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Guest editorial: Health education's response to the COVID-19 pandemic: Global challenges and future directions

Guest editorial

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While the field of health education has been called on to respond to various health crises over time, the present COVID 19 pandemic presents new and unprecedented challenges on a global scale. Public health, health promotion and health education sit at the forefront of efforts to limit the spread of the virus. At the same time as we try to stem the spread of the virus, health educators and researchers are being called on to respond to the many health-related issues that have emerged (or been intensified) in the wake of COVID 19 – including individuals' and communities' need to understand the COVID 19 pandemic itself. With this special issue, our intention was to provide a place where articles, on their own and collectively, offer stimulating and incisive necessary coverage of an ongoing health crisis to help us begin to take stock of the emergent challenges for health education across sectors; across the life course and across categories of difference, experience and disadvantage.

When we initially pitched this special issue, we sought an opportunity to contribute to the growing chorus of academic journals and other publications that had begun to emerge early in the pandemic. We wanted to bring together scholars to capture the different ways their research engaged with the emerging pandemic and the various debates and study of COVID-19. We were particularly interested in affording scholars an opportunity to reflect on and reimagine health education in light of the challenges the COVID-19 pandemic presented. At this point in the pandemic, as many in the most privileged countries begin to resume some version of their past lives, health education provides a site for some of the most important long-term interventions and responses to COVID-19. The insights of health educators and health education researchers will support researchers, policy makers and health promotion/education professionals as they examine the usefulness of health education and identify what might need to change moving forward given the ongoing changing pandemic. Together, the nine papers in this special issue provide insights into how educators and learners experienced changing teaching and learning modalities during the COVID-19 pandemic across a range of countries, including Australia, Canada, Europe, Israel, New Zealand, the United Kingdom and the USA.

These papers address health broadly as “a state of complete physical, social and mental well-being, and not merely the absence of disease or infirmity” (Nutbeam, 1998, p. 1). Across the papers, health emerges as a resource “which permits people to lead an individually, socially and economically productive life. Health is a resource for everyday life, not the object of living. It is a positive concept emphasizing social and personal resources as well as physical capabilities” (Nutbeam, 1998, p. 1). Though it is clear that this approach to understanding health is increasingly integrated within the strategies deployed to respond to the current pandemic, significant challenges remain as we embark on the journey of making sense of the pandemic and how it has changed how we make sense of health and the subsequent role that health education has to play. The authors we've assembled address these questions – and raise others.



The first point of focus for this special issue is to reflect on the conditions of teaching and learning about health during the COVID-19 pandemic and especially the rapid move to online education. Even though online education is not new and teaching practices already included hybrid and online courses, the sudden and imposed move to online teaching needs to be explored and reflected upon.

The first paper, by Cruickshank and Mainsbridge and entitled “*Pre-service teacher perceptions of teaching health education online*,” critically examines Australian pre-service teachers’ perceptions about the shift to teaching health education online during the COVID-19 pandemic. Cruickshank and Mainsbridge suggest that, confronted with the shift to online teaching, pre-service teachers were concerned about their ability to teach and engage with students. The authors report that pre-service teachers were unsure how to best differentiate activities to ensure all students could meet the intended outcomes. The paper presents findings from focus groups and personal reflections with pre-service teachers majoring in health and physical education who were required to adapt a four-week high school health education unit for online delivery. The authors point to the need to adapt teacher education and teacher professional development to ensure teachers are better prepared for online delivery in the future.

Constraints can also represent opportunities for innovation. The second article in this special issue focuses on how educators have adapted to online teaching during the COVID-19 pandemic. In their article entitled “*Online argumentation-based learning aided by digital concept mapping during COVID-19: Implications for health management teaching and learning*,” Alt and Naamati-Schneider draw upon a management of health service organization case study to describe how traditional lecture-based activities for undergraduate students were transformed into argumentation-based learning activities during the COVID-19 lockdown. Analyzing undergraduate student responses to a digital concept mapping exercise, the authors argue that combining constructivist teaching tools with advanced technology can improve the development of lifelong learning capabilities of students.

In the third paper, “*Navigating COVID-19 through diverse student learning communities: importance and lessons learned*,” Mitchell, Mork, Hall and Bayer describes how a historically Black medical school in the southern USA adapted medical education training through learning communities during the COVID-19 pandemic. Analyzing survey responses from medical students, the authors found that LCs aided in navigating adaptation to new learning platforms. The small learning community group structure created a sense of security for students specific to receiving academic help, emotional support, a network of assistance resources and a place to process COVID-19 losses and insecurities. The authors suggest that medical students’ receptivity to utilizing the learning community structure for support may relate to their commitment to addressing health disparities, serving the underserved and embracing a medical school culture that values community.

The next paper by Catriona O’Toole and Venka Simovska explores the impact of school closures on the wellbeing of staff, students and the broader school community in Ireland. The authors interviewed 15 education professionals about their experiences during closures. Participants included classroom teachers, school leaders and special educational needs teachers from diverse communities across Ireland. The findings reveal that participants believe that schools are a key in supporting their local community and that student–teacher–family relationships are highly valued by educators. Additionally, school personnel reported that they found themselves forging new identities and establishing new professional boundaries as they cared for and supported students and families during school closures. The authors conclude their article by stating that COVID-19 has had a significant negative impact on already vulnerable and/or marginalized young people. They also suggest that COVID-19

has shone a light on the important role that schools play in promoting the health and well-being in their community.

Another point of focus for health education and thus for this special issue lies in health education's capacity to foster health and well-being during the COVID-19 pandemic. A substantial body of research points to the major adverse effects of the pandemic on people's mental and social health. Uчук and Yildirim's paper, "*The effect of COVID-19 prevention methods training given through distance learning on state anxiety level: the case of private sector*," explores the impact of COVID-19 prevention training on the anxiety levels of workers in a communication sector company in Turkey. Drawing on survey data, the authors found that workers' anxiety scores were lower after the training, suggesting that effective training can improve worker well-being. The authors argue that other sectors can benefit from implementing similar training programs.

In addition to this, a growing body of evidence points to the fact that social distancing measures have dramatically impacted people's health, well-being and social lives. The fifth article by Goldstein and Flicker reflects on such changes. In the paper entitled "*It's been a good time to reflect on . . . who isn't worth keeping around: COVID-19, adolescent relationship maintenance and implications for health education*," Goldstein and Flicker examine the impacts of COVID-19 physical distancing measures on the lives and relationships of young people in Canada. The authors draw upon theories of "digital intimacies" and "relationship maintenance" to argue that young people's reflections on physical distancing and online relationships expose larger gaps in sex, relationships and health education pedagogies. The findings of the study suggest that COVID-19 physical distancing measures and school closures appeared to create the conditions for some young people to productively reflect on the labor involved in the maintenance of their relationships in relation to considerations of proximity, reciprocity and distance. The authors show that this labor was particularly articulated by women and girl participants, many of whom expressed that life disruptions caused by COVID-19 catalyzed learning about their own relationship needs, desires and boundaries. Discussions of relationship maintenance and digital intimacies elucidate the limitations of health education's tendency to construct adolescent relationships as existing along binaries of "healthy" and "unhealthy," leading the authors to argue that health education might benefit from more meaningful integration of these concepts.

In the next article, Racine and Bryson explore how epidemic modeling could provide us with an opportunity to reimagine health education and policy post-COVID-19. According to the authors there is a lack of research exploring how modeling methods are taught and how this, in turn, influences what modeling methods are employed. To fill this gap, the authors conducted a multi-method study that involved conducting a literature review and interviewing modeling stakeholders. The authors suggest that epidemiological models are powerful tools for shaping public health policy, research and practice. But in stating this, they also caution us to pay attention to how modeling methods are initially taught. Overall, their research reveals that there is still room for improvement in this area that might better equip students to engage with the full range of tools available.

Last but not least, schools have been mobilized during the pandemic to take on two challenging tasks: to contribute to the national (and even global) efforts to control the pandemic by applying a set of public health measures and engaging, among other things, in the development of pupils' health literacy and to continue to provide pupils with education in spite of the major constraints resulting from lockdowns and social distancing.

In "*How school-based health education can help young people navigate an uncertain world*", Dixon and Robertson explore the potential of health education learning to contribute to aspects of the Organization for Economic Co-operation and Development's (OECD's) Learning Compass 2030. OECD's Learning Compass offers a learning framework that uses

the metaphor of navigation to demonstrate the competencies young people need to thrive. Dixon and Robertson suggest that socio-critical health education learning is compatible with the Learning Compass' emphasis on the notion that how subject matter is taught is paramount to the topics covered. The authors consider how to reimagine school-based health education in order to better enrich students' understanding of how to navigate the complex and uncertain times they will undoubtedly face across their lives.

The final paper in this special issue explores health and education professionals' experiences of schools reopening during the COVID-19 pandemic, providing us with valuable insight as to the challenges posed by the COVID-19 pandemic upon schools. In their paper, "*Co-operation and consistency: a global survey of professionals involved in reopening schools during the COVID-19 pandemic*," Gray and Jourdan present findings from a global qualitative study distributed through the UNESCO Chair of Global Health and Education's networks. The authors' findings suggest that educators in the Global North received guidance prioritizing public health measures like social distancing, with less emphasis on educational impacts. Success came from partnerships between schools, families and local authorities, consistent guidance and enough time and resources for implementation. Fear of infection led to significant absenteeism among students and staff. The authors show that respondents – many of whom were from the Global South – were left waiting for guidance, even though they shared similar concerns and expectations. This paper offers insight into the first-hand practices and perspectives of health and education professionals about reopening schools.

This special issue provides researchers and professionals with important insights as to how the field is currently responding to the global pandemic – what has worked and why. The conditions of teaching and learning have shifted alongside every other aspect of social life. We need more from health education at the very same time that health educators work with fewer of the usual resources, with less experience in the current conditions of teaching and learning and with a greater sense of urgency. But as even the pandemic threatens to throw our field, like so many others, into a sense of crisis, health education and health educators have persevered. The articles in this special issue suggest that across venues – online, in person, in medical schools, in primary schools, with adults and with young people – health educators have been trying to respond to the many challenges that COVID-19 has thrown up time and time again. With such an accomplishment in sight, we hope that the special issue will also contribute to discussions that help us understand what we could do to strengthen current program approaches and responses. We are hopeful that the special issue will provide us with some essential guidance and lessons for moving forward.

Emily Darlington

*Health, Systemic, Process EA 4129 Research Unit, Université Claude Bernard Lyon 1,
Villeurbanne, France*

Jessica Fields and Ali Greey

University of Toronto, Toronto, Canada, and

Deana Leahy

Faculty of Education, Monash University – Clayton Campus, Melbourne, Australia

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Pre-service teacher perceptions of teaching health education online

PST
perceptions of
teaching health
online

Vaughan Cruickshank and Casey Mainsbridge

College of Arts Law and Education, University of Tasmania, Launceston, Australia

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Abstract

Purpose – The forced shift to online teaching delivery during COVID-19 suppression measures in 2020 was a complex challenge for Australian teachers. Teachers were given very little time to prepare online content and very little professional development to teach online. Their experiences prompted discussion about the abilities of pre-service teachers (PST) to adapt content to online delivery if another pandemic occurred while they were teaching in the future.

Design/methodology/approach – PST majoring in Health and Physical Education were required to adapt a 4-weeks high school health education unit for online delivery. This study analysed data from PST personal reflections and focus groups to gain a better understanding of their perceptions about teaching health education online and their confidence to adapt tasks and activities from face-to-face delivery or develop unique online tasks.

Findings – PST reported varied confidence and competence to plan for and engage in online health education teaching. PST were concerned about student learning and engagement online, and unsure how to best differentiate activities to ensure all student could meet the intended outcomes.

Originality/value – Little is known about the confidence and competence of PST to deliver fully online school health education. It is important to know more about this phenomenon to inform teacher education and teacher professional development to ensure teachers are better prepared for online delivery in the future.

Keywords Teacher education, Health education, Pre-service teachers

Paper type Research paper

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Introduction

The year 2020 presented many unique challenges on a global scale. These challenges impacted the education sector and required educational institutions to make significant modifications to the construction, implementation and pedagogical methods utilised to provide learning opportunities for students. Despite many educational institutions recently adopting and embedding forms of blended learning into their curriculum (e.g. [University of Tasmania Blended Learning Model, 2018](#)), a preference for traditional face-to-face delivery and interactive learning has remained. When the World Health Organisation declared COVID-19 a pandemic ([WHO, 2020](#)) the immediate ramifications of this declaration challenged education systems across the world like never before; forcing educators to shift to online learning and teaching overnight ([Dhawan, 2020](#)), with very little time to prepare online content and very little professional development to teach online. Prior to the pandemic many educators possessed limited skills, experience and confidence to adapt learning opportunities from offline to online and were hesitant to accept modern forms of technology to foster learning ([Tallvid, 2014](#)). Abruptly, such reluctance and lack of confidence had to be overlooked as educators across the world were thrust into learning and teacher scenarios that they were not prepared for, thus raising questions about the competence of teachers to provide quality learning experiences in the online world.

The past decade has seen significant development and advancements in technology that have created increased opportunities for remote or distance education. Online education facilitates the possibility to learn from anywhere utilising different devices, at any time ([Pedersen et al., 2017](#); [Venera-Mihaela et al., 2013](#)). Advantages of online learning include that it provides a medium for the teaching-learning process to be more student-centred, more innovative, more flexible and supports opportunities for social interaction ([Dhawan, 2020](#);



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Hou, 2015). The capability to facilitate learning experiences in synchronous environments (real-time interactions) where students can learn and interact with teachers and other students with the possibility of instant feedback affords a novel mode to engage students (Singh and Thurman, 2019). In contrast, asynchronous environments (engagement with information beyond the restraints of time and location) may lack structure and any provision of real-time information or feedback but are functional and accessible through a variety of learning systems and platforms (Liguori and Winkler, 2020). The downside of online learning includes technology issues, feelings of isolation and students' own difficulties with time management (Khan *et al.*, 2017; Stone and Springer, 2019). From a student engagement perspective online learning can be boring, monotonous, heavily theoretical and consist of modest content (Dhawan, 2020). Furthermore, typical challenges that students encounter in the online learning environment relate to feelings of isolation relevant to their engagement, access, community and support (Gillett-Swan, 2017), with technical problems and difficulty in understanding instructional goals also highlighted by students (Song *et al.*, 2004). Online learning offers freedom in terms of time and flexibility, yet students do not always have sufficient time management skills to successfully study online (Parkes *et al.*, 2014). Parkes *et al.* also suggest that teachers need to ensure that students can practice what they learn in real time for the learning process to reach its full potential.

In response to the pandemic Dhawan (2020) stated that online teaching is no more an option, but a necessity. Prior to the pandemic many universities were already providing both blended learning opportunities and fully online course opportunities (Dziuban *et al.*, 2018; Medina, 2018; Salmon *et al.*, 2017), therefore in many cases university students held a level of familiarity and experience with such mediums in terms of their own learning. Australian universities operate teacher education courses that can be studied through different modalities; face-to-face, within a blended model, or fully online, thus students have a choice of how they engage with university learning (Downing and Dymont, 2013). With the sudden onset of the pandemic and the associated changes to the delivery of learning to school students, the possibility that pre-service teachers (PST) currently studying teacher education will be required to provide online opportunities for their future students is a reality (Konig *et al.*, 2020). Thus, as a consequence of the pandemic and the rise of online learning during that period, it is important to consider whether PST are prepared to teach in a world where online learning is frequently practiced. Against this background, in recent years there has been enormous growth in online learning, creating increased demand for online teachers (Brianna *et al.*, 2019). The skills for successful teaching online extend beyond the competencies required for successful teaching in the classroom, and include heightened communication skills, mastering technology and resources for online platforms, and good time management due to the unrestricted access that the online environment enables (Rapanta *et al.*, 2020; Roddy *et al.*, 2017) Despite online learning methods and opportunities becoming more prevalent in modern day school environments, little is known about if and how PST are being prepared for such activity. Hurlbut (2018) noted that teacher education programs rarely include courses on how to teach online. While this research is now three years old, COVID-19 has highlighted the need for twenty-first century learners teacher education programs to equip the next generation of teachers with the skills to teach in a variety of media that future students will be using. Additionally, Salmon (2019) stated that future students will expect learning experiences that reflect and enhance the way they live in the world. The purpose of the current study was to examine PST perceptions of their confidence and competence to deliver fully online health education to secondary school students.

The structure of the Australian Health and Physical Education curriculum is framed upon two Strands: Personal, Social and Community Health and Movement and Physical Activity (Australian Curriculum, Assessment, and Reporting Authority (ACARA), 2020). The development of the Australian HPE curriculum cemented the subject association between

health education and physical education and established a more obvious link and direction for the learning area (Fane *et al.*, 2019). Within many secondary schools in Australia physical education and health education is taught by a specialist Health and Physical Education (HPE) teacher. In preparation for teaching within the HPE learning area, Yager (2011) acknowledged that university programs can be transformative for PST future teaching practice as well as for their own personal health and wellbeing. In addition, the importance of health education for PST in transition from students of health to health educators is evidenced in relevant literature (Leahy *et al.*, 2016; Lupton and Leahy, 2019; Welch and Wright, 2011). The challenges associated with the forced shift to online learning during COVID-19 suppression measures in 2020 prompted discussion about the abilities of PST to adapt content to online delivery if another pandemic occurred when they were teaching in the future. Currently, little is known about the confidence and competence of PST to deliver fully online health education to school students. Similarly, little is known about how the pandemic and the shift to online learning altered the conditions of teaching and learning about health. This study aims to increase knowledge in these areas.

The present study

Third-year PST at a regional Australian university completed a subject focused on contemporary health issues of young people. This subject usually involves a Work Integrated Learning (WIL) placement in which PST, in pairs, teach a four-lesson health unit to students at a local high school. The unit plan is provided by school staff, so the WIL does not interrupt their planned content sequence. COVID-19 suppression measures prevented this WIL placement occurring in 2020, so this task changed to incorporate a COVID-19 scenario. PST were still provided with a high school health unit but had to turn it into an online unit to be delivered to students studying from home. The task also required PST to reflect on what they had learned from this task that they could use throughout their future teaching career. This pilot study analysed data from PST ($N = 21$) personal reflections and focus groups (FG) to gain a better understanding of their confidence and competence to deliver fully online health education to secondary school students.

Methods

The study adopted an interpretive perspective based on the assumption that the social reality of planning for teaching health education online is not singular or objective, but that it shaped by human experiences and social contexts (Cruickshank *et al.*, 2021b). As a social reality, the human experience of planning for teaching health education online is therefore able to be studied within its socio-historic context by interpreting the individual experiences of participants. Consistent with an interpretive perspective, a qualitative methodology was used to collect and analyse data from the participants (Gratton and Jones, 2004).

Participants

All PST undertaking the subject in which this task took place were contacted via email and invited to participate in the study. 21 PST agreed to be involved in the study by allowing the research team to use their anonymised written reflections and 9 PST agreed to participate in a focus group (FG). It is important to acknowledge that all participants had experienced online health education as a student during the subject this study was conducted in (and others), and many were also casually employed as Teaching Assistants (TA) in local schools during COVID-19 suppression measures. Consequently, some participants referred to these personal experiences during reflections and FG. Participants noted that seeing online learning from these different viewpoints had improved their unit planning, particularly through seeing new

ideas for online activities, and having knowledge of activities that online students can find disengaging.

Procedures

After the final results for the subject were submitted, the subject coordinator anonymised the reflections of PST who have given consent for their reflections to be included in the study and sent these reflections to the research team. Online FGs were conducted after the semester was completed, questions were designed to gain a better understanding of PST perceptions about teaching health education online and their confidence to adapt tasks and activities from face-to-face delivery or develop unique online tasks. Additional prompt questions were used when further explanation was required. FGs ran for just over 30 min on average ($M = 33.02$, $SD = 7.00$). This study was approved by the Tasmanian Social Science Human Research Ethics Committee (Approval number: H23445).

Data analysis

Qualitative data from PST reflections were initially coded line by line into key themes in both an inductive and deductive manner (Hsieh and Shannon, 2005). The deductive analysis centred on themes from previous literature, whereas the inductive analysis allowed for new themes and connections to emerge from the data. Data were then coded axially to relate key concepts and categories to each other, and then consolidated into themes for discussion. The same process was utilised for the analysis of FG data. These themes were modified and refined through the data analysis process (Cruickshank, 2020). The analysis process was initially conducted by Author 1. The themes and sub-themes they developed were re-evaluated and refined by Author 2 before a final analysis was undertaken by both authors to agree upon the assignment of themes and indicative quotes. The findings presented below utilised excerpts from written reflections and the verbal responses of FG participants. These data are presented together to present a more informed picture of participants' perceptions of and confidence to teach health education online. Indicative quotes have been chosen for brevity, yet many other participants gave similar responses.

Results

This article articulates PST perceptions about teaching health education online. As indicated in Table 1, analysis of PST experiences led to the emergence of two key themes:

- (1) Teacher concerns, which detailed PST apprehension about how students would engage with the unit, and if the content would be sufficient for all students to meet the intended outcomes for the unit.
- (2) Personal considerations, which predominantly focused on PSTs confidence, competence and inclination to plan for and engage in online health education teaching and construct the required digital resources.

Discussion

The results suggest that the potential expectation to teach health education online in the future had caused apprehension for the PST who participated in this study. While PST were appreciative of the opportunity to better prepare themselves for future online teaching through completing this unit planning task, they had clear concerns around student learning if online delivery was adopted long term. The following discussion explores these concerns through the two key themes identified from the qualitative interpretive analysis.

Theme	Sub-theme	Indicative quotes
Teacher concerns	Engagement	<p>I would say, in order for engagement to stay at a reasonable level they'd have to be a lot of preparation put in place to try to make it like a school environment, timetable sort of scenario where at certain times of the day, they've got to be in a certain Zoom (FG Participant 7 (FGP7))</p> <p>Trying to make the content engaging for the students stuck at home and relying on intrinsic motivation to complete schoolwork was difficult (Reflection Participant 7 (RP7))</p>
	Learning	<p>We had a few short videos, we tried to put questioning in so there was a purpose to everything they were doing, rather than just "please watch this" . . . there's just not that accountability of being in the classroom so you just would not know as a teacher, what level of efforts the students putting in so I think learning would drop off a lot (FGP4)</p> <p>Finding that balance when making the instructions was hard for me, you want to be short and sharp, but you want them to understand it as well. You've only got a short space of time, by the time they get on the computer and then read instructions, how much time is really left for them to practically do anything (FGP8)</p>
	Differentiation	<p>We will get two weeks in in a normal classroom, and the rest of your unit changes because you've got to know your students and how you can best help them. Whereas in an online space, you're just kind of averaging everything and forming it so visual learners will get a little bit here and the audio students will get a little bit here and you do not really know what students need. I cannot get my head around that, like not knowing the students (FGP9)</p> <p>I found that you need to slow the unit down. I feel that in person the teacher can get through content quite quickly and address students who are falling behind immediately. Online delivery puts more of the responsibility on students to actually complete the content and then it is hard to track students' progression (RP10)</p>
	Time	<p>Something that takes time is actually setting up whatever platform you use. Rather than just take your resource and your lesson plan and go from there, you have to chuck it all online, make sure the links all work, make a video, all that stuff (FGP6)</p> <p>I found it very tedious because it was not necessarily hard work but it was just a long process, trying to convert everything onto the computer, put all the little things in the right space (FGP2)</p>
Personal considerations	Expertise	<p>I am glad I got the experience of going through the process of setting something up like that, it was a really valuable skill, but it's obviously not how I would like to go about it (FGP9)</p> <p>I found that I had to be very creative with my delivery by using videos, illustrations, images, and other forms of stimulus for different types of learners. A flipped classroom approach seemed to be the most appropriate form of effective teaching for online health education in my opinion (RP3)</p>
	Preference	<p>You cannot spend quality time with the students, so we used Zoom meetings as a weekly form of engagement. This is not an effective tool to deliver quality health education to students as it cannot create the same supportive/encouraging environment a normal classroom can bring. Since these topics are sometimes sensitive, peer discussion and hands on learning can be very important (RP3)</p> <p>I have learnt that I much prefer learning face to face, as both a teacher and a student! (RP6)</p>

Table 1.
Themes, sub-themes
and example quotes

Teacher concerns

The most prominent theme evident in participant responses was PST concerns about student learning and engagement. PST perceived that it would be more difficult to engage students online and that strategies they used to engage and build relationships with students in a face-to-face context would not successfully transfer to an online environment. Comments such as “it’s the engagement that I’m worried about” (FGP6) and “I think you’d find a lot of people either making excuses or just not willing to engage because they do not have that contact with a teacher to actually encourage engagement” (FGP7) were indicative of the feelings of most participants. These statements align with previous research (e.g. [Dhawan, 2020](#); [Parkes et al., 2014](#)) detailing the difficulty of engaging students in an online environment.

PST perceived a strong link between student engagement and student learning, and consequently were focused on presenting interesting content that students would engage with. These perceptions align with previous research (e.g. [Tai et al., 2019](#)) linking student engagement and student learning. The following exchange expresses the feelings of many PST in this study:

Researcher: So, in the process of preparing an online unit, what would you say you found most difficult?

FGP6: Making it not boring.

FGP4: Yeah for sure.

FGP6: I just pretty much thought If I was a student doing this, could I be bothered? Is it too much reading? Or is it too much listening? Some of the content was really challenging to try and teach in a way that we went, yes, if I was the student, I’d actually enjoy doing this, not making it feel like a chore.

PST detailed how their planning approach focused on ensuring videos, text and PowerPoints were short and succinct, and also used tools such as infographics to present information in alternative ways. This approach appeared to be influenced by their personal experiences and preferences when studying online, but does align with previous research (e.g. [Stone and Springer, 2019](#)) who found online students preferred shorter videos and activities. PST acknowledged that the presentation of information was a constant balance between too much and not enough, and that “it [being online] makes it harder to know student engagement levels and understanding” (RP9). PST such as FGP 5 and 9 were particularly concerned that a lack of class discussions would decrease the ability (and enjoyment) of teachers to make learning authentic, in depth and alter lesson direction based on student interests.

Many PST perceived there was less learning time in the online environment because teachers had to present more instructions online than they would face-to-face to ensure that students understood activities. Additionally, many PST (e.g. FGP 1 and 5; RP6 and 12) expressed concerns around students adequately understanding tasks due to their inability to ask clarifying questions as easily as they could in a face-to-face classroom. A link between engagement, understanding and learning is supported by previous research (e.g. [Martin and Bolliger, 2018](#)) and many PST in this study clearly grappled with how best to approach their unit as they believed it was much harder to gauge these things online.

PST were supportive and understanding of lower expectations during 2020 COVID-19 suppression measures, however they did question the affects and sustainability of lower expectations on student learning if learning was moved to online indefinitely. For example, FGP1 stated, “putting the unit online, that there was a lot of content that we had to miss out” and also that

the school [where they were employed as a TA] said to take at least 15 minutes out of your lesson, like do not bombard the students. All of a sudden that it was online, and it was just cut everything back, like expectations, and it was pretty much let's just get through this and then we'll come back face to face. But if students are only online then what are our expectations.

Research (Cruickshank *et al.*, 2021b) has noted that teachers perceived online delivery to be a temporary move until suppression measures had eased and teaching returned to normal. While this perception proved correct in many areas of Australia, questions surrounding best practice for online health education remain. If Dhawan (2020) and Brianna *et al.* (2019) are correct in stating that online teaching is growing rapidly and is now a necessity, then all teachers, both practicing and PST, may need to accept that their regular workload could include increasing demand for online teaching.

The capacity to provide differentiated learning opportunities for diverse students and student groups is an important but challenging element of effective teaching (Tomlinson, 2016). Findings from this study indicate that PST perceive questions surrounding differentiation to be a key component of best practice for online health education. Many PST in this study stated that they found it difficult to develop online tasks that catered for a variety of student abilities. For example,

I've actually found it really difficult making it broad enough so that students can really extend themselves if they want to, and also cater for students that are below standard, you know, make the learning broad enough that everyone can succeed at their own level and excel so that's probably the hardest thing. (FGP6)

It was such a process moving things online, that then moving things online and then giving it an above standard task and a below standard task can just be, I would not want to teach online to be honest. (FGP2)

PST perceived differentiation was much harder for teachers to successfully do online. It is important to acknowledge that the time pressure to move online in 2020 may have impacted PSTs perceptions about the challenges of teaching and differentiation online, as teachers did not have time to learn and implement effective online learning. While this PST perception may have been influenced by the unique context of COVID-19, these findings do align with similar findings from Beck and Beasley (2020), who reported that teachers struggle to find ways to differentiate content, product and process for online learning. Difficulties in differentiating activities may have been related to PST indicating that they felt they needed to have the entire unit developed and online before students started working on it. While this enabled students to work at their own pace, it made it harder to adapt content based on student progress and formative assessment. PST (e.g. FGP 5 and 9) stated they had focused on ensuring that they catered for different learning styles (e.g. visual, auditory) when planning their activities, but acknowledged this was only a small part of differentiation.

