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PLICKERS AND FORMATIVE: SYNCHRONOUS AND ASYNCHRONOUS ONLINE ASSESSMENTS

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ABSTRACT

Online learning is widely used as an alternative for face-to-face learning classes today. This project focuses on e-learning assessment tools, which are Plickers and Formative. These tools give an option to the teachers to conduct online assessment via synchronous (Plickers) or asynchronous (Formative) method. Both tools are free and convenient to use where the questions can be designed freely according to the teachers' needs and the result can be obtained immediately once the questions answered by the students. Furthermore, these tools can be applied for e-assessment and easy to access during tutorial activities and also can be applied for a midterm or any online class activities. Besides, the lecturers can easily transform the results into an external file for recording purposes and discuss the answers with the students. Data from both tools are very easy to trace with colorful versions that can attract students' attention and interest to join online classes effectively.

1.0   Introduction

Due to the overwhelming cases of novel coronavirus (Covid 19), most countries have imposed lockdown order that cause many sectors forced to close including academic institutions. As reported by United Nations Educational and Scientific Council (UNESCO, 2020), around 57 percent which equivalent of 990 million learners where affected with the closure of schools and institutions around the world. Started from March 2020, Malaysia imposed the first Movement Order Control (MCO) that force all social and manufacturing activities including religious activities except for daily essential services such as supermarkets and convenience shops (New Straits Times, 2020). Due to this matter, most of academic institutions from primary schools to high education systems have diverted their teaching and learning process from face-to-face to online classes. Thus, at this point most of teachers and educators are forcing themselves to apply various online learning tools to ensure the process of teaching and learning can be proceeded efficiently.

Though the method of online learning is not new, however, the situation of pandemic has create tremendous changes in face-to-face teaching delivery that create an urgency for online method to be adapted in normal learning process (Cohen, 2021). Thus, there is a need to learn and apply several online learning tools that can enhance interest of the students and make the class more alive. Due to this matter, this study intends to introduce two online learning tools that can be applied for synchronous and asynchronous online learning.

2.0   Synchronous vs Asynchronous

Previously, online learning becomes another option for academic institutions to offer specific courses to remote students. However, the need of online learning become a priority today as most countries face with critical situation in handling the contagious virus of Covid 19. Online learning has several benefits to ensure the process of teaching and learning can be conducted effectively such as increased and equitable access, flexibility in learning times and place, and connections between students and teachers located in different geographical locations. Interactions in online learning environments are characterized as asynchronous and synchronous method (Risner and Kumar, 2016). The utilization of both methods can increase the effectiveness in online learning and reduce the barrier of teachers-students gap in the process of delivering the teaching contents.

Synchronous learning. The need of online learning becomes more crucial when the world is facing with the Pandemic Covid 19. Most academic institution around the world has digging the online techniques to ensure the process of teaching and learning can be carried out efficiently. Thus, to ensure the quality of online teaching adheres with the quality achieved in traditional learning in class, there is a need to align the process of pedagogy with the best online techniques (Cohen, 2021). In online pedagogy, there are two major techniques that can be applied by teachers that consist of synchronous and asynchronous online learning.
Teachers are one of the important elements in learning environment where they deliver knowledge and skills to their students (Wdowik, 2014). Synchronous online learning is an

immediate interaction between teachers and learners where the learning process is done in real time-based through online platform (Salmon, 2013). Therefore, this method requires the presence of both teachers and learners at the same time.

A synchronous online method resembles a traditional online class where both teacher and students are meeting remotely via the Internet (Perveen, 2015). Past research had found that synchronous online learning able to increase the motivation of students to participate in the class with the presence of the teacher and their friends (Yamagata-Lynch, 2014). This method gives immediate feedback to the students and assists them to solve any problem encounter by them. Besides, real time communication also gives positive impact to the students where it increases their passion and lead to better communication with their teacher (Perveen, 2015). Therefore, synchronous online learning is the best method in assisting the teacher to conduct a class during this pandemic.

