

## Pandemic Transition to Online for Healthcare Profession Education: A Web Scrape Seeking Perspectives of Innovation and Digital Equity

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### Abstract

For health profession education programs, the pandemic caused a sudden and rapid transition to online, in an attempt to maintain the critical supply of new graduates during a pandemic. In pre-pandemic times, a gap existed between technology-mediated pedagogy and digital health literacy. The gap has been forced to narrow. Health education educators considered digital equity for students and the resultant impact of the digital divide in online environments for competency attainment related to digital health literacy and quality patient care. The research team engaged in an emancipatory action research web scrape of the immediate pivot period to online in winter 2020 to summarize the expertise being shared over social media platforms or teaching and learning excellence podcasts and blogs. The search criteria for the web scrape covered three areas, including changes in: 1) healthcare profession education, 2) innovation, and 3) diversity, equity, and inclusion. The results, in relation to pre-pandemic reflections, were on the future of education and maintaining innovative momentum found during the pandemic, the future of healthcare and being attuned to patient needs despite virtual care delivery, along with the future society and ensuring students attain digital wisdom. This web scrape speaks to what health profession education values going forward, reducing the digital divide for students and patients.

**Keywords:** action research, digital divide, digital equity, digital health literacy, health profession education, online transition, web scrape

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### Introduction

**Due to COVID-19, educational institutions implemented social distancing restrictions and** moved to an online/remote environment. Technology has already embedded deep roots in health profession education programs. However, the real-world or authentic experience could not be easily substituted into the online environment and required innovative approaches. Health profession education programs have incorporated technology for both pedagogical delivery and digital health learning, such as virtual simulation as a replacement for clinical practice (Nagle et al., 2018). However, as technology becomes more embedded, the elements of education programs that cannot be substituted with technology become increasingly more apparent.

Health profession education must prepare students for a future with technology in patient care (National Academies of Sciences, Engineering, and Medicine (NAP), 2018). However, education and practice may be changing as much from necessity as from the need to innovate. A Canadian nursing study found that the focus

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pre-pandemic was often on “technology-mediated pedagogy,” whereas healthcare was driving the need for competencies in “the delivery and management of health care services”—digital health literacy (Nagle et al., 2018, p. 23). Pre-pandemic, healthcare profession education was contextualized in an inefficient system where technology was expensive and limited (NAP, 2018). The gap between pedagogy and literacy became apparent after educators reported during the pandemic on increasing the use of technology such as virtual simulations, increasing the numbers of educators who have used it for the first time, and increasing its use as a replacement for in-person learning (Canadian Association of Schools of Nursing, 2021). Health profession educators were now being tested on their ability to close that gap and apply the ‘just-in-time’ pedagogy and digital health learning required for a pandemic.

Transitioning to remote delivery was a challenge compounded by equity and inclusion. Online teaching needs to meet underlying infrastructure requirements to be effective: stable internet connections, hardware, virtual reality (VR) capabilities, software, training, and data management. The ability of students and educators to accommodate the online environment becomes crucial. Equity and inclusion are central points for designing teaching strategies.

Post-secondary education was in a state of preliminary change prior to the pandemic. Institutions reassessed the needs of a diverse student population who were first-generation attendees, parents, or who had low-income and bore the weight of a lifetime of race and gender inequalities (Alexander et al., 2020; NAP, 2018). The hazard in the past was for institutions to assess and deliver support for historically excluded students as an aggregate group, where the year 2020 brought the vulnerability of students to the fore (Alexander et al., 2020). Students may stay on campus because of a lack of means to leave, because it was a source of employment, or for access to computers and the internet. Closing campus increased poverty, food insecurity, safety concerns, and reduced student supports for success (Alexander et al., 2020).

While innovation plays a substantial role in the creation of quality education through remote delivery, equitable considerations need to be made simultaneously. The research team explored the effects of the COVID-19 pandemic on health profession education. The question that guided our web scrape and the development of this paper is: When healthcare faculty were required to move online in the pandemic, what effect did this have on teaching and learning, innovative strategies, and digital equity or inclusion?

## Methods

The review used an action research approach (Newton & Burgess, 2008) to generate knowledge, with a goal toward understanding the emancipatory potential of digital equity as a result of converting to online because of the pandemic. An emancipatory research approach encourages healthcare educators to examine the social, political, and economic structures that are reinforced in health and education systems when they should be focused on social justice (Newton & Burgess, 2008). The pandemic forced an opportunity to critique practice, performance, and the social issues related to digital equity that were exacerbated with COVID-19 restrictions.

