

Teaching and learning during the COVID-19 pandemic: Perspectives of medical students in Singapore

Dear Editor,

The coronavirus disease 2019 (COVID-19) pandemic has resulted in many changes to medical education, including the site and mode of teaching, conducting of examinations and a shift towards prioritising the mastery of clinical skills relevant to infection control. Hence, Ng et al.'s suggestions on how to maximise learning in preparation for the final year medical school examinations piqued our interest.¹ As the pandemic becomes endemic, some of these changes emphasised in the delivery of education are likely to stay, perhaps longer than expected when they were first implemented as interim measures at the height of the pandemic. Furthermore, these changes have impacted medical students at all levels, including students who had begun their educational journeys during the pandemic itself ("COVID-generation" medical students, as we identify ourselves). In this letter, we propose additional strategies that may be of utility to younger medical students and their educators (Fig. 1).

Acknowledging the limitations posed by the pandemic and their conflict with the Oslerian method of bedside teaching, Ng et al.¹ recommend making the most of every clinical encounter by committing fully to patient care and comprehensive clinical examination. Since the era of Sir William Osler, however, technology has advanced

remarkably, allowing us to bring the patient, virtual or real, to the classroom. Our school, Lee Kong Chian School of Medicine, a joint medical school of 2 universities, has invested in state-of-the-art tools that have allowed the continuation of clinical skills practice sessions in spite of restrictions to clinical placements. For instance, the AURiS Stethoscope (Echo Healthcare, Sarasota, US), a sensor-driven simulation stethoscope, allows students to appreciate and recognise subtle acoustic cues in the safe environment of a mannikin or a patient actor. At our partner institution, Imperial College London, the HoloLens headset (Microsoft Corp, Redmond, US) is being pioneered to reduce the crowding of students at the bedside.² The headset is a pair of augmented reality goggles with the capability of generating holographic projections of bedside clinical findings and radiological images. While simulation-based teaching is unlikely to replace the richness of in-person clinical clerkships, results of a review by Okuda et al. show that it leads to clinical improvement in specific scenarios and comfort in procedures.³ In addition to clinical skills, ethical decision-making and professionalism may also be instilled through simulated scenarios that pose ethical dilemmas to students.⁴ Having tested and optimised these tools for education enables educators to shift to virtual or online objective structured clinical examinations, which have been successfully implemented at several institutions, with a review showing moderate agreement between remote assessments and conventional on-site assessments.⁵

The pandemic has also driven the adoption of innovative technologies in the clinical setting. For example, a prospective study at Imperial College London found that the use of the HoloLens headset among staff caring for COVID-19 patients reduced the depletion of personal protective equipment and minimised staff exposure to infection.⁶ As telemedicine becomes more widely adopted, it is imperative that students leverage this opportunity to become proficient in this emerging mode of patient interaction, and appreciate the nuances of and subtle differences between physical and virtual consultation modalities.

New technologies have also been adopted in the pre-clinical phase of our training. In 2021, an iPad (Apple Inc) application comprising 3D models of specimens in the anatomy laboratory was developed in our institution to allow students to study anatomy specimens remotely with remarkable precision. Students can access this

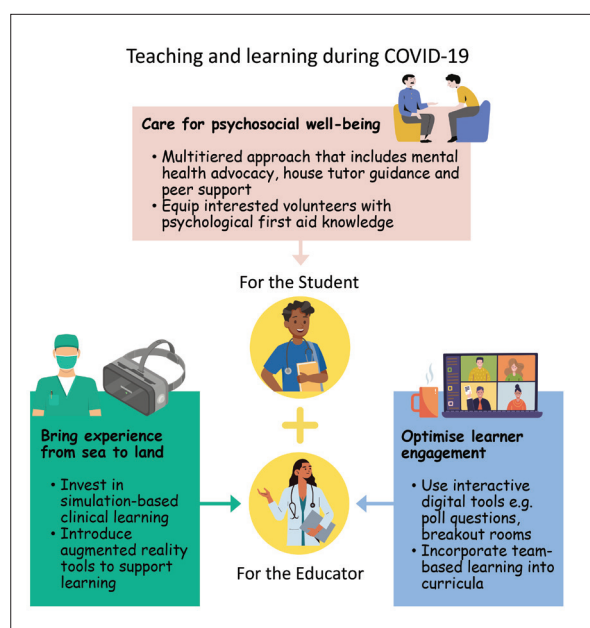


Fig. 1. Recommendations for teaching and learning during COVID-19 (created with Canva).

application from any location and at any time, providing a great sense of flexibility in revision outside the scheduled curriculum. The built-in labelling has also reduced reliance on supplementary faculty consults.

While the pandemic has presented unique opportunities for learning, it has also posed challenges to psychosocial well-being, through isolation (physical and social) and the pressure of self-directed learning. We acknowledge recent data that link online learning with lower emotional engagement,⁷ and the latter's significant positive relationship with academic performance among learners.⁸ These findings may be explained by the lack of student-lecturer and student-student social interaction within the online classroom. Take for example the small talk and side-to-side discussion between students in the traditional classroom, which seem to disappear when the same lecture is delivered in a webinar format.

As student-raised questions improve learning and fill knowledge gaps,⁹ we echo Ng et al.'s suggestion for learners to prepare questions prior to home-based learning sessions. However, in our experience, students are less likely to speak in front of an entire cohort of students compared to small-scale conversations between classmates in physical vicinity. To tackle this increased barrier to entry, we recommend that educators leverage interactive features such as camera usage, poll questions, question-and-answer platforms, breakout room functions and open annotation tools to promote constructive question-asking behaviour and enhance learning. At our school, team-based learning (TBL) was implemented even before the pandemic. Our experience is that TBL primes students to be curious learners and fulfils their psychological needs for autonomy and interaction. Hence, we support the restructuring of academic curricula to incorporate TBL in addition to didactic teaching.

Moreover, we recommend safety nets for psychological well-being through ground-up initiatives. It is vital to dispel stereotypes surrounding mental health conditions, which discourage youth-in-need from reaching out for help and support.¹⁰ This year, our student-run medical society invited professional coaches to inculcate psychological first aid skills to volunteer peer helpers. The society also created postcards with psychological aid information. Each student in our school is also paired with a personal house tutor for guidance and mentorship over the 5-year undergraduate medical education journey. With a multitiered support system, students have many avenues to seek help. Our hope is that no student gets left behind.

Ultimately, recent changes to medical education have inspired us to take ownership of our educational journeys as active participants, peers and advocates, which we realise in retrospect is the heart of a university education.

It is a paradox indeed, that the pandemic has urged a shift from instructor-led pedagogical approaches to student-driven andragogical solutions. To facilitate this shift, we have reflected upon our unique experiences as “COVID-generation” medical students and dissected out recommendations for students and educators. We hope that these recommendations will shape various aspects of medical education to better prepare medical students for a COVID-endemic future.

Acknowledgements

The authors would like to express their sincere thanks to their faculty and peers from Lee Kong Chian School of Medicine for their support throughout the COVID-19 pandemic, which has become endemic.

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