

To support medical educators, faculty development leaders in Canadian medical schools (FacDevCanada) collaborated to curate medical education resources in three categories: guidance on pivoting to online curriculum (classroom and clinical) delivery; discipline-specific learning resources, and general resources (including basic science, Indigenous health, patient safety and leadership development resources).

## 2 | WHAT WAS TRIED?

The FacDevCanada developed PIVOTMeded (Partners in Virtual and Online Teaching in Medical Education), found at [pivotmeded.com](http://pivotmeded.com). Members of FacDevCanada crowdsourced resources in the three categories described above. Resource nominations were reviewed according to the following criteria: open accessibility; lack of evident bias; lack of (or minimal) personal information gathering, and relevance to the likely needs of learners and medical educators. A Google Site platform (Google LLC, Mountain View, CA, USA) was utilised in view of: (a) the platform's relative programming ease; (b) user navigation ease; (c) the platform's facilitation of responsive and dynamic displays compatible with computers, tablets and mobile devices, and (d) the curators' familiarity with the platform. Initially, one person reviewed nominations from contributors and sought materials for inclusion. Two additional medical educators with adeptness in curating resources and configuring the website became co-editors. Two administrative staff supported resource posting and website maintenance. Each resource's post includes a link and a customised annotation.

## 3 | WHAT LESSONS WERE LEARNED?

PIVOTMeded launched on 17 March 2020. By 28 April (at the time of writing), the site had 2007 unique users. This indicates a high rate of utilisation; in comparison, a well-established open-access resource for family medicine educators, 'learnfm.ca',<sup>1</sup> had 1265 unique users in the same

6 weeks. To date, we have curated 84 open-access resources, which support medical educators to pivot curricula online. Content comes from a variety of authors and multiple countries. Users come from 74 countries; the largest cohorts are from Canada (48%) and the USA (24%), followed by Portugal, the United Kingdom and Mexico (3% each).

Half of website users visited directly (eg, by typing 'pivotmeded.com' into a browser), which suggests awareness of this website by name. One-third of users came through social media links and posts by individuals and organisations including the Association for Medical Education in Europe, the Royal College of Physicians and Surgeons of Canada, the College of Family Physicians of Canada, the Harvard Macy Institute, and faculty development units (all utilisation data from Google Analytics [Google LLC, Mountain View, CA, USA]).

Key lessons learned refer to: (a) the value of an easily memorable name and URL (uniform resource locator) for this kind of project; (b) the importance of curating site content selectively rather than providing links to a large number of resources (as evidenced by spontaneous feedback and tweets about our project); (c) the need to have multiple people collaborate on this type of project (to ensure high-quality curation within a tight time frame), and (d) the value of tweets, posts and emails from established individuals and organisations in building awareness. Beyond COVID-19, [pivotmeded.com](http://pivotmeded.com) will continue to curate open-access materials supporting online medical education.

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# High-stakes, remote-access, open-book examinations

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## 1 | WHAT PROBLEMS WERE ADDRESSED?

The coronavirus disease 2019 (COVID-19) pandemic has led to unprecedented challenges in medical school assessments. Final-year

high-stakes assessments have classically used closed-book examinations (CBEs). Alternative methods of assessment such as open-book examinations (OBEs) are emerging but are not routinely used in final-year medical school examinations. The OBE encourages the

use of problem-solving skills more akin to those used in real life. There are currently limited data comparing OBEs with CBEs. A systematic review showed there was insufficient evidence to support the exclusive use of either CBEs or OBEs in assessment; however, the studies conducted to date have rarely looked at high-stakes assessments as a result of concerns about the validity of OBEs.<sup>1</sup>

## 2 | WHAT WAS TRIED?

In view of the restrictions put in place secondary to COVID-19, we opted to use the two final-year applied knowledge tests that had been scheduled to be used in CBEs as remote-access OBEs. Candidates were able to access the examinations from anywhere in the world using any device with Internet access via an online platform. The papers were constructed from the United Kingdom Medical Schools Council bank of single best answer examination questions, which assess the candidate's ability to integrate clinical reasoning and decision-making skills. As the assessment aimed to assess the synthesis of knowledge rather than factual recall, there was no theoretical advantage to sitting the examination in an OBE rather than a CBE format. The psychometric analyses of the OBEs were compared with those of the written CBEs for the last 3 years. The OBEs were of the same duration as the previous CBEs. Only answers submitted to the online platform during the approved time frame of the OBEs were accepted. The order of the items in the OBEs was randomised for all candidates to mitigate against the risk for conferral.

## 3 | WHAT LESSONS WERE LEARNED?

The median mark for the OBEs was identical to the median mark for the last 3 years of CBEs. The average discrimination of the OBEs was

comparable with that of the CBEs when measured by mean point biserial. The number of distinctions and merits awarded were similar to those of previous years. Furthermore, the Cronbach's alpha for the OBEs remained above 0.80, demonstrating good reliability that was similar to that of the CBEs over the last 3 years.

To the best of our knowledge, this is the first time that a final-year, high-stakes medical school examination has been administered both remotely and using an open-book format. Our results suggest that concerns about the use of OBEs in high-stakes assessments may be unfounded and that remote OBEs present a viable alternative to traditional CBEs if the questions appropriately assess the integration and synthesis of knowledge rather than factual recall. We propose that a combination of remote-access online OBEs and proctored CBEs might be used in the future to strike a balance between the authenticity and validity of assessment programmes. Further studies should examine the value of online proctoring in high-stakes OBEs.

Delivering the OBEs effectively required having the appropriate people, platform and processes in place. A dedicated team was available throughout the examinations to address any issues encountered by students. We developed processes for addressing common problems such as Internet connectivity issues. Having an appropriate online assessment platform was also crucial. Candidate feedback was positive and accepting of the changes to expected assessments in light of the unprecedented circumstances.

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