The research team engaged in an informal web scrape, having considered that the pivot to online learning would not be found in program evaluation or research literature in the short time frame from the inception of the pandemic. Searches were conducted on social media and cultural platforms such as YouTube, Reddit, and Twitter, with increasingly targeted searches beginning with Google and narrowing to known health and education personalities or repositories. The search was limited to January 2020 and beyond to seek resources related specifically to the pandemic change. The search was further limited to non-medical post-secondary experiences to reflect the aggregate experience of the researchers from colleges and polytechnics with different funding models than medical universities.

The research team employed the expertise of our librarian to address a web scrape review framework. We questioned a rigorous approach as the focus of a web scrape is to seek out new innovative knowledge that may be at the beginning of a scholarly innovation cycle. Formal evaluative tools would have excluded all our resources that were embedded in flexible best practices. This is a concern of action research as it is often practiced but not formally reported on or evaluated (Newton & Burgess, 2008). These team decisions reflect the theoretical underpinnings of the program of research with which we engaged.

## Findings

Our search focused on three main concept areas: healthcare profession education; innovation; and diversity, equity, and inclusion. We discuss each area while considering the limits of pandemic timing and impact.

### Healthcare Profession Education

The COVID-19 pandemic had a critical impact on learning. Along with their own safety concerns, clinical educators and students were potential vectors of COVID. Though most students were

not in the clinical practice setting, the pandemic highlighted the relevance of ethical and professional practice dilemmas that students may experience once in practice after graduation (Rischer, 2020e). The opportunity was to enhance student online learning with teaching strategies such as unfolding case studies. (Rischer, 2020c).

The pandemic influenced practice and education, shifting paradigms (Rischer, 2020a). In the overnight transition of the system, educators realized that not all students had a suitable and supportive home-working environment, recognizing how online learning is experienced and lived within the context of economic status, gender, or race (Almost et al., 2020). Almost et al. (2020) recognized that students might live in small or shared houses; they may have a poor internet connection, limited internet access or limited broadband to access all learning materials; they may have young children or elderly parents whom they are caring for within their home; they may have lost the summer job that would have covered their tuition, rent and food, leading to a precarious financial condition; or they may not be able to afford a new computer to make online learning easier to access.

Lea (2020) identified that the development of virtual learning meant educators were expected to be nimble, which also modified their educational responsibilities. Technology-enabled virtual learning is a progression of the flipped classroom, changing the role of educator to coach and moderator of online discussions and provider of feedback. To argue, simulations may not replace actual patient encounters, but the reality is that clinical placements are shrinking, new technology is engaging, and students require opportunities to get them practice-ready (Lea, 2020).

Rischer (2020b) identified the need for nursing education to prioritize preparing students for the challenges faced in the practice setting. Online teaching was not new, but many health educators who had never taught online now had no choice (Rischer, 2020d). Rischer (2020d) suggested that educators be willing to evaluate students differently, identifying that online teaching strategies also serve as formative and summative evaluations.

## **Innovation**

The initial response to the pandemic from educational institutions focused on completing semesters in progress. Moving forward, Mushtare, Kane, Kernahan & Gannon (2020) identified challenges to adaptation to better engage students once online learning became normalized. Challenges included forums not used for meaningful discussion; the myriad of distractions to students while

engaged in video conferencing; and poor engagement with class content.

Virtual reality (VR) was identified as one way to replace hands-on training components for labs and skills. Puri (2020) discussed a partnership between academia and the software industry to produce a gaming experience to replace in-person labs. As discussed by Hennick (2020), VR is advantageous in that memory and attention are closely related, and VR is inherently attention-grabbing, which can enhance the quality of learning. Interprofessional collaboration has been identified as an area that could be well targeted by VR learning, while relational skills and empathy may not be as well taught through VR (Benner, 2020).

Open-source databases collected distance education materials for faculty to adapt and transition to online (Sarac, 2020). The purpose was to support students in “successfully coping with the challenges of emergency online education, building their digital communication skills, and reducing stress associated with technology-related fear and social isolation” (Sarac, 2020). Alternatively, Darby (2020) advocated that an overreliance on existing tools was unsustainable for faculty and inefficient for students in the long run. Darby (2020) also encouraged low-tech communications that everyone could read or watch. Educators suggested well-designed online discussion platforms that prompted high-quality classroom interactions and supported quizzes and integrated assignments as ways to deepen learning and increase engagement (Rischer, 2020a).

