eLearning in Physical Therapy: Lessons Learned From Transitioning a Professional Education Program to Full eLearning During the COVID-19 Pandemic

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Objective. The objectives of this cross-sectional qualitative study were to explore the perspectives of students enrolled in one physical therapist undergraduate education program in Australia about their experience with transitioning to full eLearning and student recommendations to improve the learning experience during the COVID-19 pandemic.

Methods. Seven focus groups with 28 undergraduate physical therapist students were conducted following the transitioning to full eLearning as a result of strict physical distancing measures. Focus group questions explored the students' experiences of the transition from face-to-face to full eLearning approach and the students' recommendations for improving future eLearning experiences. Data were analyzed using inductive thematic analysis.

Results. The 3 themes identified were: (1) students presenting heightened negative feelings such as anxiety, stress, and reduced motivation to study; (2) students continuing to value the face-to-face learning, as it provided social support and facilitated feedback from peers and tutors; (3) student recommendations for eLearning included having online lectures and supplementary videos but face-to-face practical classes and developing healthy learning habits such as scheduled times for studying, exercise, and other activities that regulate stress.

Conclusions. The transition to a full eLearning approach in an undergraduate physical therapist education program during the COVID-19 pandemic revealed that students had heightened negative emotions due to the pandemic. Students valued face-to-face practical classes to learn and receive social support from peers and

tutors. Student recommendations to future eLearning suggested changes to curriculum development geared toward a greater blended approach to learning. Blended learning may include using online lectures instead of face-to-face lectures and online resources to supplement student learning of practical skills.

Impact. As higher education moves toward a more blended approach, lessons learned from this study can help educators design future physical therapist education programs. The findings can also assist programs in delivering a full eLearning approach as the COVID-19 pandemic continues.

Universities worldwide have rapidly transitioned to a full eLearning approach during the COVID-19 (SARS-CoV-2) pandemic due to social distancing protocols.[1] A full or complete eLearning approach is defined as “learning with no face-to-face component, that relies entirely on the use of eLearning technology and techniques for the delivery of learning”[2(p4)]. For many universities, the transition to full eLearning for all education programs was unprecedented; however, eLearning has already been established as an integral part of 21st century education.[3] eLearning merges pedagogy with computer science and communication technology and is constantly evolving due to advances in each field.[3] Two systematic reviews involving undergraduate health professions students have found that eLearning is associated with positive educational outcomes, including improved knowledge, skills and satisfaction.[2,4]

Regardless of the program delivery modality, physical therapist professional education programs require a combination of effective communication skills, theoretical and conceptual knowledge, and clinical skills including manual and instrumental skills.[5] Previous studies have found eLearning in combination with face-to-face learning is an effective supplementary tool in reinforcing knowledge and skills acquisition in physical therapist education programs.[5-9] Students in these studies reported satisfaction with the flexibility, accessibility, and interactivity associated with eLearning. However, they also described feeling less motivated and more isolated due to fewer opportunities to communicate with instructors and peers [5].

In response to the COVID-19 pandemic, many physical therapist education programs temporarily moved to a full eLearning approach. This provides a unique

opportunity to explore physical therapist students' perceptions of full eLearning. Understanding these perceptions can inform future eLearning in physical therapy and other health professional programs in which there are combinations of theoretical and practical learning activities, such as occupational therapy, speech therapy, and nursing. Therefore, the aim of this study was to explore the perspectives of students enrolled in one undergraduate physical therapist education program in Australia about their early experience with full eLearning during the COVID-19 pandemic.

Methods

Study design

A cross-sectional qualitative study was conducted between the April 27 and May 15, 2020. Focus groups were selected as the method of data collection as they allowed participants to express their perspectives and build on each other's experiences.[10] Ethical approval was granted by the Human Research Committee at Curtin University (HRE2020-0182). This paper follows the Consolidated Criteria for Reporting Qualitative Research (COREQ-32).[11]

Study context

This study took place at one university within Australia in which physical therapy is offered as an education program. Prior to the COVID-19 pandemic, courses generally consisted of 1 face-to-face didactic lecture and 1 or 2 face-to-face practical classes (eg, clinical skills or laboratory classes) per week. Lectures were approximately 2 hours long and conducted in a tiered lecture theater with a capacity

of up to 200 students. Although students were strongly encouraged to attend face-to-face lectures, all lectures were recorded and live streamed online. Students had the option of watching lectures online live or at a later time. Practical classes were 2 to 4 hours in length and involved groups of 25 to 30 students in laboratory classes. Practical classes were supervised by 1 or 2 tutors per group and involved demonstrations, practice of clinical skills, and the use of specific equipment. Practical classes were not recorded, but some laboratory classes had supplementary audio-visual resources to assist with student learning. Examples of audiovisual resources were electronic guides embedded with videos demonstrating clinical skills, patient-therapist interactions, and case studies. Attendance at practical classes was compulsory and attendances were recorded.