An additional concern related to differentiation that numerous PST expressed was that online students could get "left behind" because it would be harder for teachers to build authentic relationships with them, and identify when students need assistance:

I feel like students would be more likely to get left behind in the content and stuff like that, by not having that relationship with the kids and not being able to check in as easily. Definitely has negative impacts I feel. (FGP8)

You do not get to read your students, you do not get what makes them tick, the drive they have, who needs extra support and who needs a little bit of care, who needs watching, who might need a friend to guide them. (FGP9)

PST were concerned that a move to online delivery could place too much responsibility on students to complete their work, and that some students would simply not do it. While this

concern is likely to prove accurate for some students, research (e.g. Hou, 2015; Khan *et al.*, 2017) has shown that online learning that is engaging and student-centred can motivate students to take on increased personal accountability for their learning. Teacher–student relationships are key to students’ achievement and sense of belonging in online learning communities (Stone and Springer, 2019) thus PST could be encouraged to engage with learnings from other contexts (e.g. MOOCs; Salmon *et al.*, 2017) where online study has been common and successful for many years. The addition of scheduled classes each week (e.g. Zoom session) was one strategy mentioned by many PST in this study to help develop positive teacher–student relationships and improve student engagement and accountability. Overall, it appeared that PST were concerned about the experiences of their students and were not confident they could be given adequate opportunities to meet learning outcomes in an online environment.

Personal considerations

PST chose to present their online unit on platforms such as Wix, OneNote and Canvas, but indicated varying levels of expertise to construct their online learning resources. Participants commonly used words like “difficult” and “challenging” to describe the online unit planning task;

Literally putting things online was fine, but how we go about presenting it and getting the message across to students, that was very challenging. (FGP1)

I found this task a challenging process. I did not feel like I could deliver the content to the best of my abilities through an online learning space. I also found it difficult to gauge how much work to set and how to best deliver this. (RP1)

It was challenging when thinking about how we would teach certain parts of the lesson online. For example, teaching students about contraception methods in the online space. That was difficult because students do not get the full experience of seeing/touching the various contraception methods. (RP2)

The challenges PST refer to are unsurprising seeing they were still learning to be face-to-face teachers let alone online teachers. These points are reflected in the work of Luo *et al.* (2017) who identified a dichotomy between how PST are prepared to teach and what teaching looks like in the real world. For example, PST may be trained to answer test questions but find it difficult to solve real-world problems when teaching (Luo *et al.*, 2017). It is important to acknowledge that some teachers (and students) may have a personal preference for online teaching, and that effective pedagogical approaches, both face to face and online, take time for PST to develop.

Preparing online content can be a tedious and time-consuming task. It appeared that many PST in this study underestimated the amount of time it would take to develop and present their unit online. For example, FGP1 stated “I spent a whole day trying to edit the web page to line everything up. I thought it was gonna take me not even an hour, but it took me like six to eight hours”. PST acknowledged this process would be much quicker when teaching the same unit again in the future as it would just need to be updated rather than recreated. While updating rather than developing units will likely take teachers less time, many teachers, including the PST in this study, may need to spend a substantial amount of time working with their colleagues and networks to build up their online plans and resources initially.

PST had a clear preference for face-to-face teaching, both as teachers and as students. This preference may be connected to the unique time pressures of COVID-19 suppression measures, which required teachers to move quickly without adequate time to learn effective online pedagogy. However participant responses indicated that a lack of engaging online learning experiences was a more influential factor. Many PST indicated that their learning

and engagement had decreased online and were concerned the same would happen to school students. PST regularly linked their responses back to their personal experiences as students, particularly in online university subjects. The following comment is indicative of FG discussions:

when we switched to online [university classes], I do not feel like I've learned nearly as much. And that's partly me just finding online learning not very engaging, and maybe jumping on my phone in the middle of the lecture, which I would not normally do if I've got a teacher up the front teaching me. And I'll sure students at home would do the same. (FGP6)

Negative experiences as online university students had clearly influenced PST perceptions of online learning at it was clear than many PST had not enjoyed the forced move to online university classes during 2020. PST stated they were disengaged doing online readings and listening to long online lectures. They were also concerned about student engagement considering the numerous distractions they would have around them at home, distractions they acknowledged they had fallen victim to themselves. While it appeared that PST had predominantly had negative and unengaging experiences as online learners, they were able to use these experiences in their planning. For example:

We definitely looked at our online units, what went well in those, and what caused us to disengage with the unit and we tried to swap those activities. We got rid of PowerPoints and tried to split up our videos and make them no more than 10 minutes. If I see an hour and a half lecture to watch I'm just like, no thank you, I'll do that next week, or never. (FGP4)

Despite the challenges they faced as online learners, PST acknowledged that they would probably be teaching online at some point in the future and that this unit planning task was interesting and helpful to their development as teachers. They particularly enjoyed the opportunity to experiment with tools such as infographics and videos which they had not done a lot previously. The work of [Duncan and Barnett \(2009\)](#) highlighted the substantial increase in educational institutions adopting online learning methods over a decade ago, therefore this acknowledgment made by these PST about their teaching futures is relevant. Moreover, [Palvia et al. \(2018\)](#) suggest that worldwide online education is set to become mainstream by the year 2025.

Implications for practice

PST are well placed to provide direction on how teacher education and professional development for health educators can best shift to respond to the demands of online learning. They have experience as online university students, many are young enough to remember high school and what they found engaging and disengaging at that age, and many are currently working within schools. Despite this advantageous positioning, teaching is an “outrageously complex activity” ([Shulman, 1987](#), p. 11), and PST will need to access continual professional development in order to ensure their future students, both online and face to face, are adequately supported to achieve their intended learning outcomes. According to [Gurr \(2020\)](#) there is a “new normal” in education provision that will incorporate both in-person and remote learning, incorporating a greater focus on student engagement, agency and inclusion. Against this background, the need for PST to possess levels of competence and confidence with flexible delivery modes is more critical than ever before. PST comments did demonstrate some pedagogical content knowledge (PCK) about delivering health education online, however knowledge surrounding best practice in online education is dynamic and rapidly evolving. In light of recent research surrounding online learning (e.g. [Brianna et al., 2019](#); [Dhawan, 2020](#)) PST should be proactive in pursuing opportunities to develop their PCK, and potentially more relevantly, their technological pedagogical content knowledge (TPCK; [Phillips and Harris, 2018](#)), to help develop their capacity to deliver high-quality online

learning experiences to their students. Being proactive with such professional development will also facilitate PST confidence, range of skills and creativity. Universities could also assist in this endeavour through role modelling high-quality TPCK which PST can experience as students and learn from.

While future research should explore how developing PCK/TPCK might help PST (and all teachers) develop their confidence and competence as online educators, PST in this study detailed a number of key recommendations they believed would assist teachers to deliver engaging health education online in the future:

- (1) Have a scheduled/timetabled class time (e.g. Zoom session) each week that includes full class and small group activities and discussions;
- (2) “Flip” the classroom by requiring students to access content before class, then cover content in more depth in zoom sessions and give students lots of opportunity to ask questions;
- (3) Encourage students to stay in Zoom sessions after class if they have additional questions and schedule optional “check in” sessions where students can work one on one with the teacher if they require further assistance;
- (4) Use a variety of content (e.g. video, text, image, infographics);
- (5) Make videos, PowerPoints and readings short and succinct. Avoid excess repetition and have questions throughout videos so that students are thinking and reflecting, not just passively watching;
- (6) Make the purpose of activities clear to students and focus on real-life applications of content and activities;
- (7) Take the time to search for existing resources.

Limitations

Some caution should be employed when considering these findings as data collection was from a relatively small sample at one institution in one Australian state. Generalising beyond the sample is difficult as different states may have different priorities which could affect staff arrangements and curriculum delivery and different institutions have different context for health education. This study could be replicated on a much larger scale to collect more representative data that can be used to make inferences about PST confidence, competence and inclination to teach health education online and the issues they face when doing so.

As health education is part of the broader HPE learning area within the Australian Curriculum (ACARA, 2020; Cruickshank *et al.*, 2021a), physical education (PE) could also be included in future research, particularly as some PST in this study stated they were far less confident about how to teach PE effectively online. Including the views of other stakeholders such as school students, parents (Nash *et al.*, 2020) and school leaders would also be beneficial for identifying the obstacles to a high-quality online health (and PE) program and who (e.g. teachers, parents, school, government) is responsible for different aspects of this shared challenge.

Conclusion

PST appeared to be reasonably competent users of technology but indicated a strong preference to teach health education face to face, predominantly because of negative personal experiences as online learners. This preference was based on concerns that a shift to online delivery could negatively affect both student engagement and learning. Additionally, PST

found it time-consuming and tedious to plan and develop content in an online context, and much harder to differentiate activities. It is likely that such feelings reflected the level of PST familiarity with planning and preparing online learning opportunities, again in combination with their own previous online experiences. Participants in this study were not alone in finding the move to online learning challenging, with many experienced teachers finding similar challenges (Cruickshank *et al.*, 2021b). Overall, it appeared that PST were worried about the experiences of their students and were not confident they could be given adequate opportunities to meet learning outcomes in an online environment. PST were appreciative of the COVID-19 induced experience of planning an online health unit and acknowledged that they would likely have to do this in the future. For this to happen effectively PST would benefit from education in online instructional design principles, learning options with multiple entry points, along with exposure to educational software and programs that provide convenience and flexibility. COVID-19 granted an emergency transition that essentially forced the utilisation of digital learning platforms to allow for student engagement and learning to continue. For many educators this created uncertainty, novelty and a lack of clarity regarding progressive future direction. Future research could consider building on this study by focusing on how best to develop PST PCK/TPCK to facilitate and enable increased confidence and competence to teach health education online; and how these high-quality pedagogical approaches can be best shared through teacher education and professional development.

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Corresponding author

Vaughan Cruickshank can be contacted at: v.j.cruickshank@utas.edu.au

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Online argumentation-based learning aided by digital concept mapping during COVID-19: implications for health management teaching and learning

Dorit Alt

Kinneret College on the Sea of Galilee, Jordan Valley, Israel, and

Lior Naamati-Schneider

Hadassah Academic College, Jerusalem, Israel

Abstract

Purpose – The COVID-19 pandemic has affected educational systems worldwide, forcing them to abruptly shift from face-to-face to online teaching and learning. This case study illustrates how a traditional lecture-based activity for undergraduate students in a Management of Health Service Organizations program was transformed into an argumentation-based learning activity using the technique of digital concept mapping and was deployed in an online format during the COVID-19 lockdown.

Design/methodology/approach – The students were tasked with solving an ill-structured problem bearing significance for their future professional lives and connected to the contents of their course (entitled “Assimilation of service quality in health systems”). The activity was composed of two phases. In Phase 1, participants were asked to provide five arguments to establish their proposed solution to the problem by using a concept map on a digital platform (Mindomo). In Phase 2, they were asked to substantiate their arguments. Reflective journals were used to ascertain how the participants viewed the activity. Thematic analysis was used to analyze the qualitative data by searching for themes demonstrating different epistemological positions.

Findings – Six themes were inductively derived from the students’ reflections: (1) transitioning from passive to active learning; (2) generating epistemic change; (3) social perspective-taking; (4) domain-based knowledge; (5) prior knowledge and experience; and (6) online collaboration with other students. Episodes, thoughts and feelings expressed by the students were reported so as to increase the reliability of the recurrent and common themes.

Originality/value – This study mainly shows that combining constructivist teaching and learning tools with advanced technology in an online course enables the development of lifelong learning capabilities among students in the health management professions.

Keywords Health education, Online education, Dilemma-based learning, Digital concept mapping, Self-assessment

Paper type Research paper

Introduction

The outbreak of the COVID-19 pandemic generated multiple challenges in the realm of health. Aside from coping with the clinical reality of severe illness, treating numerous patients simultaneously and dealing with an unknown virus, the healthcare system has been forced to face additional problems caused by the pandemic: the lack of professional knowledge in treating the novel Coronavirus, the need to provide aid and care using advanced technological methods, maintaining a distance when caring for hospitalized patients and those in the community, and providing digital, online services for the general public.

Coping swiftly with this wide array of sudden, urgent needs – which are liable to continue over a long period of time or reappear in the future – requires the directors and staff in the healthcare system to demonstrate diverse capabilities. These include independent and adaptive learning, cooperating to solve current complex problems, high-order thinking



capabilities, a highly developed professional ethos, intellectual flexibility and digital literacy. These capabilities are becoming an essential and inseparable part of the array of tasks that characterize healthcare professionals in the 21st century (Berkhout *et al.*, 2018; Wachter and Wehrwein, 2015).

The prevailing assumption is that academia must assume an important role in training doctors and medical staff by developing and honing these skills. Today, in the conceptual age (William, 2017), which is characterized by rapid changes, there is a greater perception that teaching and learning methods need to be altered from passive to active. This will enhance additional skills necessary in training healthcare professionals that are better suited to this era and its particular demands (Harris and Bacon, 2019). The COVID-19 crisis has unexpectedly created opportunities for accelerating the change that is needed in teaching methods by compelling the teaching staff and students to immediately adjust their teaching and learning methods to distance learning without adequate prior preparation. Alongside the challenges it poses, the crisis also offers an opportunity for changing methods and objectives in healthcare education while, at the same time, adapting the study program to the needs of students in the healthcare system. The change is also liable to be challenging since it requires establishing learning objectives and outcomes that demand changing students' epistemological perspective on the nature of knowledge and learning. It requires a transition from a teacher-centered pedagogical perception to one that promotes learning activities that revolve around the students and develop their abilities. These changes might pose various difficulties as lecturers and students alike are unaccustomed to these new teaching methods and prefer to adhere to traditional, and therefore familiar and comfortable, ones (Alt, 2018).

Consequently, it is imperative to apply constructivist approaches through distance learning in times of crisis and to provide the medical staff with suitable training. If these steps are not taken, learning will be based on prevailing traditional teaching that will potentially fail to yield lifelong learning skills that the medical staff requires and needs (Harris and Bacon, 2019). The current study attempts to demonstrate how constructivist pedagogy can be applied to solving a problem by using argumentation in distance learning. It describes how a traditional face-to-face activity for undergraduate students in a Management of Health Service Organizations program was replaced by an argumentation-based learning activity using digital concept mapping (CM) and deployed in an online setting during the COVID-19 pandemic.

Another aim is to ascertain how the students perceived the activity and its implications in relation to two learning outcomes: First, students' epistemological beliefs, regarding the nature of learning, often reported as valuable precursors of their adaptive learning (Greene *et al.*, 2018; Muis *et al.*, 2015), and their implications for pedagogy in healthcare professions. This study's main objective is to shed light on this prompt instructional shift from the participants' perspective, by analyzing qualitative data reflecting their epistemological and ontological standpoints. Second, lifelong learning skills. This study specifically aims to uncover the main challenges and opportunities of the suggested online argumentation-based learning activity with CM for nurturing health management students' lifelong learning skills such as high-order thinking skills, critical thinking and problem-solving skills. In sum, the aim of this paper is twofold: first, to present an innovative online argumentation-based learning activity aided by CM corresponding to the call for skills required for medical staff; second, to evaluate the outcomes of the proposed instructional initiative (i.e. the epistemological shift from teacher-centered to student-centered paradigm, and acquisition of lifelong learning skills) through the subjective eyes of the participants.

This study may enhance our understanding of how to use online learning effectively so as to develop students' epistemological change and lifelong learning skills, when distance teaching is required. These abilities will enable medical professionals to better contend with a

Literature review

The restrictions placed on higher education following the COVID-19 pandemic have challenged the instructional methodology practiced thus far, forcing higher-education faculty and students to teach and learn differently. This may be challenging for health professional educators who often lack formal education qualifications and, as a result, adopt pedagogical approaches of face-to-face learner interaction aligning with how they themselves were taught, despite the imperative to embrace online and constructivist approaches to teaching and learning (Seymour-Walsh *et al.*, 2020). In line with the research objectives, in this section, we will discuss an innovative pedagogical approach of argumentation-based learning, which can be used online, and its potential impact on students' high-order thinking skills and their epistemological point of view regarding the nature of knowledge and learning in health education. Second, we will illustrate how CM can be used online to support students' enrollment in argumentation-based learning and enhance 21st-century skills such as critical thinking and problem-solving skills. Each section will highlight the skills which medical personnel and medical managers might gain by experiencing first-hand this innovative technology-enabled pedagogy practiced online during the lockdown.

Argumentation-based learning and high-order thinking skills

Encouraging high-order thinking skills is deemed important in health education (Medina *et al.*, 2017). These skills can be developed by carefully designing learning activities within courses and the curriculum as a whole, such as argumentation-based learning. Theoretically informed practices may assist health-profession educators and course designers in effectively responding to the COVID-19 crisis, and in creatively and innovatively exploring novel approaches intended to develop and deliver quality online education (Seymour-Walsh *et al.*, 2020).

The literature contains various definitions of argumentation (Toulmin, 2003; Walton, 2006). Despite the differences between them, all the definitions point to argumentation as a means to rationally resolve divergent opinions in critical discussions (Noroozi *et al.*, 2012). Developing such decision-making skill sets is highly relevant in the context of global public health crises during which there is a constant, real-time need to make rational, well-founded decisions. Such skills are key components in Burkle's (2019) health crisis management model and are deemed essential requisites for fulfilling the strategic and operational phase requirements of mitigation, response, recovery and rehabilitation during sudden-onset disasters and other time-limited crises.

The term "argument" in this paper refers to the artifacts that a student creates when asked to justify claims, whereas the term "argumentation" refers to the process of constructing these artifacts (Sampson and Clark, 2008). Based on the Piagetian equilibration model of socio-cognitive conflict (Piaget, 1985), such processes should provide learners with an opportunity to review their ideas/beliefs which, in turn, motivate them to reconcile the cognitive conflict by explaining their views to the members of their group (Cheng, 2014).

An example of a didactic method that bridges argumentation, domain-specific knowledge and moral values is the Values and Knowledge Education (VaKE) approach (Patry *et al.*, 2013). This approach exposes students to dilemmas relevant to their profession, clarifies the importance of their moral values and allows the students to form an independent opinion while emphasizing practices of dialogue and argumentation. This practice is largely informed by the social cognition theory (Selman, 1980), which asserts that a key factor in promoting

social cognition is enhancing one's ability to understand another's feelings and viewpoints and acknowledge that another's viewpoint may differ from one's own. Role-playing skills entail understanding another's cognitive and emotional attributes (i.e. moods, feelings and attitudes).

Argumentation is suggested as a means to improve higher-order thinking skills of conceptual, procedural and metacognitive knowledge (Asterhan and Schwarz, 2016) rather than mere factual knowledge. *Factual knowledge* pertains to the basic elements that students must know to be sufficiently acquainted with a discipline or solve problems (Anderson *et al.*, 2001). Beyond merely memorizing facts, *conceptual knowledge* refers to understanding similarities and patterns in factual knowledge and is centered on the interrelationships among the basic elements within a larger structure (Blumberg, 2009; Wilson, 2016). *Procedural knowledge* pertains to knowing "how" to do something, for example, how to use particular methods to achieve a specific learning goal (Anderson *et al.*, 2001). *Metacognitive knowledge* is the knowledge of general strategies for learning and thinking. This type of knowledge involves two main components: knowledge of cognition and regulation of cognition (Brown, 1987; Jacobs and Paris, 1987). Weinberger and Fischer (2006) maintain that these types of knowledge can be achieved by encouraging students to construct arguments to justify their position.

Advancing higher-order thinking skills is considered an important learning outcome in health education. For example, Medina *et al.* (2017) maintain that metacognition is an essential skill to confront medical errors, which can occur because the pharmacist did not ask "do the orders make sense for the indication?" (i.e. metacognitive monitoring) or "did I check to ensure I entered things [in the computer database] correctly?" (p. 1). Harris and Bacon (2019) underscored the advantages of active learning versus passive learning in producing students' cognitive skills in healthcare-profession education. Based on their findings, student-centered learning techniques contribute to lower- and higher-order cognition more than passive learning methods do. They encourage educators to equalize instructional design "with the needs of the student and the demand of the workforce at the center of priority" (p. 143). Based on this premise, and in line with the current research objectives, the question of how an argumentation-based learning activity can be designed during a prompt shift to online learning, and how it might affect students' thinking skills lies at the core of the preset investigation.

Argumentation-based learning and epistemological beliefs

Teachers' and students' epistemological point of view regarding the nature of knowledge and learning might influence their approach to teaching and learning and how they make important instructional decisions and/or set their learning goals (Fives and Buehl, 2016; Schraw and Olafson, 2002). These beliefs are divided into teacher-centered instruction in which the teacher is perceived as the sole transmitter of knowledge and the student as the recipient of the knowledge, and student-centered instruction, which underscores the importance of experience and active learning (Chan and Elliott, 2004). Relying on their previous experience, students may be accustomed to the traditional way of learning, which corresponds to an absolutist point of view (Kuhn *et al.*, 2000). From this point of view, knowledge is composed of facts that are yet to be discovered.

There are three distinct levels of epistemological belief. *Absolutists* believe that knowledge is finite and unchanging and that objective truth exists. *Multiplists* hold a higher level of epistemological belief in which knowledge is seen as inherently subjective, consisting not of facts but of opinions, generated by human minds, indefinite and not subject to evaluation (Asterhan and Schwarz, 2016; Kuhn *et al.*, 2011). The highest level is called *evaluativism*, according to which individuals recognize the significance of weighing evidence and addressing contradictory claims (Kuhn *et al.*, 2000).

Epistemological beliefs are often reported as valuable precursors of students' cognition, motivation for learning, learning approaches, adaptive learning and achievement (Greene *et al.*, 2018; Muis *et al.*, 2015). However, while it is widely acknowledged that personal epistemology impacts students' beliefs about learning, prior research falls short of addressing the use of educational programming to efficiently impact individuals' epistemic beliefs.

Encouraging students to reach the highest level of epistemological beliefs – evaluativism – is considered a foremost learning goal in health education (Cira *et al.*, 2020; Hinneburg *et al.*, 2020; Horntvedt *et al.*, 2018). Evidence-based decision-making programs (Hinneburg *et al.*, 2020) and evidence-based practices for physicians, medical and nursing students (Cira *et al.*, 2020) are considered imperative for ensuring patient safety. Students should recognize the value of weighing evidence, which can be achieved by continually practicing teaching and learning methods that encourage conscious use and application of a wide variety of knowledge sources. This requires formulating structured queries; and conducting searches of resources from which trustworthy and reliable evidence can be acquired (Horntvedt *et al.*, 2018). Indeed, searching for evidence is considered a key competence for health practitioners. However, undergraduate programs continue to provide predominantly traditional, frontal classroom-teaching strategies that have limitations in facilitating the fostering of critical competencies required in real clinical contexts (Park *et al.*, 2020). Healthcare researchers suggest shifting education from merely providing decontextualized knowledge to a more innovative type of teaching that focuses on the use of scientific evidence to promote students' clinical reasoning and produce safe and effective healthcare outcomes (Park, 2011).

Holding higher epistemic beliefs seems to pose a challenge for clinicians; however, it may also provide opportunities for formulating important clinical questions specifically in times of uncertainty. This notion is strengthened by Cheng *et al.* (2020) who focus attention on the unique needs and concerns of healthcare students in the face of the COVID-19 pandemic and highlight the importance of designing learning activities to enhance students' critical thinking as a core skillset necessary in the discovery of facts and problems during times of crisis. Web-based experiential learning strategies are suggested to improve students' engagement and experience in learning environments aimed at helping students and clinicians recognize the existence of uncertainties in healthcare practices (Park *et al.*, 2020). Therefore, it seems worthwhile to evaluate how an argumentation-based learning activity can be employed in an online setting imposed on higher education during the COVID-19 period, and how it might affect students' epistemological point of view.

Web-based platforms for argumentation-based learning

During the first COVID-19 lockdown, in March–April of 2020, faculty members were required to design quality online courses that support a community of learners capable of working together online to mitigate the teaching and learning challenges posed by the crisis. The faculty, previously resistant to any form of technology-enabled teaching, needed to become acquainted with an abundance of technological platforms communicated by hastily assembled online trainings (Fernandez and Shaw, 2020). Nonetheless, they often failed to complement an appropriate and effective technological tool to their teaching methodology while suddenly being immersed in online teaching. Therefore, and in accordance with this research objectives, it is crucial to show how various digital learning technologies can be used to support social-constructivist online teaching activities and be leveraged to promote interaction as “the key to effective online learning and ironically the antithesis of social distancing” (p. 3). The following paragraphs describe how CM can aid online argumentation-based learning towards facilitating students' lifelong learning skills such as critical thinking.

Several online settings have been found to support sharing, constructing and representing arguments in multiple formats. For example, Noroozi *et al.* (2012) revealed a variety of

recommended external knowledge representation tools designed to represent argumentation in Argumentation-Based Computer-Supported Collaborative Learning (ABCSCCL), such as Issue-Based Information Systems (IBIS). Such knowledge representation tools help learners clarify their arguments, argue more effectively and find patterns of evidence.

Asterhan and Schwarz (2016) assert that although such computer-supported collaborative learning efforts might support argumentation, research that establishes this conjecture is still limited. To address this problem in the current study, a technology-enabled CM method was used for the first time to facilitate argumentation processes. Concept maps (Novak and Gowin, 1984) have been employed in education systems for over 30 years (Kinchin, 2014). Yet, their utilization in argumentation has been considerably less common in higher education, and minimal attention has been paid to their use in online learning. CM is a learning method and educational tool using diagrammatic interrelationships between concepts representing subject knowledge. Concept maps should not merely list random textual information but rather should depict the structure of knowledge in propositional statements that illustrate the interrelationships between the given concepts in a map (Novak, 1981).

Through CM, students are expected to be able to transfer applied didactic objectives from the classroom to their clinical practice, where critical thinking and problem-solving skills are vital for success. This premise has been reinforced by several empirical studies that demonstrate the benefits of CM used in concert with problem-based learning (PBL) in facilitating students' 21st-century skills. For example, Joshi and Vyas (2018) maintain that concept maps should be used to solve epidemiological problems in community medicine, which focus on public health concepts, mathematical calculations and "applied" interpretations. Similarly, CM's effectiveness in academic problem-solving performance, as well as in declarative knowledge questions and their perceptions regarding CM, was examined among medical students (Baig *et al.*, 2016). These researchers found that CM improved academic performance in problem-solving but not in declarative knowledge. Students' perception of the effectiveness of CM was positive. Another benefit of using CM is fostering students' ability to self-regulate their learning processes (Chularut and DeBacker, 2004; Naderifar, 2018; Roy, 2011). However, while concept maps have been shown to be an effective tool for facilitating students' critical thinking, CMs' contribution to their self-regulation abilities in face-to-face or online courses has been insufficiently investigated (Barnard *et al.*, 2009).

This study

The literature surveyed above reflects how argumentation-based learning supported by digital CM has the potential to enhance students' lifelong learning skills, such as domain knowledge, critical thinking, problem-solving skills and self-regulation abilities, and shape their epistemic beliefs. This research sought to elucidate how such innovative pedagogy can be employed online during times in which a massive shift away from frontal learning and teaching in traditional settings with physical interactions has been imposed on teachers and students. Another aim was to reveal the main challenges and opportunities for health management students. To this end, Management of Health Service Organizations students' reflective journals were analyzed to delve deeper into the questions of how the participants perceived the activity and its outcomes during the COVID-19 period. Thematic analysis was used to analyze the qualitative data by searching for themes and patterns indicating different epistemological and ontological standpoints.

Method

Participants

Data for the analysis were gathered from 65 Israeli undergraduate students enrolled in a Management of Health Service Organizations program, covering patient-doctor relations,

quality of service in the healthcare system, and ethics and patient rights. The program instructs students on the fundamentals of marketing, finance, organizational behavior, communications, legal issues and strategies. The students were enrolled in a 3rd-year course entitled "Assimilation of service quality in health systems." The participants' mean age was 25.70 years (SD = 6.02), and 85% were females. The distribution regarding ethnicity was: 72% Jewish students; 28% Arab (Muslim and Christian) minority students.

Data were gathered following the intervention, as described in the next section. Prior to obtaining participants' consent, it was explained to them that the materials used in this study would be processed anonymously and that they had the option not to allow the use of these materials for research purposes. Finally, participants were assured that no identifying information would be processed. The study was pre-authorized by the college's Ethics Committee.

