

Benefits and Drawbacks of Online Open-Book Examinations for Medical Students in the COVID-19 Pandemic

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The COVID-19 pandemic has disrupted the flow of events, particularly concerning examinations for medical students. One of the adaptations to the disruption caused by the pandemic has been the adoption of online open book examinations (OBEs).¹ As third-year medical students at King's College London, we have encountered similar circumstances with our examinations and hope to highlight the benefits and drawbacks of this format.

It is important to recognize the potential benefits of online open book examinations. For instance, some studies imply that student self-confidence and efficacy improves with this style of examination.² Given the current predicament we are in, medical students are under considerable pressure and are still expected to both provide and attain the necessary skill sets that are required for the respective stage. Thus, online OBEs would reduce the psychological burden on students and better prepare them for the challenges associated with the pandemic.

The pandemic has led to deficiencies in the core knowledge base of students. This has manifested in the form of cancellations of OSCEs and electives, which correlated with a national survey published in BMC Medical Education where 59.3% of final year medical students felt less prepared for Foundation Year 1.³ As a consequence of this fast-tracked graduation, students are being pushed early into positions of responsibility, despite the notable lack of training they have received this year. During this unprecedented crisis, it is imperative that we aim to provide a formal assessment of the curriculum. Online OBE is an appropriate format given the circumstances and acts as a satisfactory conduit for medical schools to meet educational standards set by the General Medical Council (GMC).

On the other hand, cheating is an evident drawback of online OBE.¹ This not only defeats the purpose of the exam to test the competency of students but can add further stress to individuals who are competing against each other. Normally, in-person exams are good deterrents against cheating. However, online based examinations are difficult to monitor, therefore cheating can go unchecked. From the perspective of medical ethics, cheating can be viewed as contradictory to the mantra of honesty and integrity. Despite this, we understand that ethics may not deter cheating online where invigilators are not privy to students' actions. Possible solutions to this issue could include a more robust system for online testing such as student authentication, tracking user inputs, or an indication of the consequences to cheating.

While *Jervis et al.* did not explicitly state their style of examination, another aspect to consider is the style of exam questions utilized in medical school. The multiple-choice question (MCQ) format has been widely adopted by medical schools, and in some cases also applied in

an online setting. For instance, the United States Medical Licensing Examination (USMLE) and the Medical Colleges Admissions Test (MCAT) both utilize a type of multiple-choice format known as single best answer questions (SBAQs). However, a study published in the BMJ has suggested that SBAQs can actually give a false impression of students' competency as compared to very short answer questions.⁴ An important question to raise is whether these SBAQs truly prepare students for their role in a clinical setting where multiple options are not always available to them.⁵ For this reason, it is worth investigating further whether SBAQs are the best method of examining medical students, especially in an online open book environment.

An alternative format to MCQs are short answer questions (SAQs). When correctly used, this style of questioning has proven to be popular amongst students and has been a beneficial assessment tool. It eliminates the cueing effect, therefore encouraging students to gain a deeper understanding of their learning material, as well as requiring the use of key skills such as critical thinking.^{5,6} Both students and examiners are able to grasp areas of weaknesses better with this method and can also provide a useful opportunity for giving and receiving feedback.⁵ However, though this format may initially seem ideal, like the MCQ structure, it too does not come without its own issues. Limitations such as the complicated production of questions and marking schemes, subjective marking and restriction of materials being tested via this method, have been highlighted.^{5,7} Regardless of whichever format is used in an examination, implementing robust guidelines related to the construction of questions that effectively assess one's ability can further engage higher cognitive skills among medical students, thereby improving competency.⁸

As with the style of question, it is important to assess the format of examination. The efficacy of open book examinations in comparison to closed book examinations (CBEs) has been investigated. Studies indicate that open book exams require higher cognition.⁹ Furthermore, open book examinations provide better reinforcement and recall for students, thus bolstering their learning schemas and memory recall.¹⁰ OBEs have also displayed potential as formative assessments, acting as sufficient predictors of exam performance in summative exams.⁹ In spite of these benefits, OBEs can potentially mask weaknesses in memory retrieval for students when feedback is concerned¹⁰; it is suggested that using OBEs in conjunction with CBEs can improve memory recall and knowledge retention in students.⁹

In summary, one can acknowledge that there are multiple factors to consider in relation to online OBEs for medical students. We recognize that there are caveats to providing an online open book exam but realize that providing an examination as opposed to fast tracking

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students may prove more beneficial in preparing them for frontline work in this crisis. We believe that investigation into the efficacy and practicalities of online OBEs will be needed for universities in the coming year.

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