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Proctoring Test: An Attempt to Improve Fairness during Online Assessment

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***Abstract*—** The recent pandemic has forced an overhaul to the overall approach towards education delivery in Malaysia in general, and UiTM specifically. One of the main aspects which have been modified is the evaluation of the taught materials. The current honour system implemented in UiTM, which requires every student to pledge their honesty during all evaluation processes, covers the legal aspect for the tertiary education provider. However, it does not guarantee that these pledges are upheld. Recent student work suggests that the pressure to provide the best answer during an online exam, tempts the students to violate their respective pledges. Hence, a proctored test is conducted to improve and ensure fairness among students during the online test session. In our recent approach, students were observed using video monitoring. Students were required to switch on the camera of their devices and share the entire screen during the online test. The proctored session was recorded and reviewed at a later time. Many issues and limitations were found in this first attempt, mainly due to internet connectivity issues, technical issues and device issues. Hence, improvement to the current proctoring method is suggested in this study. Improvements to the proctoring session include a two-device approach, live proctoring, using other platforms, and providing detailed guidance to avoid technical issues. While a live proctoring session with a set number of students monitored by an invigilator is best to ensure fairness, this approach is difficult to implement when dealing with a large number of students, and minimal invigilators.

Keywords—*proctor, online test, video monitoring, internet-based test, proctored test*

I. INTRODUCTION

COVID-19 is accelerating the global adoption of online learning and teaching at all levels of education. Although common learning and teaching transactions such as communicating and lecturing can be easily accomplished using various online learning technology, assessing learning outcomes through closed book examinations becomes more difficult. Due to this pandemic situation, most online courses have shifted their test or examination to internet-based testing (IBT) which poses a slew of concerns in terms of academic integrity and plagiarism (Hussein et al., 2020).

This online assessment is not a new thing, in fact, the IBT has been introduced since the mid-1990s, in which three types of online tests eventually emerged, namely unproctored internet-based testing (UIT), artificial intelligence (AI) proctored testing and live proctored testing (Bartram, 2009; Langenfeld, 2020). Despite the high-tech feature, efficiency, and convenience of UIT, experts have voiced concerns about the examinee identification, legitimacy of the scores and the security of the content (Tippins, 2009).

Studies have shown that score distribution tends to be higher in UIT than in proctored conditions (Chen et al., 2020; Martinelli et al., 2018; Steger et al., 2020; Watters et al., 2011). For example, a study by Martilleni et al showed that students learn to cheat by comparing the overlapping answers. Meanwhile, Watters et al stated that 46% of students were aware of other students receiving assistance with online quizzes or exams.

The precautions taken by an instructor to prevent cheating have a significant impact on a student's ability to cheat and the risk of being caught. Therefore, proctoring is the most common type of such precaution, in which test-takers are observed while taking a test to prevent prohibited communication and the use of prohibited materials. To reduce logistic burden, an online live proctored test (PT) is deemed feasible during COVID-19 for both students and faculty. Proctoring would be unnecessary in an ideal world, but there is substantial evidence that we do not live in such a world, moreover during these recent years. Hence, the researchers intend to explore something new to ensure fairness and security to all the students.

II. RATIONALE AND OBJECTIVES

When COVID-19 started in 2019, most teaching and learning activities have been shifted into online distance learning (ODL) where all classes, tutorials and quizzes are done on online platforms. UTI has been adopted into all courses from March 2019 till now as the researchers' department is still

new to online learning. Similar to the previous studies, most students have shown excellent results with the majority of them scoring relatively higher than previous batches.

As a result, justification was made and although the previous tests employed online platforms with flexible timing, it is undeniable that there was a tendency for students to cheat during the tests as there was no invigilation. Although the precaution steps taken by the researchers were setting random question sets for each student and a fixed time to complete the test, students still scored higher than the conventional paper-based test.

To reduce the events of cheating while justifying fairness to all students, the researchers tried the proctored testing for PHD211 code, i.e., aseptic dispensing and sterile pharmaceutical subjects to improve the online test.

III. METHODOLOGY

In this first PT for aseptic dispensing and sterile pharmaceutical subject, Ufuture, Microsoft Teams (MT) and Google Meet (GM) were employed as the platforms. A mock session was done on the 18th of May 2021 to ensure that students were ready and equipped with all the requirements before the real proctoring test, which was held on the 26th of May 2021. For the first step, students were required to turn on their webcam and start recording using GM followed by sharing their entire screen.

Next, the instructor made the test available in the Ufuture platform and pasted the link for the test in the MT chatbox. After the students finished answering the test and stopped the Google Meet, students received a link for the recorded video through their email. The link then was submitted by filling in a Google Form provided by the instructor via MT. The videos were reviewed by human proctors to identify any possible events of fraud or cheating.