The intervention

VaKE (Patry *et al.*, 2013) was designed and piloted in this study. VaKE is deemed a useful teaching tool that combines morality and values-centered education with knowledge content, emphasizing social behavior and the development of critical thinking in a PBL environment. In line with VaKE, the participants were presented with a problem relevant to their course content, dealing with *accreditation*. The students were asked to argue for or against the implementation of the accreditation process within hospitals. The task had two phases. In Phase 1, participants were asked to detail five arguments to establish their decision by using a concept map. Group work was allowed, although individual work was preferred and encouraged. In Phase 2, relying on the materials taught in their courses, the students were asked to search for and obtain the necessary supporting information to substantiate their arguments and to associate ethical values with at least two of the arguments they had provided. Next, the participants were instructed to specify and explain in detail the differences or similarities between their respective arguments. *Mindomo*, a popular internet platform for designing concept maps, was utilized. To facilitate the assessment of their maps, well-established criteria were provided to the students in advance of the activity (Panadero *et al.*, 2013).

Data collection

The students were asked to contemplate their personal learning process during the activity and to submit a reflective journal at the end of it. In the journal they were instructed to write about their self-perceived progress from the point of their preliminary argument to a more complex one and to describe their challenges and gains in light of the experience. At the outset, participants were given reflective prompts (Tripto *et al.*, 2016), such as "Describe the main challenges raised during the activity," or "Describe what worked well during the learning activity." This practice encourages students to document their thoughts during an activity and prompts them to think and write about their learning in a multidimensional way (Alt and Raichel, 2020; Zohar and Barzilai, 2013). In addition, the students were encouraged to contemplate things that have the greatest personal significance for them. The entries were typically 8–10 paragraphs in length.

Data analysis

65 entries were analyzed in line with the deductive and inductive approaches. Based on the deductive approach, initial categories were generated based on our theoretical review: (1) epistemic change; (2) social perspective-taking; (3) domain-based knowledge (including factual, conceptual, procedural and metacognitive knowledge); and (4) online collaboration

with other students by means of digital CM. The inductive approach facilitated the identification of additional meaningful categories. According to [Strauss \(1987\)](#), both these aspects of inquiry are absolutely essential throughout the analysis. Thus, both logically derived categories and those that may have “serendipitously” arisen from the data may find their way into the research ([Merton, 1968](#)).

Thematic analysis was used in the present study for identifying, and reporting additional themes found within the data ([Braun and Clarke, 2006](#)). This highly flexible approach provides a rich and detailed account of data with only a few prescriptions and procedures. It is a practical, effective technique, recommended for examining the viewpoints of different participants and summarizing key features of a large set of data ([King, 2004](#)). Each entry was summarized to provide a general view of the essence of participants' reports. Next, the entries were coded. The most important data were filtered and clustered into categories. To increase interrater reliability, two researchers engaged in the iterative dialogue aimed at capturing the essence of the research findings. No software was used. Episodes, thoughts and feelings expressed by the students served to increase the reliability of the recurrent and common themes.

Researchers' positionalities

The first author is a researcher specializing in the field of 21st-century instruction, learning and assessment. Her research centers on promoting lifelong learning skills via formal and non-formal learning environments. The second author is a researcher in the fields of healthcare management, medical education, and healthcare policy and marketing. These different but complementary backgrounds allowed the researchers to approach the study with extensive prior knowledge of the subject matter and to address certain topics, such as structuring the learning activity, with greater ease. To attain deeper reflexivity, the authors discussed their respective theoretical, research and practical perspectives throughout the research and writing process. In addition, the researchers kept a reflexive journal of the research process ([Tobin and Begley, 2004](#)). This self-critical account was used to document the logistics of the research, methodological issues that arose and each researcher's personal reflections ([Lincoln and Guba, 1985](#)). This assessment process ensured the logic and traceability of the research.

Findings

Six categories were detected in the analysis of the students' reflective journals: (1) transitioning from passive to active learning; (2) generating epistemic change; (3) social perspective-taking; (4) domain-based knowledge (including factual, conceptual, procedural and metacognitive knowledge); (5) prior knowledge and experience; and (6) online collaboration with other students.

From passive to active learning

When writing in their journals, the students claimed for the most part that this teaching method was new to them. For example, Shada described the work process as being not just different but contradictory to previous learning processes she had experienced: “Usually we were asked to read articles and then relate our opinion based on the article. In this assignment, we were asked to do exactly the opposite: to first say what we think and claim, and then to justify and strengthen our claim with the help of articles.”

Rotem noted that this was a new and unfamiliar method that increased her sense of creativity and her motivation to complete the assignment: “During the academic year we have to submit many assignments, and the processes and ideas behind them are very similar.

Using the [concept] map caused me to be creative and to think in a different way. It appears that the process is regarded as a transition between the traditional way of learning and a method that places the learner at the center of the learning process.”

Epistemic change

During the learning process, the students experienced a perceptual change regarding the learning process and the acquisition of knowledge. At the outset, having no previous knowledge of the topic, the students made use of their intuition when building the first concept map. In the course of the assignment, when asked to provide a basis for their arguments, the students were exposed to a variety of directions that presented a complex reality about the topic which either contradicted or supported their initial point of view. In the following example, Roni reports on the complexity of the use of accreditation, which cast doubt upon her initial perception:

I approached the assignment about accreditation, knowing absolutely nothing about the topic. I heard about the concept of “accreditation” during the lesson for the first time, and I understood that it was something that has become compulsory for every hospital and ensures the assimilation of quality in the hospital. However, during the assignment, I learned other aspects of accreditation, including points about the heavy workload and burdens that are placed upon the nurses and the medical staff and the additional issues they are forced to deal with that are not connected to caring for patients.

Half of the students described their journey of gaining an understanding about acquiring knowledge and providing a firm foundation for it. It began with their personal feelings and intuition while building the first map. However, during construction of the second map, the understanding grew that it is necessary to establish the facts before making rational decisions. This was described by Orli:

The activity helped me to grasp the rationale for the decision and to understand the issue of accreditation. I had to search for scientific knowledge sources that presented well-based, reliable arguments. Today I feel that my opinion and my understanding of the topic are based on facts and not merely on general knowledge or personal feelings. The professional knowledge showed me the degree of importance of the accreditation process and its numerous advantages, provided it is done in a manner suitable to the organization.

Social perspective-taking

During the assignment, the students were provided with an opportunity to reexamine their ideas/beliefs, which, in turn, motivated them to reconcile the cognitive conflict by explaining their views to their group members. The students realized that there is a discrepancy between their existing knowledge and the point of view of others. This raised doubts about the validity of one’s point of view, as explained by Shiran,

My initial opinion was against accreditation, but as time went by, I became avidly in favor of accreditation. I understood that my former negative opinion stemmed from a lack of budgets, and I had heard from nurses that it was all a deception. As we progressed with the assignment and talked while we were writing, I believed that my initial opinion had been mistaken and that the other members in my group were correct. We found articles in favor [of accreditation], we discussed it, and persevered in finding its positive aspects. During a lesson in Ethics, there was a lecture about accreditation given by a guest lecturer. I was fascinated when she explained that there was no difference in the number of errors or infections between hospitals with accreditation and those without it. It made me wonder about the deception that accreditation presents and whether it is truly beneficial.

Rachel emphasized that the assignment had encouraged her to take an interest in the opposing side. She explained the challenge the assignment placed before her in this aspect, “compelling” her to investigate aspects that contradicted her initial assumption:

We had to understand the other side in order to form a basis for our opinion. We had to understand that every coin has two sides. The objective, among other things, is to improve the level of service and the quality of care, and to decrease the incidences of illness and death. Since I was under the impression that there was apparently no benefit to accreditation, I came to the conclusion that it currently does more harm than good. Reading the articles presented me with other opinions, and cooperating with other members of the group helped us focus on our opinions and formulate a basis for them.

Erez also explained that the process increased his interest in “the other side” and exposed him to opinions that were contradictory to his own. He was compelled to listen and to understand them. “During the process of searching for material on the Internet, I was exposed to a wide variety of opinions about accreditation, including opinions of people who were critical of it. I listened to opposing opinions in order to understand the reasons for them, with the idea that they might influence my opinion about it.” Six students reported using the practice of role-playing in order to enable them to closely explore and better understand opinions differed from their own. This was explained by Gila:

I was initially in favor of accreditation. I believed that hospitals underwent a refreshing process related to everything connected to quality of service when they were being examined by an external factor. Progressing from the first map to the second brought many challenges, discussions, and questions. I found myself asking whether I would change my opinion if I were in the position of a nurse in a hospital, and for a moment, I was skeptical.

Domain-based knowledge

Based on the literature review, argumentation is suggested to improve conceptual, procedural, and metacognitive knowledge rather than merely factual knowledge. Analysis of the students’ journals revealed that for many of them, the assignment helped develop high-level thinking, on a continuum from conceptual to procedural and metacognitive knowledge, rather than merely supporting factual knowledge.

Factual knowledge. The students reported that they were exposed to vast amounts of knowledge in the course of the assignment. The assignment enriched their world of knowledge about accreditation, its advantages, and disadvantages. This stage was important for the beginning of the formulation of the second map and marked the beginning of the way toward establishing an argument. Yifat, for example, explained

I accumulated a vast amount of knowledge. I read and enriched my knowledge of the topic. I read studies that had been conducted that examined the accreditation process and its advantages. I think that I accumulated knowledge above and beyond what I needed, which helped me to reinforce my opinion (in favor of accreditation).

The students reported that the CM helped them remember the vast amounts of material and concepts they had learned on the topic. Hussein reported: “The activity definitely helped us to understand the topic of accreditation in hospitals. When you process the material that you read and learn, you assimilate it and remember it for a longer period of time.”

An additional characteristic that contributed to recalling the learning material was the visualization of the map. The use of visual aids such as colors and different backgrounds helped students to remember the material better, as explained by Maytal:

The map helped a lot. The visual aspect of the map helps organize and focus the material, keeps it in order, and mainly helps in remembering the topic. It is a visual map that is rich in colors that also serve as a factor that helps you remember.

Conceptual knowledge. A recurrent theme in the students' reflective reports was related to conceptual knowledge. This type of knowledge refers to patterns and interrelationships among the basic elements within a larger structure that enable them to function together – for example, knowledge about similarities and patterns in factual knowledge elements. The students predominantly emphasized the contribution of the CM to organizing their knowledge and identifying the connections between arguments, as described by Gabi:

I learned how to use the program and to develop a comprehensive manner of thinking and looking at several arguments simultaneously and to identify the various connections between them. However, I noticed that some of the articles were compatible with several arguments, and I felt I needed to thoroughly assess the degree of compatibility.

Ehud described how the digital CM helped him not only to organize the learning material but also to organize his thinking and to identify connections between concepts. "Building the map helped me to organize my thoughts and to return frequently to the main position and all the arguments, and to ensure that I didn't repeat myself. It also helped me to begin to consolidate thoughts about connections without the limitations of a pattern, program, or specific application."

Procedural knowledge. The assignment presented the students with a dilemma. To find a solution, they had to make use of various research strategies. Unlike factual knowledge, which is based on primary research, the students were required to research the existing reality in order to form an opinion about the topic. Their research journey contributed to a better understanding of the phenomenon and encouraged the students to study the topic more deeply. This was explained by Yael:

The process was far from simple and required comprehensive searching day and night and many hours of reading in Hebrew and English. Even if I found a basis that was close to my argument, I didn't compromise at all because I wanted precise proof so that it would not be possible to contradict my argument. While reading the articles, I was surprised to find more advantages to the accreditation program. Whenever I found an additional advantage, I immediately looked for more articles that supported the advantage. I then added supplementary arguments to the map.

Similarly, Sigal and Rinat explained that the assignment forced them to comprehensively seek information, including information that contradicted their arguments. This enabled them to receive a clearer picture of the issue and to better substantiate their positions regarding accreditation.

The activity contributed to a better understanding of the evidence and strengthened my personal position on the topic. It also helped me to thoroughly understand the idea behind the accreditation process and why it is so important for improving and people's lives.

I think that using the map to present our arguments compelled us to delve deeply into things, to focus, and to learn the topic thoroughly: What do the hospitals need? What is the objective? What is required of the medical staff? We asked ourselves questions; we learned to recognize both sides and all the positions and opinions regarding accreditation.

Metacognitive knowledge. The students described how the activity helped them to self-regulate their learning. One of the tools that significantly promoted this was the table of criteria used to evaluate the concept map that was constructed together with the instructors. Sigal explained: "The criteria helped me build the assignment in stages. I worked on the map, stage by stage, according to the sections in the guidelines. That way, I made sure not to miss a single point and to complete the assignment well." Leah also explained:

Before we began preparing the second map, we read the criteria in order to know what we were expected to present. While we were preparing the map, we looked at the criteria again to see if we were headed in the right direction. When we finished preparing the map, we reread the criteria again

and saw that we had constructed the map well, and according to the criteria. We conducted an examination of each of the five arguments that we had raised to verify that each of them was presented and explained precisely and to make sure that each was presented completely on the map.

The students also mentioned that the predetermined schedule for preparing the assignment, as well as the constraints due to COVID-19, had caused them to realize the importance of the resource of time in learning and to utilize it properly. Shachar described her insights regarding the learning process:

I think there are two main things that I need to do to improve my part in the process. The first is to break the terrible habit of postponing assignments until the last minute. That means doing things on time, allocating the work over a number of days, and finishing the assignment easily in a relaxed manner without pressure and without having to stay up late at night to finish it.

However, the students repeatedly made a point of stressing the difficulty of independent learning mainly in searching for quality sources of information that supported their arguments, in clarifying values that arose from the dilemma, and in adhering to schedules, as described by Maytal:

The main difficulties began with finding articles. There was also difficulty thinking of values that arose from the dilemma that required a different way of thinking. Since we were a large group, we were able to brainstorm together and to come up with ideas. Because of COVID-19, I had to work [at my job] 16 hours each day, and it was difficult to adhere to the schedule and submit all the assignments, but you eventually learn that anything is possible.

Prior knowledge and experience

This theme deals with students' ability to relate to their own background knowledge. The participants reported that the opportunity they were given throughout the experience to apply prior knowledge in the activity helped them during the learning process. Some drew upon prior knowledge acquired throughout their lifetime which was found to be beneficial when proposing a solution to the dilemma they had been given. For example, Shaul had previously worked in medical centers. His experience there served as an additional information source for understanding the issue of accreditation. Despite this, he still needed additional supportive evidence in order to consolidate his opinion into a well-established argument, as he described:

I have experience working in medical centers, so I have seen and understood the importance of the accreditation processes and their significant contribution. Reading professional literature on the topic, together with the findings of the other group members only bolstered my opinion. Today I have no doubt that accreditation is obligatory for large health organizations. There is proof of this in literature that accreditation plays a significant role in improving the quality and level of care for both the patients and the medical staff. However, I think that regarding smaller organizations, it is necessary to adapt the method of implementation and application of accreditation so as to better serve them in the best possible way.

Online collaboration with other students

According to the students' reports, using the Internet platform (Mindomo) for constructing concept maps helped group members to cooperate efficiently, as stated for example by Osnat: "The advantage of the map is that you can see all the ideas of members of the group in an organized manner." However, many students reported difficulties that arose due to the COVID-19 restrictions, which hindered optimal cooperation between the group members, notwithstanding the variety of available technological tools. This was noted by Ehud: "Because of the Coronavirus crisis, we could not meet, and we had to conduct 'virtual'

discussions. We held group Zoom meetings, phone calls, and a WhatsApp group. It's a bit more difficult to work as a group in this way."

Galit also explained that it would have been preferable to meet in person in order to divide the workload equally among the students. As the process progressed and they understood the constraints, the group learned to "overcome" the difficulty and found ways to promote optimal group work using technological tools,

In light of the situation that we were forced to deal with, we had to do the assignment online. It was extremely difficult to meet together and to conduct discussions about the assignment in an orderly way. Even when we held online meetings, only one person would work on the map, while the rest of us attempted to express ourselves and help build the map. Despite these difficulties, we learned to overcome the problems and to use other programs such as Zoom or Google Meet and to schedule meetings to build the map. We learned how to upload data to the Internet and to make do with what was available.

In addition to the difficulties in communication among the group members, the students also attested to experiencing some technological problems. They were unfamiliar with the Mindomo digital platform and had to learn it from the instructor. They were also assisted by fellow group members, as described by Aviv:

All the members of the group experienced problems while building the map because it was the first time we had ever constructed this type of map and use this digital platform. Some of the difficulties stemmed from the situation in the country, which was far from ideal, in which we were forced to conduct some of the meetings by Zoom. In the beginning, it was complicated, and we were certain that we wouldn't succeed, but after several attempts, we succeeded in connecting all the knowledge that was required and in creating a detailed map.

Discussion

This research sought to show how constructivist learning can be performed online for health management students during the COVID-19 period. It demonstrates how the promotion of argumentation-based learning with digital CM might elicit new and different beliefs and conceptions of learning and knowledge, encourage social perspective-taking, spur high-order thinking skills and enable online collaboration.

The students entered the process basing their arguments primarily on intuition and "black or white" definitions that had been presented during short lectures at the beginning of the course, and thus exhibited beliefs regarding the existence of absolute truths. As the learning process progressed, the students were exposed to an array of different viewpoints. They recognized the complexity of the topic, and thus reached a higher level of epistemological belief in which knowledge is seen as inherently subjective, generated by human minds. Finally, the requirement to base their arguments on facts advanced them to a higher epistemological level – evaluativism – where they recognized the significance of weighing evidence and addressing contradictory knowledge claims (Kuhn *et al.*, 2000). During times of crisis, with significantly important decisions before them, public health officials, as well as individual physicians, are expected to utilize rational, evidence-based decision-making strategies. The response to the COVID-19 pandemic around the world has, however, been characterized by governments, health institutions and physicians advocating management strategies inconsistent with rational, evidence-based reasoning (Djulgovic and Guyatt, 2020). Students who have experienced an epistemic change during constructivist practices will demonstrate an ability to alter preconceived epistemic beliefs of how the health professions should be taught, and how critical thinking skills should be attained.

The activity described in the present study also promoted socio-moral thinking skills and "role-taking" practices. The students examined the situation from another person's perspective, considered and evaluated others' perspectives while engaging in social

interactions and reading academic materials (Kim *et al.*, 2018). This practice is related to the social cognition theory (Selman, 1980), and role-taking skills which enable a person to understand another's cognitive and emotional aspects. Incorporating an ethical dimension in the problem, in line with the VaKE approach, led to a role-taking practice that may have contributed to the students' cognitive-moral development. Socio-moral thinking skills are perceived to be invaluable during times of crisis. For example, Wang and Tang (2020) maintain that tackling health inequities during the COVID-19 outbreak is of high importance. The lack of health-equity assessment during the current crisis has been evident. Therefore, it is suggested to place an emphasis on equity in health education in an effort to strengthen the health system and emergency responses during public-health crises that may arise in the future. Such learning initiatives that nurture socio-moral thinking in a time of a global crisis have the potential to produce a generation of professional practitioners who aspire to prioritize solutions dedicated to collaboration and social justice (Siry, 2020).

With reference to domain-based knowledge, factual knowledge was more prevalent in the earlier stages of the activity, while the students were constructing the first map. However, designing the second map elicited higher-level thinking needed to identify patterns, similarities and interrelationships among the elements in the map. The activity, which necessitated a profound understanding of the materials and problem-solving skills, provided scaffolds for students to self-regulate their learning. These competencies are especially important in times of crisis, and particularly for health practitioners during a global pandemic. Throughout the COVID-19 crisis, practitioners have been forced to rethink key ideas, traditions, conventions and even values in order to adapt to ever-changing circumstances. Skills aimed beyond the immediately known and familiar are required to contend with the new situation in which existing models or solution strategies are unavailable or unproductive.

In addition, students' prior knowledge was found contributive to their ability to recognize and take advantage of deep structural content. Researchers maintain that compared to learners with less domain knowledge, more knowledgeable learners tend to be more sensitive to structural features relevant to the domain (Braithwaite and Goldstone, 2015). For example, experts may have more experience understanding situations in terms of the abstractions relevant to their field, or their rich prior knowledge allows them to circumvent limitations in their working memory (Day and Goldstone, 2012).

In recent years, most medical programs have been grappling with major calls for curricula change, particularly in educational technologies. This has become more prominent during the current health crisis (Torda, 2020). In our study, the CM digital platform enabled real-time collaboration among the students. This element of the activity was extremely important during the COVID-19 lockdown, during which the students could not physically meet each other. The students emphasized their preference to meet their group members face-to-face, and in their efforts to overcome the situation imposed on higher education, they found creative ways to communicate in order to accomplish the learning goals. The experiences gained by using such collaborative digital platforms during the lockdown might inspire innovative changes that will ultimately have long-term benefits for medical education.

Nevertheless, several challenges were put forth by the students. For example, some of them were unfamiliar with the digital CM platform required to be used in constructing their arguments. Others struggled to understand its functions during the process and were not fully aware of the options available for sharing the map with the group. Some reported failing to self-regulate their learning adequately; for example, how to optimally manage their time during the pandemic.

Limitations

The present study features several limitations that merit mention and opens avenues for future research. First, it was conducted in a single country and was limited exclusively to

health management students; therefore, the results cannot necessarily be generalized to students of other countries and health study tracks. A cross-cultural examination is needed to substantiate the findings. Second, several researchers (Braun and Clarke, 2006; Nowell *et al.*, 2017) point to the disadvantages of thematic analysis, asserting that the lack of clear and concise rules around this analysis may sustain the “anything goes” critique of qualitative research. The flexibility of thematic analysis can lead to inconsistency when developing themes derived from the research data. Future studies should use multiple methods and data sources to develop a comprehensive understanding of the implications of the online learning activity investigated in the current research.

Conclusions and implications

The reality of the COVID-19 pandemic lockdown has challenged the types of conventional teaching, widely practiced in health education and created an opportunity to tip the scale towards active rather than passive methods of teaching and learning. New and renewed learning activities are now required, characterized by learning objectives for medical education that are relevant to the changing demands of the 21st century. The COVID-19 period has galvanized educators into by stressing the pressing need for adapted and appropriate instructional methods that meet the needs of the profession in the present and the emerging ever-changing challenges that are yet unknown. As part of this process, we must train students of health management by developing the necessary qualifications in the early stages of their studies in medical schools, nursing schools and medical management schools, as well as in the advanced stages of learning and professional training. Applying novel teaching and learning activities informed by constructivist pedagogical approaches can ensure the continuity of effective health education during the COVID-19 crisis, and beyond. Online activities aimed at advancing 21st-century skills relevant to health profession in times of uncertainty should be seen as an opportunity to enhance the potential for long-term improvement of health professionals’ education and development, thus preparing the health workforce to better adapt to new situations.

This study shows that combining constructivist teaching and learning tools with advanced technology, through an online course that encourages active learning, facilitates the acquisition of lifelong learning abilities among students in the health management professions. This constitutes another step toward adapting the health system and its practitioners to the mounting demands and needs of the 21st century. The authors’ hope is that this study might encourage health-profession educators to use the experience gleaned during this global pandemic to re-examine the current teaching and learning demands in health education. It may also encourage educators to broaden their educational approach toward incorporating lifelong learning skills, such as problem-solving and critical thinking, which could greatly benefit health professionals in times of crisis. Developing these skills at the initial training stage would enable medical practitioners to better cope as professionals with the wide range of needs of the staff working in the health system today. This would mean reforming and adapting the system to the new and dynamic present-day reality, which demands demographic, environmental, cultural, social and technological changes.

Although still preliminary, these findings point to potentially exciting new avenues for future research, the findings of which are likely to have an impact on online setting design. Such future efforts might increase the potential of implementing innovative instructional strategies that promote lifelong learning skills through online learning environments. These endeavors pertain to the use of technology in learning environments built upon a sound pedagogy, and to the question of how health-profession educators and students engage with novice practices of learning and teaching that are adapted to a time of turmoil and crisis. These include the epistemic change of teachers and learners, learners’ skills and ethical aspects related to the profession.

Teaching and learning experiences gleaned during the COVID-19 crisis signal the necessity to shift from a focus on content to a focus on competency-based education. Increasing flexibility in terms of content taught and stressing learning outcomes instead of teaching goals might better help in fostering a new generation of health professionals who can think critically and advance from simply applying prior knowledge to new situations to solving complex problems that require innovation. These strategies include developing an awareness of practices and existing knowledge and honing skills that improve adaptability in the search for innovative approaches to solving problems in times of uncertainty.

Health curriculum designers should also consider incorporating technology in health education in a way that enables students to develop their collaborative skills and abilities. Students' knowledge and experience gained during the pandemic associated with distant peer-collaboration might contribute to their future professional careers, which will likely demand such skills. Thus, in view of the new and constant health challenges our society is facing, future educational efforts must devise innovative approaches using technology-enabled teaching methods that afford students the opportunity to nurture critical thinking skills, professional values and ethics, and improved collaborative skills.

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Further reading

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Corresponding author

Dorit Alt can be contacted at: doritalt@014.net.il

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Navigating COVID-19 through diverse student learning communities: importance and lessons learned

Diverse student learning communities

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Ashley Kennedy Mitchell

Department of Medical Education, Morehouse School of Medicine, Atlanta, Georgia, USA

Amy Lovejoy Mork

Department of Pathology and Anatomy, Morehouse School of Medicine, Atlanta, Georgia, USA

Jan Hall

Department of Medical Education, Morehouse School of Medicine, Atlanta, Georgia, USA, and

Carey Roth Bayer

Departments of Community Health and Preventive Medicine and Medical Education, Morehouse School of Medicine, Atlanta, Georgia, USA

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Abstract

Purpose – The purpose of this case study is to describe one Southern United States of America (US), historically Black medical school's approach to adapting medical education training through learning communities (LCs) during the COVID-19 pandemic.

Design/methodology/approach – The COVID-19 pandemic created a wide variety of problems for higher education. Classes moved quickly from in-person to virtual instruction with little time for training; faculty and students had to adapt to new learning platforms, learning styles, study techniques and technological challenges. Emotions ran high due to constant change, transitions and numerous unknowns. The LC structure embedded in the curriculum of this US medical school aided in the navigation of these challenges.

Findings – Of the 95 MD1–MD4 respondents combined who responded to the COVID-19 LC survey, 67% rated the LC sessions good/outstanding, 20% average, 7% poor/fair and 5% N/A. When asked if LCs had helped them during the pandemic, overall, 66% said “yes” and 34% said “no.” When asked how LCs have helped during the pandemic, themes emerged related to safety, adapting to feelings of isolation/mental health/emotional support, and academic progress.

Originality/value – The small LC group structure created a sense of security for receiving academic help, emotional support, a network of assistance resources and a place to process COVID-19 losses and insecurities. Receptivity to utilizing the LC structure for support may relate to the medical students' commitment to addressing health disparities, serving the underserved and embracing a medical school culture that values community.

Keywords Learning communities, Medical education, COVID-19, Curriculum, Medical students

Paper type Case study

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Introduction

The COVID-19 pandemic's impact on higher education has been widespread and fast-moving. While e-learning has been used in some settings for a number of years (Rodrigues *et al.*, 2019), many colleges and universities began transitioning to virtual learning in record time while still having to continue to meet their student populations' educational and emotional needs. Classes moved quickly from in-person to virtual instruction with little time for training; faculty and students had to adapt to new technological learning platforms, learning styles, study techniques and challenges while still mastering the content being taught and studied. Much has been written about learning structures (Bloom *et al.*, 1956; Krathwohl, 2002) as well as theories about communities of practice and the learning environment across disciplines (Lave and Wenger, 1991; Roberts, 2006). Yet, during the pandemic, emotions ran high due to constant change, transitions and numerous unknowns, including factors impacting learning that are not as well studied.

This was uniquely true for medical schools, where tightly packed and in-person reliant curricula shifted to being taught through hybrid or online learning with stricter testing procedures and fewer chances for in-person clinical experience. Pandemic changes and stressors affected medical students' mental and physical well-being (Chandratre, 2020) in addition to the normal rigors of medical school. To address these realities, medical schools must respond to the needs of their students through the implementation of strategies to enhance student coping and mental preparedness (Kazerooni *et al.*, 2020, p. 763).

One education structure to consider for working on enhancing student coping and mental preparedness is the learning community (LC). An LC can be described as a group of individuals sharing common goals, values and ideas that actively engage in learning with and from each other. LCs, an iteration of small group learning, provide opportunities for students to engage in mentoring and wellness activities with support from both their peers and faculty (Shochet *et al.*, 2019). LCs intentionally focus on fostering student engagement and communication, not only with faculty and the curriculum but also with peers and through self-reflection (Ferguson *et al.*, 2009). This is often accomplished through a perceived increase in social and community support.

The purpose of this case study is to describe one Southern United States of America (US), historically Black medical school's approach to adapting medical education training through LCs during the COVID-19 pandemic.

Approach

The medical doctorate (MD) student LCs focus on building knowledge, attitudes and skills related to the Accreditation Council for Graduate Medical Education (ACGME) six core competencies: professionalism, patient care and procedural skills, medical knowledge, practice-based learning and improvement, interpersonal and communication skills and systems-based practice (ACGME, 2020). The MD LC program was created to serve a secondary purpose of encouraging relationships and fostering a sense of community during a period of medical class expansion. Students are divided into LCs named after school-based values and culture. Prior to their first day in medical school, faculty assign student LC groups that are racially, ethnically and geographically diverse.

