

## Short Communication

### Challenges of Academic Integrity during COVID-19 Pandemic

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#### Abstract

Traditionally, tests and exams are key components in continuous assessment to assess and monitor students' learning and academic progress. The standard pen-and-paper format is usually adopted in order to test students' understanding and their knowledge on the subject matter in closed-book and proctored tests or exams. To ensure the academic integrity and fairness, all students are arranged in either classrooms or exam halls to complete the tests or exams. In such a proctored environment, cheating can be greatly prevented among students.

In view of the outbreak of COVID-19, the University recommended teachers to facilitate and conduct online assessments and to avoid face-to-face examinations. To assess our students based on these criteria, we have revised our assessment schemes for our course, SBMS1432 Human Anatomy and Physiology II, accordingly, and replaced all on-campus assessments with online assessments or e-assessments. It was a big challenge as changing the assessment format into an online mode involved a tremendous amount of work and effort putting together to ensure the success of the systemic computer technology approach when compared with the traditional written assessment.

Here we discuss our assessment strategies applied to our course, and how we managed to maintain the academic integrity for all the online assessments in the course. We also shared our experiences on the pros and cons of each of the settings and invigilation methods. There was a total of two multiple-choice question online tests and one online exam in this course. We designed and conducted these online assessments in various formats, which include a) display all questions at a time, b) display questions one at a time, and c) randomize the order of questions or answers. Furthermore, we adopted three different combinations of invigilation methods including i) Blackboard with Zoom monitoring, ii) Lockdown Browser with Response Monitor plus Zoom monitoring, and iii) Lockdown Browser with Zoom monitoring, respectively, and tested the feasibility and the effectiveness of each of these different combinations, so as to minimize the chance of cheating while ensuring that these online assessments could serve as preventive measures against the potential spreading of COVID-19.

To conclude, it is important to ensure a stable internet connection on both ends (examiners/invigilators and students), provide clear and detailed instructions and guidelines to both students and invigilators with test trials in advance, and a smooth systemic invigilation

process. These online assessments in our course were conducted effectively without any misconduct or bad behaviors of students.

Keywords: academic integrity, cheating, e-assessment, remote invigilation, Lockdown Browser, Response Monitor and Zoom Monitoring

## **Introduction**

In view of the outbreak of COVID-19, the University recommended teachers to facilitate and conduct online assessments and to avoid face-to-face examinations. Traditionally, tests and examination are key components in continuous assessment to assess and monitor students' learning and academic progress (Taylor, 1994). The standard pen-and-paper format is usually adopted in order to test students' understanding and their knowledge on the subject matter in closed-book and proctored tests, assessments or examinations as a reflection of their learning progress in terms of grading (Maclellan, 2001). To ensure academic integrity and fairness, all students are arranged in either classrooms or exam halls to complete the tests or exams with physical invigilation. However, we had not had prior experiences in the set up and facilitation of full e-assessment and remote invigilation in this course in the past.

Regarding academic integrity, students are required to be educated and commit its value including honesty, trust, fairness, respect, and responsibility as whole person development for the intellectual honesty and competency of their career paths in the community (Fundamental, 1999). Even though students entirely understand the consequences of cheating and any other forms of unethical misconduct which may result in punishment and penalties, they may choose to commit such academic dishonesty especially cheating in tests or exam during their university life. Cheating remains a common problem in schools and universities including the problem of authentication (O'Malley & Roberts, 2012). Those students involved might think that cheating would not be caught easily and they might have experienced a lot of stress in study and choose to commit such misconduct in order to get a passing grade (Franklyn-Stokes & Newstead, 1995). Using computer technology for e-assessment in such a proctored environment, teachers must alter the assessment protocol to prevent students from any violation of academic integrity, i.e. the cheating behavior, to maintain the quality of education in our University (Buzzetto-More & Alade, 2006).

To assess our students based on the criteria recommended by the University, we revised our assessment schemes for our course, SBMS1432 Human Anatomy and Physiology II, accordingly, and replaced all on-campus assessments with online assessments. It was a big challenge as changing the assessment format into an online mode involved a tremendous amount of work and effort putting together to ensure the success of the systemic computer technology approach when compared with the traditional written assessment. We investigated on the feasibility and effectiveness of the revised assessment methods and how to maintain the academic integrity for the online assessments in the course, SBMS1432, Human Anatomy and Physiology II with a class size of about 70 students.