As a consequence of COVID-19, on March 30, 2020, this institution temporarily moved to full eLearning. Lectures and practical classes that were previously delivered face-to-face were shifted to fully online in the same scheduled time slots. Lectures were delivered through Echo360 video platform (Echo360 Inc, Reston, Virginia, USA) and videoconferencing using Collaborate Ultra (Collaborate Ultra, Blackboard Learning Management System [LMS], Blackboard Inc, Reston, Virginia, USA). Both platforms allow recording, streaming, and interactive features. Collaborate Ultra was also used for practical classes to randomly distribute students into smaller groups called breakout groups. Group sizes varied from 3 to 6 students in each breakout group depending on the learning activity. Tutors facilitated a variety of learning activities, such as case-based learning, think-pair-share, and the use of workbooks with images and questions specifically developed for eLearning. Students were also encouraged to practice clinical skills on an individual basis in their

household in front of their web camera to receive instant feedback from tutors or asynchronous feedback on video assignments students were asked to submit. Additional videos were created to supplement practical classes, such as chunked lectures (ie, grouping of lectures into short, meaningful videos for online delivery) and additional clinical skills demonstrations that were previously only delivered face-to-face. Tutors joined all separate breakout groups at different times to discuss student queries and provide feedback on their activities.

Recruitment and data collection

From a total of 600 physical therapist students enrolled in the first, second, and third years of the 4-year program, purposive sampling and snowball sampling methods via email and word-of-mouth were used to recruit the sample. To capture a diverse range of perspectives and experiences, we recruited students from the first 3 years of the program, international and local students, high-school entry and mature-age students, and a proportion of women to men that reflected the wider student population for the program (60:40). All had attended face-to-face practical classes at the physical therapy school in the 6 weeks prior to the transition to full eLearning. Students were approached and invited to participate in this study by 2 of the authors (L.M. and C.C.), who were final-year physical therapy students and not eligible for this study. Students were reassured that there would be no repercussion for declining participation in the study. Interested students received a study information sheet and had the opportunity to ask questions prior to giving informed consent. The names of participants were not shared with anyone outside of the research team and anonymity was protected by removing the names during the transcription process and presenting participant characteristics in aggregate form. Focus groups ranged in

size from 2 to 5 participants per group and interviews lasted for an average of 60 minutes. Recruitment continued until data saturation—the point at which no new concepts emerged in subsequent focus groups and informational redundancy was achieved.[12]

Seven focus groups were conducted 4 to 5 weeks after physical therapist students had transitioned to eLearning. Participants attended 1 out of the 7 online focus group interviews according to the year of study and their availability through Collaborate Ultra videoconferencing. Collaborate Ultra allowed for the recording of the audio during all focus group interviews. The focus groups followed a semistructured interview guide developed by the research team (Figure). Aligned with the aims of the study, the guide explored full eLearning experiences using the phenomenological interview framework outlined by Bevan.[13] Bevan's framework covered 3 main domains: contextualization ("Tell me about your learning experience since moving to eLearning"), apprehension of the changes ("Tell me about your current study habits/strategies"), and clarification of changes ("Describe how your study habits/strategies changed since we moved to eLearning"). Two additional questions covered the barriers and enablers for eLearning to further investigate student perceptions regarding teaching practices and student learning with full eLearning. The guide was revised following the initial focus group interview and one more question and sub-question were added to seek further clarity on the information provided.

Focus groups were facilitated by L.N., a physical therapist who has worked as a university lecturer for 12 years and has experience in qualitative research. He was

known to the participants through their university studies but was not involved in their teaching or assessments at the time of the study. L.N. was not involved in the recruitment of participants. Open and honest discussion was encouraged, with participants reassured that their opinions would not be heard or shared with anyone outside of the research team. The focus group facilitator ensured that each participant had an opportunity to voice their opinions and return to questions and answers they wished to expand on. At the end of each focus group, L.N. summarized the discussion to check for accuracy and provided participants with the opportunity to validate their responses. Three researchers (K.S., L.M., C.C.) observed all focus groups for the purpose of note taking and data familiarization. No repeat interviews were carried out. All audio recordings were transcribed verbatim and deidentified prior to analysis.