Each LC contains approximately 12–14 students and is facilitated by two to three faculty mentors: at least one teaching in the basic sciences and one from a clinical field. LCs are longitudinal, with students continuing in the same LCs for all four years of medical school. LCs are a required component of a longitudinal interdisciplinary course that blends human values, human behavior, epidemiology and biostatistics, clinical preceptorship, introductory patient diagnosis, wellness, interprofessional education (IPE) and professionalism topics as a series of lectures and activities. Due to the structure of the curriculum and the need for

additional clinical experiences in years 3 and 4, the number of LC sessions per academic year descends as students move through medical school: 15 in MD Year 1, 8 in MD Year 2, 4 in MD Year 3 and 1 in MD Year 4.

A typical prepandemic 90-min LC session begins with a faculty-developed discussion guide that is provided to the student leaders at least one week prior to the scheduled session. The student leaders, having signed up to lead the session at the beginning of the year, use the provided discussion guide as a template. From there, they create their session specifics by providing necessary background or instructional materials followed by open-ended questions and student-facilitated discussion. All students in the LC are expected to engage in the discussions. Faculty mentors are present at all sessions to provide clarification or additional information on a topic if needed but avoid taking a leadership role in the session. Each session can begin with an optional 15-min student check-in. This check-in is designed to allow students to speak freely about their current experiences, thoughts and emotions.

In March 2020, all LC sessions were changed from in-person to virtual sessions. In acknowledgment of unique pandemic stressors, LC mentors purposefully encouraged more connection with and among students, focusing less on the scheduled topics. This can be seen in the adjusted schedule. The LC schedule was altered to allow for sessions fully focused on students checking in as well as for other sessions to be particularly catered to pandemic scenarios. [Table 1](#) displays both the prepandemic and current schedule of topics for LCs. To coincide with the schedule, the discussion guides were altered to keep in mind the new foci and the virtual format of the sessions. For example, the introduction to LCs session included discussion on online etiquette, proper quarantine/isolation communication protocols and school-related pandemic resources. In-person interactive activities were also revised or replaced with virtual conferencing activities. Additional group reflections on individual wellness were added to each discussion guide. Several content-specific portions were removed and placed within the course's suggested readings and resources for self-directed learning.

Each year, students complete electronic mid and end of year LC evaluations. The electronic evaluations assess student perceptions of the learning environment, peer-to-peer and student-to-faculty interactions, benefits of LCs and concerns about learning communities. This evaluation includes both Likert-scale questions and open-ended response questions. For academic year 2020–2021, students also completed a short mid-year assessment with a focus on LCs during the COVID-19 pandemic. In this mid-year survey, students self-reported their overall experience so far, how LCs have helped them during the pandemic and how LCs can help in the pandemic and in general in the future. The survey included both multiple-choice and open-ended questions. Students completed the evaluation online using Survey Monkey, a web-based survey software service. Students received links to the survey via their school email.

For both mid and end of year evaluations, open-ended student questions were analyzed using content analysis to identify trends in phrases used by students to describe LC strengths and areas of improvement. Quantitative questions were calculated using the Survey Monkey Analysis feature.

Findings

Ninety-five (95) MD students from across years (MD1, MD2, MD3, MD4) completed a brief survey on LCs and COVID-19 in fall 2020. Of the 95 respondents combined, 67% rated the LC sessions as good/outstanding, 20% rated them as average, 7% as poor/fair and 5% as N/A ([Table 2](#)). When asked if LCs had helped them during the pandemic, overall, 66% said “yes,” and 34% said “no.” ([Table 3](#)) When asked how LCs have helped during the pandemic, themes emerged related to safety, adapting to feelings of isolation/mental health/emotional support,

Prepandemic LC schedule		Current LC schedule*	
All sessions are in person sessions		All sessions are online via zoom	
Session year	Learning community topics	Session year	Learning community topics
MD-1	Medical school dilemmas	MD-1	Medical school dilemmas
MD-1	Introduction to LCs/Setting up ground rules	MD-1	Introduction to LCs/Setting up ground rules/Online etiquette
MD-1	Self-assessment	MD-1	LC check-in
MD-1	Communication	MD-1	Communication and conflict management
MD-1	Conflict management	MD-1	Student choice/Current events
MD-1	MD 1/MD 2 meet and greet	MD-1	MD 1/MD 2 meet and greet
MD-1	It's a marathon, not a sprint	MD-1	Professionalism
MD-1	Ethics	MD-1	It's a marathon, not a sprint
MD-1	Current events	MD-1	Ethics
MD-1	Leadership	MD-1	LC check-in
MD-1	Cross-cultural experiences	MD-1	Cross-cultural experiences
MD-1	Career panel	MD-1	Career panel
MD-1	Navigating the healthcare system	MD-1	Student Choice/LC check-in
MD-1	Optimizing personal assets	MD-1	Optimizing personal assets
MD-1	Healthcare reform	MD-1	Healthcare reform
MD-2	Summer reflections	MD-2	Student updates and summer reflections
MD-2	Strategies for success	MD-2	Student check-in
MD-2	MD 1/MD 2 meet and greet	MD-2	MD 1/MD 2 meet and greet
MD-2	Sustaining balance in 2nd year	MD-2	Email check-in
MD-2	Implicit bias and unearned privilege	MD-2	Implicit bias and unearned privilege
MD-2	Death and dying	MD-2	Death and dying
MD-2	Looking back, looking forward	MD-2	Looking back, looking forward
MD-2	Something uplifting	MD-2	Something uplifting
MD-3	Adjusting to 3rd year/Maltreatment	MD-3	Adjusting to 3rd year/Maltreatment
MD-3	Career selection and self-awareness	MD-3	Career selection and self-awareness
MD-3	Looking back/Looking forward	MD-3	Looking back/Looking forward
MD-3	Taking on year 4/Advice to rising 3rd years	MD-3	Taking on year 4/Advice to rising 3rd years
MD-4	Final farewell	MD-4	Final farewell

Table 1.

Prepandemic and current LC schedules

Note(s): *All sessions were modified for a virtual platform and optional check-ins were encouraged in the first 15 min of each session. Pandemic related questions and resources were also added to preexisting topics

Table 2.

MD1-4 students: reflecting on your learning community experiences from Summer 2020 through Fall 2020, please rate your overall experience so far

Student year	Outstanding/Good	Average	Fair/Poor	N/A
MD1	77%	17%	5%	0%
MD2	59%	26%	11%	4%
MD3	67%	19%	6%	6%
MD4	0%	0%	0%	100%
*Combined total yr 1-4	67%	20%	7%	5%

Note(s): *Data across all years combined, no distinction made in student year

and academic progress. In the open-ended responses, phrases related to the theme of safety included “COVID-19 precaution reminders (wear a mask, 6 feet of social distancing, wash your hands for 20 s with soap and water),” “safe space for discussion” and “a place to vent.” For the theme of feelings of isolation/mental health/emotional support, sentiments expressed

included “adaptation to isolation,” “connection,” “community,” “support,” “encouragement,” “kept me sane” and “forming bonds and friendships with fellow classmates.” In academic progress, the theme emerged from responses related to asking for help “staying on track” and “providing resources both academic and non-academic.”

When asked how LCs could help them with COVID-19 and medical school in the future, students indicated the following suggestions:

- (1) A call for all LCs to have check-ins at the beginning of each session,
- (2) More support for managing isolation,
- (3) Requests for additional LC sessions with the individual LC group as well as across other LC groups to make more connections,
- (4) Advice on Zoom/virtual learning burnout,
- (5) Advice on navigating academic testing as well as virtual residency interviewing, and
- (6) Guidance on how to stay connected.

Lessons learned

During the pandemic, the LCs, held virtually through web conferencing, helped streamline information, empower student leadership, identify support systems and foster relationships between faculty and students as well as peer to peer. There were several lessons learned during this experience. First, there could be some differences in LC experiences by medical school year. The response rate (22%) was too small to do expansive comparisons across the MD1, MD2, MD3 and MD4 responses, yet we included two sets of data categorized by class to get a sense of possible early trends (Tables 2 and 3). MD1 and MD2 students had more scheduled LC sessions during the time period evaluated than MD3 and MD4, which skews the perspectives presented more toward the preclinical years. MD1 students were the first MD class at this institution to start medical school in a fully virtual environment, hence their perspectives may differ from the MD2, MD3 and MD4 students who have had a much greater level of in-person interaction and education in prior years. In total, 77% of the MD1 class respondents to the survey rated their experience as “Outstanding/Good,” higher than any other class response, which suggests an elevated level of support from LCs in the midst of the isolation of the pandemic. It also suggests that the support role of LCs may have been less necessary for those students who had previously experienced in-person learning and had the opportunity to build additional supportive relationships outside of the LC structure.

Similarly, the MD3 class particularly enjoyed the virtual LCs. In previous years, the MD3 students, who were scattered across the metroplex in different clinical sites, noted difficulties with attending in-person sessions due to scheduling and traffic. The change to virtual sessions alleviated some of those student stressors. MD4 students did not have a scheduled session during the time period evaluated but were included as they may have gathered

Student year	Yes	No
MD1	86%	14%
MD2	41%	59%
MD3	71%	29%
MD4	0%	100%
*Combined total yr 1–4	66%	34%

Note(s): *Data across all years combined, no distinction made in student year

Table 3.
MD1-4 students: have LCs helped you navigate your medical school semester during the pandemic?

independently of the formal curriculum during the time period as a means of support or connection; this may explain the N/A and low percentage of perception of formal LC curriculum support.

Second, regularly reminding faculty and students to stay flexible, adaptable and open to change in the face of numerous unknowns is helpful in decreasing anxiety for situations outside of their control. LCs served as a vehicle to deliver information to students with immediate student feedback to said information. Third, altering curricular content to make space for check-ins and processing world events is helpful for enhancing feelings of safety as well as a sense of community. Mentors and student leaders were given the flexibility to deviate from the assigned content to use all or a portion of the 90-min session as a student check-in. LC sessions often began with “Roses and Thorns,” an assessment of student experiences, successes and challenges since the last session. This portion of the session enabled students to voice their concerns in a safe space, giving peers the opportunity to support each other in agreement.

Fourth, the virtual learning environment and the in-person physical learning environment function differently. A 90-min, large group in-person session does not necessarily transfer minute for minute in the virtual learning environment. Verbal and nonverbal communication strategies look and feel different in the virtual environment compared to in-person learning; numerous online distractions lead to decreased focus and increased fatigue. During the 90-min LC sessions held via Zoom, students were required to engage by having their cameras on (i.e. Join with Video). This was essential in order to both give and receive verbal/nonverbal feedback from others and simulate “in person” as much as possible to support a sense of belonging. Students being completely aware that LCs are a safe space and that “what is said in LC, stays in LC” began to express specific concerns, such as not being in a quiet space at their fully “occupied” homes, some with multigenerational families; others were in dwellings alone and were deafened by the “silence;” while others were embarrassed of their surroundings, which now were clearly visible on Zoom calls. Nonetheless, amidst these hardships, a sense of camaraderie emerged when “survival skills,” new learning techniques and self-care tips were shared via peer feedback. Yet the one thing that surfaced at the top of the gnawing list of concerns was sustaining their academic grades. In a medical school environment, which already tended to be a highly competitive academic arena, the pandemic only heightened academic anxieties.

When changes happen rapidly, such as those seen during the COVID-19 pandemic, and education is forced to go virtual without adequate planning time, courses may lead to Zoom/virtual learning burnout for both the faculty and students. According to [Gaur et al. \(2020\)](#), similar pedagogical challenges have been experienced in medical education in the United Kingdom as well as around the world. This may be more acute in student preclinical years as their curriculum is more heavily basic science focused and may utilize more virtual instruction during the pandemic compared to later medical school years. Consequently, the opposite may be true for students in clinical years, who may not see each other, either in person or in the virtual space, as often. Virtual LCs may help those students in clinical settings connect with their classmates when other modes are not readily available.

Fifth, committed and continuous faculty for LCs remains one of its strengths. LC mentors are dedicated to their LC not only by attending the LC 90-min group sessions but also holding one-on-one evaluation sessions with each student twice a year at mid academic year and end of the academic year. Through the individual and group interactions, as well as the fact that faculty mentors matriculate with the LC cohort from year to year; mentors become very familiar with their students’ typical behaviors and personalities. As it was described by one LC mentor, “we are all in the same storm, but we are not in the same boat.” As such, LC mentors reported that they were able to pick up on nuances when the students displayed signs of struggling and/or voiced mental and emotional hardships. LC mentors were

proactive in following up with the students via email or direct messaging in apps such as GroupMe and Facebook. When appropriate, they would encourage the student to seek assistance from Counseling Services or Student Learning Support Services and then follow up with the student at a later date. Additionally, based on faculty feedback, Counseling Services conducted an in-service for LC mentors on how to interact with students about whom they were concerned.

Sixth, LCs must continue to be relevant and timely or they risk being seen as an “add-on.” With a tightly packed curriculum, LCs can potentially become just another time commitment. Some students may find the loosely structured, conversation-focused LC sessions less critical in comparison to other coursework. It is important for faculty, student leaders and student participants to commit to the sessions. This engagement includes equal and active participation from all members of the LC. The relevance of the session should also be included in the discussion guide and explained during the conversation. A focus on the importance of self-reflection, peer mentoring, active listening and student engagement can enhance positive student perceptions of LCs.

These six LC lessons:

- (1) Noting the unique needs of different years in medical school,
- (2) Teaching and practicing adaptability and flexibility,
- (3) Encouraging student check-ins,
- (4) Acknowledging the differences, strengths and weaknesses of in-person versus online sessions,
- (5) Recruiting and maintaining committed faculty, and
- (6) Continuously assessing discussion topic relevance and student engagement, highlighting the complex nature of rapidly changing medical educational programs.

This time in medical education history calls for systematic innovation and ingenuity to continue training future physicians (Sahi *et al.*, 2020). The call for innovation is particularly important in light of COVID-19's and numerous other health disparities' disproportionate impact on Black, Indigenous and People of Color (CDC, 2020). Our student body is comprised of more than 80% racial and/or ethnic minority students with a majority of students choosing primary care specialties in residency training. Medical school LCs should continue to evolve and change based on faculty and student feedback to address the needs of an increasingly diverse student body. This allows for streamlined and effective programming in service to future medical students and in future challenging times. As the USA approaches a “quasi normal” postpandemic, the impact that virtual learning had on current students' experiences needs to be monitored over the entirety of their time in medical school. Assessment of the cohorts affected by the COVID-19 pandemic will be essential to identify if unusual struggles or needs for resources arise.

Originality

Perspectives from historically Black colleges and universities (HBCUs), particularly those focused on community engagement and service, widen the conversation around medical school offerings and curricula. Underrepresented students often come into medical school with lower MCAT scores compared to their counterparts (Lucey and Saguil, 2020). Students that are underrepresented in medicine may also experience different external pressures, cultural norms and realities that could be affected by an event like a pandemic. However, as Gasman and Nguyen explain, HBCUs are experienced in the transformation of these students

from applicants to high-achieving and prepared professionals (2015, p. 12). Producing a competent and diverse healthcare workforce is essential in the quest for health equity and combating health disparities (Marrast *et al.*, 2014). To retain and support a diverse medical student body, there must be consideration for the social determinants of health that may affect the global and national student population differently. Students choose HBCUs in part due to their environment, which focuses on mentoring and relationship building (Gasman and Nguyen, 2015). Since HBCUs are known for strong relationships and in-person experiences, a communicable disease pandemic creates challenges in maintaining the strengths of campus life through virtual experiences. This paper describes using LCs as a vehicle to create and maintain relationships, receive real-time feedback from students and monitor student well-being in the absence of in-person experiences.

This institution's values and mission attract students who are interested in health equity, service to the community and the importance of diversity in providing culturally appropriate health care, particularly for people of color and underserved urban and rural populations. Leadership, faculty and staff work together to recruit students who align with this culture and mission. This process creates a medical student body with a diverse set of backgrounds, cultural and social representations and community affiliations. The student body represented in this case study is composed of more than 80% racial and/or ethnic minority students, with a majority choosing primary care specialties in residency training.

Medical student success has been attributed to three key elements: (1) milieu and mentoring, (2) structure and content of the curriculum and (3) monitoring (Elks *et al.*, 2018). LCs, part of all three key elements, are ingrained in both the curriculum and the culture. LC structure is used as an organizational basis for group work within courses, large school events and student-initiated meetings. Recruitment strategies, student body diversity and LC permanence are all factors that may contribute to the student body's amenability to sharing and reflecting with both faculty and peers.

The abruptness of the COVID-19 pandemic ushered in panic and insecurities. By utilizing the already established LC structure intrinsically built into this medical school curriculum, the cohesive small groups easily connected and were able to address concerns as a team. Navigating uncharted territories together brought a sense of security and further bonded the small LCs. Mentors and students alike voiced their uncertainties of the future, all while being supportive of one another. The LC structure was a forum to process academic anxieties, emotional concerns, COVID-19 losses and insecurities.

When changes to curriculum are mentioned, the focus is often on content-specific courses and not on academic and student support services. However, by focusing on students' ability to cope with stressors and self-reflect, students become more equipped to perform in their other coursework as well. During the pandemic, students were fearful of losing their academic momentum. Utilizing the LC model, peers began receiving academic assistance from each other. The sharp edge of competitiveness was replaced with collaborative efforts to see each other not only survive but also succeed. The LC students began to lean on each other and share what academic techniques worked and did not work for them. Additionally, this medical school has institutional resources that offer Student Learning Support Services, of which LC mentors frequently and intentionally remind the students to utilize. The Student Learning Support Services reported that many students utilized tutoring services during the pandemic, and some participated in the workshops.

This LC structure was already robust and impactful but became helpful as both a mode of teaching and of support for students during the pandemic. Students were able to interact with each other in a safe space that fostered validation and a sense of security. The faculty mentor involvement and relationship with the students were strong and worth the effort and investment. The students received assistance from their LC mentors, but perhaps, most importantly, they learned to be resilient from one another in these times of uncertainty.

Conclusion

The COVID-19 pandemic has created both challenges and opportunities for medical education. It is clear from this case study that finding ways to continue to create a sense of safety and community during times of stress and unpredictability are key for faculty and students at this institution. The preexisting LC structure appears to be an advantageous curricular component for adapting medical education during a pandemic, as well as creating a sense of safety and community. As time goes by, and space is intentionally made for reflection, curricular change may need to occur to assess what modes of medical education can remain virtual as opposed to in-person, as well as increase or decrease learning sessions based on student need. O'Byrne *et al* (2020) call for pandemic preparedness content to be added to medical education curricula. As medicine continues to evolve, pandemic preparedness education will need to include not only the biomedical and research aspects of COVID-19, but also the psychosocial components for managing the lived realities of future frontline healthcare providers.

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Corresponding author

Ashley Kennedy Mitchell can be contacted at: akennedy@msm.edu

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Same storm, different boats! The impact of COVID-19 on the wellbeing of school communities

Impact of
COVID-19 on
school
communities

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Catriona O'Toole
School of Education, Maynooth University, Maynooth, Ireland, and

Venka Simovska
School of Education (DPU), Aarhus University, Copenhagen, Denmark

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Abstract

Purpose – The COVID-19 pandemic has impacted the functioning of education systems in a multitude of ways. In Ireland schools closed on March 12th and remained closed for the remainder of the academic year. During this time educators engaged with students, families and colleagues in new and diverse ways. The purpose of this study was to explore educators' experiences during the closures, particularly regarding the impact of the pandemic on the wellbeing of students, school staff and wider school communities.

Design/methodology/approach – A series of one-to-one interviews, lasting approximately one hour, were conducted in July 2020 with 15 education professionals online via Zoom or Microsoft Teams. Participants occupied various roles (classroom teacher, school leader, special educational needs coordinator, etc.) and worked in a diverse range of communities in Ireland. Qualitative data from interviews were transcribed and emergent themes identified through an inductive followed by deductive analytic approach.

Findings – The interviews highlighted the central role that schools play in supporting their local communities and the value teachers place on their relationships with students and families. Many teachers and school leaders found themselves grappling with new identities and professional boundaries as they worked to support, care for and connect with the students and families they serve. There was considerable concern expressed regarding the plight of vulnerable or marginalised students for whom the school ordinarily offered a place of safety and security.

Originality/value – The findings reveal how COVID-19 has exacerbated pre-existing inequalities and the central role of schools in promoting the health and wellbeing of all its members.

Keywords Education, Schools, Covid-19 pandemic, Education professionals, Inequality

Paper type Research paper

Introduction

The emergence of coronavirus disease 2019 (COVID-19) has had a sudden and profound effect on schools and communities globally. The public health measures designed to curb the spread of the virus resulted in abrupt closures of schools, childcare, workplaces and community sporting and cultural activities. These mitigation efforts have not been felt equally across the population, but have interacted with existing patterns of inequality across dimensions of income, age, gender and ethnicity (Bambra *et al.*, 2020; Marmot *et al.*, 2020). For instance, a substantial number of children have no access to Internet, or live in homes in which there is no suitable place to do homework (OECD, 2020; Van Lancker and Parolin, 2020); thus, the loss of learning for children has been greatest amongst those from

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economically and educationally disadvantaged backgrounds (Engzell *et al.*, 2020; Jæger and Blaabæk, 2020).

Similarly, the disproportionate effects of COVID-19 on wellbeing and mental health have been documented (Lee, 2020; Marmot *et al.*, 2020). Throughout the lockdown, cases of domestic violence escalated and there were surges in alcohol misuse within family homes, which placed children and young people at higher risk of exposure to violence and abuse. Save the Children (2020) noted that lockdown placed many families in a “pressure cooker” environment as a cascade of factors came together to increase family tensions, including the pressure of work and study at home, emotional and financial strain and the inability to grieve properly when a loved one dies. In Ireland, the Gardaí (Irish police) reported a 25% increase in domestic violence calls in April/May 2020 compared to the same period in 2019 (Doyle, 2020). Over 20% of adults said that their alcohol consumption had increased since lockdown, with the greatest increases reported amongst those living with children (27%; CSO, 2020). The Irish Society for the Prevention of Cruelty to Children (ISPCC, 2020) reported a 100% increase in visits to its website during the first lockdown, whilst children and families living in overcrowded and confined spaces (including asylum seeking families and Travellers) were more likely to contract the virus as well as experience increased levels of anxiety and isolation (NESC, 2021; OCO Ombudsman for Children’s Office, 2020).

This evidence is illustrative of the stress and challenges experienced by children and families throughout the country. However, they do not reveal the whole picture as some children may not have the capacity or the opportunity to seek help. Furthermore, with schools and other services closed, the opportunities to spot signs, hear about children’s experiences or make referrals for support, have significantly diminished (Baron *et al.*, 2020). Nevertheless, it is clear both in Ireland and internationally that the psychological distress of children and young people who feel trapped or isolated at home is a very real issue and has the potential to become a greater problem than the virus itself (Hargreaves, 2020).

Education professionals have also been profoundly impacted by COVID-19. Before the pandemic, the level of stress and burnout amongst the teaching profession was already at worrying levels (e.g. Education Support, 2019; Fitzgerald, 2008; Foley and Murphy, 2015). Global patterns indicate the increasing complexity of teachers’ roles and responsibilities following education reforms in many countries, and the intensification of principal’s workload all of which is placing increased pressure on teachers and school leaders (Ontario Principal’s Council, 2017; DNFA, 2018). The pandemic has added to these existing challenges. Teachers and school leaders were required to respond rapidly and with flexibility and creativity throughout this time of turmoil, at the same time as balancing personal commitments such as caring for and educating their own children and/or caring for vulnerable family members (Hargreaves and Fullan, 2020). Removing teachers from their usual work environments and asking them to work in new ways inevitably raises the question of what it means to be a teacher (Kim and Asbury, 2020). Furthermore, with more students experiencing stress and adversity, teachers’ role in the provision of whole school wellbeing and mental health support also becomes more complex. All of this is likely to take a toll on the wellbeing of education staff, but also impact their professional identities and modes of engagement with teaching.

This study draws on theoretical perspectives underpinning the Health Promoting Schools (HPS) framework, which was first developed by the World Health Organisation in the 1980s. The HPS Framework adopts a holistic and salutogenic approach to promoting health and wellbeing in schools (Langford, 2014), highlighting the importance of attending to the full gamut of school structures and processes (curriculum, policy, relationships and partnerships, emotional climate, etc.). Researchers and scholars in this field have moved beyond a narrow focus on individual skills and behaviours, to explore socio-cultural and other contextual factors that influence health and wellbeing (Leahy *et al.*, 2020; Simovska and McNamara, 2015). This framework prompts the need to consider the determinants of wellbeing during the pandemic,

including the various adversities, traumas, stresses, resources and supports that exist for members in particular school communities. It also suggests considering wellbeing of school communities in a holistic way, rather than focusing on teacher or student wellbeing separately.

With this framework in mind, we sought to explore education professionals' experiences during the first lockdown in Ireland (March–June 2020), particularly their perspectives regarding the impact of the pandemic on the wellbeing of students, school staff and wider school communities. As argued by Lupton (2020), despite the difficult conditions related to conducting research during the pandemic, social research is urgently needed to explore and document people's everyday experiences of living during a global health crisis. Educational researchers can contribute to understandings of how schools communities have been affected by living in the pandemic and to shaping educational responses occurring now and in a post-COVID world. Thus, in researching how COVID-19 affected the wellbeing of teachers, students and the school community in Ireland, we were interested in exploring the diverse realities of various groups and the implications for school wellbeing efforts now and into the future.

Methodology

Semi-structured interviews were carried out with 15 education professionals across various schools throughout July 2020. A theoretical sampling frame (Given, 2008) ensured a diverse range of educational professionals and school settings were captured. Participants were recruited through social media fora and professional networks. We sought to ensure participants represented important dimensions of variation in school composition and organisation, particularly in terms of school sector, size, gender, social mix and geographical location. This allowed us to capture the experiences and challenges across diverse school settings. Nevertheless, owing to the short timeframe for data collection, the final sample included more participants from primary vs secondary school contexts.

As shown in Table 1, the sample consisted of seven males and eight females occupying various professional roles in education. Seven participants worked in schools that are

Pseudonym	Gender	Main role in school	School level ^a	DEIS/Non-DEIS ^b	Mix
Aryanna	Female	Classroom Teacher	Primary	DEIS	Mixed
Jack	Male	Director of alternative school	Secondary	–	Mixed
Sam	Male	Classroom Teacher	Primary	DEIS	Mixed
James	Male	Classroom Teacher	Secondary	DEIS	Girls
Shauna	Female	Special Educational Needs Coordinator	Secondary	Non-DEIS	Mixed
Mary	Female	Principal	Secondary	DEIS	Mixed
Chris	Male	Classroom Teacher	Secondary	Non-DEIS	Mixed
Grainne	Female	Classroom Teacher	Secondary	Non-DEIS	Boys
Michelle	Female	Principal	Primary	Non-DEIS	Mixed
Philip	Male	Deputy Principal	Secondary	Non-DEIS	Boys
Colin	Male	Principal	Secondary	DEIS	Mixed
Sandra	Female	Classroom Teacher	Secondary	Non-DEIS	Girls
Saoirse	Female	School Guidance Counsellor	Secondary	Non-DEIS	Mixed
Sophie	Female	School Completion Co-ordinator	Secondary	DEIS	Mixed
Patrick	Male	Home School Liaison Co-ordinator	Secondary	DEIS	Mixed

Note(s): ^aPrimary schools cater for children aged 4–12 years; secondary school cater for the 12–18 year-old age group

^bDEIS (Delivering Equality of Opportunity in Schools) denotes those schools who qualify for entry into the DEIS scheme, a government-funded scheme that provides additional resources for schools with high concentrations of students from socioeconomically disadvantaged backgrounds (DES, 2005)

Table 1.
Participant grid

designated as disadvantaged (DEIS). One participant reported being of Asian ethnicity, everyone else identified as White Irish. There was a fairly good geographical spread (three schools from Dublin and three from other Eastern counties, two from western counties, five from the south and two from northern regions of the country). No Irish-medium schools, fee-paying schools or special schools were included. Despite a relatively small sample size, previous research has shown that it is possible to ensure a good deal of variation by drawing from participants in as few as 10 schools (McCoy *et al.*, 2014).

Interviews were conducted online using MS Teams and lasted 40–60 min. They were recorded, with consent, and the anonymity of participants and schools was ensured. Research ethics guidelines were followed and ethical approval for the study was obtained from Maynooth University Social Science Research Sub-Committee. The interviews were transcribed verbatim and analysed using a hybrid approach, which incorporated a data-driven inductive process based on Braun and Clark's (2006) analytical model, followed by a deductive process, whereby a pre-existing framework (in this case the HPS Framework) was applied to the data (Crabtree and Miller, 1999). This process allowed for themes to initially emerge from the data and in turn, for the theoretical concepts to shape the themes, which we outline in the next section.

