inquiry and learning by collaborating with his peers [SA]
	Opportunities to access learning materials	I can collaborate with peers [SC]
	Opportunities for self-directed learning.	Asynchronous learning allows her to learn at her own pace [SB]
	Opportunities to self-monitor learning	I have to undergo online learning and self-monitoring because of the pandemic, she admitted that she is now a lot more aware of tasks given [SC] She shared that she was still able to study at her own pace with asynchronous learning [SD]
Perceived challenges	Poor access to the Internet	He encountered problems accessing learning materials online due to poor Internet access [SA]
	Lack of interaction with peers	The risk with asynchronous learning is that it can be a lonely experience not having classmates and the lecturer around to share ideas and knowledge [SB] Asynchronous learning lacks classroom engagement as students learn in different periods [SF]

**Table 1.**  
 Selected excerpts from the students' personal reflective notes.

and opportunities to self-monitor learning. As for the perceived challenges, only two sub-themes emerged namely poor access to the Internet and lack of interaction with peers.

### **3.1 Findings from the asynchronous learning group**

As seen in **Table 1**, the main and sub-themes that emerged based on the students' personal reflective notes were analyzed thematically to show how the participants benefited from using synchronous vs. asynchronous methods based on their perceived advantages and perceived challenges.

### **3.2 Findings from the asynchronous learning group**

#### *3.2.1 Perceived advantages in asynchronous learning situation*

##### *3.2.1.1 Opportunities for learning*

According to student A, he finds that asynchronous learning can provide students with opportunities and advantages for learning. He had to return to his hometown after the lockdown. However, the asynchronous learning method assisted him in accessing materials in a more convenient way as he did not have to worry about poor Internet connection anymore. The asynchronous learning allowed him to access the learning materials anytime.

Next, with asynchronous learning also, Student A could refer to the learning materials from time to time. The asynchronous learning method allowed him to permanently store and save learning materials in his personal computer. He expressed that whenever he faced any confusion or if he was unable to understand certain topics, he would just need to refer to the learning material that his lecturer has provided to them through any approachable platform such as the MyGuru platform (Learning Management System set up by the university). However, he shared that his lecturer permitted him to personally text or mail her if he wanted to enquire about topics taught through the recorded lessons.

As for Student G, he finds asynchronous learning has provided students with the privilege of learning independently without having to worry about Internet accessibility. As he acknowledged, synchronous learning requires the two-way interaction with students and lecturers, of which classes are conducted online, and many of them have difficulties and issues pertaining to that matter. Students in rural or underdeveloped areas may experience inaccessibility as some regions lack a proper or stable Internet connection. Thus, asynchronous learning offers a more flexible, relaxing, and organized time management for students to learn subjects on their own time and in a preferred space without having to worry about "always on" Internet connection.

Besides that, asynchronous learning equips students with more opportunities to learn in a compact and wholesome experience. In this case, Student G believes that students are more organized in grasping knowledge and obtaining resources faster than having to rely on lecturers solely. Students may ask lecturers for further justification and may contact them efficiently without having to worry about missing out in classes. Student G believes that the learning process should be focusing at his own pace and how he can understand particular subjects without rushing and fear of missing out. Therefore, his choice in online learning leans strongly toward asynchronous, as it offers him the choice to learn better and improve his learning experience in his own way, to provide himself with the time he needs to learn certain topics in a more comprehensive manner.

Lastly, Student G rarely frets about getting a poor connection, because he has a strong, stable connection in his house due to WIFI. However, those students, who are poor, underprivileged and may not afford to pay expensive bills weekly or monthly, may find this issue extremely worrying because they might not catch up with online classes. Hence, lecturers may share their materials online, and students are free to check and complete their tasks within the time frame given. All in all, asynchronous learning provides flexibility, a better learning experience, and affordability for all students. Student G advocates asynchronous learning as the main online education experience.