Analysis

Data were collected and analyzed in parallel so that concepts which emerged in earlier focus groups could be explored in subsequent focus groups. Data were analyzed using inductive thematic analysis.[14,15] Thematic analysis is a robust method for coding qualitative data and identifying patterns across the data set in relation to the research questions. It involves 6 phases: (1) data familiarization; (2) code generation; (3) theme generation; (4) theme revision; (5) theme definition; and (6) result reporting. [14,15]

Four researchers, all trained in qualitative analysis, were involved in the coding process. Two were experienced qualitative researchers and physical therapists (K.S., B.O.). Two were 4th year undergraduate physical therapist students (L.M. and

C.C.). Data from each focus group were coded by at least 2 researchers. Where one researcher was involved in the participants' courses in a given focus group, they were not involved in the coding of data from that focus group. Coded data were discussed and refined in meetings with the research team resulting in the construct of a coding tree (Tab. 1). Once a refined coding tree had been agreed on, it was applied to all focus group transcripts by K.S. Three researchers (B.O., L.M., C.C.) cross-coded the transcripts to check that all relevant data was accurately captured. A qualitative data management software (NVivo 12, QSR International, Melbourne, Australia) was used to support the organization of coded data. Patterns between and within codes were discussed and challenged by the research team, drawing on their theoretical knowledge of andragogy, content knowledge of physical therapy teaching and learning, and experiences as both tutors and students. Through this process, preliminary themes were generated. Themes were reviewed by the research team for accuracy and clarity in comparison with the raw data. Saturation was achieved after five focus groups; 2 additional focus groups were conducted to challenge, confirm and clarify the preliminary themes.

Results

A total of 28 physical therapist students with a mean age of 23.5 (SD = 5.0) years participated. Sixteen were female (57%); and 7 (25.0%) were in the 1st year, 13 (46.4%) were in the 2nd year, and 8 (28.6%) were in 3rd year of the program. Five participants (17.9%) were international students who had moved to Australia to attend university. The demographics of the participants are presented in Table 3.

Three overarching themes were identified: (1) heightened negative feelings; (2) face-to-face learning is important; and (3) recommendations for eLearning. These themes are described below, supported by quotes as presented in Table 4. Although the design of a qualitative study such as this one prevents inference regarding the generalizability of the findings, we have provided an indication of the frequency with which each finding was endorsed within focus groups.

Heightened negative feelings

Participants from all year groups expressed negative feelings toward the challenges imposed by the rapid transition to eLearning due to the COVID-19 pandemic**.** This included feeling anxious, stressed, and overwhelmed due to the perceived increase in workload, the perceived effects of "excessive" screen time, reduced motivation to learn, and feeling worried about mental health in the context of global uncertainty about the future course of the pandemic.

Several participants, from 4 out of 7 focus groups, felt that their workload had increased. For example, one year-1 student described how self-directed learning activities were taking up more time than usual and "eating into" their personal time (Q1). Difficulty in establishing study/life balance while learning from home was reported by a year-2 student who described the "blurring of lines" (Q2). Another year-2 student described how "screen fatigue" caused them to lose motivation during learning tasks (Q3).

Participants from all focus groups (7/7) described feeling unmotivated to learn. For example, one year-3 student talked about the importance of the physical

environment in getting into the “learning mindset” (Q4). A similar sentiment was described by a year-1 student who suggested that watching a lecture in bed was less engaging than watching from a designated workspace (Q5).

Concerns about the current uncertainty in the world were expressed by many students (from 4/7 focus groups) and this was especially evident among international students. For one year-3 international student, uncertainty about the future made them question their ability to practice physical therapist skills for examinations (Q6). A year-2 student also described feeling overwhelmed and worried about mental health due to constantly having to readjust study plans (Q7) (Tab. 2, quotes 1-7).

Face-to-face learning is important

Participants emphasized the important role that face-to-face social interactions had in feeling more engaged and motivated to learn, and they perceived that face-to-face learning was critical for developing practical skills. Face-to-face learning was linked to the ability to obtain peer and tutor feedback in a timely manner, as well as having peers to practice on, and getting more “value for the money” spent for the course.

A large proportion of participants from all focus groups (7/7) believed that their learning environment—that is, external factors conducive to teaching and learning, such as their social (eg, peer support), organizational, cultural, and physical environments[16]—were intertwined with their ability to share information and feel more engaged and motivated to learn. For example, one year-1 student described how the “energy” they got from the social interactions on campus facilitated their engagement in learning (Q8). Some perceived that “being social” online took more

effort and was less enjoyable, as described by one year-2 student (Q9). The lack of separation between home and the classroom was previously reported by a year-2 student who felt that it interfered with ability to study (Q2).

Virtual working groups, in which students could see and hear each other, were considered a poor substitute for face-to-face interactions due to perceived reduced collaboration. Many participants expressed their dissatisfaction with noncollaborative peers who chose not to share their web cameras and microphones or participate in discussions. One year-1 student believed that students would be less reluctant to speak during face-to-face classes (Q10).

The inability to attend face-to-face practical skills classes was a primary concern among participants from 7 out of 7 focus groups who perceived reduced opportunities to practice. All participants agreed that face-to-face practical skills classes were essential. For example, one year-3 student explained that “practicals help cement the theory knowledge” and were difficult to learn from videos (Q11). Participants from all year groups experienced difficulties in translating written and video instructions into practical skills. For example, a year-1 student attributed difficulties to the lack of adequate tactile cues while practicing (Q12).