Findings

A number of themes emerged from our analysis. We discuss these below, starting with the themes relating to students and continuing with the themes relating to educators. We round off the discussion of findings by considering the lessons learnt in terms of school development.

Rising to the challenge: young people taking up new roles and responsibilities

Participants in the study expressed admiration for how children and young people were responding to the pandemic. According to the interview accounts, many young people had taken on additional work or care responsibilities within the family during lockdown, such as looking after younger siblings so their parents could continue working, or helping with agricultural work. Some young people “moved in with grandparents, so that their grandparents had some able-bodied person there to help them” (Philip, deputy principal, secondary school), others supported their local communities by “delivering supplies to cocooning elderly” (Grainne, secondary school teacher).

At the same time, concern was reported about the burden young people were shouldering. Grainne, a secondary teacher, described one of her students, “*a high achiever*”, whose parents were both healthcare workers:

he was doing his damndest to try and get all of his [school] work done . . . whilst also having to de-covid the house because his parents were working in a really infected zone. It was just surreal, you know, what these teenagers are having to deal with.

Participants were also critical of the way in which young people were often singled out and blamed for their “irresponsible” behaviour in certain sections of the media: “*Some of the [media] messaging being sent out was absolutely horrendous. For kids who already think very little of themselves, to be telling them somehow they were gonna be the vectors, that are gonna kill their grandparents*” (Jack, director, alternative school). Evidently, the professionals put themselves on the side of their students, acknowledging the efforts children and young people made to cope with the lockdown, support their families and maintain their self-worth in the face of negative public discourse.

Adversity, marginalization and psychological distress among students

Whilst some students were faring well, the education professionals we talked to recounted the various challenges that many were dealing with. Many students were worried about school

work, exams and about family members; some students were extremely isolated, “they don’t leave the house” or “hadn’t been outside the door in six weeks”. Many study participants spoke of their concerns for students that they lost touch with, “kids that were really affected by remote learning – who didn’t really engage at all” (Saoirse). There was particular concern for children with additional education needs, disabilities and mental health difficulties who had lost access to professional support. The study participants also voiced concerns about regression in learning, particularly for students who learn English as an additional language.

Some study participants detailed the psychological toll school lockdown had, especially on students living in marginalized communities and those with histories of trauma and adversity. Issues like self-harm, suicide, domestic violence, neglect, substance misuse and violence were highlighted. For instance, Jack, a director of an alternative school, confided that *“I worry, I really do worry . . . over this period I had one young person who had tried to take her own life . . . ehm . . . I had three young people self-harming . . .”* In a similar vein, Grainne was aware that one of her students has been used as a “drug mule”, another has self-harmed. She felt that *“the biggest issue for my students would be . . . that they get involved in drugs or they get involved in robbing”*.

Patrick (a home-school-community liaison co-ordinator) reported that a school he works with had experienced the death of a former student by suicide. He expressed concern about the possibility of suicide contagion in the community and the challenges that school closures posed for identifying students who may be vulnerable:

If a student passes away in the school, you have to start looking at our student’s level of vulnerability and if they are at risk because of it . . . It was more difficult when we weren’t as a team face to face. It was more difficult to work out circles of relationships – which students were cousins, friends, close neighbours of the deceased young person—when we weren’t in the same room.

While in normal circumstances the school would be attentive of the potential risks and take action to ameliorate them, in the lockdown this was very difficult, if not impossible. In addition to the increased risk for the students, this situation also raised the level of stress experienced by professionals.

Principals were cognisant that in the course of a normal school year they would make a number of child protection referrals. They were concerned about children experiencing neglect or abuse who may be missed due to school closures, but also about the potentially increased number of children experiencing such adversities, due to the pandemic itself.

I think everyone was pushed to limits here during this time, and so, whether that brought out, maybe violence in the home . . . or neglect . . . [When schools reopen] I’m going to have my child protection eyes on at a magnitude I’ve never had before. (Michelle, primary school principal)

The professionals we interviewed working in marginalised communities were acutely aware that the school functions not just as a place for learning, but also as a safe place – a sanctuary – for many children and young people. The citation below is illustrative for this point:

And for so many of them, that is their safety net, you know. They come for school, because they’re minded, and they’re looked after, and they feel safe, and they feel secure, and it’s their safe place, you know . . . They will stay there till six o’clock in the evening sometimes. And, em, I dread to think what’s happened to some of them, I really do. (Grainne, secondary teacher)

This theme clearly extends the previous one and shows the devotion, care and concern professionals experienced for students during the lockdown. The accounts demonstrate that the lockdown disrupted the regular work of school, not only in terms of teaching and learning but also concerning child protection and wellbeing. This, as the further discussion of the findings will demonstrate, resulted in increased levels of concern and stress among the professionals.

Teaching and learning in a virtual classroom

The study participants used various platforms to facilitate online learning. Only one participant (Sandra) reported providing fully synchronous online classes in line with the school's pre-pandemic timetable. Most teachers provided a blend of synchronous classes, pre-recorded classes and online support. The analysis showed that according to the professionals interviewed, online teaching presented challenges for everyone – teachers, students and families. Firstly, the “digital divide” was frequently mentioned. Some regions in the country (particularly rural areas) have poor connectivity to broadband which posed problems for students and teachers alike. The pictures sketched in the interviews were vivid; one principal described a student “[. . .] outside in the yard walking around with his hand up in the air – his phone up in the air, trying to get signal to send an email with work to a teacher” (Philip). Another school principal talked about “a teacher who had to go to her father’s house every day to do her teaching, because her own house didn’t have good enough internet connection” (Mary). In addition, students from poorer families often did not have access to devices at home, or they had to share iPad or laptops with siblings and parents, which prevented them from engaging fully in online learning, and in some cases, was a reason for conflicts and tensions in the family.

Secondly, the analysis showed that synchronous classes were problematic because, according to participants, some of the students did not feel comfortable making visible their private space to others in the class. Mary, a secondary school principal highlighted that:

[. . .] many kids don’t want to be seen on camera, they’re worried what else will be seen on camera, apart from themselves yknow. In a school like ours, where there would be some kids living in extreme poverty, and I can imagine that they would not want that seen, and that they were worried about it . . .

Evidently, issues of inequality took a different shape as private space became part of the online classroom. In some cases, vulnerability, shame and other feelings of discomfort prevented students from engaging in teaching and learning.

Thirdly, the analysis pointed to vulnerability of teachers too, especially in second-level schools. A recurring theme was concern about the potential manipulation and sharing of images and recordings by students. The following citations are representative for these concerns:

There were videos being made of teachers and other students that were being shared in Snapchat and all of that. Therefore, the school advised teachers “if you do wish to do a Zoom class – which you don’t have to, but if you do, that’s fine—turn off your own video. If you’re demonstrating something, that’s fine, but don’t have your own face visible. (Philip, deputy principal, secondary school)

In this case, the teachers were advised not to have their video turned on during the class, which may have had a negative impact on students’ engagement during the session. In another example below, a principal describes the wariness of his colleagues/staff.

Not all teachers are comfortable with the idea of recorded lessons or live lessons going out to students that are at home. A few teachers are concerned about how images of themselves and recordings of themselves being used and put up on social media. (Colin, secondary school principal)

This points to additional stress factors for teachers related to online teaching. As well as being concerned about their students, they had to cope with increased personal exposure and vulnerabilities that online teaching brought. In some cases, as the excerpt below shows, the distress was quite high, and based on specific experience.

[. . .] so it would have been the usual heads cut off bodies and stuck on porn. Or, ‘I’ve got mental health problems’, you know, they’d have these speech bubbles out of the teachers’ mouths. Some teachers will come in for a lot more stick than others, but generally it was, either they were mentally

deficient or they were, you know, stupid or backward, or else they were young and good-looking. And obviously from being in a boys school, in that context, there obviously is going to be . . . , em females are going to get the brunt of that. And a few of them have had, em, a terrible time . . . And, em, you know, I've seen footage of myself being manipulated, and stuff like that. And there's nothing you can do about it. In fairness to my school, they have done an awful lot to clamp down on that. But I think putting up live footage of you teaching is really just asking for trouble, particularly in my context. (Grainne, secondary teacher)

The excerpt points to difficult experience of being a female teacher working in boys' school, but Grainne also described homophobic bullying targeted at a young male teacher in the school. Despite the efforts of the school leadership to prevent such behaviours, teachers felt vulnerable and under a lot of stress.

Finally, educators emphasised the fundamental educational value of face-to-face communication and relationships between students and teachers:

Staff definitely want to get back into the classroom. It's the natural way for them, and I suppose that relationship is so crucial to education generally, isn't it? Like, one-to-one and face-to-face. (Colin, secondary school principal)

The extract above highlights the decisive role direct contact between teachers and students plays in education. Face-to-face contact was deemed especially crucial for younger children and those with special educational needs. It was also evident from the interviews that many participants missed the cut and trust of everyday face-to-face interactions with students and families:

Get me back in the classroom! I do not want to do blended learning in September; that is just hell on earth. It's awful. I really, really hated it, and d'you know, there was actually one or two days where I got a bit upset – it was bizarre. I remember being just like, oh, I really miss them. You know, and they're lovely boys . . . (Grainne, secondary teacher)

The excerpt above is illustrative of the passion and emotional connection of teachers related to being physically present with students along with the dynamism of the classroom that the online world simply could not replace. Related to this was teachers reporting feelings of inadequacy and guilt because they could not be physically present for their students. It seems that although educators took up the challenge of organizing meaningful teaching by using available digital platforms, there were challenges and significant discomfort for students and teachers alike. In addition, it is evident that in the professionals' views, the totality of experience of being an educator cannot be fulfilled without physical presence, face-to-face contact and an embodied relationship with students.

Navigating new professional boundaries

Given the changes in work practices, many study participants found themselves navigating professional boundaries in new ways. Some teachers reported responding to student emails at all times of day and night, some principals gave parents their personal mobile phone number to ensure they were accessible. Many teachers in marginalised communities described efforts to maintain contact with their students, such as visiting family homes and sending educational resources by post. Teachers that provided synchronous lessons reported a new sense of informality, which required a greater level of negotiation of boundaries between teacher and students.

When you teach synchronously, you are, for the most part, in your students' bedrooms, which is exceptionally private. You know, like they're teenagers – there are some of them who, you know, are a bit too vulnerable for that. You are, you know, invading their personal space, and they are for you also . . . (Sandra, secondary teacher)

While the accounts discussed earlier illuminated the teachers' feeling of vulnerability, the excerpt above describes the vulnerability of students, and the need to renegotiate personal space in the relationship between teachers and students.

Another teacher we interviewed, Aryanna, works in a primary school where many students live in Direct Provision accommodation. Direct Provision is a system used in Ireland to cater for the basic needs (shelter and food) of asylum seekers while their claims for refugee status are being processed (it has been criticised as being inhumane and degrading by human rights organisations). Aryanna described supporting the mother of one of her students, who was extremely distressed about a situation that "*had nothing to do with school, had nothing to do with me, had nothing to do with the kids, but . . . I couldn't, as a mother, as a human being, I couldn't do nothing*", because the families' application for asylum in Ireland may have been in jeopardy if the situation wasn't resolved. Aryanna also described her concern for the children who were witnessing their mother's extreme distress within the confined space (a single room) that was available to them. Evidently, this teacher describes the need to redefine professional boundaries in time of extraordinary crisis and engage as a (political) human being. She reflected:

I think in one sense, that blurring of the boundaries . . . I think that's a really beautiful thing. It's a piece of humanity, that quite frankly, having worked all over the world, I see as missing a little bit in some Irish teachers . . . in that attempt to make that very clear delineation between us and them.

Working from home also meant that participants had to navigate new work/life boundaries; these related not only to juggling work and home responsibilities but also efforts to ensure confidentiality and to protect their own families from hearing about workplace issues. Sophie works on a School Completion Programme to support students at risk of early school leaving and their families. She reported:

There's no distance from where I am now to where my children are. It really difficult to hear the stuff we hear . . . When you work in this area, you protect your family from what happens in work so that they don't know that stuff. But when there's the potential for you to be heard on the phone, when you're trying to have a support call for a family in chaos . . . it's really challenging.

The concern expressed above goes both ways – it is about guarding the confidentiality of the students and their families and about protecting one's own family, especially children, from the hardships experienced by other people and the worries that this may evoke.

In summary, the accounts in this theme point to the deep commitment of education professionals to the students and families they work with, and readiness to redefine professional boundaries with a view of providing support for those who needed it the most in the midst of the crisis. In some cases, the professionals struggled to ensure that their commitment does not expose their own families to increased stress and worry.

Lack of adequate governance

Nearly all participants expressed dismay and frustration at the way in which the state Department of Education (DES) communicated with schools. It is evident from the interviews that on a number of occasions the Department issued directives, known as "circulars" to schools on Friday afternoons, which caused considerable frustration as the following interview excerpts highlight:

There was this pattern of dropping circulars on a Friday evening" (Chris, secondary teacher).

The Friday evening thing! We came to such a stage that I used to have to say to people, you know, I'm just going to have to keep Friday afternoon completely free, because something is probably going to come from the Department and I'm going to have to get it out to the parents. (Mary, secondary school principal)

Participants also expressed irritation about guidance for online learning that arrived too late – “like, two months after we’d been at the cold face” (Chris). In addition, professionals were extremely frustrated that DES announcements were often issued or leaked to the media in the first instance. The two interview excerpts below are illustrative for these experiences.

But the media would have had announcements. The Irish Times (newspaper) would have broken some story or another . . . like, I saw it on Twitter. It hadn’t been emailed to me. It hadn’t been notified to me any other way. And I think that’s a real insult to the good work that’s being done in schools (Philip, deputy principal).

Information is kinda leaked first and then you’ve parents panicking. So, like, I had to send out, you know, a holding text to parents, ‘cause I knew they were worrying, to say, look, you know, we’ve heard that this is happening and will notify you as soon as we get information. (Mary, principal)

The lack of adequate governance and consultation was insulting to educators, increased their stress levels, but also their sense of responsibility towards parents. Evidently, all of this had a deleterious impact on staff wellbeing and their sense of public support in extraordinary circumstances. The study participants felt that parents and teachers were being pitched against each other and that the manner in which the DES communicated contributed to “teacher bashing” in the media. The overwhelming view of school personnel was that far from supporting schools, the national authorities added unnecessarily to the workload and stress of all education stakeholders, especially school leaders.

The importance of solidarity and school leadership

The analysis pointed to an increased sense of camaraderie and community between colleagues. An emerging theme is in the interviews was awareness that colleagues’ personal circumstances varied; that “everyone’s in a different place”. Many study participants expressed that they missed the informal conversations with colleagues and other moments of social connection, mutual inspiration and support:

Like, there’s nothing better than bouncing ideas off others, and that was one of the things I missed about school, you know when you’re going down the corridor and you have an idea, and you go all whacky! (Michelle, primary school principal)

The analysis showed that school leaders expressed appreciation for their staff, most of whom were going “way beyond the call of duty”, but they were also concerned for their wellbeing. Colin, a secondary school principal, stated his staff “couldn’t rest if they thought that some students were finding work difficult, and they had to check on them”. Similarly Mary reflected:

I’ve just so much admiration for how quickly they came on board, not everyone now obviously but the vast majority . . . Generally for me, I think what they needed a lot was reassurance that what they were doing [was ok] . . . I certainly would’ve had worries for the wellbeing of some of my teachers because they were going over and above what was required. (Mary, secondary school principal)

Evidently, principals recognised and appreciated the work of their teaching staff, the burden teachers carried in terms of their teaching role, but also in caring for students and families during the lockdown.

In relation to their own workload, principals spoke about the support they received from other school leaders, the school board of management, and other, mostly informal networks:

There’s no doubt about it, there is a brilliant support network [amongst] principals themselves, and it was a very valuable safety net to have . . . everyone is very honest and open about their issues, so . . . those meetings were very supportive, you know. (Mary, secondary school principal)

Nevertheless, while principals tended to be stoical about the challenges and uncertainty they were facing, the analysis pointed to a massive concern about the reopening of schools,

especially the responsibility they carried for ensuring the health and wellbeing of their staff and students. Some reported that their school buildings are “not fit for purpose”, with narrow corridors and small classrooms, inappropriate for social distancing. Further, principals were worried about possible staff shortages; they predicted problems securing substitute teachers in the event that core staff took ill. Other concerns related to whether the state would provide sufficient resources for cleaning, sanitising and for personal protective equipment. They expressed concern for Special Needs Assistants most of whom are involved in “close contact personal care.” One participant flagged that there is “massive stresses on school leadership, everything is so up in the air”; another anticipated that “school principals are all going to be sick by November”.

Silver linings?

Many study participants noted there were certain positive aspects to the lockdown. These included spending more time with family, rediscovering possibilities for outdoor physical activity and new ways of coping with the lockdown, as illustrated in the citation below.

There is a newfound respect among students, or appreciation among students and young people now for the simpler things in life, for being at home, and being with family, and having to get on with your family. Even the whole physical aspect to wellbeing – I know a shop-owner here, he sells bikes and he said, in the three months after the pandemic, of lockdown, he sold 2,000 bikes. (Colin, secondary school principal)

It is notable, however, that the possibilities for outdoor pursuits were not flagged by participants working in marginalised areas. On the contrary, these participants highlighted that many families were living in communities where there was a lot of anti-social behaviour, violence or outdoor alcohol consumption. In this context parents had little option but to keep their young children indoors where they could ensure their safety. According to Michelle (a primary school principal), “One mammy reported that she wasn’t allowing the children outside at all. So, even though the weather was beautiful, she said it’s safer for the children to be inside”.

Another positive aspect identified through the analysis of the interviews related to “lessons learnt”, which could potentially lead to change in educational policy. For example, one participant felt that the pandemic provided an opportunity to reform the Leaving Certificate (high stakes, state examination at the end of the Senior Cycle, second-level education), however he was not overly optimistic:

I think that what has happened now should feed into what the new Senior Cycle is going to look like . . . [I’m] concerned, that when things do return as normal as possible, we’re just going to go back to the way we were. And, you know, racing about everywhere . . . and time isn’t here for this or that. I think in general, not just in school, we have to appreciate, that life isn’t a big race. (Colin, secondary school principal)

Some teachers found that the different pace and place of working provided them with time to reflect on their values and professional identity, as the extract below highlights:

You would find yourself looking out the window and thinking, yknow, who am I as a teacher? What do I value? Am I doing enough here? When Covid hit and schools closed, I realised, okay, let’s go back to the bigger picture here . . . let’s think about what’s important again. (Sam, primary teacher)

In a similar vein, teachers expressed the benefits of the increased need to develop their professional capacities and competences. *It’s made pedagogical practices much more exciting, just to be learning again . . . I really hope that that positivity of the skills and the pedagogical practices that have changed will move forward with us, and we’ll have gained a lot from it.* (Sandra, secondary teacher)

Others simply enjoyed the working from home experience and found they got more done, as there were fewer interruptions. Grainne (secondary teacher) felt her stress levels reduced and she slept better:

[. . .] and bizarrely, I was sleeping so much better, my stress levels plummeted, and it was just . . . I remember thinking, “wow, I’ve slept!” ‘Cause when I’m working, I don’t really sleep . . . I’ve definitely seen the lines on my face reduce, yknow, the bags under my eyes—gone!

There were some benefits reported for students as well, Colin, a secondary school principal, reported that *“the freedom and the flexibility to work within their own constraints at home suits some students. But that’s a minority”*.

Discussion

The pandemic and resulting school closures have had an enormous impact on the wellbeing of the school community. Our study highlights that education professionals were deeply engaged and devoted to students and families they worked with, sometimes with the cost of increased stress, vulnerability or concern for themselves or their own families. They acknowledged the resilience of students, in times when most of the public discourse tended to demonise young people or cast them as careless and egocentric. Furthermore, education professionals were fully aware that while we are all in the same storm of the pandemic, not everyone is in the same boat. Concern about inequalities and a desire to support the most vulnerable students was evident in the interview accounts. At the same time, the professionals did not feel sufficiently acknowledged and supported themselves, particularly by central education authorities. They did, however, report the vital significance of collegial solidarity and support.

In line with predictions of other authors (Darmody *et al.*, 2020; Van Lancker and Parolin, 2020), this study revealed that school closures were disproportionately affecting those already marginalised by society. Most recurrently reported challenges for students were isolation, worry, loneliness, self-harm and suicide. Concern about student using drugs and being lured into crime gangs were also expressed. Educators were especially concerned for students living in challenging circumstances, including asylum seeking children living in emergency accommodation, those exposed to adverse and traumatic experiences (such as poverty, neglect and violence), students with additional educational needs and those at risk of substantial loss of learning, school refusal and drop-out.

Educators went to great lengths to connect with students and families. Previous surveys in Ireland have found that during the first lockdown the majority of schools put measures in place to contact student daily or every other day, with schools relying mainly on email and various online platforms (Burke and Dempsey, 2020). However, this study shows that many educators, particularly those serving marginalised students, had to find new and more imaginative ways to maintain contact with students. This included visiting family homes, delivering educational resources and messages by post and regular phone calls. It was clear that an ethic of care and desire to sustain relationships were central driving forces in these endeavours.

The study highlighted that schools are a staple in their communities and offer a lifeline for many students. They provide a space, not just for learning and intellectual stimulation, but also a place of safety, connection, predictability and routine. This study provides evidence of the collective resilience, resourcefulness and sense of solidarity that exists within school communities. However, it raises inevitable questions around what is expected of schools vs what is feasible for them, given available resources. With evidence of increased distress and trauma experienced by children during the pandemic, it is clear that schools will need greater awareness of trauma and how it impacts students’ lives. In addition, it is well known that professional working with children who experienced adversity tend to report high levels of compassion fatigue, secondary traumatic stress and burnout (Howard, 2019), which can

compromise their capacity to provide empathetic responses to students in their care, and is distressing for teachers in its own right. Given the challenges of the pandemic there is a pressing need to move beyond paying lip service to teacher wellbeing. Resources to support whole-school trauma-informed approaches will be crucial in this regard, in order to create the conditions that enable both students and staff to flourish (O'Toole, *in press*).

The shift to remote teaching has disrupted and altered the nature of interpersonal connections that teachers have with students, families and colleagues. Similar to Kim and Abrey (2020) we found that this shift affected teachers professional identity and for some prompted a re-evaluation of core values. Teachers in our study were navigating new ways of working, new professional boundaries and reflecting on what it means to be a teacher. They overwhelmingly expressed a desire to return to face-to-face teaching, acknowledging the importance of physical presence and embodied relationships, both for their students' wellbeing, but also for their own job satisfaction, meaning and purpose (Spilt *et al.*, 2011).

In addition to re-evaluating their professional identity, educators were forced to adapt their current ways of working often without sufficient resources, training or support. They expressed a range of feelings including vulnerability, guilt and worry, which were often evoked by reflecting on the plight of their students/families. Sexual harassment and homophobic bullying of teachers by students was another issue that was raised, and whilst this issue has surfaced in previous research (O'Toole *et al.*, 2018), it remains an under researched area.

There were also considerable pressures on school leaders, who at the time of interviews were bracing themselves for the colossal challenge of keeping Covid out of their schools and keeping their communities safe. Harris (2020) noted that school leadership during a crisis is exhausting and incessant work. While the school leaders we spoke to were responding positively and stoically to the crisis, the pressures on them were deemed unhealthy, unsustainable and very likely to have a detrimental impact on school wellbeing going forward, a finding echoed by Dempsey and Burke (2020).

There was a deep sense of anger and frustration in relation to the state Department of Education. The lack of adequate governance, collaboration and involvement was deemed to be an insult to the good work being done in schools; it undermined relationships between teachers and families, and increased the workloads and pressures on school leaders. The wellbeing of students and teachers are profoundly intertwined (O'Toole and Simovska, *in press*). In this time of turmoil and uncertainty, the priority for wellbeing must extend to school leaders and teachers, as well as students (Harris and Jones, 2020). Enhanced support, meaningful collaboration and compassionate leadership from the Department of Education could substantially enhance the wellbeing of teachers and school leaders. In addition, teachers may benefit from professional supervision (as is available to other frontline professionals, Lawrence, 2020); a system that would that allows them to share some of the distressing encounters their job entails with a trusted colleague so they can be emotionally and practically supported at a time when their role is harder than ever.

In summary, our findings support the need for reimagining and re-positioning education in a post-pandemic world, rather than merely returning to the way things were. COVID-19 presents an opportunity to take what we know about the universal human needs for safety, belonging and social connection and to "build back better" (PSC, 2020). In relation to educational equality, this means developing educational policies in which values of participation, inclusion, community and trust are prioritised over individualism, accountability and competition. In the Irish context, COVID-19 has shed light on how certain groups of children are placed at risk of neglect, abuse and other harm due to structural inequalities; it has also revealed educational incongruities, such as the dangers of relying on high stakes, summative examinations that generate high levels of stress and anxiety for students and their families (Smyth *et al.*, 2019) and increasingly for teachers as well (Devenney and O'Toole, 2021).

As noted earlier, one of the educational frameworks that acknowledges the intersection of wellbeing and education, is the Health Promoting Schools framework, or the so-called settings approach to health and wellbeing promotion in schools (WHO, 1998; Simovska and McNamara, 2015; Saboga-Nunes *et al.*, 2020). Indeed this framework partly informs Ireland's wellbeing policy for schools (DES, 2019). The findings of this study reassert the need for whole-school approaches, in which wellbeing is embedded in all aspects of school life (relationships, policies, culture and curriculum). However, they point to the need for greater focus on the social determinants of emotional and psychological distress, enhanced support for trauma-informed approaches and more compassionate/collaborative leaderships from the state. This would support the collective resilience of schools, enabling them to respond to the pandemic flexibly, safely and in equitable ways, as they work to sustain – or even transform – their core purpose in response to crisis situations (Simovska, 2020).

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Corresponding author

Catriona O'Toole can be contacted at: catriona.a.otoole@mu.ie

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“It’s been a good time to reflect on...who isn’t worth keeping around”: COVID-19, adolescent relationship maintenance and implications for health education

Alanna Goldstein and Sarah Flicker

Environmental and Urban Change, York University, Toronto, Canada

Abstract

Purpose – This paper adds to the growing body of research examining the impacts of COVID-19 physical distancing measures on the everyday lives of young people. It draws on theories of “digital intimacies” and “relationship maintenance” to argue that young people’s reflections on COVID-19, physical distancing and online relationships expose larger gaps in sex, relationships and health education pedagogies.

Design/methodology/approach – Five semi-structured online focus groups were conducted with Canadian adolescents aged 16–19 probing their experiences of dating and platonic relationships during COVID-19. Narrative thematic analysis methods were used to develop themes outlining how physical distancing measures have affected young people’s relationship norms, expectations and values.

Findings – COVID-19 physical distancing measures and school closures appeared to create the conditions for some young people to productively reflect on the labor involved in the maintenance of their relationships in relation to considerations of proximity, reciprocity and distance. This labor was particularly articulated by female participants, many of whom expressed that life disruptions caused by COVID-19 catalyzed learning about their own relationship needs, desires and boundaries.

Research limitations/implications – Results from this research are not widely generalizable, as each participant had a unique experience with COVID-19 physical distancing measures, schooling and in-person contact. Due to anonymity measures implemented, participant narratives cannot be confidently associated with demographic surveys that hampered the ability to offer an intersectional analysis of participant experience.

Originality/value – Discussions of relationship maintenance and digital intimacies elucidate the limitations of health education’s tendency to construct adolescent relationships as existing along binaries of “healthy” and “unhealthy.” Health education might benefit from more meaningful integration of these concepts.

Keywords Focus groups, Health education, Media, Adolescents, Relationships education

Paper type Research paper

Introduction

Globally, restrictions implemented to curb the spread of COVID-19 have had deleterious impacts on youth wellbeing. In North America, lockdowns and school closures have negatively affected young people’s mental health (Singh *et al.*, 2020) and exacerbated existing educational disparities (Montacute, 2020). Silliman Cohen and Bosk (2020) suggest that lesbian, gay, bisexual, transgender, queer and/or questioning youth, as well as youth from other historically marginalized populations may be particularly vulnerable to the detrimental effects of increased isolation due to diminished access to essential community supports.

We conducted a series of focus groups with Canadian adolescents to explore experiences with platonic and romantic relationships during this period of social distancing. Using the lenses of “digital intimacies” (Scott *et al.*, 2020) and “relationship maintenance” (Dindia and Canary, 1993) theories, our analysis of participant narratives suggests that COVID-19

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restrictions have provided the space necessary for some young people to reflect on the quality of their relationships in new and potentially productive ways. We contend that the COVID-19 crisis may therefore present unique opportunities for health educators to rethink and refine strategies for educating around young people's relationships.