IV. PROCTORING TEST AND ITS LIMITATION

To the best of the researchers' knowledge, there are three types of proctoring tests currently known. First, live proctoring, in which the test is run on a given date and time with virtual monitoring from a human proctor. Second, recorded proctoring that allows students to take a test at any time but the student needs to record test session, and the third is automated proctoring that does not require any human proctor to review or monitor the test, but a proctoring system will detect any instances of fraud or dishonesty during the test (Hussein et al., 2020).

In the present study, the researchers utilised a hybrid method that incorporated live and recorded proctoring because all the students took the scheduled test at a specific time and were required to record their camera images using the Google Meet recording feature. A simple step-by-step instruction was shared in the official WhatsApp group (Figure 1) together with the mock test video, which was uploaded on the YouTube platform as many students did not attend the session (Figure 2). Two students were proctored live by a lecturer due to issues identified earlier during the mock session (Figure 3).

The recorded PT videos were reviewed following the test. Although the test ended successfully, there were a lot of hiccups and errors that occurred during the test that were discussed later during the troubleshooting session between instructors.

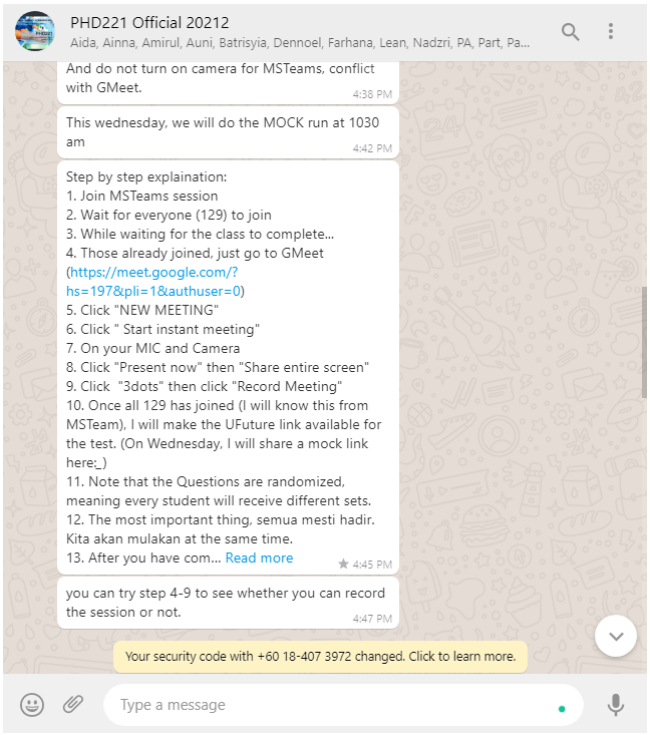

Fig.1. A brief step-by-step instruction was given via WhatsApp group

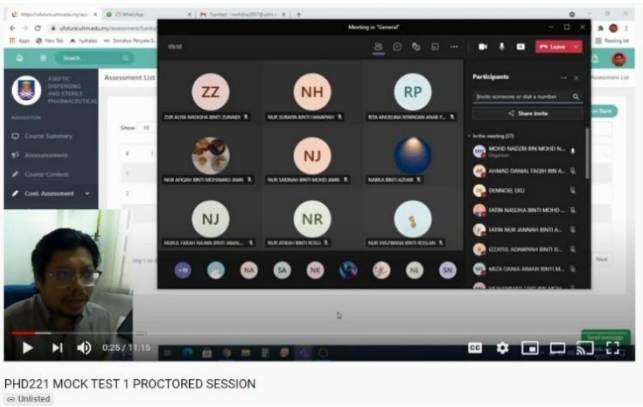

Fig.2. Recorded mock proctored test uploaded into YouTube

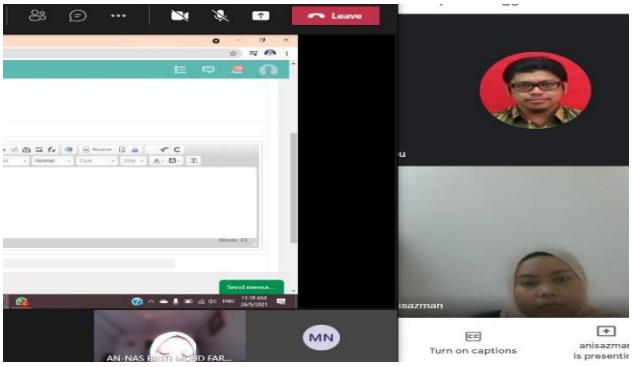

Fig.3. Live proctoring of two students.