Asynchronous learning. As compared to synchronous learning method, asynchronous online learning also provides an effective learning process where it gives more time for teachers to see and provide feedback to the students. As supported by previous findings stated that immediate response unable to give teachers enough response on students' performance (West, 1994). Thus, by having asynchronous online learning, it can assist the teachers to review the performance of the students and make a preparation before discuss with the students.
Asynchronous online method does not need the presence of teachers and students at the same time. It can be conducted at anytime by using several platforms such as discussion in forums and blogs where the students can view the teaching materials at their ease (Risner and Kumar, 2016). This online method is the first method that replaces traditional learning process due to slow Internet connection can be a troublesome for teachers to conduct online class using synchronous online method.

In academic institutions, most universities have online learning management system (LMS) that supports the asynchronous learning activities. The lecturers can use this platform to upload all recorded teaching materials and other online activities via LMS and students can access all materials at anytime. The presence of the system is really helpful in supporting the asynchronous online method.

3.0   E-Assessment Procedure

Basically, the process of e-assessment begins with the preparation of the set of questions. The format of the questions can be multiple-choice questions, true and false, short essay and others. Once the questions are prepared, then the lecturer can sign up for e-assessment tools to export the questions. During class, the students need to login to their e-assessment account and join the assessment via the link or code given by the lecturer. Some platform allows teachers to invite the students via email or export the students name from Google classroom account. Therefore, the process of inviting students is much easier.

For synchronous online learning, the assessment requires the students to response to the questions and received the feedback simultaneously, whereas for asynchronous method, the students can answer the assessment at their time and the results can be revealed once the lecturer expose it to the students later. Therefore, it is easy for lecturers to assess the students' results and their understanding on that assessment. Figure 1 presents the concept of the e-assessment procedure.

Figure 1. e-assessment procedure

The first procedure in preparing e-assessment is input where teacher need to upload set of questions or instructions on online learning tools. Then, the process of e-assessment is carried out where the students are required to answer the questions given. Later, results of students are derived and the teacher can gather feedback for students' achievement. In this study, two types of e-assessment tools can be adapted by teachers, which are Plickers and GoFormative. These tools are chosen due to convenience characteristics that are easy for teachers to adapt in their online class.

Plickers. To support synchronous online learning process, there is a need to design online learning that can increase the efficiency of teaching process with the involvement of the students. A good synchronous online design able to emphasize on students understanding and participation effectively (Galanti, et al. (2021). Plickers is one of free online assessment tools that can be applied by the teachers when conducting an online class activity. It is a rapid-response classroom application that allows teachers to create an online activity that requires the students to answer questions in the real time.
By using Android apps, lecturers can easily gather student responses in a real-time. On the other hand, Plickers can turn assessments or check-ins into opportunities for play, engaging students by empowering them to share what they know. The lecturer can assess students' results to enhance students understanding, tailor instruction, and construct long-term planning. Figure 2 shows the process of creating the questions in Plickers.
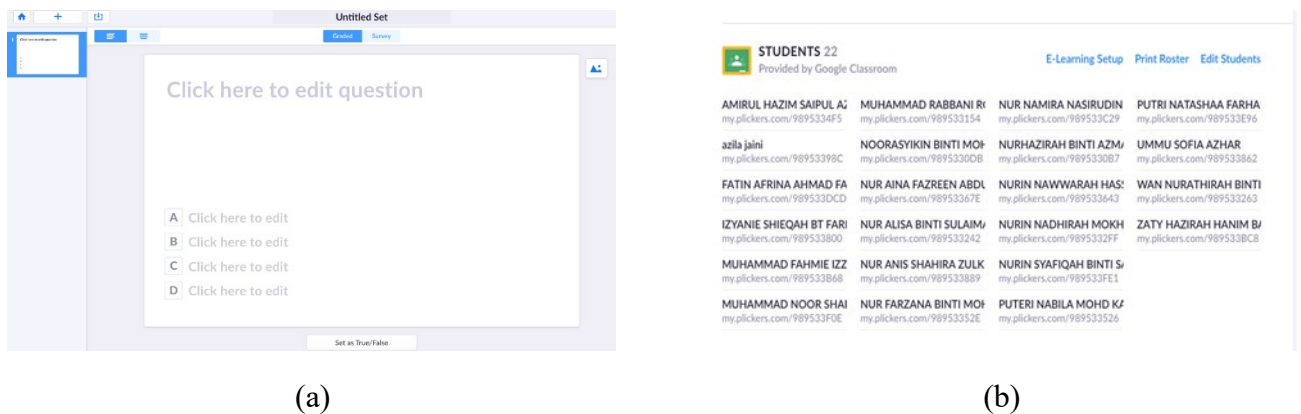

