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MEDICAL AND HEALTH PROFESSIONS EDUCATION

PERSONAL VIEW

Ensuring continuity of education during a pandemic—Experience from an entry-level physiotherapy programme

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I. INTRODUCTION

Coronavirus Disease 2019 (COVID-19), which requires no introduction, is transmitted through droplet transmission and is highly contagious (del Rio & Malani, 2020; Guan et al., 2020; Sohrabi et al., 2020). After it was declared a pandemic on 11 March 2020, the Singapore government implemented a "circuit breaker" period, or partial lockdown, on 7 April 2020 (Ministry of Health, 2020). In spite of numerous initiatives for faculty to embrace technology-enhanced learning over the past years, it was a steep take-off for most programmes at institutes of higher learning. This short personal view intends to share our experience from the sole entry-level physiotherapy programme in Singapore.

II. ONLINE LESSONS

During the preliminary stages of the pandemic, faculty proactively switched all face-to-face lectures and tutorials that involved 50 or more students to online lessons. As the academic timetable had already been established, there was little to no disruption to lesson scheduling. Synchronous methods of e-learning occurred via video-conferencing software, such as Zoom and Microsoft Teams, and was used for lectures and tutorials. The virtual classroom allowed live interaction, and was especially useful for small group case study discussions when students were allocated into breakout rooms. Asynchronous methods of e-learning took the form of pre-recorded lectures, predominantly via Microsoft

PowerPoint or iSpring, or recordings of live lectures. This promoted ubiquitous learning where the learner could learn at a time and place of their convenience, and which garnered positive feedback of over 60% from an unofficial survey of students. One student commented that "the online lectures were very useful, especially those that are pre-recorded so [that we] won't miss out on what the professor is saying".

While the move to online teaching was essential, it certainly had its challenges. Many of the faculty were not proficient with the advanced features of Zoom, resulting in initial hiccups in organising multiple lessons for over a hundred students. For example, being unfamiliar with the software, lack of stable Wi-Fi off-campus, and insufficient software accounts were some teething problems. Training workshops for the use of Zoom were initially planned prior to the pandemic, however these could not be realised due to sudden time constraints. Training and troubleshooting manuals were thus made available for all educators and students via an online portal, in addition to a phone helpdesk for further assistance. Furthermore, the other challenge we faced was the short amount of time available to produce and upload enough e-learning material, such as filming of teaching videos, organising self-directed packages, and modifying lecture material to suit live online or pre-recorded delivery. Students also faced challenges due to the multiple modules they were enrolled in during the academic term, having to keep track of up to five

randomly-generated meeting identification numbers (ID) each day. The use of one meeting ID per module, set at a regular occurrence, was implemented to alleviate this burden.

One concern we had was over "Zoom fatigue" and general lack of engagement from students. One strategy we implemented was to insert stretching exercises and a rest period after each hour of lesson. Quiz apps, such as Kahoot and Socrative, was also used to poll content-specific questions, to promote student engagement and active participation. These strategies helped to sustain attention span and was deemed successful as reflected by near-100% participant responses and structured module feedback. One student commented that she was "quite happy that we can still continue lessons, although it is modified…and not have to worry about the uncertainty of lessons being cancelled".

III. BLENDED FORMAT FOR PRACTICAL LESSONS

Physiotherapy students are highly dependent on skills-based learning and hands-on practice, which equips them with competencies to treat real patients in the clinical setting. Conducting practical lessons was met with additional challenges due to the strict rules on safe distancing, restrictions on human movement, and limits on class size and frequency. We approached this using video-augmented practicum. A pre-recorded demonstration of physiotherapy skills was disseminated to students via the learning management system (LMS) before each hands-on lesson. This strategy was useful for teaching of skills which require physical space and simulation, such as performing auscultation, manual handling, patient positioning and transfers, airway suctioning, or walking tests. To illustrate, in the teaching of cardiopulmonary exercise testing (CPET), we divided the content into several components: an introductory video and stepwise guide on how to conduct the exercise test; a self-directed learning package on CPET results interpretation with self-evaluation; and a hands-on practical session of performing the full CPET with peers in the human performance laboratory on university campus. Faculty then utilised the face-to-face practical sessions to provide critical feedback and correct students' techniques. Students were further able to consult with faculty and receive real-time feedback on their performance of skills via video-conferencing, if requested.