According to Student E, asynchronous learning gives equal learning opportunities to both students with a stable and unstable Internet connection as the materials or lessons uploaded by the educator can be downloaded and reviewed over a longer period. Compared to synchronous online learning where students are expected to attend class within a set time, asynchronous learning offers students the flexibility to do so. This is especially advantageous to the students who have part-time jobs or a large family, which makes it harder for them to attend online classes at fixed times.

While living at home, students may have to prioritize other matters than their studies such as helping their family's business or taking care of their younger siblings; so, asynchronous learning is a solution that benefits these students. Next, since asynchronous learning helps students to store the materials and lessons in their own storage space, there is little concern of some students being left behind in a lesson compared to their friends. With synchronous learning, some students might miss classes and the ongoing lesson might not be recorded by the lecturer. This is different from asynchronous learning where one can access the stored data wherever and whenever needed. However, as asynchronous learning gives students the freedom to access it whenever they want, there is a possibility that students might not view the recorded lessons or the uploaded materials. As a suggestion, the educator can ask students to summarize their findings from the lessons or the materials within a period and upload them on a platform set by the lecturer. Questions and instructions such as "What are the important points that you get from this particular lesson?" or "Summarise your findings from this week's video" will encourage students to review the materials.

#### *3.2.1.2 Opportunities for community of inquiry*

Asynchronous learning provides the opportunities for students to be able to discuss and create a community of inquiry and learning by collaborating with peers. One advantage of asynchronous learning is that it is hassle-free for students who had to balance their time with house chores and studies especially when they had to learn and join online learning in their homes because of the movement control order.

#### *3.2.1.3 Opportunities to access learning materials*

The asynchronous method adopted by the lecturer was quite helpful for so many reasons. It is convenient and adaptable despite the condition. Student C expressed that asynchronous learning works well only if there is enough guidance and useful materials provided. She believes that being in university means one has to learn to be independent and cannot expect the lecturers to spoon-feed students all the time. At the same time, she also feels that lecturers should equip students with proper notes and tasks for a particular course; then, asynchronous learning will be more effective.

According to student C, if a new subtopic in a subject of the syllabus is introduced, sufficient materials should be provided so that the students can comprehend

the content delivered confidently. “Hence why I think asynchronous learning could still work provided materials are given beforehand.” The material in this context also means additional notes that students can make full use of to do reading to gain more understanding of the assignment. For example, “an assignment is given based on Week 7 material posted on Myguru. The material stated should then be easily accessed by students and lecturers to monitor as well. With this clear instruction, I think more students will benefit from it. Explanations are also needed with the materials provided. Some may not have the coverage to access classes online; therefore, some of my lecturers opted to prerecord their lessons to be accessed whenever the rest are able to. One of the disadvantages of using asynchronous learning is when some subjects lacked guidance in explaining the subject or requirement of each task. Some students have been experiencing this over the online distance learning (ODL) and it affects their work pace.”

According to Student C, asynchronous learning builds up individual discipline. She admitted that she used to depend a lot on attending physical classes to stay updated on her learning; however, ever since they had to undergo online learning and self-monitoring because of the pandemic, she admitted that she is now a lot more aware of tasks given. Asynchronous learning requires one to be diligent in accessing the materials or search on each subject’s requirement and this is why she thinks in a way that it builds more positive character in students if it is taken seriously. It helps an individual in being independent to go out of the comfort zone to reach out to lecturers themselves for inquiries and work through their assignments with all the information they have gathered.

#### *3.2.1.4 Opportunities for self-directed learning*

Student B believes that learning took place better *via* asynchronous learning. She further shared that asynchronous learning may seem a little difficult for some students because they do not have the lecturer present physically in front of them to explain certain topics. She also believes that this learning method depends on the individual. Asynchronous learning allows her to learn at her own pace and time and she feels that many would not take advantage of it by learning what is given later and maybe skip parts if they are lazy to listen to the lectures.