(a)   (b)
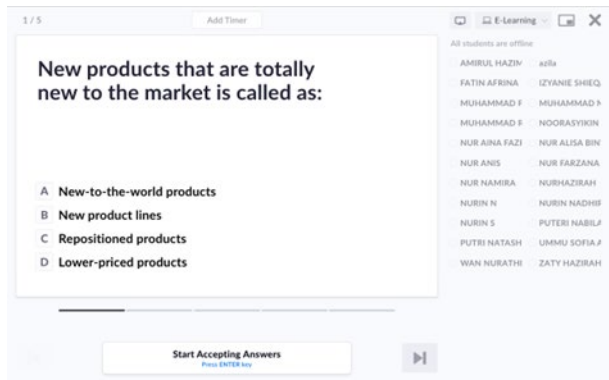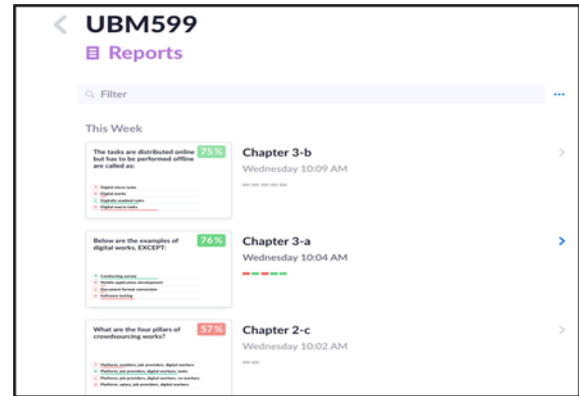
Figure 2. (a) Create/ import questions (input)   (b) Invite students (input)

(c)   (d)
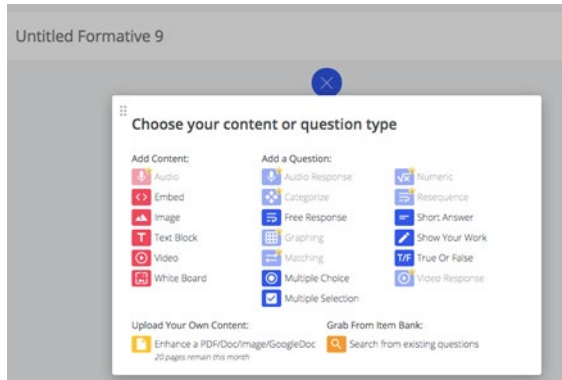
Figure 2. (c) e-assessment   (d) Students' results (Feedback)

First, teachers need to sign in to Plickers account and set the setting as teacher. Then, teacher can create class and invite the students either via email or import from Google classroom. Then, teacher can create a set of question either import it from the question banks or write the questions in Plickers. Then, once teacher play the questions, students need to answer it immediately. By using Plickers, teacher can set a timer for every question or control the time by clicking end button. Once students answered the questions then teacher can reveal the answers. Thus, the students can immediately identify the correct answers.

Formative. While Plickers requires the presents of both teachers and students at the same time, Formative is an asynchronous online learning method where the students can answer the assessment at any time they want. Asynchronous online learning has been practiced earlier than synchronous online learning where the communication through emails and forum discussions had taken place in most online courses (Anderson, 2008).

Formative is a web-based tool that allows teachers to design online assessments, tasks, or assignments that are easily accessible from any electronic devices such as mobile phones, tablets, or laptops. Formative offers free access that allows teachers to create any online assessments from scratch or upload existing questions into the web. The flexibility of Formative web that allow PDF file to embed into the web has simplified the teachers' works and save their time in creating the questions online. Figure 3 shows how Formative work for the teachers and students.