Many participants (7/7 focus groups) emphasized the importance of peer and tutor feedback for enhanced learning. For example, a year-3 student believed that peer feedback was different, as they could comment on mistakes and suggest different approaches (Q13). When compared to face-to-face classes, the participants from 6 out of 7 focus groups found it harder to obtain tutor feedback through eLearning due

to limited tutor availability and asynchronous timing between self-directed activities and feedback. One year-1 student explained that instantaneous feedback provided in face-to-face learning allowed them to correct techniques instantly as opposed receiving online feedback on assignments a couple of weeks later (Q14). Participants who lived by themselves or who did not have a suitable person available to practice on during classes were also concerned about the reduction in opportunities to practice or about not learning as effectively. For example, one year-3 student who lived alone believed that learning was hindered without “human contact” and discussing techniques with peers (Q15). Finally, international students expressed concerns about not receiving the standard of education they expected. One year-2 international student explained that they perceived face-to-face learning as ”more value for the money” (Q16) (Tab. 2, quotes 8-16).

Recommendations for eLearning

Based on their recent experience with eLearning, most participants expressed their preference for a blended learning approach in the future, where theory and interactive lectures remained online and practical skills were delivered face-to-face. Their main recommendation for enhancing eLearning experiences was to advise students on developing healthy eLearning habits.

Blended learning approach

The majority of participants (7/7 focus groups) indicated a preference for blended learning, perceiving that this approach would allow more time to comprehend lecture content via online lectures and consolidate information through face-to-face practical classes. A year-3 student for example, preferred the online delivery of the “theory

side of the program" and suggested that they only really needed to go on campus for the practical skills training (Q17).

All participants opted for face-to-face practical skills classes, supplemented by practical skills videos. Another year-3 student explained that the value of this combination was due to the option of watching videos in preparation for classes (Q18). Regarding online lectures, most participants (7/7 focus groups) reported they had already been watching prerecorded and online live lectures prior to the move to full eLearning. A year-2 student clarified that their preference for recorded lectures was due to its flexibility, ability to pause and rewind as needed, and time efficiency (Q19). After experiencing full eLearning, there was a clear preference (7/7 focus groups) for online lectures (ie, interactive eLectures), during which they could interact with peers and teaching staff, instead of prerecorded lectures. In fact, many participants (5/7 focus groups) found it easier to interact with peers and teaching staff during lectures through interactive eLearning platforms rather than face-to-face. For example, a year-2 student appreciated being able to ask questions "on the spot" without feeling as thought they were disrupting others (Q20) (Tab. 2, quotes 17-20).

Healthy eLearning habits

According to the participants, the top healthy eLearning habits were: establishing a schedule (6/7 focus groups), taking breaks from studying (6/7 focus groups), exercising and regulating stress (3/7 focus groups), and having a dedicated study space at home (3/7 focus groups). For example, one year-1 student reported they had established a routine by following their usual course timetable and behaving like

“an internal student” (Q21). For a year-3 student, having a routine helped give them a sense of belonging and purpose (Q22).

Participants recommended taking breaks to avoid excessive screen time and inactivity while studying. Another year-3 student described that having breaks helped them focus better on learning (Q23), whereas a year-2 student highlighted the importance of taking breaks to exercise and regulate stress (Q24). Having a dedicated study space at home was also deemed helpful to get into the right frame of mind, as described by a year-2 student (Q25) (Tab. 2, quotes 21-25).

Discussion

At the conclusion of focus group interviews 4 or 5 weeks after transitioning to full eLearning, 28 undergraduate physical therapist students reported perceived heightened negative feelings about the rapid transition to eLearning and the perceived increased workload, excessive screen time, reduced motivation and the current uncertainty in the world. Based on their experiences, students recommended that future eLearning in an undergraduate physical therapist program include a blended learning approach in which lectures are delivered online and practical classes remain as face-to-face on campus to enable student interaction and immediate feedback from peers and tutors. Furthermore, participants provided advice on how students can optimise their learning during full eLearning by establishing a schedule for studying, taking breaks and exercising to regulate stress, as well as having a dedicated study space.