## **Digital Equity and Inclusion**

Diversity of race, culture, gender, religion, sexual orientation, and socioeconomic background each contribute to a unique perspective of the world and influence learning. During the period of transition to online learning, limited attention was given to digital equity and inclusion because of the urgent need to pivot quickly and resume educational programming so as not to delay the preparation of healthcare professionals. Institutions loaned laptops or other devices to ensure students could adequately access courses (Mushtare, Kane, Kernahan & Gannon, 2020). The ultimate, misplaced responsibility for access rested with the student, and this requirement perpetuated exclusion (Mushtare, Kane, Kernahan & Gannon, 2020).

Students from low socioeconomic backgrounds faced increased academic challenges while shifting to online learning during the pandemic (Volante, 2020). Concerns such as limited access to the internet are a structural phenomenon known as the ‘digital divide,’ which reinforces inequities (Mushtare, Kane & Dolmage,

2020). Alternatively, the pedagogical use of universal design promotes access and inclusion for a diverse population of learners during COVID-19 (Mushtare, Kane, & Dolmage, 2020). Educators engaged in seeking out access concerns and developed alternatives to ensure students had opportunities to accomplish course goals.

An inclusive learning structure, one that is not teacher-centric, increases student engagement (Mushtare, Kane, Sathy, & Hogan, 2020). An inclusive approach is desired to overcome oppressive or colonial structural phenomena found in higher education. For example, assigning participation marks for those who speak up in online environments may be exclusionary to those students who favour participation as quiet listening.

Considering differences when establishing learning communities in courses may be accomplished by low-risk activities such as posting pet pictures or allowing time for students to reflect (Mushtare, Kane, Kernahan & Ganon, 2020).

Online learning environments require management to mitigate the potential to expose students that have disabilities, mental health challenges, or individuals that they support in their lives (Mushtare, Kane & Dolmage, 2020). Online platforms force a need for disclosure that would have been unnecessary in a traditional classroom (Mushtare, Kane & Dolmage, 2020). The lasting impact of high-risk activities is the continued stigmatization of groups of students and their exclusion from education.

## Discussion

The web scrape focused on the three areas of the healthcare profession education; innovation; and diversity, equity, and inclusion. We consider those three areas in relation to the future of education, society, and healthcare.

### The Future of Education

The pandemic presented obstacles to the traditional learning/teaching model rendering the development of competent graduates. The transfer of health profession education to online platforms such as Zoom and vSim was an attempt to maintain standards, but it does not have the authenticity of face-to-face, high-fidelity simulation or clinical practice.

The post-pandemic institution is required to maintain the innovative flexibility found in 2020. Just as educators evaluate new teaching strategies, a cycle is required to sustain innovation at the institutional level (Morriss-Olson, 2020)—in a sense, to catch up to the virtual health practices that arose from the pandemic.

Benefits such as free Wi-Fi data, open access instead of paywalls, and shared simulations related to COVID-19 management ensured the diffusion of learning and science (NAP, 2018). Innovative responses to new education models post-pandemic should be collaborative to prevent a return to siloed education. The pandemic has created momentum for the further integration of technology into health profession programs. But the concern remains that momentum drivers may be reversed, hindering any fruitful change that arose.

### The Future of Society

The priority was to produce healthcare professionals. Yet, in a pandemic, set in an age of fiscal restraints, reducing infrastructure to support student success and placing the responsibility for learning on the student (Mushtare, Kane, Kernahan, & Gannon, 2020) put the future of work at risk. The paradox of technology during 2020 was the rationalization of continuing online because, for the majority of the population in wealthy countries, students would adapt (Bates, 2020). The difficulty of moving online, especially with such speed, is that “the intelligent use of technology can sometimes lead to a reduction in inequality, but much more often, it amplifies the status quo” (Bates, 2020). Inclusion—decreasing exacerbating inequities of historically excluded groups—then became the obligation of governmental investment (Bates, 2020). Alternatively, others determined that community colleges and polytechnics needed to revisit their original purpose of serving their local communities (Alexander et al., 2020) to ensure students could continue their education during the pandemic. Technology can be lauded for increasing the skills and learning opportunities for health profession students or being the cause of an increasing digital divide. The issue is that in health profession education, digital equity is also reflected in practice in the interplay of digital health literacy with the social determinants of health.