Digital intimacies, relationship maintenance and COVID-19

"Digital intimacies" refers to the degree to which our social and intimate relationships are increasingly intertwined with new media technologies and social media platforms. According to [Scott et al. \(2020\)](#), digital intimacies include a range of activities and practices such as "sexually explicit image sharing" and "meeting sexual partners," and also refers to "how young people engage in communications via digital platforms/technologies to forge intimacy" (p. 676).

Here, we examine young people's reflections on digital intimacies as they relate to experiences of relationship maintenance. The concept of relationship maintenance derives primarily from the fields of psychology and counseling and refers to the people's behaviors engage in "to keep a relationship in existence, to keep relationships at a specific state or condition, to keep a relationship in satisfactory condition, or to keep a relationship in repair" ([Dindia and Canary, 1993](#), p. 163). These behaviors can be both strategic and routine. Strategic maintenance behaviors are those that are intentionally undertaken to sustain the relationship, while routine behaviors tend to operate at "a lower level of consciousness" and are "not used intentionally for maintenance purposes" ([Dainton and Stafford, 1993](#), p. 689).

Inherent to all relationship maintenance is the need for some degree of reciprocity. [Rousseau et al. \(2019\)](#) suggest that "individuals are motivated to perform relational maintenance behaviors (costs/input) as long as they see their relational investments reciprocated (rewards/outcome)" (p. 175). However, maintenance behaviors are also used to develop and preserve a communal bond, and to reduce "relational uncertainty" through enhancing one's ability to read, understand and predict a partner's behavior ([Forsythe and Ledbetter, 2015](#)). Together, these motivators indicate that reciprocity, interdependence and meaningful communication are key to developing high-quality relationships.

The enactment of relationship maintenance behaviors is not neutral but deeply gendered. Women tend to engage in more romantic relationship maintenance behaviors than men; a discrepancy rooted in socialization processes that lead both men and women to "perceive women to be more relationally oriented" and to have "higher expectations for women to employ relationship maintenance strategies" ([Aylor and Dainton, 2004](#), p. 361). These gendered differences intersect with practices of digital intimacy: women are also more likely than men to use social media and online communication technology to engage in relationship maintenance behaviors, such as "liking" posts, sending personal emails or commenting on photos ([Muscanell and Guadagno, 2012](#); [Kimbrough et al., 2013](#)).

Relationship maintenance may be particularly important for young people. Adolescence is a time when many young people seek increasing autonomy from familial relationships ([Ellis and Zarbatany, 2017](#)) and rely on their relationships with friends, peers and romantic partners both for emotional support and to produce their social, gendered and sexual identities ([Collins et al., 2009](#)). A large proportion of young people's relationship behaviors now take place online ([Wang and Edwards, 2016](#)). However, physical proximity remains important. Proximity enables the kinds of nuanced individual-to-individual and individual-to-group interactions that support the development of burgeoning adult identities ([Epstein, 1983](#)). In-person interactions also facilitate routine maintenance behaviors such as sharing laughter or engaging in physical forms of contact, both of which have been shown to produce endorphins and improve relational bonds ([Dunbar, 2018](#)). Prior to COVID-19, young people's online relationship interactions were primarily used to supplement, rather than replace, in-

person engagements. Wang and Edwards (2016) found that most adolescents they surveyed indicated that social media was not their preferred method for exploring or building new relationships or for engaging in relationship maintenance (p. 1,213). Instead, respondents used social media primarily to “develop social capital by exploring existing relationships” (p. 1,213). Khan *et al.* (2016) similarly found that “the benefit of having an online social life is contingent upon also having a supportive face-to-face peer network” (p. 943). The value of physical co-presence to romantic relationship satisfaction was also evident in our own recent study of young people’s dating relationships during COVID-19 (Goldstein and Flicker, 2020).

However, as adolescents have found themselves isolated at home during the pandemic, their ability to interact with others in-person has been curtailed. In this context, many young people have been required to engage with romantic partners and friends almost exclusively through digital means. For instance, Ellis *et al.* (2020) found that following the implementation of physical distancing restrictions and Canadian school closures in Spring 2020, approximately 65% of adolescents were spending between 5 and 10 h on social media every day (p. 181), while 12% of adolescents reported spending more than 10 h per day online. During these many hours spent online, over 50% of teens indicated that they spend 1–2 h/day texting with friends, and 40% reported spending 1–2 additional hours video chatting with friends (p. 183).

Yet even as quantitative research indicates that young people are spending their time during COVID-19 physical distancing restrictions engaged in increased online communication with friends, peers and loved ones, there are little data illuminating how they make sense of the quality of those interactions, nor how those interactions relate to broader considerations of young people’s digital intimacies. We examine how moving (almost exclusively) online has shaped young people’s relationship experiences during COVID-19.

Study details

Participants (aged 16–19 years) were recruited from across Canada through ads posted on Facebook and Instagram for a week at each timepoint. We conducted two sets of focus groups: three in the beginning of June 2020 ($n = 25$) and two at the end of November 2020 ($n = 13$). We chose to conduct online focus groups to accommodate public health restrictions around in-person gatherings, and because online focus groups are ideal for exploring sensitive subject matter due to increased options for anonymity and fewer barriers to participation (Forrestal *et al.*, 2015). The first set of focus groups occurred at a time when all provinces and territories in Canada had been under varying degrees of lockdown; all schooling was suspended. The second set of focus groups took place amidst the “second wave” of COVID-19 when most secondary schools remained open for a combination of either in-person, hybrid- or virtual learning, albeit under strict physical distancing mandates. Consequently, participants in the second phase of the study were experiencing varying schooling and social environments that involved different levels of in-person contact.

Interested participants were emailed an online consent form and a link to complete an anonymous demographic survey. The 57 people who returned the signed consent form, completed the survey, and met age and residence eligibility criteria were emailed a secure Zoom link for their preferred focus group slot. During the focus groups, participants were encouraged to “rename” themselves using pseudonyms and to provide their gender pronouns (which we use here to refer to them throughout). Only 38 participants ultimately attended the focus groups. Based on the pronoun participants used at the time of the focus group (she/her, they/them, he/him) as well as information provided in demographic surveys, 32 were female (84%), 3 were non-binary (8%) and 3 were male (8%).

Each focus group lasted 90 min and was facilitated by the first author, a Postdoctoral fellow with experience in focus group moderation (Goldstein, 2020) using a semi-structured

interview guide. Undergraduate research assistant note takers were also present for most focus groups. We followed best practice guidelines for synchronous online facilitation including: over-recruiting, keeping groups small, testing equipment, providing detailed instructions, monitoring participation, encouraging the use of mute, reaction and chat features, and using electronic incentives (such as email gift cards) and integrated recordings (through the use of Zoom's embedded recording function; see [Abrams and Gaiser, 2017](#); [Fox et al., 2007](#)). Most participants chose to leave their cameras off but made liberal use of the microphone and chat features. All were sent a \$20 gift certificate of their choice following the session. To capture the discussions, we utilized the Zoom auto-transcription and recording features in conjunction with our own transcription practices.

Each transcript was reviewed by both authors who engaged in a series of inductive thematic analysis discussions (see [Riessman, 2008](#)). Data (including audio and chat transcripts) were then coded by the first author into categories that included narratives and conversations. Here, we analyze narratives that fit within the broader category of "relationship labor," (i.e. ones that indicate participants' reflections on the actions they or their friends and partners undertook to maintain their relationships at a distance). Through an iterative coding process, we further divided the category of "relationship labor" into three subcategories of "proximity," "reciprocity" and "distance."

Results

Theme 1: proximity

Many participants reflected on the role that physical proximity typically plays in their ability to enact relationship maintenance behaviors. For instance, Joy explained that "before Covid, a lot of my friends met in school and we kind of like hung out every day." Bridget shared that her friends "used to go to the mall, or go shopping, or have sleepovers and hang out after school and like that's what we really relied on for our connection." Penny added that while she regularly talked to her friends during COVID-19 restrictions, "I do not necessarily have fun the same way I would if I was able to see them in person." For those who had returned to in-person schooling, physical distancing restrictions and masking requirements continued to interfere with the proximity necessary to create and maintain friendships. For instance, Nat, who had recently transferred schools, explained that "I find it's a lot harder to make new friends and everything, just because like, the six feet thing. . . the masks and everything, like you cannot see people's faces, you have to stay away from them."

Several participants also reflected on the impact that a lack of proximity was having on their love lives. For instance, Sophie described how starting a dating relationship during COVID-19 restrictions was difficult because, "I do not think you can fully replace the experience of meeting someone in person, . . . [it] plays a huge part in your attraction and your compatibility with that person." Chloe too shared that, although she had returned to in-person schooling, physical distancing restrictions designed to control the movements of students meant that getting to know a new crush remained difficult. She explained that "I met this guy about a month ago and it's really hard to like get to know him, because. . . I have to sit in a completely different area. . . and I cannot move my chair to go by him and get to know him."

For those already in relationships, a lack of physical proximity to their partners was impacting relational intimacy and communication. Contemplating these effects on her partnership, Anna offered, "I do not really like being vulnerable with her over FaceTime, because I'm such a physical comfort seeker. . . I'm like, being vulnerable and I'm talking and then I just cannot have a hug." Karen too suggested that "it's just been really hard on like the communication part and how like you cannot truly express your feelings because texting, you do not hear that tone. . . You do not, like, see their face. It's just words on a page."

Across all focus groups, participants lamented the loss of routine relationship maintenance behaviors, such as sharing activities, listening and communicating, and providing/receiving physical contact. However, some participants also explained that COVID-19 restrictions had enabled them to see that many of their relationships were rooted almost entirely in the conveniences afforded by proximity. For instance, Mia explained how prior to COVID-19, “I would talk to a bunch of people. But then during Covid, where school is cancelled, I just stopped talking to them because I could not see them every day. And I realized those people were just probably peers or classmates, rather than real friendships.” By contrast, Bridget reflected that distance was not only affecting some of her friendships adversely, but also activating others, stating “I’m kind of enjoying more the friendships where I do not have to always do things with people, where I can have a conversation over text.”

Participants’ narratives highlight the centrality of physical proximity for young people’s ability to start and maintain routine romantic and platonic relationships, as well as the inability of digital communication to adequately replace that proximity. The absence of proximity as mandated by COVID-19 restrictions, however, did appear to give some participants the literal and emotional space to reflect on the degree to which their relationships depended on physical proximity and highlighted for some the value of those who communicate well and can continue to express care from a distance.

Theme 2: reciprocity

Participants also indicated that this period had heightened their awareness of the importance of reciprocity in their relationships. While certainly most young people were using communication technologies to connect with friends and partners prior to the pandemic, the exclusive use of mediated technologies during school closures meant that all relationship maintenance behaviors became more purposeful. That is, relationship maintenance enacted at a distance requires some degree of intention, planning and execution. For some teens, the effort involved in enacting that maintenance suddenly became visible. For instance, Hope described that during COVID-19, she had “lost a lot of friends because they did not put as much effort into our friendship as I did.” Farah too shared that “since Covid-19 started. . . I’ve noticed that there’s so many people that actually do not really care about you and like, I would like always message them.”

It should be noted that a lack of reciprocity in relationships – whether friendships or otherwise – can also cause problems if one partner appears over-invested in the relationship. For instance, Rose shared that during COVID-19, she “lost so many of my friends” due to inequities in their need for her time and attention. She explained that “I had a friend show up to my house. . . right in the peak of the pandemic and be like, ‘I need you to come out right now.’ And I’m like, ‘No, no, we’re not co-dependent. Leave me alone.’”

Relatedly, some participants, such as Kaia, reflected on the difficulties of engaging in relationship maintenance behavior at a distance, stating that,

Personally, I’m really bad at texting and stuff, or like keeping up conversations and I feel like if you’re like me, or someone who’s just like, not able to speak online, and is just better at talking to people in person, it’s so hard to keep up with friends and keep up with relationships.

Kaia’s narrative points to how relationship maintenance during COVID-19 requires a degree of comfort with and competency in mediated communication that not all young people possess.

For those in romantic and dating relationships, the effort put in by each partner also became more obvious. For instance, Elizabeth attributed her break up during quarantine to her partner’s lack of effort in maintaining the relationship:

While we're in quarantine, he just stopped like putting in any effort, which was really annoying. And he just kind of thought that he did not have to talk to me because like we're not seeing each other. So, I found like that was kind of hard to deal with.

Blair too explained that she had broken up with her boyfriend during the first wave of COVID-19 when she realized that "the communication that was going on in the relationship was all me. . .it was so one-sided; I was the only one putting effort in and it became really apparent." For other participants, physical distancing restrictions forced them to find novel ways to engage in romantic relationship maintenance. Sophie shared that, unlike Elizabeth, quarantine had "really made me kind of value and appreciate my boyfriend more, because these days I've been in a really bad mental state, but he was always very supportive. Like, you know, even if it's just a sweet text or whatever."

These narratives all describe how physical distancing necessitated by the pandemic has enabled some young people to see, with increasing clarity, relationship maintenance behaviors, particularly as they intersect with the labor involved in communicating via new media technologies. This newfound visibility has highlighted both the intentionality inherent to that maintenance, as well as the importance of relationship maintenance reciprocity. Participants' narratives indicate a burgeoning awareness that care and love are not only feelings, but are exemplified through acts that are deliberately performed.

Theme 3: distance

Several participants also shared that they had learned a more diffuse set of lessons about their own relationship patterns, values, needs and boundaries as a direct result of the physical distance necessitated by public health measures. For instance, Sarah expressed learning that she should have engaged in more in-person relationship maintenance when she had the chance, claiming that in the past she and her friends "would be in the same room but with all of us on our phones. It kind of makes you realize that during that time, you should have been like acknowledging everyone's presence."

Joy too shared that she had gained a deeper appreciation for in-person relational encounters:

If you have, like, a social distance meetup in the park, everybody's standing far away, like saying "hi" to each other. Like those interactions become a lot more rare, so they become a lot more meaningful and you like appreciate those times a lot more.

To the extent that in-person contact now carries with it a certain degree of risk from COVID-19 infection, it can be assumed that in-person meetups might be reserved for those relationships that are considered most vital. Determining who is considered risk-worthy might be a kind of yardstick, then, for which relationships are most valued. As Sophie summed it up: "It's been a good time to reflect on. . .who isn't worth keeping around." These calculations appear to similarly extend to starting new romantic relationships. For example, Charlie explained that, prior to COVID-19, dating "was a fun thing to do, almost like a pastime" but now "it's a lot bigger of a deal to be going out with someone, like to actually find someone that I want to spend time with, because I'm exposing myself to someone else."

For other participants, the lessons learned during COVID-19 distancing restrictions came from having the time and space necessary for deeper self-reflection. For instance, Christa explained that "one thing that's good. . .about Covid. . .[is that] it does definitely give us time for ourselves to check in on our mental health. . .taking time for myself is really helpful in all my relationships." Meanwhile, for Karen, who described her immune system as "kind of crap," COVID-19 had "definitely been a time to reflect and see who your true friends are." Other participants reflected that COVID-19 restrictions had similarly provided them with the distance needed to finally end toxic relationships. For instance, Sierra shared that "I've lost a lot of friends during Covid. . .I've kind of been you know reevaluating myself and, you know,

putting myself first and thinking more. . . And it's heartbreaking. But at the same time, it's really eye-opening." Nat too shared that he had had a fight with a close friend prior to the implementation of physical distancing restrictions and had realized "with the time away, I guess not being close to each other's face all the time, that we were both kind of toxic to each other."

Participants' narratives of the lessons they learned during COVID-19 distancing measures suggest that this time has provided young people with unique opportunities to better ascertain their own needs and wants within their relationships. Furthermore, for some young people who were embroiled in toxic relationships prior to COVID-19, the imposition of isolation measures appears to have given them the distance they needed to analyze and end those relationships safely.

Discussion and relevance to health education

Even as COVID-19 isolation measures have undoubtedly caused immense relational and emotional harm for young people around the world, participants' narratives also indicate that they may have created the conditions for youth to reflect on the quality of their relationships and the labor involved in maintaining those relationships, in new and potentially productive ways. These reflections have several important implications for health and relationships education.

First, findings evince the value of introducing concepts of relationship maintenance more explicitly into school-based health education curricula. Historically, school-based health education has tended to be preventative or protective in focus, emphasizing the risks and dangers of adolescent romantic and sexual relationships, including risks relating to sexual health, sexual abuse, harassment and teen dating violence (Bay-Cheng, 2003). To protect against these risks, many curricula now include discussions around what constitutes "healthy" and "unhealthy" relationships and provide skill-building activities aimed at helping young people improve their communication and conflict-resolution competencies and avoid danger (Janssens *et al.*, 2020). Binary constructions of adolescent relationships as either "healthy" or "unhealthy" and emphases on the biological aspects of sexuality do not, however, necessarily reflect the nuance associated with most young people's romantic and platonic relationships. This limitation is indicated by Penny, who stated that in her health education "They really did not talk about relationships. . . they more just talked about the sex part of it. . . they did not really talk about how to maintain a healthy relationship." Similarly, in a survey of 3,000 American young people, Weissbourd *et al.* (2017) note that 70% of respondents "reported wishing they had received more information. . . about some emotional aspect of a romantic relationship, including 'how to have a more mature relationship' (38%)" (p. 12). These findings echo participants' desires for more opportunities to discuss those sticky aspects of relationships that make them complex and meaningful, rather than merely "good" or "bad."

Some recently developed school-based health education curriculum guidelines from countries offering comprehensive sex education do appear to include discussions of concepts that are related to relationship maintenance practices. For instance, in the province of Ontario, where many participants in this study reside, the recently updated Health and Physical Education curriculum (2015) states that "healthy relationships" should be discussed as "based on respect, caring, empathy, trust, and dignity" (p. 71). Similarly, the Australian Curriculum provides guidance for health education to consider how "empathy and ethical decision-making contribute to respectful relationships" (Australian Curriculum, Assessment and Reporting Authority, 2014), while in the UK, the Department of Education's recently developed Relationships and Sex Education and Health Education guidelines (2019) include discussions of healthy relationships as constituted by "mutual respect, consent, loyalty and trust" (p. 29).

Although the concept of “relationship maintenance” does not explicitly appear in these curriculum guidelines, discussions of caring, empathy and respect do appear to value similar approaches to thinking about what constitutes mutually satisfying relationships. However, as [Scott et al. \(2020\)](#) note, these curriculum documents are often deliberately non-prescriptive, “so implementation is likely to vary considerably between schools with respect to the extent to which topics will be addressed, at what age, and how” (p. 676). Furthermore, these curricula do not explicitly address the gendered aspects of relationality and relationship maintenance. Rather, competencies that are connected to practices of relationship maintenance such as “communication skills” are presented as gender-neutral and skills that all young people need to work on to equal degrees ([Janssens et al., 2020](#)). Yet the results from our study highlight the gendered nature of relationship maintenance, and the ways in which the labor involved in engaging in that maintenance often falls on women and girls. This gender disparity is visible, firstly, in the fact that most participants who took part in this study were female and/or non-binary. That girls and non-binary youth felt compelled to take part in a focus group explicitly addressing adolescent relationships during COVID-19 underscores how the work of thinking about and caring for relationships is still a burden disproportionately shouldered by women and/or non-binary people.

Health education as a field might therefore draw on the research around emotional labor and relationship maintenance more broadly to explicitly address gender imbalances in young people’s relationship practices. Failing to consider the gendered nature of relationship work invisibilizes how those who occupy historically marginalized positions are more likely to think about and work on their relationship competencies to maintain their own safety; this is likely particularly true for those who are multiply marginalized due to their race, sexuality, immigrant status and/or ability. Integrating an intersectional gendered analysis into discussions of relationship competencies and relationship maintenance might help young people better understand how deeply rooted norms around gender, sexuality, race and other subjectivities continue to structure what might be perceived as “natural” relationship dynamics.

Finally, the narratives shared by participants also suggest the need for curricula to better attend to the role that new media technologies increasingly play in young people’s relational lives, including in their relationship maintenance practices. While participants were undoubtedly engaged in varying forms of mediated relationality prior to COVID-19, the experience of being forced to engage with friends and romantic partners primarily or exclusively through new media appears to have given some young people the opportunity to reflect on the specific affordances and limitations of doing so. Although many curricula are increasingly including discussions of new media, these discussions tend to emphasize those aspects of online relating that are considered clearly harmful or “risky” for young people, such as cyberbullying ([Gaffney et al., 2019](#)) or sexting ([Albury et al., 2017](#)). Nuanced considerations of young people’s digital intimacies are rare. For instance, in the Ontario Health and Physical Education curriculum (2015), considerations of online relationships are almost exclusively discussed in relation to issues of harassment, violence and abuse. In the UK’s Department of Education curriculum guidelines (2019), the section covering “online and media” almost exclusively addresses issues relating to safety, privacy and exposure to pornography or other unwanted content (p. 22). Where this document does explicitly consider intersections of intimacy and digitality, it suggests that by the end of secondary school, pupils should know “the characteristics of positive and healthy friendships (in all contexts, including online)” (p. 27). This statement situates online relating as secondary to normative relationship development rather than as one of the primary sites where young people’s intimacies are forged, maintained and dissolved.

Rather than focusing only on online practices or interactions that represent safety and legal concerns, school-based health education pedagogies might therefore look to better

integrate digital intimacy research into discussions of caring relationships to help young people work through the murkier and more mundane aspects of their relational lives. As this study indicates, young people are already developing their own complex (if idiosyncratic) set of norms and expectations around what constitutes desirable online relationship practices. However, prior to the physical isolation caused by the COVID-19 pandemic, young people may have had fewer opportunities or felt less need to consciously reflect on those norms and expectations. For instance, how often should partners in a romantic relationship text each other? What obligation do friends have to respond to a FaceTime request? What are one's feelings around a romantic partner "liking" their ex's Instagram posts? Health education curricula that center these quotidian relational conundrums can help young people further clarify their own relationship needs, boundaries and desires within an increasingly mediated world.

Limitations and conclusions

The small-scale nature of this study, and the idiosyncratic nature of each participant's particular experience of COVID-19 lockdowns and isolation measures, means that results are not generalizable to all young people. For instance, the online nature of these focus groups likely resulted in the participant sample skewing towards higher-income households, as the technology and Internet capacity needed to partake may have proved to be barriers for lower-income youth. Furthermore, we were unable to link reported self-identified ethnicity data that were gathered through the survey with transcripts because most participants chose to use a (new) pseudonym on Zoom. A study that explicitly analyzes how racialized and/or newcomer youth are experiencing their relationships during COVID-19 would be immensely valuable. In future studies, we will take further care to ensure that participants use the same pseudonyms throughout so that we can better match demographics to contributions.

Despite these limitations, young people's narratives of how they are thinking about and navigating their relationships during this unprecedented time offer important lessons for health educators. COVID-19 has illuminated the everyday challenges young people face in their relationships, and the everyday work they are doing to tend to those relationships; challenges and work that, increasingly, intersect with mediated technology. While helping young people mitigate relationship risks both in-person and online is essential, participant narratives in this study demonstrate that young people are more than just at risk in their relationships, but are also engaged in intimate, thoughtful, caring and "eye-opening" learning about society, self, other and the relations between. It is up to health education as a practice to hold space for that learning, while also helping young people recognize care as a kind of discipline that does not come naturally, but rather as a series of acts that are strategically and routinely performed.

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Corresponding author

Alanna Goldstein can be contacted at: goldstein.alanna@gmail.com

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Epidemic modeling as a means to reimagine health education and policy post-COVID

Elise E. Racine and Joanna J. Bryson
Hertie School, Berlin, Germany

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Abstract

Purpose – As illustrated by coronavirus disease 2019 (COVID-19), epidemic models are powerful health policy tools critical for disease prevention and control, i.e. if they are fit for purpose. How do people ensure this is the case and where does health education fit in?

Design/methodology/approach – This research takes a multidisciplinary approach combining qualitative secondary and primary data from a literature review, interviews and surveys. The former spans academic literature, grey literature and course curriculum, while the latter two involve discussions with various modeling stakeholders (educators, academics, students, modeling experts and policymakers) both within and outside the field of epidemiology.

Findings – More established approaches (compartmental models) appear to be favored over emerging techniques, like agent-based models. This study delves into how formal and informal education opportunities may be driving this preference. Drawing from other fields, the authors consider how this can be addressed.

Practical implications – This study offers concrete recommendations (course design routed in active learning pedagogies) as to how health education and, by extension, policy can be reimaged post-COVID to make better use of the full range of epidemic modeling methods available.

Originality/value – There is a lack of research exploring how these methods are taught and how this instruction influences which methods are employed. To fill this gap, this research uniquely engages with modeling stakeholders and bridges disciplinary silos to build complimentary knowledge.

Keywords Health education, Health policy, Epidemiology, Modeling, Agent-based models/ABM, Qualitative methods

Paper type Research paper

Introduction

In the 21st century, the world has witnessed four infectious disease pandemics: human immunodeficiency virus (HIV/AIDS), severe acute respiratory syndrome (SARS) in 2002, H1N1 influenza virus in 2009 and most recently coronavirus disease 2019 (COVID-19). Even more epidemics have occurred, including Western African Ebola virus, Zika virus and Middle East respiratory syndrome coronavirus (MERS). Evidence suggests that the likelihood of large-scale infectious disease outbreaks will only increase due to globalization, urbanization, changes in land use and greater exploitation of the natural environment (Madhav *et al.*, 2017). This is concerning, especially considering that as of May 24, 2021, the COVID-19 pandemic has resulted in over 167.2 million confirmed cases and 3.4 million deaths globally (John Hopkins University, 2021). These events have fueled discussions around how we can best prepare and where health education fits into these efforts. Over the last year, public health and scientific health education have played a significant role in not only limiting the coronavirus' spread but also addressing the unprecedented global challenges that have emerged in the wake of this novel disease. An important aspect that is often lacking in these conversations, however, is the use of tools accessible to those given this monumental task of tackling the pandemic.

Such tools include epidemiological models, which have formed the basis for crucial government decisions in response to COVID-19. These are powerful tools that have a long



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history of expanding our understanding of infectious disease dynamics, aiding disease prevention and control, and shaping health policy. But to effectively accomplish these tasks, these models must be fit for purpose (see [Garner and Hamilton, 2011](#); [Keeling and Rohani, 2007](#)). This is a more difficult problem than it may first appear. To begin with, there are a number of different modeling methods to choose from – each with their own advantages, disadvantages, limitations and barriers to use. Two of the most prominent methods are compartmental models (CMs), a form of mathematical modeling, and agent-based models (ABMs). While CMs have been utilized by epidemiologist since the 18th century, ABMs are a newer computational approach that has recently gained in popularity (see [Gallagher, 2017](#)). Presently, there is a lack of research exploring how (1) these methods are taught and (2) this education influences which methods are ultimately employed. To fill this gap, our research addresses the following questions:

How are these modeling methods taught and does this impact their utilization? If so, how?

How can epidemiological modeling instruction be improved moving forward? What are the implications of these changes for health policy more broadly?

In speaking with public health educators, modelers, students, researchers and policymakers via interviews and surveys and analyzing key secondary data (e.g. course curriculum), this research paper provides a comprehensive overview of how the health education field approaches infectious disease modeling instruction. In doing so, it builds off recent work revealing which methods are over and underutilized and have higher barriers to entry and adoption within public health. This work demonstrates that despite certain advantages – including the ability to capture the complex interactions between socioeconomic, demographic and epidemiological factors – ABMs are frequently disregarded in favor of more established approaches (e.g. CMs). To determine how and whether this neglect of ABM may be addressed and epidemic modeling instruction in general revised, we have turned to other fields and the lessons they have to offer. In engaging in this exploration and providing concrete recommendations, this paper pushes us to reimagine health education and policy in the wake of the COVID-19 pandemic and helps bridge disciplinary silos by building complimentary knowledge.

Epidemic modeling: a brief overview

Modeling is the formal, simplified representation of the relevant features and relationships of some target system or process ([Badham, 2020](#); [Hunter *et al.*, 2018](#)). As such, models offer potential for invaluable insights, enabling better understanding of complex phenomena. Within the field of public health, infectious disease models have been critical to studying disease processes, forecasting epidemic spread, assessing the socio-economic impact of diseases and evaluating the effectiveness of various preventative and control measures ([Garner and Hamilton, 2011](#)). This information can be especially useful when dealing with an emerging public health threat, like COVID-19, or when testing novel interventions. These models may take many forms varying in complexity. They are categorized according to how they treat time (continuous or discrete intervals), space (non-spatial, continuous spatial or discrete spatial), population structure (homogeneous or heterogeneous mixing) and variability, chance, and uncertainty (deterministic or stochastic; [Garner and Hamilton, 2011](#)).

Each of these types of models makes various assumptions and has their advantages, disadvantages and limitations. Considering this and the assortment of options available, selecting a model aptly suited to one's purpose(s) is crucial. These decisions depend on a number of factors (e.g. infection dynamics, data quality, modeler experience, level of temporal or spatial resolution required; see [Garner and Hamilton, 2011](#)). But how do individuals make these choices and why? While there is a subset of the literature that attempts to advise individuals by providing best practice guidelines for the various stages of the modeling process (e.g. design, validation, implementation; see [Garner and Hamilton, 2011](#); [Taylor, 2003](#);

Law, 2005; Sargent, 2007; Badham *et al.*, 2018), there is a lack of research examining how modeling education influences these decisions. The present article aims to fill this gap.