A. Issues During Proctored Test

From the feedback's form received at the end of the proctored test, few issues were identified which can be divided into three categories: internet, device, and technical issues. Despite a brief survey conducted prior to the PT test and all the students have at least two devices and only one student who only used an iPad (Figure 4), the researchers did not expect the possibility of problems such as technical and devices issues occurred even though the internet issue is unavoidable.

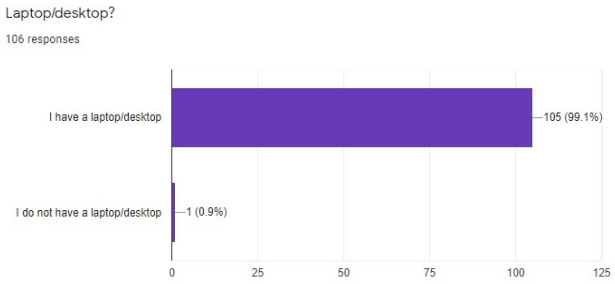

Fig.4. A brief survey on students' devices prior to proctored test

Out of 117 students, almost two-third (65%) of them stated that they had no issue during the proctored test. The video recording of the student who has no issues clearly showed a video length of 90 minutes (which is the whole duration of the test), the platform which the test is conducted as well as his behaviour and manner during the test *via* the camera (Figure 5). However, technical issues contributed to 15% followed by internet issues with 14% and the remaining 6% is due to device issues (Figure 6).

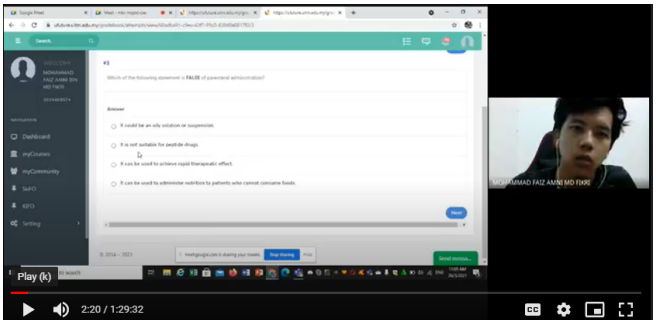

Fig.5. Video recording example of a student which had no issues following the proctoring approach.

The distribution of the issues varies by group but the technical issues occurred for all groups (Table 1), which could be improved in the next PT by improvising the steps and creating a proper guideline for all students. In the next PT, the researchers intend to make it compulsory for students to attend the mock session, watch the step-by-step videos, and read through a portable document format (PDF) guideline.

Among the technical issues that occurred during the proctored test were that students forgot to open their camera, shared their screen, and pressed the record button. An example of a student facing technical issues is shown in Figure 7. In this case, the student turned on her camera and recorded the session. However, upon opening UFuture to answer the test, she was not aware that the camera had automatically or accidentally turned off, hence not showing her face throughout the test. These are three issues that could be solved by simplifying the process of recording and by ensuring students to read and follow the guideline given. The unavoidable problems such as malfunctioning camera and laptop system failure might cause disruption, but these problems occurred only to three students.

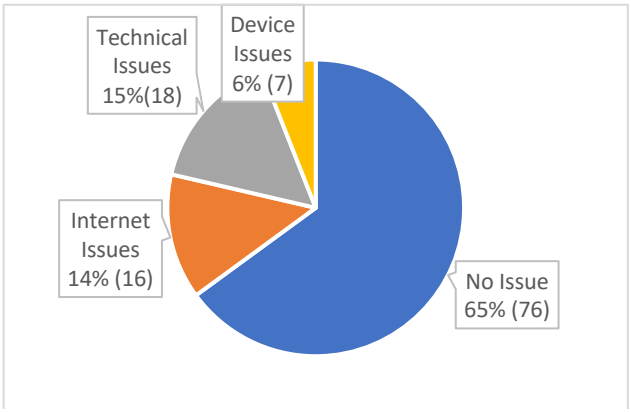

Fig.6. Issues found during proctored test

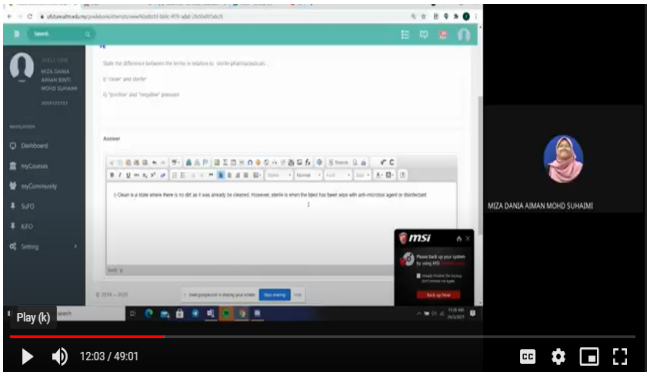

Fig.7. Video recording example of a student facing technical issues whereby the camera was not turned on.