Student B shared that she personally prefers the asynchronous learning method. It allowed her to access the recorded lectures within a flexible time frame. Furthermore, she relates her learning to her introverted attitude as a student as she prefers to learn individually at a very quiet place. She shared that the asynchronous learning method was similar to researching about something she could not master and by doing this, she could learn better. She shared that when a lecture is going on, it cannot be repeated and that one needed to catch up really fast when the lecturer is speaking. But through asynchronous learning and materials given to her, she could replay the material whenever she needs to and learns better in a sense. Learning in an asynchronous learning environment is reasonable due to the pace.

Student B prefers to study at her own pace. She does not feel pressured while learning this way; she said that while “someone does a face-to-face meeting; you feel pressured where you have to be attentive and keep jotting things down as they speak. This also helps us in terms of replay the lecture, take notes and practice it without the concern of you being worried of the speed of lecturers when they conduct a class.”

Besides that, Student B feels that online learning saves a lot of money where she just has to submit her work online and does not have to print anything before submitting it to the lecturer. In this manner, Student B shared that she could save cost and paper. Learning individually is totally fine but when it comes to group work, it is a little hard to contact especially those who do not have a stable or good Internet

connection in their areas. It is best to segregate tasks than sending in and compiling it when it is done. Student feedback should be collected for the upcoming semester, to lessen group work if needed.

The risk with asynchronous learning is that it can be a lonely experience not having classmates and the lecturer around to share ideas and knowledge in a better way. The intellectual energy is not delivered in the same way. It is even difficult to have everyone sharing ideas and discussing online simply because they do not wish to but when one is in class one has to discuss. There would be a lack of discussion and feedback when asynchronous learning takes place. Basically, asynchronous learning is where students get all the vital materials to learn and it is up to them to complete learning at their own convenience.

#### *3.2.1.5 Opportunities to self-monitor learning*

Based on Student D's reflection, she found asynchronous learning brought convenience in her studies. This is because she realized that the entire learning now would depend on a good Internet service for her to complete her studies in current semester due to the COVID-19 pandemic. She shared that she was still able to study at her own pace with asynchronous learning. Some students with poor Internet access were unable to join the online learning classes and this disrupted the learning process merely for students in rural areas. Student D was grateful as some of her classes initiated asynchronous learning style, and this enables her to keep track of her studies in her free time by watching the videos and notes uploaded by the lecturers. Other than that, regarding attendance, there should be other ways such as giving homework to ensure student attendance is acknowledged so that students will not be accused of being absent. All in all, it is not wrong to have online classes but educators really need to consider other students who are having Internet difficulties as well. This could be simply solved by having a survey on what option the students prefer. Student D concluded by stating asynchronous learning was always the better option.

#### *3.2.2 Perceived challenges*

##### *3.2.2.1 Poor access to internet*

Student A views asynchronous learning can be difficult for those having problems with Internet connection. He encountered problems accessing learning materials online due to poor Internet access. He had to find ways to solve this problem so that he could view the recorded lecture videos posted by his lecturer.

##### *3.2.2.2 Lack of interaction with peers*

Student F shared that asynchronous learning was being implemented during the whole semester due to the pandemic happening in the country. Thus, some lecturers opt to use asynchronous learning for the whole semester. Student F felt that asynchronous learning helped her in learning the subject or the topic better since it offered flexible time. Student F expressed that she could choose whenever she wanted to study the subject or topic. The learning session can be accessed at her own time because it was done as a podcast or prerecorded lecture.

She felt that asynchronous learning lacks classroom engagement as students learn in different periods. If she had confusion regarding a topic, she was unable to get immediate feedback from friends as they might have not learned it yet; but using asynchronous learning, she could read and learn the topic at her own pace.

There is no pressure for Student F to complete the topic before the next class. This gives Student F the chance to review the information, take notes, and complete the tasks provided at her own pace.

Student F feels comfortable as she does not have to rush to complete the tasks. This is because she feels that she gets more opportunities to learn or explore more about the topic. But sometimes she feels asynchronous learning as a lonelier learning experience since it cannot deliver the same vibe or energy as a real-time interaction. This can interface with the debate or discussion between the classmates, and the students might have a lack of social interaction and classroom engagement. Lastly, if given a choice, she would choose a mixed type of learning as both types of learning to have their advantages and disadvantages.