The temporary introduction of a full eLearning approach in this physical therapist education program appeared to heighten the level of negative emotions in response to the COVID-19 pandemic. In addition to experiencing rapid changes in learning activities and uncertainty within the program, many students had experienced changes in other aspects of their life including loss of employment or their social support network (eg, social gatherings, amateur sports). Changes in other aspects of their lives is likely to have impacted the psychosocial wellbeing of students. Although we did not specifically assess aspects of the students' psychosocial health, it is worth noting that during this pandemic, there has been a rise in clinically significant symptoms of depression and generalized anxiety symptoms in the Australian adult population.[13] Symptoms of depression and anxiety were more evident among those who had lost jobs, were socially isolated, or were in a vulnerable condition.[17] Interestingly, none of the students expressed their concern with contracting COVID-19, but that might be because the numbers of infections in the local jurisdiction where this study took place were low relative to many other countries. To put it in perspective, at the start of the interview period on April 27, 2020, 566 people had contracted COVID-19 in the institution's city, and 6720 people in the whole of Australia. At the time of the last focus group on May 15, 577 people had contracted COVID-19 in the institution's city, and 7019 people in Australia.[18] In comparison, the United States had 813,821 active cases on April 27 and 1,068,226 active cases on the May 15.[19]

University institutions and academics need to acknowledge the impact of COVID-19 on their students' emotional health as it may negatively influence students' academic and clinical performances. Developing evidence-based strategies to manage

negative consequences of COVID-19 at the university level will be critical to manage students' mental health and maximise their learning experience. Such evidence-based strategies need to involve guidance on mental health strategies and referral services to appropriate mental health care. Guidance on the benefits of maintaining a routine, staying connected with others, and exercising were widely divulged by government and non-government agencies as restrictions took place, and reinforced by the participants in our study.[13] In addition to these recommendations, universities need to consider expanding on their student support or referral services to mental health care to understand the nature of the psychological adjustments that resulted from altered social support and opportunities to participate during this exceptional world-wide pandemic.[1] Additional efforts and investments in sustainable mental health care have already been implemented by different governments around the world, and this is likely to be considered and provided at the university level too.[20]

A blended approach to eLearning in a physical therapist education program is supported by literature and appears to be consistent with contemporary approaches to higher education.[5-7] Firstly, many of the participants in the focus groups preferred online lectures over face-to-face didactic lectures and found interactive lectures more beneficial.[4,5] However, learning practical skills through physical face-to-face interactions encourages social engagement and feedback which was highly valued among the undergraduate physical therapist students in our study. Previous evidence has supported that students prefer face-to-face learning of practical skills in physical therapist education programs.[5] As experienced by the students in this study, in acquiring physical skills, online resources such as videos can be highly beneficial and act as supplementary material rather than primary learning activities.[21]

Having a blended approach with online lectures and electronic resources combined with face-to-face practical classes in health professional programs should be kept in mind for future pandemics. It is worth noting that physical therapy has traditionally been considered a 'hands-on' profession, but during the pandemic many physical therapist consultations have also transitioned to an online telehealth model.[22] The COVID-19 pandemic may provide an impetus to change how aspects of physical therapist education programs are taught and delivered in the future, such as including the training in communicating with patients via videoconferencing platforms. The World Health Organization also recommends greater investment into information and communication technology to deliver education to health professionals, use resources more strategically, and plan for evolving requirements.[2,4] Health professional educational institutions seeking to adopt new technologies will need to provide the infrastructure and support to its staff in their transition. The successful implementation will be dependent on the provision of a skilled information technology workforce to support students and staff in using a range of technological tools. Educational institutions will also need to consider that although staff may spend less time in face-to-face teaching, additional staff time will need to be committed for developing and designing eLearning approaches.[2,4]

Despite the fact that the students in our study preferred online lectures, many still attended the university library or buildings to attend online classes. Participants in this study missed the opportunity to attend university and saw the campus environment as a place not only for learning but also to gain social support from

peers. Therefore, it seems that there is still a place for physical university campuses in higher education.

One of the aims of this study was to report recommendations for eLearning from the students' point of view. Such recommendations may help other undergraduate physical therapist students studying online in the future. Students may also benefit from seeing the challenges and negative emotions associated with transitioning to full eLearning from their peers; knowing they are not alone with their emotions may help. The recommendations generated from this sample of students included practical recommendations around study breaks and stress regulation activities such as exercise and going outdoors; as well as recommendations around the content and format for blended learning approaches.

Limitations

The findings of this study offer an insight into the early experiences of eLearning during a pandemic among a diverse group of students in the first 3 years of a physical therapist education programs in Australia. In considering the transferability of our findings to other settings, several limitations must be acknowledged. Focus groups were recruited from a single university and the sampling strategy sought diversity, not generalizability. Although our sample size may be considered small by quantitative research standards, we used best-practice qualitative research strategies such as theoretical sampling and triangulation of viewpoints among the research team to challenge emerging interpretations and reach saturation. We focused on themes that were frequent and consistent across year groups. It is worth noting that each year presented specific difficulties that were not challenged in

subsequent focus groups as they were considered too specific to the year group and their respective courses or teaching staff. Specific difficulties included year-2 students worried about having less time allocated to online practical classes, whereas year-1 students struggled with the transition from high school into university. For this purpose, 2 final-year students (year 4) were involved in the analysis to check for data relevance and consistency and make sure that the interpretations were grounded in the students' voices.