Table 1: Distribution of issues according to groups.

Group	Issues			
	No Issue	*Internet*	*Technical*	*Device*
A1	5	3	2	1
A2	10	1	3	0

B1	2	4	1	2
B2	8	1	1	0
C1	8	1	3	0
C2	9	0	1	2
D1	6	2	2	1
D2	10	0	2	0
E1	11	2	1	0
E2	7	2	2	1
TOTAL	**76**	**16**	**18**	**7**

Most of the students were complaining about the unresponsive issue of the Ufuture platform. As an alternative, adaptation to other platforms must be taken into consideration. The internet issue is also one of the major barriers in doing this PT and this limitation has occurred many times as the internet connection in Malaysia is not very reliable. In terms of connectivity, there are disparities between urban and rural areas, with urban household internet penetration reaching 75.8 % while rural household internet penetration is only 24.2% (Hamizah et al., 2017).

These issues were experienced by our students, with some experiencing internet slowdown and poor connection, resulting in the recorded video or GM being halted. Around 52% of the students admitted that their internet connection is mediocre in the post-test survey.

B. Limitations and Suggestions for Proctored Test

Although there are significant advantages of PT such as it can reinforce academic integrity and improve exam security, it is undeniable that technology has disadvantages. Among the disadvantages are the cost of human proctors and the amount of time required for the human proctor to review the recorded videos. The most feasible option is to use live proctoring if our faculty has enough manpower to cater to the number of students enrolled in the course.

Therefore, the researchers offer a few suggestions to improve the next PT, which may provide a less complex process for the students to follow. By using two devices approach or live proctoring, students may save up their data and technical error could be avoided.

Table 2: Suggestions to improve proctored test

Suggestion	**Explanation**
Two devices approach	Using a smartphone, students will record their test and to reduce the data consumption, instead of using Ufuture the question will be given in PDF form. Students will need to write their answer on a blank paper snap the image of their answers before uploading their answer scripts via PC to the designated submission form either Ufuture or Google Form.
Live proctoring	Using Google Meet, students will be required to set their video at the lowest resolution however with an acceptable image view by the proctor. By using this method, students do not need to record the test and can save their data consumption. Students need to answer the online test on Canvas or Microsoft Team.
Switching to another platform for online test	Ufuture is a learning management system (LMS) currently being used by all UiTM students. Due to the high amount of usage, the system will usually crash or have technical errors due to the high number of users. Therefore, if the test needs to be run on an online platform, Canvas or Microsoft Team may be a better choice.
Technical suggestion	A step-by-step video and an instruction file will be sent. It is compulsory for students to read through the instruction given in the guideline file and view the video so that technical error can be avoided. Students are also required to attend the mock interview since based on the present study, less than 25% students attended it.

If live proctoring is adopted, a stricter protocol must be imposed, in which students need to verify the identification of the student who is taking the exam. PT is more suitable to be done for qualitative tests or subjective assignments which involve written essays.

UIT can still be used for quizzes and multiple-choice questions as it provides ease of marking, reduces the burden of instructors while encouraging students to conduct self-directing learning. There is no one size fits all in choosing which type of internet-based test as each of them come with pros and cons.

V. DISCUSSION

There are several suggestions to improve the quality of PT in terms of technical issues by having a remote proctor that can be reached via audio or chat whenever students are experiencing any problem related to the devices used during the PT. The remote proctor also can be contacted in case there is a problem with the internet connection so that the person is aware of the problem and can help in extending the time needed by the student if necessary. However, this might increase the cost of PT as one remote proctor can cater to only several numbers of students.

If cost is not a problem, faculty may opt for softwares such as the Software Secure system which has been proven effective

in solving academic integrity concerns without jeopardising students' performance. The software is very convenient to be used by students as they can download the system directly into their PC or laptop without having to go to any designated centre. The drawback of this system is it requires a high-speed internet connection and the expensive price of the camera (Cochran et al., 2010).

VI. CONCLUSION

Even though proctored tests are becoming more popular as a tool for assessing online learning, they must be supported on a continuous basis to evolve. To prevent academic disintegration, it is also necessary to have a transition from the current learning management system (LMS) to another online testing platform that includes proctoring software (Prisacari & Danielson, 2017). As the burden load of Ufuture system is currently very high and it cannot accommodate a synchronized proctored test, the researchers would like to suggest an asynchronized proctored test with a recorded video method for those subjects that are short on instructors. A controlled environment for online testing can also be achieved by having a stricter guideline on who can be the proctor to ensure security. The use of proctored tests demonstrated effectiveness in reducing cheating events. However, taking into consideration students' anxiety when facing internet, technical and devices issues during the proctored test, the authors would suggest a simple method to be adopted. In addition to this, the online distance learning experiences could be improved from time to time.

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