But before exploring how methodological instruction may impact model accessibility, selection and usage, we begin with a brief overview of these diverse epidemiological modeling approaches. We focus this introduction on two classes of models in particular – mathematical models (specifically CMs) and ABMs – as these are the primary methods (1) applied to infectious diseases according to the literature (see Hunter *et al.*, 2018) and (2) referenced by participants. For information regarding alternative approaches (e.g. network, Bayesian and machine learning), see Keeling and Eames (2005), Keeling and Rohani (2007), Siettos and Russo (2013), Duan *et al.* (2015), and Gallagher (2017).

Mathematical models

The earliest method known to be used to model infectious diseases, mathematical equations, is still the most common. Also known as equation-based models (EBMs), these models generally assume homogeneous populations where all members are at equal risk of infection and take into account a few key factors, which “are embodied in some variables parameterized with average quantities or mean values in equations” (Duan *et al.*, 2015). In doing so, they focus their analysis at a macro-level and offer a simplified description of epidemic diffusion. While this simplicity is one advantage of the approach, such assumptions and simplifications also limit the method’s ability to represent the complexities of epidemic spread in detail (see Duan *et al.*, 2015; Keeling and Eames, 2005; Hunter *et al.*, 2018).

Epidemic mathematical models typically fall into two categories – deterministic models and stochastic models. The former includes CMs, which have been employed increasingly frequently by epidemiologists since the late 1970s (Anderson and May, 1992). With compartmentalization forming the basis of the majority of contemporary epidemic models (Keeling and Eames, 2005; see also Keeling and Danon, 2009), these have been applied to various diseases (e.g. measles, COVID-19, H1N1, HIV/AIDS and gonorrhoea). In CMs, a homogeneous, well-mixed population is aggregated into compartments according to health status (Duan *et al.*, 2015; Keeling and Eames, 2005; Kermack and McKendrick, 1927). Ordinary differential equations (ODEs) determine the proportion of the population in each state at a particular point in time. Depending on the infectious disease, different states may be appropriate. For those that confer long-lasting immunity, for instance, an *SIR* (susceptible, infectious and recovered) or *SEIR* (susceptible, exposed, infectious and recovered) model is frequently employed.

There have been attempts to make this basic framework more complicated and reflective of reality by, for example, further stratifying compartments to account for more characteristics, such as age, occupation, vaccination status and socioeconomic status (Hunter *et al.*, 2018; see also Duan *et al.*, 2015; Keeling and Eames, 2005; Hethcote and Yorke, 1984; Keeling, 1997). Despite these modifications, however, compartmental models treat the individuals within a subgroup as homogeneous entities, assuming both (1) random mixing between these persons and (2) that they all behave in the same manner. As Gallagher (2017) notes, this “assumption of homogeneity is highly controversial.” Some argue that the method, therefore, is a poor substitute for the agent-centric and contextual nuances of reality. Others have tried to better capture the realities of epidemic spread by employing stochastic (i.e. random) frameworks such as chain binomials, Markov chains, Bayesian approaches or Monte Carlo sampling (see Allen, 2008; Allen and Burgin, 2000; Gallagher, 2017; Duan *et al.*, 2015; Fintzi *et al.*, 2017; Britton, 2010; O’Neil, 2002; Korostil *et al.*, 2013). However, stochastic versions of common CMs generally retain the underlying shape—and, by extension, assumptions—of their deterministic counterparts (Gallagher, 2017).

Agent-based models

To provide more detailed representations of infectious disease dynamics, some academics have turned to ABMs – also referred to as individual-based models. Agent-based modeling is a

computational method where the behavior of individuals is specified algorithmically, making these models more intuitive to many audiences, as well as more detailed (Wilensky and Rand, 2015). The method is lauded for its ability to accurately depict the properties of complex systems (see Badham, 2020; Luke and Stamatakis, 2012) and has a long history of use in fields outside of public health (e.g. animal behavior, ecology, economics, political science and management studies). More recently, ABMs have increasingly been applied to address disease transmission and control; a development that has converged with an expanding awareness of the benefits of adopting system-based approaches in public health (see Tracy *et al.*, 2018; Badham *et al.*, 2018; Luke and Stamatakis, 2012; Rutter *et al.*, 2017; Silverman *et al.*, 2020).

In ABMs, autonomous agents interact with both one another and their environment based on predefined rules (Tracy *et al.*, 2018; see also Hunter *et al.*, 2018; Bruch and Atwell, 2013; Gallagher and Bryson, 2017; Garner and Hamilton, 2011). Each agent has its own (1) set of rules, (2) characteristics and behavior, and (3) situations and decisions (Crooks *et al.*, 2018). In simulating these decisions, ABMs can capture the interactions, interrelationships and adaptive behavior of these entities over time (Hunter *et al.*, 2018; Bobashev *et al.*, 2007; see also Gallagher and Bryson, 2017; Garner and Hamilton, 2011). Insights into aggregate system dynamics emerge from the “collective effects of [these] individual action selection[s]” and interactions (Gallagher and Bryson, 2017). Given how epidemics are propagated by human behavior, interactions and movement (de Jong *et al.*, 2019), understanding the consequences of these may be critical to addressing a public health threat, like COVID-19.

Ultimately, the ability to determine macro-level phenomena from micro-level analysis is a major advantage of the approach. In adopting an agent-centric perspective, the method also incorporates heterogeneity, randomness, chance and uncertainty, giving a potential for more realistic representation of this complexity. We can thus more easily regard the impact of more intangible elements – such as individual circumstances, beliefs, resources, perceptions and social status (see Badham, 2020) – on disease spread. The method owes its growing popularity in part to advances in computational power and data availability (see Tracy *et al.*, 2018; Gallagher and Bryson, 2017; Duan *et al.*, 2015; Garner and Hamilton, 2011), as well as the invention of user-friendly programming software and platforms specifically designed for ABMs (e.g. NetLogo, Repast). Large-scale agent-based simulations have also been created to study epidemic diffusion, making the method even more accessible, especially to those with limited programming skills. However, as several sources note, logistical hurdles remain and include a lack of training in agent-based techniques (Tracy *et al.*, 2018; Auchincloss and Garcia, 2015; El-Sayed *et al.*, 2012). These hinder the successful application of ABMs in not only epidemiology but also in public health more broadly.

Methodology

Taking a multidisciplinary approach, our study combines qualitative secondary and primary data from a desk-based literature review, interviews and surveys. Through these latter two, our research uniquely engages with various modeling stakeholders (e.g. academics, students, modeling experts and policymakers) both within and outside the field of epidemiology. This complements a literature review spanning academic literature, grey literature and course curriculum. The following section begins with a description of these in the “Data Sources and Collection” segment before continuing with an explanation of our “Analysis” and concluding with a discussion of our “Considerations and Limitations.” By adopting this research design, this work provides a comprehensive, timely and meaningful contribution to our knowledge of epidemiological modeling instruction. This understanding is necessary to determine if and how such instruction may be revised.

Data sources and collection

Secondary data came from academic literature, grey literature and course curricula. Academic and grey literature was sourced through Google Scholar, ScienceDirect, Springer

and the reference lists of included papers. All works were identified using the keywords: ABM/agent-based/individual-based OR EBM/equation-based/mathematical/compartamental AND epidemic*/infectious disease*/epidemiolog* AND model*. In total, 21 term pairings were employed. Course curricula reviewed were limited to general epidemiological modeling classes instructed in English between 2018 and 2020 at the undergraduate or graduate levels as part of a degree program. Syllabus or comprehensive course descriptions detailing the various modules and modeling methods utilized had to be available to the authors. Courses that (1) focused on a specific disease or advanced techniques and/or (2) were taught as part of a summer school, short course or workshop were not considered. Most classes, consequently, were conducted by schools of public health, including at institutions such as Harvard University, Columbia University, John Hopkins University, Emory University, University of Georgia, University of Michigan, University of Washington, University of California Berkeley, University of Oxford, Imperial College London, London School of Hygiene and Tropical Medicine and the Swiss Federal Institute of Technology (ETH) in Zurich.

This evidence was supplemented by primary data collected via six semi-structured key informant interviews (KIIs) and 26 survey responses. The 32 unique participants comprised five groups: (1) 12 epidemiological modeling experts, (2) 9 modeling experts from other relevant disciplines (e.g. ecology, sociology and evolutionary biology), (3) 17 academics utilizing and teaching these methods, (4) 8 students and other newer users learning how to apply these tools and (5) 3 policymakers working on the COVID-19 response and using model outputs to inform decisions. Some of these groups, specifically (1), (2) and (3), overlapped. KIIs can produce invaluable data and insights, including confidential information, that cannot be obtained via alternative methods (Kumar, 1989).

We created two interview guides: one for modelers, academics and students, and a second for policymakers. While these interview guides were used for reference, the informal, semi-structured nature of the interviews also provided the flexibility to explore new ideas and topics that arose. Interviews were completely voluntary and conducted in English over Skype, Zoom or Google Hangouts. Prior to the interviews, respondents received a consent form and participant sheet with additional information, including how data would be collected, stored and used. Interviews occurred only once written or oral consent was obtained and ranged from 51 to 110 min in length. All interviews were audio recorded (explicit permission was granted in advance and participants were made aware that such recordings were not compulsory) and transcribed verbatim. Extensive notes were also taken. All participants were anonymized, and all interview evidence coded and stored in password protected documents and devices.

To provide additional flexibility as a number of individuals contacted for the study are or were involved with the COVID-19 response, the research team also constructed a structured, self-administered questionnaire. This questionnaire was created following the completion of the third interview, which enabled the researchers to test the quality of the questions and refine any wording. The survey was anonymous and contained open-ended questions. In line with best practice guidelines, these questions were arranged in a logical order according to difficulty and topic. Five versions of the survey were designed to account for participants' varying backgrounds in both epidemiology and modeling methods. Participants were directed to the appropriate version depending on how they answered two initial questions regarding their experience.

Informants for the KIIs and questionnaire were sourced using two methods of purposeful sampling (expert and snowball), which unlike random selection processes enables researchers to strategically select interviewees based on their relevance to the study (Bryman, 2008; Teddlie and Yu, 2007). In expert sampling, individuals were chosen for their knowledge, experience and expertise (Patton, 2018). Snowball sampling was then employed

to identify additional participants by asking individuals to either recommend other experts (Crouse and Lowe, 2018) or share the survey with relevant individuals. Both methods are conducive to the KII (Creswell and Clark, 2011) and questionnaire techniques.

Analysis

Primary and secondary data were analyzed using Braun and Clarke's six-phase reflexive thematic analysis framework. This approach has the advantage that the coding and thematic analysis processes are guided by both theory and empirical data. In addition, as the framework is both theoretically and methodologically flexible, it can be used to answer questions concerning behaviors, perceptions, experiences, conceptualizations and the factors underlying and/or influencing a particular phenomenon (Braun and Clarke, 2006; Braun *et al.*, 2016). It is, thus, particularly well-suited to research exploring interdisciplinary questions, consisting of several methods and/or involving a multidisciplinary team such as our own. There are six main steps with various best practices to be employed at each stage.

To ensure empirical relevancy, coding categories and subcategories (step 2) were developed only after (1) familiarization with the data (step 1) and (2) the collection of a certain number of responses (i.e. 5 interviews and 13 surveys). Following best practice guidelines, a second coding round was also conducted. This measure not only ensured that our codes were coherent, systematic and robust but also aided the development of more latent codes (Braun *et al.*, 2016). We then organized these codes into broad preliminary themes (Step 3), which we further modified in context of the research questions (including to form subthemes) (step 4) before concluding with a final refinement (step 5) and write up (step 6) (Braun and Clarke, 2006; Maguire and Delahunt, 2017). As part of step 4, we returned to the original data to determine whether our themes "fit" the data and coherently addressed our research questions (Braun *et al.*, 2016). Consistent with Braun *et al.* (2016), step 5 entailed writing theme definitions, which further clarified and refined the central organizing concept, scope and boundaries of each theme. In total, 58 initial codes were identified in steps 1 and 2. Upon completion of the six-phase process, these were arranged into 4 themes and 12 subthemes (see Figure 1). In line with the aim and scope of this journal, our paper focuses on the bolded themes and subthemes.

Considerations and limitations

Our analysis is limited by the bias, validity, reliability and availability of our various sources, including primary data. While bias is inherent in the selection processes of non-probabilistic samplings, interviews and surveys were evaluated for representativeness and a conscious effort was made to recruit from a wide pool of knowledgeable informants (Kumar, 1989). Each participant was further assessed according to the following criteria: knowledgeability, credibility, impartiality, willingness to respond and outside constraints (Kumar, 1989). Snowball sampling helped accredit several informants whose names were repeatedly mentioned (Patton, 1990). A number of contacted individuals were a part of the COVID-19 response and their expertise was in high demand. This fact naturally affected replies, including leading to some interested individuals being unable to participate. Once again, the questionnaire partially addressed these challenges.

It has been demonstrated that questionnaires can add breadth to a study and address interviewer biases. In an attempt to further reduce biases and encourage participants to speak candidly (see Spears and Lea, 1994), confidentiality and anonymity were emphasized in both participatory components. Open-ended questions were utilized to avoid guiding respondents' answers. Such formats have been documented to lead to more valid and reliable answers (Jackson, 2020). In addition, the researchers crosschecked all responses for inconsistencies and incongruities and attempted to find data that questioned the preliminary findings of the study (Kumar, 1989). Grey literature was utilized in an effort to further identify

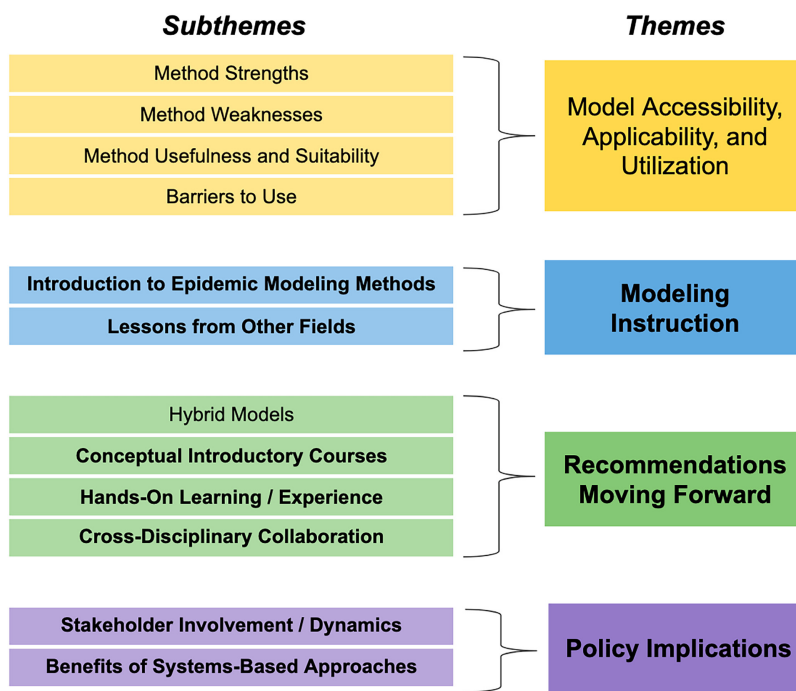


Figure 1.
Research themes and subthemes

relevant evidence. Grey literature may offer valuable contributions – particularly on current or emerging topics. As the COVID-19 pandemic is an emerging public health threat that has prompted new models and research in this space, grey literature has been an important aspect of our research. That said, critical steps have been taken to evaluate the quality and reliability of the grey literature sourced ([Brown, 2018](#)).

In utilizing triangulation and systematically incorporating multiple complementary methods, we endeavored to neutralize these limitations, add accuracy and depth to our data and analysis, and, ultimately, bring a greater degree of rigor to our research (see [Sumner and Tribe, 2008](#)).

Findings and analysis

Reviewing the COVID-19 modeling projects that have emerged, we see a preference for compartmentalization techniques, particularly the classic SIR/SEIR compartmental method. Our conversations with participants provide valuable insights into not only how health education may contribute to this trend but also potential means of addressing it. Many participants noted that there was a tendency among modelers to use the methods with which they are most familiar. This is understandable and highlights the importance of studying which methods are taught and how. For instance, ABMs were frequently described as underutilized in appropriate contexts. Several reasons were provided – including challenges around reproducibility, “hostility toward the adoption of new methods” and concerns around being able to publish individual-based methods in reputable peer-reviewed journals – with most participants emphasizing the “lack of knowledge and training in relevant skills.” While prior literature has alluded to some of these, our research illustrates the complex dynamics

between such factors, particularly as they relate to current state of health education. We examine this further in the following section, which begins with “Prevailing Epidemic Modeling Instruction” before progressing to “Lessons from Other Fields.” Each segment provides critical understanding for our discussion and practical recommendations moving forward.

Prevailing epidemic modeling instruction

Participants cited three main avenues via which they discovered modeling methods: (1) formal education (i.e. undergraduate, graduate and/or doctoral studies), (2) research (both their own and other projects’) and (3) self-taught using various resources. In several instances, these introductions overlapped. One subject, for instance, described teaching themselves how to perform agent-based modeling for their doctoral dissertation research. As each scenario provides vital insight into how epidemic modeling methods can be better taught in health education, the following paragraphs delve deeper into these various introductory means and their implications. But in general, those familiar with mathematical methods, especially CMs, were much more likely to have learned these in a formal education setting than those using agent-based approaches.

Of those who received a formal education in modeling methods, the approaches that these individuals studied appear to largely correlate with their educational field. For example, those with a background in mathematics (or related disciplines like physics), often started with CMs or other similar methods. In contrast, participants whose backgrounds were in a field involving complex interactions (e.g. systems dynamics, ecology, evolutionary biology) were more likely than their peers to be acquainted with agent-based modeling. For the eight individuals familiar with both EBMs and ABMs, seven stated they studied mathematical methods first while in university before being exposed to individual-based approaches either through self-education or in their graduate or doctoral studies.

This aligns with the evidence gathered from curriculums. Of the 27 introductory health education courses surveyed at the undergraduate and graduate levels, we found only one course that concentrated on agent-based epidemiological modeling methods. For several other general modeling courses, agent-based methods were the focus of a module or were briefly touched upon when discussing computational methods. Graduate courses were more likely than undergraduate classes to cover individual-based techniques. However, the majority of courses did not mention agent-based approaches, instead centering around mathematical methods, especially CMs.

Most participants noted how the environment in which they were introduced to a particular method influenced the contexts in which they initially perceived it to be applicable. For example, one modeling expert discussed how they “did not consider using [ABMs] in the beginning” since they originally learned about the method examining models of flocking behavior and that was the context they then associated with the technique. Another participant shared feeling discouraged from studying agent-based modeling in a formal education setting:

I did take a course in agent-based modeling as a student . . . I found it too hard and I dropped it . . . because I was learning how to program at the same time as learning how to understand what an agent-based model was. It was just too many new things at once and so that increased the barriers for me. I know that’s a problem for a lot of people. (Student/New User)

Prerequisite knowledge, particularly of programming, was cited as a barrier to learning individual-based techniques by several additional participants as well. Others described challenges around parameterization and making appropriate assumptions in ABMs. These accounts can help explain the aforementioned correlation between the participants’ disciplinary background and the methods covered in their formal modeling education. Not

only are these individuals exposed to opportunities to learn these particular methods, but they are also more likely to possess valuable knowledge that makes certain techniques more approachable. According to one interviewee, these educational gaps have resulted in:

A lot of people who do not know what the options are for modeling . . . That's a huge issue for making people aware . . . People have to know what to Google at a minimum in order to engage with the right techniques. (Epidemiological Modeling Expert)

Furthermore, courses that did exist often did not have students implement the methods themselves. For example, one subject aspiring to a career in academia shared that they “tried to teach [themselves] how to build models . . . but [they] never had an actual use case.” This individual went on to theorize that if they had had more hands-on experience that they may feel more confident utilizing the methods in their current research. This participant was one of several who also noted (1) concerns about being able to publish these methods in reputable peer-reviewed journals in their field and (2) a lack of opportunities for research and practical experience in the ABM space. Of those who were introduced to modeling methods via research opportunities, all but one relied on such projects to learn about agent-based methods. Of these individuals, who largely comprised modeling experts and academics, many similarly noted challenges around funding and publishing for ABMs, as well as a tendency for this research to be someone’s “side project.”

Of the nine participants who described themselves as “self-taught,” only one learned CMs through such means. The fact that the overwhelming majority of these individuals taught themselves agent-based methods may indicate that the method is more accessible to self-instruction than CMs, particularly for those with prior programming experience. However, it may also signal that the needs for ABM training are less likely than CM training to be met in formal educational contexts. As one interviewee said:

It was mostly elective stuff that I discovered out of my own interest. There were no core courses offered in [agent-based modeling]. (Academic and Epidemiological Modeling Expert)

Another stated you had to “actively seek [the method] out.” Several – including modeling experts, academics, and students/new users – described “painful” or “tedious” learning experiences where they attempted to apply agent-based modeling in their own research with little formal guidance. Of those that initially taught themselves individual-based approaches, four formalized this education during their doctorate and/or post-doctorate work. As for the resources individuals consulted to learn about new epidemiological modeling methods, the most commonly referenced were academic literature and textbooks. This included several individuals who used these sources to analyze existing models. Others turned to websites, online tutorials, sample code, conferences, seminars, workshops, experts, and colleagues for this information. Overall, however, participants communicated dissatisfaction with the limited resources available and a desire for more formal education opportunities – especially for ABM approaches.

Lessons from other fields

As [Duan et al. \(2015\)](#) remarks, epidemiology has become increasingly intertwined with other disciplines (e.g. sociology, mathematics, management science, computer science, complex systems), which has prompted the rapid evolution of both mathematical and computational epidemiological modeling methods. Considering this development, we elected to speak with experts with experience applying these approaches, including agent-based modeling, in alternative contexts. The purpose of this aspect of our research was to see what relevant lessons could be drawn from these examples and translated to health education. We heard from 9 individuals with various backgrounds: (1) 1 in mathematics, (2) 2 in innovation research and economics, (3) 1 in ecology, (4) 1 in evolutionary biology, (5) 1 in behavioral neuroscience, (6) 1 in psychology, (7) 1 in sociology, and (8) 1 in public health (not epidemiology).

These discussions stressed the importance of formal education opportunities in a variety of methods at both the undergraduate and graduate levels. Other means for promoting reproducibility and acceptance were cited, including the establishment of common protocols for applying ABMs. Not only can such standards alleviate publication concerns, but they have the potential to tackle perceptions within public health that these approaches are “less scientific” or “robust” than mathematical approaches (see [Tracy et al., 2018](#); [Trochim et al., 2006](#)). Fields that have been more successful in cultivating respect and acceptance of a multitude of methods also reported close collaborations between stakeholders – specifically academics, outside researchers, consultants, model users, field/lab teams, and government officials and policymakers – as “extremely important to [this] success.” As one participant with a background in innovation research and economics shared:

There is a repeated interaction between these various actors. Modelling and other issues are discussed during actual cases, and also at various seminars and conferences. As such, all these actors are involved in a dynamic “co-creation” of an understanding of methods, models, and economics in general.

Another interviewee expanded upon the advantages of such strong interactions when discussing the multidisciplinary nature of many complex problems relating to human populations and dynamic systems. They recommended cooperation amongst “specialists in multiple different modeling traditions” as they “work on the same question[s].” This could, for example, take the shape of integrating these models into larger research efforts. Such actions may also make it more likely that the necessary financial support is provided to those utilizing these methods. Overall, in fields (e.g. innovation economics, ecology) where a range of methods were frequently employed and collaboration was common, participants noted fewer challenges around learning, funding, or publishing alternative approaches, like ABMs.

Discussion

In providing detailed information into disease transmission, ABMs can advance our understanding of infectious disease dynamics, guide intervention measures, and, ultimately, aid society in our fight against the complex factors driving epidemic propagation. Despite these potential benefits, however, the method is underutilized relative to more established approaches (see [Silverman et al., 2020](#)). As our conversations with key stakeholders reveal, modeling instruction has contributed to this preference by focusing on certain methods (i.e. mathematical models). In doing so, it not only fails to foster the development of the skills necessary to implement agent-based approaches, but influences the contexts in which students perceive these methods to be useful. This has consequences for health policy as well, including missed opportunities to both employ these methods for decision-making and better involve policymakers in the entirety of the modeling process. We further delve into these various implications and connections in the following sections. This discussion begins with a “Summary of Results and Implications for Health Education” and continues with “Practical Recommendations for Health Education Moving Forward” before concluding with “The Policy Connection: Exploring ABMs for Public Health Policy More Broadly.”

Summary of results and implications for health education

As highlighted by our discussions with participants, the challenge facing health education in regard to how epidemic modeling methods are taught is partly a curriculum problem and partly a culture one. These conversations have also affirmed that these two aspects are interrelated and reinforce one another, and resolving the issue requires tackling both. For instance, a lack of educational opportunities introducing scholars to less traditional methods (e.g. ABMs) inhibits individuals from employing these methods in their own work. This can

not only contribute to the underutilization of and perceived biases against these approaches, but, as a result, limit funding and/or publishing opportunities – including due to a limited number of reviewers with adequate subject matter and ABM expertise (see [Badham et al., 2018](#); [Rutter et al., 2017](#)). All of these developments can, in turn, negatively impact modeling instruction. Ultimately, these factors have led to an overwhelming majority of participants teaching themselves agent-based methods. Engaging with these complexities via first-person accounts is a critical step towards theorizing potential solutions.

For such solutions, the various guides and short courses (see [Smith and Conrey, 2007](#); [Railsback and Grimm, 2011](#); [Wilensky and Rand, 2015](#); [Badham, 2020](#)) that our participants have frequently turned to provide an excellent starting point. They have also served as inspiration for option two of our recommendations below. Other fields, such as ecology, offer some further insights into how we can embark on the task of reimagining epidemic modeling instruction so as to address both the curricular and cultural aspects of this challenge. In particular, our conversations with individuals from these diverse backgrounds have emphasized the importance of cross-collaboration, interdisciplinary approaches, greater financial support, increased integration into larger research efforts, and more engagement with existing findings. From our work studying epidemiological modeling, we similarly believe these efforts, especially around collaboration, are vital. Cross-collaboration has been noted by others in the literature, including [Badham et al. \(2018\)](#), due to the cross-cutting nature of health issues. This becomes even more relevant when tackling a public health threat, like COVID-19. In such cases, engaging in cross-collaboration can enable us to take advantage of all the tools available.

As one participant pointed out, these partnerships could benefit from a common educational foundation that (1) draws from prior scholarship and (2) promotes the rigorous exploration of the research questions and theories underpinning complex issues. Several other participants emphasized the need for honest discussions around models and methods that recognize these tools' usefulness and limitations in specific contexts. These accounts have served as inspiration for our policy course recommendation. Such conversations are critical to building awareness of the types of questions one must ask at the beginning stages of the modeling process to determine the appropriateness of a particular approach (see [Badham et al., 2018](#)). Participants were of the opinion that taking such steps could make students feel more comfortable engaging with a variety of modeling methods.

We also advocate for: (1) more funding, including for so-called nontraditional techniques, (2) more hands-on opportunities to apply a variety of modeling methods, and (3) classes at various levels, including introductory, that in a balanced manner discuss the advantages and disadvantages of various methods and how these approaches can work together. We delve deeper into these recommendations in the next section, which involves a more practical exploration of how these could be implemented in an educational setting. But in summary, these activities would assist health education in reflecting the diversity of the modeling field moving forward. In addition, we would like to recognize that several participants referenced the needs for (1) a common dataset to test models against, (2) a better suite of tools, and (3) established systematic protocols for model calibration, verification, validation, and reporting within public health (see also [Tracy et al., 2018](#)). We maintain that the creation of such datasets, tools, and a codified set of best practice guidelines would support not only the use of multiple methods, but cross-collaboration and critical model validation. It was, however, beyond the scope of this paper to offer more concrete recommendations around these points.

Practical recommendations for health education moving forward

Despite agent-based modeling being “particularly suited to infectious disease epidemiology” ([Badham et al., 2018](#)), formal epidemiological modeling instruction presents few chances to learn about such approaches. While other works have acknowledged the logistical challenges public

health researchers face in formally acquiring the skills and understanding necessary for applying agent-based methods (see [Badham et al., 2018](#); [Smith and Conrey, 2007](#); [Luke and Stamatakis, 2012](#); [Tracy et al., 2018](#); [Auchincloss and Garcia, 2015](#); [El-Sayed et al., 2012](#)), limited research has examined epidemic modeling instruction explicitly and how it could be improved. In speaking with key stakeholders, this article builds upon these prior works, striving to fill this gap by presenting concrete recommendations inspired by these conversations and curriculum analysis. We focus these suggestions on three potential course options: (1) a conceptual introduction to modeling, (2) hands-on experience, and (3) ABMs for public health. Note that these options are complementary—a single institution could potentially choose to do any number of them.