Another limitation of this study is that we did not collect data on nonverbal communication among the focus group participants. Analysis of body language and facial expressions may have provided additional insight into students' attitudes toward eLearning and helped to validate and verify our interpretations. To address this limitation, we engaged in member checking, providing participants with the opportunity to correct or add to their responses and to challenge or confirm our emerging interpretations at the end of each focus group.

This study focused on the early perceptions of students on full eLearning. Future longitudinal research analyzing students' perceptions over time is recommended to investigate sustained changes and behaviours. Additionally, this study did not analyze the influence of full eLearning on student education outcomes in a physical therapist education program, which is another area that requires further investigation.

As we think about the future of physical therapist professional education in the era of COVID-19 and beyond, it will be critical to concurrently examine perceptions of

faculty and administrators, issues around meshing program philosophies and theoretical grounding with andragogical approaches in academic and clinical settings (including technological advances that influence andragogy), and societal expectations for physical therapist practice and health care practice in general. Future research to address this will be critical for the development of physical therapy curricula in the COVID-19 era and beyond.

Conclusion

To conclude, the COVID-19 pandemic has provided physical therapist students with a unique opportunity to experience a full eLearning approach. Although the COVID-19 pandemic has heightened negative emotions, it has also shown students the value of face-to-face practical classes for learning and fostering social interactions with peers and tutors. The responses from the students in this study may also encourage academics to design curriculum that are more conducive to a blended learning approach after the pandemic. Blended learning may include using online lectures instead of face-to-face lectures and also providing online resources to supplement student learning of practical skills. Further provisions in the areas of technological infrastructure and mental health support at the university level are needed to adequately support staff and students during the course of the COVID-19 pandemic and beyond.

Author Contributions

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Ethics Approval

This study was approved by the Human Research Committee at Curtin University (HRE2020-0182).

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The authors completed the ICMJE Form for Disclosure of Potential Conflicts of Interest and reported no conflicts of interest.

References

1. Crawford J, Butler-Henderson K, Rudolph J, et al. COVID-19: 20 countries' higher education intra-period digital pedagogy responses. *J Appl Learn Teach.* 2020;3(1):1-20.
2. Atun R, Kersnik J, Beck D, et al. *ELearning for undergraduate health professional education - a systematic review informing a radical transformation of health workforce development.* Geneva, Switzerland: World Health Organization;2015.
3. Sangrà A, Vlachopoulos D, Cabrera N, Anderson T. Building an inclusive definition of e-learning: An approach to the conceptual framework. *Inter Rev Res Open Distr Learn* 2012;13(2):145-159.
4. George PP, Papachristou N, Belisario JM, et al. Online eLearning for undergraduates in health professions: A systematic review of the impact on knowledge, skills, attitudes and satisfaction. *J Glob Health.* 2014;4(1):010406.
5. Gardner P, Slater H, Jordan JE, Fary RE, Chua J, Briggs AM. Physiotherapy students' perspectives of online e-learning for interdisciplinary management of chronic health conditions: a qualitative study. *BMC Med Edu.* 2016;16(62):62-62.
6. Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Guirao-Piñeyro M, Castro-Martín E, Díaz-Rodríguez L. A blended learning approach to palpation and ultrasound imaging skills through supplementation of traditional classroom teaching with an e-learning package. *Man Ther.* 2012;17(5):474-478.
7. Cantarero-Villanueva I, Fernández-Lao C, Galiano-Castillo N, Castro-Martín E, Díaz-Rodríguez L, Arroyo-Morales M. Evaluation of e-learning as an

adjunctive method for the acquisition of skills in bony landmark palpation and muscular ultrasound examination in the lumbopelvic region: A controlled study. *J Manip Physiol Ther.* 2012;35(9):727-734.

8. Preston E, Ada L, Dean C, Stanton R, Waddington G, Canning C. The Physiotherapy eSkills Training Online resource improves performance of practical skills: a controlled trial. *BMC Med Edu.* 2012;12(1):119-119.
9. Mącznik AK, Ribeiro DC, Baxter GD. Online technology use in physiotherapy teaching and learning: a systematic review of effectiveness and users' perceptions. *BMC Med Edu.* 2015;15(1):160.
10. Krueger R. *Focus groups. A practical guide for applied research.* First ed: Sage Publishing; 1994.
11. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care.* 2007;19(6):349-357.
12. Sandelowski M. Theoretical saturation. In: Given L, ed. *The SAGE Encyclopedia of Qualitative Research Methods.* Thousand Oaks: Sage 2008:875-876.
13. Bevan MT. A Method of Phenomenological Interviewing. *Qual Health Res.* 2014;24(1):136-144.
14. Clarke V, Braun V. Thematic analysis. *J Posit Psychol.* 2017;12(3):297-298.
15. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* 2006;3(2):77-101.
16. Foundation JM. *Improving Environments for Learning in the Health Professions.* United States of America: Josiah Macy Jr. Foundation;2018.