IV. CONDUCTING ASSESSMENT DURING A PANDEMIC

Following the declaration of the pandemic, our programme converted all physical paper examinations to online examinations. Commercially available remote proctoring systems, such as Respondus® and Proctortrack by Verificient, allowed us to mitigate cheating in the virtual environment. The three-point identity check in these systems ensures that authentication is vigorous, while the manual or artificial intelligence proctoring technology enables remote invigilation. 'Browser lock' disables platform-sharing functions such as screen-sharing or remote desktop control that would otherwise allow a proxy to take the examination.

V. ONLINE VIVA VOCE

To assess the "thinking" portion of patient management, we conducted online viva examinations in lieu of physical examinations. To prepare for the large volume of online assessments, we underwent several trials of Zoom, tinkering with features such as the waiting room and breakout rooms. These trials enabled us to familiarise ourselves with the logistic flow, as well as troubleshoot issues such as interruptions during entrance and exit, transfer of host rights, and audio-visual glitches. Administrative coordinators were designated to manually allocate students into the breakout rooms, which was preferred over pre-allocation in order to reduce errors. In anticipation of potential lapses, we used a separate chat messaging software for assessors and coordinators to flag and resolve technical issues. A spreadsheet was used to schedule detailed information about switchover times and room allocation for each candidate, ensuring smooth transition from main room to breakout rooms, as well as to resolve any scheduling conflict. Advance dissemination of the examination schedule and login details was crucial in minimising technical issues. Marking rubrics with clear descriptors were developed, with time set aside for pre- and post-viva calibration amongst assessors. Students had access to the marking rubrics, and a mock run was held to familiarise students with the logistic flow of the assessment. With these preparations in place, we were able to conduct online viva examinations for over a hundred students successfully and efficiently.

VI. VIDEO SUBMISSION FOR SKILLS ASSESSMENT

To assess the "doing" portion of patient management, we utilised video-based assessment. The evidence for video-based assessment in healthcare education is at its infancy, with most evidence evolving around the idea of video-based peer feedback, assessment for communication skills, or the assessment of surgical skills. We tested this method in a final-year elective module that required learners to demonstrate manually-assisted cough—a skill that would traditionally be performed in front of an assessor and marked against a checklist. Casually dubbed the 'open-book practical

assessment', faculty listed detailed requirements of the assessment, which gave students time to practise skills before recording and submission. The use of student-generated video assessment (mean marks 77.84 ± 4.59, class size of 30) to replace traditional skills assessment (mean marks 80 ± 3.88, class size of 25) was considered a success as there was no significant difference in the pass-fail ratio between the affected cohort and prior cohorts. In addition, we observed some unintentional benefits, such as the demonstration of digital capability and communication skills by the students, while aligned with the learning and assessment objectives – a finding consistent with the available literature (Walters et al., 2015).

The assessment of skills may also be performed real-time through video-conferencing. However, the logistics and time required to assess such a large number of students within a relatively short timeframe made it a task too immense for us to undertake. Nonetheless, with adequate manpower and resources, it could undoubtedly be feasible, perhaps even superior, as a form of video assessment.

VII. CONCLUSION

The unprecedented COVID-19 pandemic has forced us to refashion pedagogical approaches to our curriculum and to embrace positive changes for the future of physiotherapy education. Utilising aforementioned strategies, we were able to deliver our teaching effectively and almost entirely virtually, despite initial hiccups. Pragmatically, it would be ideal to formally evaluate the impact of a virtual curriculum on established learning outcomes, as well as the general acceptability of such a programme for both students and faculty. In the event of future similar state of emergencies, it may even be prudent to develop a blueprint of and stepwise approach to pedagogy escalating along the spectrum of face-to-face methods versus virtual technology. We hope that this short personal view will provide other educators with some solutions to coping with the challenges of teaching surrounding this exigent time.

Notes on Contributors

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Declaration of Interest

The authors declare no form of possible conflicts of interest, including financial, consultant, institutional and other relationships that might lead to bias or a conflict of interest.

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