Using technology to bridge the gap for remote healthcare education during COVID-19

The COVID-19 pandemic has initiated profound changes to the delivery of healthcare education. With traditional in-person instruction, learners are at risk of acquiring and spreading the virus to others. Therefore, alternative strategies for immediate, effective and safe continuation of healthcare education are needed. To support this transition, technologies previously considered for the sake of novelty may now be reconsidered as technologies for the sake of necessity. Rather than reinventing content and setting up individual infrastructure for delivery, we can capitalise on existing momentum in innovation to facilitate remote education while saving resources for other urgent efforts. Incorporating fidelity in healthcare education will allow us to effectively continue training and assessment of healthcare professionals through safe-distanced approaches.

TECHNOLOGY CAN HELP FACILITATE REMOTE HEALTHCARE EDUCATION

Technology has played an invaluable role in our response to the diverse challenges presented by the COVID-19 pandemic. For example, as demand temporarily outstripped existing production capacities, 3D-printing quickly scaled and addressed widespread shortages of face shields or nasal swabs on commercial and grassroots levels. Videoconferencing platforms were adapted for webinars, student lectures or remote doctor consultations. Similarly, fidelity enhanced learning is primed to support healthcare education during COVID-19 for students and advanced healthcare professionals alike. In anticipation of a potential second wave of COVID-19, medical schools have chosen remote online instruction for the fall semester and possibly beyond, which will result in medical schools using considerable resources to hastily develop their own online content. This fragmented approach is inefficient, redundant and risks the overall lower quality of content. Educational technologies such as massive open online courses (MOOCs) and virtual reality, once considered impractical and cumbersome, might offer a pragmatic solution for remote continuation of healthcare education during these unprecedented times.

MOOCs use technology to facilitate remote delivery of online content, including filmed lectures and interactive online forums, presenting a resource-efficient solution to transition to remote learning. MOOCs enable learners to continue small-group problem-based learning using online forums and videoconferencing, as well as provide infrastructure for secure delivery of assessments with immediate feedback. Collective development and delivery of pre-clerkship curriculum via MOOCs is practical, allowing institutional resources to be efficiently diverted towards helping students who require support during this transition.

In addition to didactic instruction, simulation training and assessment is widely used in healthcare for licensure and continuing certification. Traditional healthcare simulation faced specific challenges long before the current public health crisis, criticised for being resource intensive as simulation centres are expensive to build, equip, staff and maintain. In addition, simulation training must now also adapt to fulfil learning objectives while maintaining safe physical distance.

At the onset of the COVID-19 pandemic, many simulation centres quickly pivoted towards tele-simulation, which translates traditional simulation into a virtual format. Learners manage simulated patients or manikins controlled by simulation operation specialists via videoconference instead. Tele-simulation presents a remote alternative to in-person simulation, especially to target specific learning objectives. However, tele-simulation retains the same challenges as traditional simulation, requiring expensive equipment, personnel and available only at predesignated times.

Alternatively, there are hundreds of immersive healthcare simulation applications, e-learning resources, low-fidelity digital simulators and virtual reality programmes to learn and practice a wide range of scenarios from resuscitation to radiology. These interactive and engaging technologies require little or no set-up by instructors and are endorsed by international healthcare simulation societies as a replacement for medical and nursing students to complete their clinical hours during COVID-19. Furthermore, many educational technologies offer immediate and objective individual feedback for learners, more comprehensively and detailed than what is usually possible during in-person group instruction. Informative feedback is a core component of competency-based learning, and essential to guide learners’ deliberate practice. Importantly, recent developments in virtual reality have finally allowed the medium to catch up to demanding clinical teaching expectations of a reliable, responsive and realistic immersive learning experience.

ADDRESSING BARRIERS TOWARDS ACCESSING TECHNOLOGY

After COVID-19 prompted our transition to an even more online-connected world, we witnessed the blatant and systematic inequalities our increasing reliance on technology has revealed. In addition to potential issues surrounding security, privacy and data breaches, we have continued to move full speed ahead towards comprehensive digitisation of our lives, regardless of these challenges. Endorsing technology-centred medical education may bias against those who cannot readily access necessary hardware, software and high-speed internet. However, by leveraging existing turnkey technologies like MOOCs, virtual simulation and other electronic learning resources, individual institutions have the flexibility to divert resources which would have been otherwise used to create original online content towards providing support for learners who are disadvantaged against thriving in an online education setting. These changes may also bias against those who are not as comfortable with technology, or simply do not engage with this format of education. However, by selecting, vetting and adopting existing high-quality resources, instructors are spared from potentially sacrificing the quality of instruction while they muddle through the transition to a potentially unfamiliar online format. As we move together into the unknown future, it is imperative that education continues to strive to be inclusive towards all of its learners and instructors.

Interruptions to healthcare education represent a dangerous and potentially underestimated threat to patient safety and outcomes. To ensure that our healthcare systems are able to respond to the increasing needs of our communities, fidelity enhanced learning will help support healthcare learners during COVID-19, and possibly for years to come. Inevitably, these adaptable and creative technologies will be balanced with existing instructional approaches, allowing us to shape our new normal with a perspective of innovation, preparedness and optimism.

LETTER
Simran Ghoman,1 Maria Cutumisu,2 Georg Marcus Schmölzer1

1Department of Pediatrics, Faculty of Medicine and Dentistry, University of Alberta, Edmonton, Canada
2Centre for Research in Applied Measurement and Evaluation, Department of Educational Psychology, Faculty of Education, University of Alberta, Edmonton, Canada

Correspondence to Georg Marcus Schmölzer, Centre for the Studies of Asphyxia and Resuscitation, Neonatal Research Unit, Royal Alexandra Hospital, 10240 Kingsway Avenue NW, Edmonton, Alberta T5H 3V9, Canada; georg.schmoelzer@me.com

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REFERENCES
1 Society for Simulation in Healthcare. Position statement on use of virtual simulation during the pandemic. Published 30 March 2020. Available https://www.ssih.org/Home/ctl/ArticleView/mid/54750/articleId/2238/COVID-19-SSHINACSL-Position-Statement-on-Use-of-Virtual-Simulation-during-the-Pandemic (accessed 2 Apr 2020)
2 Emanuel EJ. The inevitable reimagining of medical education. JAMA.
3 Beaunoyer E, Dupéré S, Guitton MJ. COVID-19 and digital inequalities: reciprocal impacts and mitigation strategies. Comput Hum Behav 2020;111:106424.