17. Fisher J, Tran T, Hammargerg J, et al. Mental Health of people in Australia in the first month of COVID-19 restrictions: a national Survey. *Med J Aust.* 2020.

18. Department of Health WA. Coronavirus, COVID-19 in Western Australia. https://experience.arcgis.com/experience/359bca83a1264e3fb8d3b6f0a028d768. Published 2020. Accessed.

19. Worldometers. Coronavirus, United States. https://www.worldometers.info/coronavirus/country/us/. Published 2020. Accessed.

20. Moreno C WT, Galderisi S, Nordentoft M, Crossley N, Jones N, Cannon M, Correll CU, Byrne L, Carr S, Chen EYH, Gorwood P, Johnson S, Kärkkäinen H, Krystal JH, Lee J, Lieberman J, López-Jaramillo C, Männikkö M, Phillips MR, Uchida H, Vieta E, Vita A, Arango C. How mental health care should change as a consequence of the COVID-19 pandemic. *Lancet Psychiatry.* 2020;7(9):813-824.

21. Bloomfield J, Jones A. Using E-learning to support clinical skills acquisition: Exploring the experiences and perceptions of graduate first-year pre-registration nursing students - a mixed method study. *Nurse Educ Today.* 2013;33(12):1605 - 1611.

22. Lee AC. COVID-19 and the Advancement of Digital Physical Therapist Practice and Telehealth. *Phys Ther.* 2020;100(7):1054-1057.

Figure and Tables

Tell me about your learning experience since moving to eLearning
Tell me about your current study habits/strategies
Describe how your study habits/strategies changed since we moved to eLearning
What are the enablers to eLearning?
What are the barriers to eLearning?
What would improve your experiences of eLearning?
Questions added after the initial focus group interview:
If you had a choice between eLearning and face-to-face learning, which would you choose? Why?

Figure. Semistructured interview guide on student experience of eLearning during COVID-19.

Table 1. Coding Tree

Codes	Themes
Feeling anxious, stressed, overwhelmed, and/or worried Reduced motivation	**Heightened negative feelings**
Social interactions Peer support Learning environment Separation between home and classroom Opportunities to practice Practicals help cement the theory Feedback (from tutors and peers)	**Face-to-face learning is important**
Blended learning model: online lectures and face-to-face practical classes: Prerecorded and online live lectures Interactive eLectures Supplementary practical skills videos Healthy study habits: Establishing a schedule Taking breaks Exercising and regulating stress Having a dedicated study space	**Recommendations for eLearning**

Table 2. Demographics of Participants in the Respective Focus Groups

Participant	Year of Study	Sex	International Students
Focus Group 1			
P1	2	M	Yes
P2	2	F	No
P3	2	F	No
P4	2	F	No
P5	2	M	No
Focus Group 2			
P6	2	F	No
P7	2	F	No
P8	2	F	No
P9	2	F	Yes
Focus Group 3			
P10	2	M	No
P11	2	M	No
Focus Group 4			
P12	3	F	No
P13	3	F	No
P14	3	F	No
P15	3	M	No
P16	3	M	No
Focus Group 5			
P17	3	M	No
P18	2	M	No
P19	3	M	Yes
P20	3	M	Yes
P21	2	F	No
Focus Group 6			
P22	1	F	No
P23	1	M	Yes
P24	1	F	No
P25	1	F	No
Focus Group 7			
P26	1	F	No
P27	1	F	No
P28	1	M	No

Table 3. Supporting Quotes[a]

No.	Quote (Participant, Year)
Theme 1: Heightened Negative Feelings	
Q1	*"I feel like it's a lot of work each of these activities they are sending each week and you've got to get them submitted by this time, then get feedback blah blah. It's just been a lot of, I don't know, it's a lot. Whilst when you used to do activities in-class, it didn't seem like such a workload". (P27, Y1)*
Q2	*"I guess the line between studying and breaks is kind of blurred for me a little bit, it isn't as cut and dry where before it was I could relax at home and then go into uni to study". (P11, Y2)*
Q3	*"I've found like you go into class and you stare at a screen and then it's like ok now we've got to study and you're staring at a screen so like you're more tired you're more unmotivated". (P2, Y2)*
Q4	*"It's definitely the motivation comes from the environment, it comes from the atmosphere, the [university] space exists to study and to practise in to refine skills to make mistakes in and if you're not there then you lose motivation to do that". (P17, Y3)*
Q5	*"When I am on my bed watching a lecture I think I will be a lot more disengaged and not necessarily taking in the information as much as if I was sitting at a desk you know in my good workspace". (P25, Y1)*
Q6	*"… right now it seems like we are waiting for oh when is everything going to go back on… how are we going to take the OSCE and all that. It's just the uncertainty makes me feel like I don't know how to practise". (P19, Y3)*
Q7	*"We're constantly having to readjust what we're doing with our study plans and um it's really really overwhelming… It does feel like we are being given a little bit extra work because we are doing this online which kind of piled on top of everything else we have to do, and mental health and all of this kind of uncertainty in the world right now doesn't feel great." (P6, Y2).*
Theme 2: Face-to-face Learning Is Important	
Q8	*"I guess there is an element of working with people that gives me energy. Like an assignment, I would usually put it off till later, distracted with something else. But the element of working with people gets me more engaged". (P23, Y1)*
Q9	*"it's a lot easier if you're coming all from a class together you're leaving a class and it's kind of let's go do this for you grab lunch… it's a bit more like easy take the opportunity to do the practise, as I feel like in the online system now we have to be very proactive about*