## Methodology

During the period from mid-February to mid-May in the second term, we set a total of two multiple-choice question online tests and one online examination in this course. We designed and conducted these online assessments in various formats using the Blackboard platform, which include:

- a) display all questions at a time,
- b) display questions one at a time (trial test only), and
- c) randomize the order of questions or answers and display all questions at a time.

Furthermore, we adopted three different combinations of remote invigilation methods including:

- i) Blackboard with Zoom monitoring,
- ii) Lockdown Browser with Response Monitor plus Zoom monitoring, and
- iii) Lockdown Browser with Zoom monitoring, respectively

## Results

We analyzed the various computer-based test formats and different combinations of remote invigilation methods of the online assessments and a summary is listed in Table 1 below.

Table 1: Comments and teachers' feedback for the display of the online tests and exams via Blackboard and various remote invigilation methods.

e-Assessment Display Format	Comments and Feedback	Remote Invigilation Method	Comments and Feedback
1. Display all questions at a time	<p>e-Assessment process was conducted smoothly with good WiFi connection at both the invigilators' and examiners' side and the students' side;</p> <p>Most students with good WiFi support completed the online test successfully, but a couple of students with poor WiFi connection showed "freeze" screens and cheating behaviors were therefore suspected.</p>	Blackboard with Zoom monitoring	<p>Synchronous remote invigilation;</p> <p>Teachers may give warnings to those students who are suspicious during the online test in the corresponding breakout rooms in Zoom meeting and invigilation can be conducted via webcam;</p> <p>Suspected cases were resolved with the help and support from ITSC as the students involved were proven to have unstable network connection during the time of "freeze" screens based on the data and analyses provided by ITSC.</p>

<p>2. Display questions one at a time (Trial test only)</p>	<p>e-Assessment process might have problems (e.g. “freeze” screens) when WiFi connection was poor.</p>	<p>Lockdown Browser with Response Monitor</p>	<p>Asynchronous remote invigilation; Response Monitor could alert teachers by “flagging” those suspected cases and classifying them as high, medium and low suspicious levels;  A few suspected cases were detected and further investigated;  Teachers could investigate the cases by watching the videos that captured students’ face and environments.</p>
<p>3. Display all questions at a time</p>	<p>e-Assessment process was conducted smoothly with good WiFi connection at both the invigilators’ and examiners’ side and the students’ side;  Most students with good WiFi support completed the online test successfully.</p>	<p>Lockdown Browser with Response Monitor plus Zoom monitoring</p>	<p>Synchronous remote invigilation;  Teachers may also give warnings to those students who are suspicious during the online test in the corresponding breakout rooms in Zoom meeting and invigilation can be additionally conducted via webcam;  A few students had problems with Response Monitor (e.g. failed to be detected by the camera or failed to complete the environment check process and thus were unable to enter the test) and an alternative invigilation method was arranged for them with Zoom monitoring;  No cheating or suspected cases observed.</p>
<p>4. Randomize the order of questions or answers and display all questions at a time</p>	<p>e-Assessment process was conducted smoothly with good WiFi connection at both the invigilators’ and examiners’ side and the students’ side;  All students completed the online exam successfully.</p>	<p>Lockdown Browser with Zoom monitoring</p>	<p>Synchronous remote invigilation;  Teachers may give warnings to those students who are suspicious during the online test in the corresponding breakout rooms in Zoom meeting and invigilation can be conducted via webcam;  No cheating or suspected cases observed.</p>

## Discussion

Due to the current COVID-19 pandemic situation with the restriction of social distancing, the online assessments must be conducted to replace face-to-face examinations till the end of Term 2. However, a number of research reported that students conducted cheating, plagiarized website content, or sought illegal help in the absence of a secured and validated invigilation system (Apampa, Wills, & Argles, 2010). Therefore, we investigated whether the combination of the video conferencing system (e.g. Zoom meeting), the Lockdown Browser system (e.g. Response Lockdown Browser) and/or the biometric system (e.g. Response Monitor) could be arranged in order to provide a secured and proctored environment for the online assessments in this course.