First, teachers need to sign in to Formative account and set the setting as teacher. Then, teacher can create class and invite the students via class code or email. Then, teacher can create a set of question either import it from the question banks or write the questions in Formative web. Then, once teacher open the setting for students, then the students can answer the questions at their time. The teacher can close the questions once the students answer all questions. Then, teacher can discuss the answers with the students and review the students' performances.
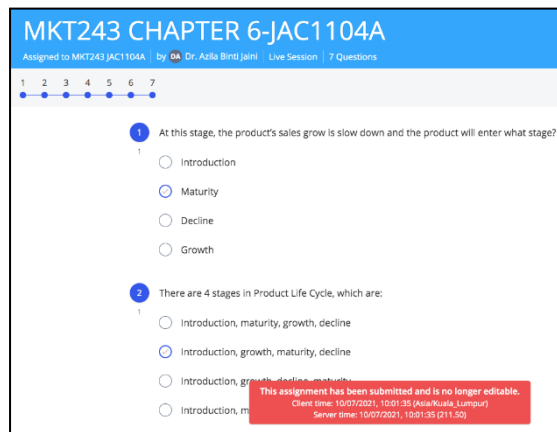
(a)

(b)

Figure 3. (a) Create/ import questions (input)   (b) Invite students using code (input)

(c)

(d)

Figure 3. (c) e-assessment   (d)   Students' results (Feedback)

4.0   Discussion

Interactions in online learning environments are characterized as asynchronous and synchronous (Risner and Kumar, 2016). The availability of synchronous and asynchronous methods are really effective in supporting the teaching and learning process today. Both methods have it own advantages and disadvantages. For Plickers, it provides useful features where the students' responses will be saved like normal and available in reports and score sheet. Therefore, the students just need to follow simple process for registration where they just need to accept the registration link given by the lecturers. Plickers also saves teachers' time because it is simple to use, set up, and requires only one electronic smart device, which reduces risk of failure or technical difficulties.

Besides, Plickers provide teachers with additional ease in being able to review students' answers in real-time and viewing the Plickers reports after class to ascertain which students might need more help. This feature creates high motivation and participation from the students. Thus, it support past findings that indicate students showed higher motivation when they participate in the class with the presence of the teacher and their friends (Yamagata-Lynch,

2014). Furthermore, teachers also able to offer students appropriate work and instruction based on their specific learning requirements and understanding level is effectively.

The usage of Plickers has been conducted in one public university. The application of Plickers receives positive feedback from the lecturer and the students. The simple features offered by Plickers are very convenience to use and apply in online class activities. The response given by the students also positive where they pay higher attention in online class activities. Since the lecturer can gather immediate feedback from the students, therefore the discussion on every task given is more interactive where the students can ask any question at the same time.
However, Plickers activities cannot be conducted with low Internet bandwidth. The main obstacle facing by most students is the speed of Internet that can make them unable to attend online class according to the teacher's time. For example, some students that stay in remote area face a difficulty in getting Internet access and make them miss the online class (Risner and Kumar, 2016). Thus, teachers need to have both synchronous and asynchronous method to help these students.

Formative is an asynchronous e-assessment tool. With free access feature, this tool allows teachers to create various types of questions that consist of multiple choice, true and false, short answer and drawn "show your work" questions to deliver to the students. Furthermore, Formative also has interesting features where it can add other content to the questions such as images, texts, or a YouTube video. Moreover, this e-assessment tool can display as multiple roles where the teachers can watch the students answer from the teachers' side of the site.
The application of Formative is already being applied in public university. The results gathered from this tool are very positive from lecturers and the students' sides. The results of students can be gathered automatically after submissions by the students allow lecturers to review the performance of the students immediately. Thus, Formative is an effective e-assessment tool that saves the lecturers' time in assessing the students.