### **3.3 Findings from the synchronous learning group**

#### *3.3.1 Perceived advantages in synchronous learning situation*

##### *3.3.1.1 Opportunities for digital collaboration ideas*

Student A1 is a postgraduate student and is also working as a teacher at the same time. She experienced the synchronous learning due to the COVID-19 pandemic and lockdown that forced the entire higher learning institutions to close down. She expressed that the world she knew was about to undergo one of the most dramatic changes ever experienced. As for her postgraduate lesson made possible *via* synchronous learning, she shared that her lecturer set up a message group for her group to communicate important details about the classes and also to share other concerns related to teaching and learning activities.

She also feels that the lecturer's approach to set up a message group has been very comforting as it allowed them to share their concerns and has brought them even closer together as a team. For teaching and learning to take place in this pandemic situation, her lecturer applied synchronous learning approach to teach the current trends in English language teaching course. Her lecturer used one platform namely Zoom for students to join the class. Her lecturer decided to start by sharing simpler digital collaboration ideas, recorded YouTube channels, and game-based learning platforms such as Kahoot! Student A1 shared that her lecturer was aware of the lack of resources faced by some students, but she also knew how popular and powerful the mobile phone is and how it can be used to overcome the huge digital divide.

Synchronous learning employs video conferencing and other multimedia techniques to allow lecturers and students to interact with each other at the same time even if they are not at the same place. It is therefore also referred to as "live" or real-time instruction. In addition, synchronous learning also provides discussion rooms that allow students to ask questions and share ideas online. During the discussion period in her class, her lecturer observed the interaction among students and the discussion content of the whole class, and gave students appropriate support whenever needed.

In order to prevent the problems of distraction during the course program, the lecturer asked students to answer some questions by text or audio. All such conversations along with contents can be recorded using tools such as Zoom and made available to the students for review either after completion of the class or in the form of course material for asynchronous learning. This possibility does not exist in traditional face-to-face teaching.

First day of the live online learning experience was a mixture of excitement, worry, and apprehension. The experience of synchronous teaching and learning has been both challenging and rewarding. Student A1 expressed that the purpose of communication is not limited to imparting knowledge but it helps her to learn and

retain the information shared during the teaching and learning session. Lecturer's amiable nature can inspire students to participate more during the instruction and also express their anxiety coping with challenges and stress during the COVID-19 pandemic. It shows them other possibilities and encourages them on their journey to learn a foreign language, which is likely to play an important role in their future.

### 3.3.1.2 Opportunities to engage students for learning

Synchronous sessions should be dedicated to three major tasks rather than just knowledge delivery on the teachers' part so as to help students as much as possible: making comments on students' learning progress (praise, encourage, remind, urge, punish, etc.) and giving more specific feedback (and sometimes quiz may be used to assess students' self-learning outcomes), engaging students as much as possible in discussions and providing guidance (with the aid of technologies, this process can be made more interesting than traditional classroom discussion, e.g., ask students to do online voting for the best work and explain why), and finally question and answer. The first task helps to urge sluggish students to work harder while further motivating those hard-working learners. The other two attend to students' needs of instant communication with teachers and fellow students, and clarifications of confusions in learning. For older learners, for example, students in tertiary institutions, and interactions with teachers and students are especially important. After all, good command of knowledge cannot be achieved through cramming; it should be constructed and absorbed [B1].

The interactive process of discussions, debates, brainstorming, sharing, questioning, and answering, under teachers' guidance, is the very process of knowledge construction and absorption. Student B1 said "in the current course we are taking, students are always encouraged to offer opinions, which is greatly beneficial. For example, on the topic of assessment, our teacher asks us to share our understandings of "assessment", "test", "measurement" and "evaluation", and talk about ways of assessments we adopted in our teaching (most of us are both graduate students and schoolteachers at the same time) before giving her own opinions and other academic explanations. This is a much better way for us students to gain a deeper understanding of assessment than simply giving definitions of the above four concepts." All in all, synchronous sessions are essential in ICT. The main concern should be how to better combine information technologies with teaching objectives. Learning and practice are always best for teachers in ICT education.