After having tested and analyzed the feasibility and the effectiveness of each of these formats and different combinations of invigilation methods of the online assessments, we found that there were pros and cons in any of these methods as discussed in Table 2 and Table 3.

Table 2: Comparing the pros and cons of various formats displayed in the online assessments:

Assessment Display Formats	Pros	Cons
1. Display all questions at a time	Allow students to go back easily to review and modify their answers.	Students may capture all questions and save for future use or any other purposes.
2. Display questions one at a time (Trial test only)	Can prevent students to capture all questions for future use or any other purposes.	Students cannot go back easily (or are prohibited) to review and modify their answers.
3. Randomize the order of questions or answers and display all questions at a time	Can prevent students to share their answers with one another.	Teachers may need time and/or have difficulties in tracking the questions or answers when students have questions or problems.

Table 3: Comparing the pros and cons of different combinations of invigilation methods of the online assessments:

Invigilation Methods	Pros	Cons
1. Blackboard with Zoom Monitoring	Invigilators may give warnings to those students who are suspicious during the online test in the corresponding breakout rooms in Zoom meeting and invigilation can be conducted via webcam.	Students may surf other browsers and contents in other computer folders during the online test;  Two teachers and one administrative staff as invigilators only – one in each of the breakout rooms in Zoom. May need extra support if problems arise.

2. Lockdown Browser with Response Monitor (Trial test only)	<p>Students cannot surf other browsers or contents in computer folders by implementing the Lockdown Browser in the online test;</p> <p>Any suspected students will receive warnings if he/she has some head/face movements while performing the online test as Response Monitor can detect any suspicious movements and the test processes are recorded down in videos and automatically classified as high, medium and low risk levels;</p> <p>No remote invigilation is required.</p>	<p>The test may be interrupted if the internet is unstable;</p> <p>Students may be blocked from attempting the online assessment if they cannot fulfill the pre-tasks (e.g. environment check, whole face detection and photo taking, etc.) required by the Response Monitor.</p>
3. Lockdown Browser with Response Monitor plus Zoom monitoring	<p>Students cannot surf other browsers or contents in computer folders by implementing the Lockdown Browser;</p> <p>Students are divided into small groups in breakout rooms in Zoom meeting and invigilation can be conducted via webcam;</p> <p>Any suspected student will be given warnings if he/she has some head/face movements while performing the online test as Response Monitor can detect any suspicious movements and the test processes are recorded down in videos and automatically classified as high, medium and low risk levels.</p>	<p>The test can be interrupted if the internet is unstable;</p> <p>Students may be interrupted by other students who use their microphones to communicate with the invigilators via Zoom when they encounter problems in the Lockdown Browser;</p> <p>Students may be blocked from attempting the online assessment if they cannot fulfill the pre-tasks (e.g. environment check, whole face detection and photo taking, etc.) required by the Response Monitor;</p> <p>Two teachers and one administrative staff as invigilators only – one in each of the breakout rooms in Zoom. May need extra support if problems arise.</p>
4. Lockdown Browser with Zoom monitoring	<p>Students are divided into small groups in the breakout rooms in Zoom meeting and invigilation can be conducted via webcam;</p> <p>Students cannot surf other browsers or contents in computer folders by using the Lockdown Browser;</p> <p>Three teachers and three administrative staffs as invigilators and examiners – one of each in each of the breakout rooms in Zoom with sufficient support throughout the online exam.</p>	<p>Students are instructed to use “Chat Room” function only to communicate with invigilators to avoid disturbance of other students during the online exam, but an emergency hotline will be given in case problems arise.</p>

Therefore, there is indeed no “magic” solutions to ensure the academic integrity of students. On the one hand, we trust our students. On the other hand, we ought to provide fair assessments and ensure academic integrity. We could only do our best to minimize the chance of cheating while ensuring that these online assessments could serve as appropriate assessments for our students and preventive measures against the potential spreading of COVID-19.

## **Conclusion**

To conclude, it is important to ensure a stable internet connection on both ends (examiners/invigilators and students), provide clear and detailed instructions and guidelines to both students and invigilators with test trials in advance, and a smooth systemic invigilation process. These online assessments in our course were conducted effectively without any misconduct or bad behaviors of students.

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