Students required technology-mediated education to attain ‘digital wisdom’ (NAP, 2018). While students want fun, accessible, and social learning, educators are restricted by time and funding constraints. This highlights the difficulty with change and the ease of sliding back to the status quo rather than embracing a new normal (Rischer, 2020e). For health profession education, digital equity and health literacy gaps are most apparent “in [clinical] placements during school, in the first job after graduation, and in the training-practice transfer of continued professional education” (NAP, 2018, p. 112). These three time points represent years in an individual educational experience where the digital divide may result in an impact on quality patient care.

## The Future of Healthcare

The primary focus during the online transition of the pandemic was retaining the past education model, along with the urgency to move forward. This meant that there are inherent barriers for diverse groups of learners which will need to be addressed for worthy elements of pandemic changes to remain. While considering digital health literacy for patient-centred care, learners will be required to address digital professionalism and ethics (NAP, 2018). During the pandemic, patient digital equity became an immediate need and concern as providers moved to virtual clinics. Post-pandemic, as health professionals experience burnout, technology will become a more significant topic of discussion to provide education to an already short workforce.

The argument exists that competency-based education, rather than outcome-based, achieves better success and decreases institutional costs (Alexander et al., 2020). However, the contrasting argument is that students lack empathetic communication skills and decision-making ability on graduation, which impacts patient and interprofessional team outcomes (NAP, 2018). Attunement to patient needs is difficult to teach and convey over virtual reality (Benner, 2020). Subtle changes in patient condition are learned through mentorship and experience in face-to-face environments. A rapid online roll-out was required, but for health profession education to remain sustainable post-pandemic, evaluation should not be far behind. Assessing how competence is met within the limits of virtual innovation needs to surpass more than learner satisfaction.

The process of completing this web scrape addressed and revealed complexity. Our interprofessional team approached this web scrape from a need to advance the teaching initiatives specific to our health profession backgrounds but also meet specific scholarship interests, such as integrating digital health equity, virtual reality, and addressing equity, diversity, and inclusion. Action research, by necessity, has a short timeline to affect change. Applied scholarship often has a longer timeline to design and evaluate outcomes and discover new pathways to innovation. This web scrape attempted to meet immediate needs but resulted in an evaluation of teaching scholarship that had been 'slowly' emerging (Vostal, 2022). The paradox is how to value timely scholarship (Vostal, 2022) yet ensure research teams meet applied research expectations from organizations under the strain of fiscal, human resource, and digital divide restraints. The post-pandemic college and polytechnic cannot afford to address one inequity at a time, especially since the pandemic exacerbated issues that require immediate mitigation for diverse

students and faculty (e.g., social determinants of health). The most significant challenge remains the design of deliberate approaches for student success and program progression, i.e., decreasing attrition, increasing retention, and maintaining competencies for health profession students who have chosen patient-centred careers. The answer resides in flexible, competency-based learning pathways that meet student needs. Flexible pathways are often interpreted and acted upon as online and remote education. Yet, current practices in online and remote health education are largely detrimental to health profession student learning and satisfaction. Health profession students require authentic in-person and literally hands-on patient learning experiences with consideration for equity, diversity, and inclusion. Therefore, technology usage should augment, rather than diminish, learning and secure solid opportunities for underserved and at-risk student populations. The future requires emancipatory education and health scholarship. Colleges and polytechnics require cognizance of their responsibility to meet the needs of the community by reducing barriers for those historically excluded and oppressed.

## Conclusions

The approach for this review was emancipatory action research focused on the experience within non-medical health professional education programs. We presumed that empirical evidence of innovation in health profession education would not be published but would be reported during the pandemic through social media. This proved *not* to be the case as most resources found in the web scrape reported on commercial applications that already existed or best practices of technology that moved from champion use to widespread implementation. The limitation was that a web scrape approach was less rigorous. However, the process of reduction in the web scrape review has resulted in a reference list of go-to resources for up-to-date integration of educational theory to real-world concerns.

The pandemic highlighted the challenges faced by even those who had significant experience with technology in teaching. There is a need for face-to-face instruction to be augmented with flexible teaching/learning approaches using technology. To accomplish this, identifying and addressing access challenges will be key for ensuring equitable learning opportunities for students from varying backgrounds to reduce the impact of the digital divide. Educational institutions will be required to maintain the technological momentum found during the pandemic. New graduates must be ready with digital health literacy skills for a healthcare environment that is attuned to patient choice either face-to-face or virtually and the commensurate responsibility

to provide appropriate care over digital media. This web scrape delineated what health profession education values going forward: balancing equity and inclusion by reducing the digital divide for students and patients.

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