Synchronous learning can be defined as all types of learning in which students and teachers are in the same place, at the same time, in order for learning to take place. This includes in-person classes and live online meetings when the whole class or smaller groups get together. Student C1 said "during this Covid-19 pandemic breakdown, most of the learning institutions have opted to proceed with the teaching and learning process by using online platform to deliver the lessons. My lecturer conducted her online lessons via the Zoom platform. As stated in the schedule, we have to attend our online sessions for four hours and we do have breaks in between. My lecturer usually teaches during the first hour followed by discussion based on the topic presented."

According to Student C1, her lecturer makes the lesson interesting and to ensure the students pay full attention, she prepares some questions for discussion that are usually related to their teaching experiences. Her lecturer checks on their discussion and they are also instructed to do a presentation on the matter discussed. To ensure no students will be left out due to some technical glitches or connection breakdown, her lecturer records all the sessions and delivers them *via* WhatsApp. The benefits that student C1 can point from having this synchronous learning is

that the lecturer has the ability to still control the class and give instant feedback to the students on the subject taught in the session. Although it is conducted virtually, the students can still give their cooperation in participating in each in-class activity prepared. Through the implementation of synchronous learning virtually, student C1 thinks that it is the right time for every educator to self-check their self-efficacy in handling IT and conducting virtual classes. This is in-line with the demand of our current students who obviously are so attached to gadgets. Student C1 expressed that is really exciting having the class online as it suits the students' technology competency.

### *3.3.1.3 Opportunities for collaboration*

Student D1 reflected on the synchronous learning approach which was used by his lecturer during the COVID-19 pandemic. Synchronous learning is learning that takes place simultaneously in real time. Learners attend class at a scheduled time either in a traditional classroom or *via* the web using various technologies. As we know, all the schools and higher learning institutions have been shut down for almost 3 months during this pandemic. So, his lecturer opted to teach the post-graduate class by using the Zoom platform. Usually, the link is given 15 minutes before the class. All the lecture notes, task sheets, and YouTube videos will be given through the MyGuru platform. His lecturer records the Zoom sessions and then shares the recorded lessons to the group *via* WhatsApp. Students then can view the lesson anytime that they want to recall what they have learned on that day. After the lecture session, his lecturer has discussion, question, and answer sessions with the group before the class ends.

According to Student D1, relying only on synchronous lectures using the Zoom platform is ideal. In these times, online platforms are the only way to ensure teaching and learning are not affected. If teachers and lecturers cannot teach, students are the ones who are most impacted. E-learning is the future of education. Educators need to start learning and using technology in the classroom, and parents need to be onboard by supporting schools in using digital education tools. Students get excited to learn online and are very engaged. He shared that his lecturer has ensured that she supplements extra reading materials with other engaging activities such as discussions. This can further inform the lecturer whether the students had understood the subject, or the topic area taught.

Student D1 also believes that time always moves forward, so as a student he needs to keep updated and follow the trends in online learning. Synchronous learning implementation made the students more excited in using the technology to learn. This helps to enhance the lecturer-student relationship. He looks forward to the classes as technology makes learning more fun and meaningful. According to Student D1, he and his classmates love to collaborate and be involved in class discussions.

## **3.4 Perceived challenges**

### *3.4.1 Lack of information to align technology with teaching objectives*

Student B1 expressed her main concern on how lecturers can plan and implement teaching and learning to make it more meaningful for students to learn. The main problem would be to find solutions to combine information technologies with teaching objectives. Learning and practice are always best for teachers in ICT education.