Since Formative is asynchronous learning tool, thus students have flexibility in receiving the tasks and respond to it at their time. Therefore, it can alleviate the problem in difficulty to get online according to the teacher's time. Though the students cannot communicate with the teachers at real time, however, they can drop a question and the teacher is able to provide real-time feedback in the form of a grade and a written comment. Thus, Formative still allows two-way communication between the teachers and the students.

5.0   Conclusion

Today, our world is facing with the spread of Covid 19 virus that cause the closure of all sectors including academic institutions. The urgent transformation of traditional learning into online learning leads to chaotic situations among teachers and learners. Therefore, this study is conducted to analyze the effectiveness of online learning assessment tools, which are Plickers and Formative. These two e-assessment tools are very convenient and easy to use by both teachers and learners.

Online learning provides two major characteristics that consist of synchronous and asynchronous methods. These two methods are required to ensure the process of teaching and learning that be carried out efficiently. Synchronous method is the direct replacement of traditional class where it's require the existence of both teachers and students at the same time through online. Meanwhile, asynchronous method is conducted where the teachers and students can communicate at any time they want and the feedback is not in the real time.

Plickers is an online assessment that offers synchronous communication, while Formative is asynchronous online communication. Both tools are free access and very convenience to use by teachers. With only three simple steps, teachers can conduct online assessment with a quick time. First, the teachers need to create input (questions, task, assignment) either by importing it from existing files or simply create the questions in the web. Then, the students are invited once the class is created either through email, class code or import the students from Google Classroom web. Then, e-assessment process is carried out either through synchronous or asynchronous method. Lastly, the teachers can view the students' performances that derive automatically once the students answered all the questions.

E-assessment tools can generate the students' interest and attentions due to it have many unique features that can assist the teachers to assess their students. Furthermore, these tools create diversification in teaching tools that can enhance the motivation of students to interact with their teachers and friends. Besides, the features of Plickers and Formative are easy to handle and it can manage high volume number of students in one class. At the same time, these tools can easily trace students' attendance and response virtually.

6.0   Acknowledgement

6.0   References

[1] A. Perveen, Synchronous and asynchronous e-language learning: A case study of virtual university in Pakistan, Open Praxis. 8, 1 (2016) 21-39.

[2] J.A. Cohen, A fit for purpose pedagogy: Online learning designing and teaching, Development and Learning in Organizations: An International Journal. 35, 4 (2021) 15-17.

[3] L.C. Yamagata-Lynch, Blending online asynchronous and synchronous learning, The International Review of Research in Open and Distributed Learning. 15, 2 (2014).

[4] M. Risner, S. Kumar, Graduate student perceptions of a globally networked course, Journal of Applied Research in Higher Education. 8, 3 (2016) 287-301.

[5] R. West, Needs analysis in language teaching, Language teaching. 27, 1 (1994) 1-19.

[6] S. Wdowik, Using a synchronous online learning environment to promote and enhance transactional engagement beyond the classroom, Campus-Wide Information System. 31, 3 (2014) 264-275.

[7] T.M. Galanti, C.K. Baker, K. Morrow-Leong, T. Kraft, Enriching TPACK in mathematics education: Using digital interactive notebooks in synchronous online learning environments, Interactive Technology and Smart Education. (2021).

[8] 14-day movement control order begins nationwide on Wednesday, New Straits Time, available at: https://www.nst.com.my/news/nation/2020/03/575180/14-day-movement-control-order-begins-nationwide-wednesday, accessed on 2 July 2013.

[9] Goformative, (2020), available at https://goformative.com/, accessed on 2 July 2021.

[10]   Plickers, (2013), available at https://www.plickers.com, accessed on 2 July 2021.

[11]   UNESCO   (2020).   Covid-19   impact   on   education,   available   at: https://en.unesco.org/covid19/ educationresponse, accessed on 2 July 2021.

[12]   T. Anderson, Toward a theory of online learning, in: T. Anderson (Eds.), Theory and Practice of Online Learning, Athabasca University Press, Athabasca, 2008, pp. 121-142.

[13]   Strunk Jr., E.B. White, The Elements of Style, third ed., Macmillan, New York, 1979..