	making that time and it's quite difficult… it's taken a lot of the yeah the fun social interaction out of being at uni" (P7, Y2).
Q10	*"About half of the time when you are placed into a Breakout Group, you get to play out the strings with other students who are reluctant to speak so they won't turn on the microphone or their video, whereas face-to-face they are forced to talk to you". (P27, Y1)*
Q11	"*I find the practicals help cement the theory knowledge. So not having where I can be hands-on is making it quite difficult from the practice perspective… It's very hard to see a video and do a skill". (P14, Y3)*
Q12	*"… when we have the face-to-face classes when we're practising for example, passive movements, you would be practising on another student so then you get that sensation of what it feels like and that helps". (P22, Y1)*
Q13	*"Technically you can practise with a person but the feedback is going to be different to like you know like 2 physio students or even 3 physio students that are studying together and then they can notice each other like um mistakes or observing like the different approaches between your peers that you guys may be able to find something that you might have overlooked". (P19, Y3)*
Q14	*"In [face-to-face] practical classes it works quite well because you got two tutors and they will come around the room… they watch what you're doing at the time and you get the feedback you know immediately, so you can work on that straight away. Whereas… so far it has taken a good couple of weeks to receive feedback, which is just not very ideal". (P27, Y1)*
Q15	*"I live alone so I've got no one in the house to put my hands on and um so it's… about human contact… discussing and getting them to do it on you and you kind of learn and grow together". (P17, Y3)*
Q16	*"Face-to-face teaching I think, especially for physiotherapists, is really irreplaceable… as an international student, it's more value for the money." (P20, Y2)*.
Theme 3: Recommendations for eLearning	
Blended learning	
Q17	*"I think the theory side of the course has become actually more interactive with doing the Collaborate [eLearning] and online quizzes and stuff like that so I feel like we only really need to be able to go in for practical stuff to actually just practice just the skills." (P16, Y3)*
Q18	*"Before we had COVID come in, I would watch some of the videos in preparation for class just so I had an idea about the technique and how to do it so I definitely think they should stay." (P16, Y3)*
Q19	*"I prefer the pre-recorded lectures because you don't have to*

	necessarily watch it in the allocated time slot so if you do have extra free hour you are able to watch it there and I also find that the lecturers sometimes speak too fast and I don't have enough time to write everything down so with pre-recorded it gives me the opportunity just to pause it write everything down make sure I understand it and then keep on going with it". (P8, Y2)
Q20	*"It's a lot easier to put your hand up and like ask a question on a screen than it is to do that in a lecture because you feel like if you do that in like a real time scenario… you feel like you're holding up everyone's time". (P4, Y2)*
Healthy eLearning Habits	
Q21	*"I have printed out my timetable and stuck it up directly in front of my at my study desk at home… I'm trying to do everything at the same time I would have done if I was an internal student… I still get myself dressed and then I come in check my timetable and I'll try and still keep the routine." (P27, Y1).*
Q22	*"Having the structure in the schedule is really nice because it reminds you that you're still part of something. It reminds you that you belong to the University and that you're still enrolled in a course and there's still so much to do." (P17, Y3)*
Q23	*"You have to be able to get up from your computer and leave and take small breaks and come back. Because you need those breaks to be able to get you actually do better and coming back to it fresh than forcing yourself to sit for eight hours." (P13, Y3)*
Q24	*"I've found really useful to be able to go outside and exercise so I've been using that for so that's really helping, my stress especially the most effective biggest benefit is just being able to do that when I get stressed about uni[versity]." (P7, Y2)*
Q25	*"I think having their allocated space definitely helps… so not using my computer in bed to watch the lecture as tempting as that is so actually being at my desk and having my computer setup and I know it's ready to go certainly puts me in that study mind frame." (P7, Y2)*

[a] OSCE = objective structured clinical examination; P = participant; Q = quote; Y1 = year 1; Y2 = year 2; Y3 = year 3.