## 4. Discussion

The use of asynchronous and synchronous learning methods both pose advantages and disadvantages based on the data obtained from the preservice and in-service teachers' reflective notes. One obvious problem faced by the preservice teachers in the asynchronous learning approach was to stay connected with peers to exchange ideas and discuss topics related to the recorded lessons. Preservice teachers who experienced the asynchronous learning approach expressed the lack of opportunity and engagement to interact with peers and also the lecturer to get immediate feedback. Preservice teachers said that the synchronous learning approach could not deliver the same vibe or real-time interaction as compared to the face-to-face or the traditional teaching approach.

A combination of both asynchronous and synchronous learning approaches can promote the development of social interaction and community of inquiry in the education landscape. This is supported by Zawacki-Richter [14] who investigated the impacts of the COVID-19 on teaching and learning at universities in Germany. Findings showed that both e-learning and face-to-face learning have advantages and disadvantages of using digital media for instruction. Educators can be creative to offer students "a different kind of learning" [15]. This is supported by a diversified resources and materials that can be problem-based, cooperative, collaborative, interactive, flexible, and self-directed. Nevertheless, more focus should be given to the types of pedagogical added value e-learning can offer, relying on the needs of the students, and the course content that will be taught.

The findings of this study are supported by many authors (e.g., [16–19]) on the need for educators to devise a balanced ODL strategy whereby preservice teachers can experience and attend both asynchronous and synchronous learning approaches in order to provide equivalent learning opportunities. On the other hand, preservice teachers admitted that they could not stay focused and follow the face-to-face lectures accordingly given their limited attention span. Some of them even expressed that they lacked the confidence to pose questions to their lecturers when they attend the face-to-face online lectures. The reasons given were mainly due to their fear of the lecturer, besides feeling timid and inhibited [20]. It is noted that educators must embrace some flexibility in their teaching approach and offer choices for students to adopt both asynchronous and synchronous learning approaches.

Studies on both asynchronous and synchronous learning approaches are in their infancy. Findings from this study suggest that both asynchronous and synchronous learning approaches offer a variety of educational, practical, and economic advantages. Universities worldwide can still increase their student intake with greater enrolment although knowing the fact that classroom space would be an issue but given the nature of the synchronous learning approach, they can still accept a huge population of students [21, 22]. Synchronous learning approach can offer students equal and comprehensive learning experiences beyond geographical borders [23, 24]. Education now is open to everyone including those working full time, and parents looking after children as they can join off or on campus to pursue their studies [25]. Students who join online distance learning or remote learning can now ask questions *via* online, add comments, and literally get engaged in discussion in a similar vein as compared to the on campus students [22]. As a result, it creates an opportunity to create a community of inquiry to interact socially and intellectually to share knowledge through the asynchronous learning approach [21, 26].

Khalil et al. [27] investigated undergraduate medical students' views regarding the effectiveness of synchronized online learning at Unaizah College of Medicine and Medical Sciences, Qassim University, Saudi Arabia, due to the ongoing

COVID-19 pandemic. A qualitative research design was employed by using focus group discussions synchronously comprising of seven open-ended questions. Findings revealed that online sessions were time saving and their performance improved as a result of the time used wisely. However, participants expressed other challenges such as their behavioral challenges during the synchronous learning session, technical, and also online exams. Participants showed their interest toward online learning for the future academic years. Both the asynchronous and synchronous learning approaches are essential parts of the information and communications technology.

## **5. Conclusion**

In this information age, ICT in education has become widely accepted, generally actualized and greatly developed around the world, not to mention the incredibly vital role, ICT has been playing in this COVID-19 pandemic when face-to-face classroom instruction is rendered risky. ICT benefits learners by offering them vast digital resources at their fingertips and giving them the freedom to tailor their own learning timetable, among many other advantages. While some learners' motivations and interests are boosted with the highly raised autonomy, instant feedback and discussions are in great need for them as always, and some students, especially those young students, may slack off in asynchronous sessions, for want of self-discipline and self-learning strategies. That is why synchronous sessions are indispensable in ICT, and synchronous sessions are the ones making ICT real education instead of merely a collection of advanced and powerful tools.

## **Conflict of interest**

The authors declare no conflict of interest.

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