Option one: conceptual introductory course. The first option involves redesigning how students are introduced to these techniques and draws from accounts of not only what has and has not been successful, but what educational needs are and are not being met. This could take the shape of offering a conceptual introductory course that covers: (1) the history of modeling, (2) the different methods available, (3) what each method offers, and (4) examples from various disciplines of successful implementation. For example, a course with nine modules could look as follows:

Module one: an overview of the history of epidemic modeling and brief introduction to modeling methodologies.

Modules two and three: a further deep dive into the different modeling methods, including how to develop a proper hypothesis and collect data fit for purpose. It will also cover the criteria for transparent modeling and how to interpret and communicate model results. The latter aspect could concentrate on using model outputs to shape health policy more specifically.

Module four: a complementary computational lab component where students can experiment with basic models (e.g. adjust parameters). This does not need to be highly technical and can instead focus on building intuition about the system, what makes a good model, and why models are useful instruments.

Modules five through seven: each week can focus on a discipline and the models being utilized to address a particular research question within this field. Potential disciplines include epidemiology (both infectious and non-infectious), evolutionary biology, ecology, and innovation economics. Alternatively, this module could specifically center around public health modeling applications and share examples from infectious disease epidemiology, social epidemiology, health economics, etc. (see also “Option Three: ABMs for Public Health”).

Modules eight and nine: ask students to apply what they have learned by determining a research question and what modeling method(s) they would use to address it. They can also brainstorm what data they would need and where they would go to find such information. Have them present their findings.

The course would be largely non-technical and focus on providing a comprehensive overview. It could also be adapted at both the undergraduate and graduate levels. This recommendation goes back to our earlier points around (1) how many available ABM courses demand extensive prerequisite knowledge, (2) that individuals tend to employ the methods with which they are most familiar, and (3) the lack of introductory instruction on agent-based approaches both in general, but also particularly at the undergraduate level. By engaging students in these conversations before they start the more technical component of their modeling education, we can expose them to the full range of tools available and encourage a multi-method approach. Additionally, this option aims to make these methods feel accessible and help students understand how these methods can further their own work – both present challenges identified by our participants.

In particular, the modules use case-based teaching and problem-based learning where possible to establish relevance, which various studies have identified as being essential to fostering student engagement and motivation (Kember *et al.*, 2008; Williams, 2005). Consequently, it could serve as a strong foundation for students to then progress to more hands-on learning (i.e. Option Two). To achieve this latter objective around accessibility, as one participant succinctly summarized, “connecting abstract models to real-world phenomena is essential.” In doing so, it can also help tackle misconceptions (1) about the purposes of engaging in modeling exercises and (2) that certain approaches are “niche” or “inaccessible.” Incorporating published papers using more alternative methods could especially work towards addressing perceived barriers around publication difficulties and encourage greater experimentation.

Option two: hands-on experience. As cited by a number of participants, modeling education could benefit from more opportunities for students to participate in hands-on activities. Our second recommendation seeks to fill this gap. It not only builds upon the case-based teaching and problem-based learning techniques introduced in Option One, but aligns with current scholarship documenting the benefits of employing such active learning pedagogies for public health education (Godley *et al.*, 2020; Reinschmidt *et al.*, 2018) and other related fields (Freeman *et al.*, 2014). These benefits extend beyond fostering motivation to include the encouragement of self-directed learning and the integration of knowledge and practice (Eberlein *et al.*, 2008; Williams, 2005). The practical course is inspired in part by a course described by one of our interviewees, Jen Badham’s (2020) “agent-based modelling for the self-learner” tutorial, and Uri Wilensky and William Rand’s (2015) “introduction to agent-based modeling” textbook. In all three, individuals are tasked with building their own models. Through this process, they not only cultivate critical technical skills and understanding of the system being modeled, but have to make important decisions on what components to include (see Gallagher and Bryson, 2017). In the case of agent-based modeling, it can also introduce participants to agent-centric thinking (see Badham, 2020).

We envision similar instruction taking place at an undergraduate or post-graduate level in which students are asked to engage in the entire model lifecycle – including establishing a research question, designing and implementing a model, collecting data, calibrating and validating the model, and interpreting and communicating results – while adhering to best practices (e.g. criteria for transparent modeling). An additional step could be added where students propose a policy response or intervention based on the results. As Tracy *et al.* (2018) notes, “following the modeling cycle through its circular path . . . would present real opportunities to advance knowledge about public health problems.” We believe it could have the added benefit of cultivating greater appreciation for the effort, skill, and expertise that modeling requires and, by extension, respect for the field. Such respect is paramount for and the foundation of better communication and cross-collaboration. The course could also stimulate experimentation by offering guidance to students interested in exploring less established techniques. Moreover, as Badham *et al.* (2018) acknowledge and our participants further substantiated, despite the various tutorials available for self-instruction, “it can be difficult to adapt the learning to a specific research question without ongoing support.” This course could provide this vital missing piece.

Option three: ABMs for public health. While this paper has focused on how ABMs can aid us in our understanding of and fight against infectious diseases, the approach has many other applications within public health. This includes noncommunicable disease (e.g. cancer, heart disease, obesity, diabetes), health behaviors (e.g. smoking, alcohol consumption, physical inactivity, unhealthy eating), social epidemiology (e.g. violence, provision of health care services, adult social care), and other issues characterized by a complex interaction between demographic, epidemiological and socioeconomic factors (Tracy *et al.*, 2018; see also Badham *et al.*, 2018). Considering the lack of courses dedicated to agent-based modeling in general, particularly within health education, our final recommendation is the development of an “agent-based modeling for public health” course. The vision would be to not only educate future public health

leaders about this method's potential and how it can be harnessed for their particular questions, but familiarize them with the key considerations for developing models for these contexts. The need for such instruction has been identified by others as well. PHASE, for instance, is currently developing an "Agent-based modelling for population health" short course curriculum and could be a possible partner for health education institutions to work with on this task. Previous workshops on the topic offer further guidance [1].

The policy connection: exploring ABMs for public health policy more broadly

Epidemiological models, including mathematical models and ABMs, have proven to be powerful tools for policymaking. They are, however, still underutilized. Recently, there has been recognition that our methods for developing public health policy could be more effective (see [Bruch and Atwell, 2013](#); [Sterman, 2006](#); [Mabry et al., 2008](#); [Silverman et al., 2020](#)). ABMs and other systems approaches that recognize causal mechanisms (e.g. the impact of individual behavior), offer both micro- and macro-level analysis, and compare multiple hypothetical policies or interventions illustrating the various tradeoffs can be viable solutions. But how do we get more policymakers interested in engaging with these approaches? We recommend a policy-focused modeling course. With a non-technical curriculum, this would resemble the conceptual introductory course previously mentioned, but with more of a policy focus. Students would still learn about the various modeling methods, the model lifecycle, and examples of these techniques in practice. There would also, however, be a stronger emphasis on how to interpret and communicate modeling results in policy contexts and how these tools can be employed in policy analysis and evaluation. This could center around public health applications or take a broader approach.

Moreover, the course could be targeted at not only health education students, but also those studying public policy. The purpose would be to make these tools accessible to future decisionmakers, as well as provide these individuals with the skill set to effectively evaluate and translate their outputs into effective, long-term solutions. Both require these individuals to understand what models, as representations of reality, can and cannot accomplish and their inherent uncertainty. This course could help establish realistic expectations about both this and the timescale needed. In doing so, it could prepare policymakers to communicate with modelers and the other actors involved in these processes, including what sort of questions or information are relevant. Consequently, such a course could also lay the foundation for more long-term, cross-disciplinary collaborations that better align with the (often multiple) stages of public health research. Further research, however, is needed to identify other activities that could orient expectations towards long-term relationships (see, for example, the work of Jennifer Badham).

In general, we need to facilitate greater involvement of policymakers in the modeling process. Many participants highlighted a "considerable disconnect" between academics, modelers, field personnel, and policymakers. While some emphasized the influential role policymakers have to play in the conceptual stages of a model, several pointed to the "value and usefulness of consistent and objective interactions between modelers and policymakers throughout model development." The push for such engagement has occurred concurrently with efforts directed at making models more transparent and reproducible. Health education has the opportunity to be at the forefront of promoting both shifts. Considering how academic research can influence public health policy and practice, greater visibility of the method in academic settings could also lead to greater acceptance within policy contexts. Furthermore, as [Tracy et al. \(2018\)](#) stress the process of developing an ABM can be a major strength of the method (see also [Auchincloss and Garcia, 2015](#); [Diez Roux, 2015](#)). This is because it can serve as a device for bringing together diverse stakeholders and disciplines, while the rigors of the modeling process itself exposes assumptions, highlights gaps (e.g. in empirical data, knowledge), stimulates exchanges, generates new hypotheses, and, ultimately, leads to more expansive research questions ([Tracy et al., 2018](#)).

Concluding remarks and suggestions for future research

Epidemiological models are powerful tools, but harnessing their benefits for society entails selecting which methods to employ. There is significant potential in applying less established methods, such as ABMs, to more richly represent the realities and complexities of infectious disease dynamics. But how these methods are used to shape public health research, practice, and policy begins with how they are taught. This research reveals that there is still room for improvement in this area that might better equip students to engage with the full range of tools available. Drawing from discussions with key stakeholders and lessons from other disciplines, we have provided a series of recommendations as to how health education can accomplish this task. Further research, however, is needed, which we hope this work will help inspire. This includes additional analysis not only relating our findings to the limited literature on modeler behavior, processes, and incentives, but examining which modeling methods are taught via more informal health education pathways (e.g. bootcamps, summer institutes, online platforms like Coursera) and how this distribution compares to the more formal learning opportunities explored here.

While the fact that the overwhelming majority of participants deploying ABMs taught themselves agent-based methods stresses the need for more formal instruction, it also highlights a potential opportunity. More specifically, it may indicate that the method is more accessible to self-instruction than CMs. Examining the validity of this statement could be an important area for further research as we continue to consider how to restructure health education in the wake of COVID-19. Case studies examining how agent-based approaches have been successfully integrated into epidemiological modeling courses at various education levels would also be beneficial. Never before have epidemiological models been so at the center of public attention. This situation not only offers real potential to push forward such research, but may hopefully act as an impetus to reimagine health education in light of the needs and gaps that twenty-first century pandemics have highlighted.

Note

1. These include workshops in public health (e.g. the “Agent-Based Models for Population Health” course at the 2016 Epidemiology and Population Health Summer Institute at Columbia University, the “Agent-Based and Hybrid Modeling for Health Researchers” bootcamp at the University of Saskatchewan) and from other fields (e.g. Computational Modeling for SocioEcological Science [CoMSES Net] International Winter School on “Agent-Based Modeling of Social-Ecological Systems,” “Introduction to Agent-Based Modeling” at the Santa Fe Institute, the undergraduate-level “Introduction to Agent-based Modeling and Simulation” course at George Mason University).

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Corresponding author

Elise E. Racine can be contacted at: elise.racine@ndph.ox.ac.uk

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How school-based health education can help young people navigate an uncertain world

Health
education in
an uncertain
world

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Rachael Dixon

School of Health Sciences, University of Canterbury, Christchurch, New Zealand, and

Jenny Robertson

Faculty of Education, The University of Auckland, Auckland, New Zealand

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Abstract

Purpose – The COVID-19 pandemic has provided us a striking demonstration that the future is dynamic, unpredictable, complex and volatile. It is increasingly important that those working in the field of school-based health education reimagine the possibilities and potential of the subject to rise to the challenges presented and make a difference in learners' worlds. In this paper we explore the potential of health education learning to contribute to aspects of the Organization for Economic Co-operation and Development's (OECD's) Learning Compass 2030 from our perspective in Aotearoa New Zealand. This is a learning framework that uses the metaphor of navigation to demonstrate the competencies young people need in order to thrive in the world and has a significant focus on wellbeing for people and society (OECD, 2019).

Design/methodology/approach – We explore the links between the learning compass and a socio-critical approach to secondary school-based health education learning opportunities by producing and refining our own knowledge of the learning contexts and experiences that could potentially contribute to the elements of compass. We present this as dialogue produced through asynchronous online conversations between the paper's two authors across a three-month period in 2020 – a method befitting our COVID-19 times.

Findings – After employing a deductive thematic analysis we found extensive links between health education learning and aspects of the compass which are congruent with the notion that it is more about how the subject is taught than what is covered in a socio-critical health education. We communicate our findings by organising them into three themes that arose for us in analysis: learners' capability to understand the world, navigate the world and change the world.

Originality/value – We conclude the paper with key questions to consider if we are to reimagine school-based health education in order for learning experiences in the subject to enrich learners' understanding of how to navigate the complex and uncertain times they will face across their lives.

Keywords Health education, Adolescents, Qualitative methods

Paper type Research paper

Introduction

The COVID-19 pandemic has provided us with a striking demonstration that the world we live in is dynamic, unpredictable, complex and volatile. For many of us, the political systems within which we live, work and study have become more visible; and socio-economic disparities have widened (Lupton, 2020). We are all too aware of the need for community and national structures to act with agility in response to the uncertainty COVID-19 has unleashed on us all. As we turn to 2021, life is far from what we used to know as "normal" and we have come to realise that we are indeed living in an age of uncertainty, multiplicity and dynamism (McPhail, 2020).

In 2015, the OCED initiated the Future of Education and Skills 2030 project. As a starting point, the project revisited the OECD's Definition and Selection of Competencies: Theoretical and Conceptual Foundations (DeSeCo) project which was active at the turn of the twenty-first century (OECD, 2019). Four competencies were identified in the DeSeCo project as being critical for young people to live a successful life in a well-functioning society: using tools,



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interacting in heterogeneous groups, acting autonomously and (cutting across the preceding three) thinking (OECD, 2005). The four competencies were taken on in the Aotearoa context (Hipkins *et al.*, 2014) as five “key competencies” [1] which are a central component of the current mandated curriculum policy statement: *The New Zealand Curriculum* (Ministry of Education, 2007). After revisiting DeSeCo, the OECD developed The OECD Learning Framework 2030, which uses a navigational metaphor to highlight the competencies students need to orient themselves towards thriving in the world. This is known as The Learning Compass 2030 (from here “the compass”) (OECD, 2019).

The compass comprises seven elements. Core foundations are the skills, knowledge, attitudes and values that provide a basis for developing other elements in the compass. Next are three transformative competencies which the OECD prioritises in order for young people “to contribute to and thrive in our world, and shape a better future” (OECD, 2019, p. 16). The four cardinal points of the compass are knowledge, skills, attitudes and values. These are different from those described in the core foundations element as these are contextualised to, and operationalised in, specific curricular disciplines such as health education. Surrounding the compass is what the OECD term “The Anticipation-Action-Reflection cycle” (p. 17). In context of health education, this can be seen as a process to enable young people to take health-promoting action. The final element is student agency and co-agency with others, which is connected to identity, self-efficacy and a sense of belonging.

It is important to recognise that the educational work of the OECD is not without critique. Criticism exists in relation to the OECD’s Programme for International Student Achievement (PISA) and the inaugural measurement of global competence in PISA 2018. While it is beyond the scope of this paper to extensively critique the work of the OECD in this space, we note that the OECD’s interest in education is economic in nature, and PISA brings with it great influence internationally (Cobb and Couch, 2018). If the idea of global competence assumes that people can possess similar understandings, attitudes and values that are deemed important in the twenty-first century workplace, then global competence shifts from a focus on social and cultural goals towards economic ends (Cobb and Couch, 2018). Likewise, where the compass accords value to certain competencies at the expense of others, the question of whose worldview(s) are being represented (and whose are not) needs to be asked, and the elements of the compass need to be viewed through a critical lens.

A socio-critical approach is a feature of health education in Aotearoa (Fitzpatrick and Burrows, 2017). Re-development of the New Zealand curriculum statements in previous decades (Ministry of Education, 1999, 2007) moved learning for all subjects away from being about the reproduction of prescribed syllabi of knowledge across the year levels, to being about the big ideas and concepts of a discipline. In an effort to have a future focused curriculum which recognises that knowledge needs to change over time in order to respond to a changing world, and where so many competing knowledges exist, a sustainable curriculum statement had to respond to these challenges (Hipkins *et al.*, 2014; Tasker, 1996).

For health education the foundations for a socio-critical approach came from different directions. The first direction was the need to conceptualise the health and physical education learning area (HPE) for curriculum purposes, which at the time was informed by a wide body of literature as summarised by Tasker (1996, 2004). The second direction was a collection of more broadly focused principles and values that spoke to the very essence and purpose of education being framed by the national curriculum statement. Key to this direction was the inclusion of an effective pedagogy statement and the five key competencies (Ministry of Education, 2007). The effective pedagogy statement requires teachers in Aotearoa to create supportive learning environments, encourage reflective thought and action, enhance the relevance of new learning, make connections to prior learning and experience, facilitate shared learning, use e-learning effectively to develop digitally fluent students and approach all teaching decisions through an inquiry process. Through these practices teachers then provide learning opportunities that

enable students to learn to think critically and creatively, participate and contribute and manage self, alongside relating to others (i.e. the key competencies).

Therefore, the foundations for a socio-critical approach in health education are grounded in teacher pedagogy (expected of all teachers in all subjects) added to by the constructivist approaches to subject knowledge teaching promoted by the original HPE curriculum developers (Tasker, 1996). The health education knowledge developed from this starting point is shaped by four strands with broad learning outcomes, seven key areas of learning and four underlying concepts. Arguably, it is the latter that best give shape to a socio-critical health education in the country (Robertson, 2015). The underlying concepts are: hauora, wellbeing; health promotion, the socio-ecological perspective; attitudes and values. The concepts are drawn from sociology and population health-related knowledge. Respectively, this knowledge is: A Māori (indigenous people of Aotearoa) model of wellbeing, the Ottawa Charter, an ecological model of health and wellbeing and notions of social justice.

In practice this means that when planning learning programmes to meet learners' needs, teachers and students select topics for study relevant to their experiences of the world and use learning area and subject concepts as a way to organise and learn contextual and content knowledge related to these topics. Consequently, the familiar topic matter for which health education is known, such as mental health and wellbeing, identity and self-worth, managing change and building resilience, healthy eating, sexuality and gender, friendships and relationships and alcohol and other drug education, is not a fixed body of understanding transmitted in much the same way to classes all around the country, but a unique programme of learning for every learner in every classroom, and as part of a local curriculum that responds to learners in each school (Ministry of Education, 2019). While we acknowledge the slippage that exists between the statement of official policy and the enactment of curriculum in any context around the world, the limited research that exists has pointed to evidence of a critical health education experience in Aotearoa, particularly at the senior secondary school level (Dixon, 2020; Fitzpatrick and Russell, 2015; Fitzpatrick and Allen, 2019).

Above, we have established a connection between the earlier DeSeCo competencies and the key competencies in *The New Zealand Curriculum* (Ministry of Education, 2007), the components of the learning compass, and a socio-critical approach to health education. We turn our attention now to exploring the extent to which learning experiences of secondary school health education in Aotearoa connect to the compass and alongside it, the potential of learning in health education to help young people navigate an uncertain world.

Methodology

The epistemological position underpinning our research is social constructionism. Burr (1995) provides a clear explanation of the key assumptions underpinning a social constructionist understanding of knowledge: criticality towards taken-for-granted ways of understanding the world, ways of understanding are historically and culturally relative, knowledge is constructed and sustained by interactions between people and knowledge and social action go together. Social constructionism holds that there is no fixed, determined nature to people or the world. Instead, it is through interaction with other people, and through language, that meaning is made, and knowledge is produced. As Burr asserts “when people talk to each other, the world gets constructed” (1995, p. 7). Social constructionism is pertinent in terms of school-based health education and education more generally in the twenty-first century. *The New Zealand Curriculum* underlines the importance of a supportive learning environment and facilitating shared learning, stating that “learning is inseparable from its social and cultural context. . .students learn as they engage in shared activities and conversations with other people” (Ministry of Education, 2007, p. 34). In relation to the educational work of the OECD, learning is “shaped by the context in which it is situated and is actively constructed through social negotiation with others” (OECD, 2012, p. 3).

Participants in the research are the paper's two authors. Our careers in health education in Aotearoa have followed similar trajectories: Beginning as secondary school teachers of the subject, before taking on roles in curriculum and assessment development at a national level, creating resources for teachers, working in professional learning and development for health education teachers, being active in advocacy for the subject through our involvement with the professional association in the country, and (currently) teaching in initial teacher education and health education-related university degrees. As a result, we have a strong understanding of both the intent of health education in Aotearoa and the enactment of teaching and learning in the subject across the country – the realities faced by teachers and learners on the ground. We acknowledge that it is somewhat unconventional to undertake a research study in which the only participants of the study are the paper's authors. However, as connected to the socially constructed nature of knowledge explained above, the epistolary data production method explained below, and finally the unusual circumstances that COVID-19 has brought upon us, the research upon which this paper is based provides an example of how researchers can experiment with new approaches.

Our method of data production was epistolary interviewing (Debenham, 2007), an asynchronous form of online communication. A growing number of authors in the education and health fields have in recent years turned to online interviewing for reasons such as convenience, cost and accessibility. Asynchronous interviewing enables both researcher and participant to be able to write and reply to interview questions at their convenience rather than having to adhere to fixed interview times (Ferguson, 2009; Fritz and Vandermause, 2018; James, 2016). Producing data online provides the ability to interview participants who are geographically dispersed, without the usual associated costs (Hawkins, 2018; Ratislavová and Ratislav, 2014) which opens opportunities to reach diverse participants. Another advantage in terms of convenience and cost is that written transcripts have been created through the online communication itself, requiring minimal preparation to be ready for analysis. Of note when researching health-related issues, online interviewing might be accessible for people with disabilities or chronic health conditions (Fritz and Vandermause, 2018) or for people whom have experienced a traumatic life event. For example, Ratislavová and Ratislav (2014) used the method to interview women who had experienced perinatal loss and concluded that online interviewing enabled them to access participants who would not have felt comfortable in a face-to-face interview, and that participating in a asynchronous conversation over time had some therapeutic effects for the women (in much the same way writing in a journal can help people process situations of change, loss and grief).

Conducting an online conversation to produce research data over time offers both advantages and disadvantages. On the one hand, time enables the participants to reflect more deeply and use supporting references when responding to the interview questions (James, 2016) and enables a relationship to be built (Ferguson, 2009; Ratislavová and Ratislav, 2014). On the other hand, each interview may last weeks or months, which could be a significant time commitment for both researcher and participant (Fritz and Vandermause, 2018). Other notable disadvantages of this method of data production include potential participant attrition (Ratislavová and Ratislav, 2014), the inability to record non-verbal cues (Hawkins, 2018) and the intricacies involved in researchers actively engaging with multiple online conversations over time (Debenham, 2007).

We chose to produce data through online asynchronous conversation for two specific reasons, as connected to the advantages described above. First, we are located in different locations in Aotearoa. Second, we wanted to allow ourselves time to consider our responses to the questions posed and draw on supporting evidence when constructing our replies. Without the constraints of temporality and spatiality inherent in face-to-face in-depth interviewing (James, 2016), we were able to produce and refine our knowledge of the compass and the connections that exist between elements of the compass and health education in Aotearoa

over time and at a distance. Our asynchronous online conversation took place across a three-month period in late 2020. The “conversation with a purpose” (Burgess, 1988) followed a semi-structured approach. Considering the elements of the compass, we developed a list of possible topics to cover. The first interview question was posed by email to “kick off the conversation” and successive questions flowed from the ensuing asynchronous conversation. Our choice of method connected to the social constructionist epistemological framing of the research and was also a data production method befitting of our (COVID-19) times.

Data from the online interview transcripts were analysed using a thematic approach (Braun and Clarke, 2012). Using the elements of the compass as the foundation upon which to focus our analytical attention, we coded our interview transcripts using key ideas from *OECD Learning Compass 2030: A series of Concept Notes* (OECD, 2019). From these codes, we organised our data into themes that connected elements of the compass to health education in Aotearoa. We thus used a deductive form of thematic analysis (Braun and Clarke, 2012) that enabled us to construct knowledge about the connections between our knowledge and understanding of health education and the elements of the compass.

Findings and discussion

After conducting our deductive thematic analysis (Braun and Clarke, 2012), we found extensive links between health education learning and aspects of the compass. Three main themes that arose for us are young people’s fledgling ability (through undertaking learning experiences in health education) to develop capability in the following three areas: *understand the world*, *navigate the world* and *change the world*. Learners progress through these areas (each informing the next) as they become in the world.

The connections between health education learning and aspects of the compass are congruent with the notion that it is more about *how* the subject is taught than *what* is covered in a socio-critical health education. Demonstrating this, woven through the themes are findings from our conversation that relate to a critical approach to pedagogy in which knowledge and skills for critical thinking and critical action in health contexts are valued, developed, and practised. We begin our exploration of each theme with an extract from our epistolary interview, to set the scene for the findings therein and to demonstrate the dialogical nature of our data production method.

Understand the world

The learning compass elements of knowledge, skills, and attitudes and values—with an overarching goal of wellbeing—seems something of a gift for validating our current health education curriculum statement. However, without well-developed cognitive abilities to firstly understand the world, any attempt to achieve what the curriculum intends is fruitless (Jenny).

In addition to learners’ cognitive foundations and the complex environments within which young people are living and learning, what do teachers of health education prioritise as valued knowledge and skills for the young people they work with, and how well equipped are they for this task? (Rachael).

It’s a teacher’s job to help students understand aspects of their world they do not yet understand or even know exist (Jenny).

Throughout our conversation, we discussed the numerous ways in which the elements of the compass connect not only to health education in Aotearoa but also the values and the key competencies in *The New Zealand Curriculum* (Ministry of Education, 2007), which thus provides an opportunity for all subjects in the curriculum to connect to the compass. However, the very fact that “students can use the learning compass to find their way towards

wellbeing” (OECD, 2019, p. 25) places a socio-critical health education as a discipline of study (Fitzpatrick and Burrows, 2017) in a strong position to make meaningful contributions to the types of knowledge, skills, attitudes and values and competencies articulated in the compass.

Across our conversation we explored the importance of learning the skills for (and having opportunity through student-centred pedagogies to practise) wellbeing needs analysis, goal-setting, taking action and reflecting upon the action. As part of this, a wide range of skills are developed and refined, such as literacy skills, research skills, communication skills, time and event management, advocacy, problem-solving and decision-making, discerning between conflicting information and mediating between people with different views and ideas. For example, accessing and using data from a New Zealand study on youth mental and emotional health to understand the nature of mental health-related issues for young people, then prepare and present a talk or write a letter advocating for recommendations for (systemic) health-enhancing change. The skills above connect to those articulated in the learning compass in terms of meeting complex demands in situations of uncertainty, being adaptive and reflective and undertaking an iterative learning process that involves critical thought, action and reflection (OECD, 2019). The pedagogical practices that we explored in connection to the above skill development include role plays to rehearse skills, structured discussions and debates, students being given choice on topics and scenario-based discussion in small groups. These are practices that are viewed as relevant and effective in (mental) health education contexts (Dixon, 2020; Fitzpatrick *et al.*, 2018; Sanjakdar, 2019).

However, “*even before the skills there needs to be good quality knowledge*” (Jenny). Valued knowledge in health education in Aotearoa is shaped by teacher inquiry into learners’ needs and the intersecting strands, key areas of learning and the underlying concepts of HPE (Ministry of Education, 2007). The compass states that knowledge and skills are interconnected, and the compass delineates four types of knowledge: disciplinary, interdisciplinary, epistemic and procedural. Data in our online conversation predominantly connected to disciplinary (subject-specific) knowledge as an essential foundation for understanding health education ideas, and epistemic knowledge in relation to developing learners’ ability to think and act like a practitioner (OECD, 2019). In other words, the importance of developing not only knowledge about health-related contexts but also the need to apply a conceptual lens (in our case, the underlying concepts of HPE) to make sense of health-related issues. For young people outside of Aotearoa, conceptual lenses in health education could include ideas relating to social determinants of health, health promotion, social justice and/or critical health literacy.

As our conversation progressed, we grappled with the dominance of invoking “everyday” knowledge (McPhail, 2020) about health at the expense of developing disciplinary and epistemic knowledge. As Jenny stated, “*it’s unfortunate that some of the most critical learning is not the most exciting and so much health education is dominated by the headline-grabbing in the moment topic matter, not the big ideas and transferable knowledge and concepts*”. We know that notions of health and illness are ubiquitous in society, and a lot of health education learning draws upon real-life content and contexts. When young people (and perhaps their teachers) draw upon everyday life experience and knowledge in the health education learning environment, a balancing act is needed. An over-emphasis on what one already knows about the world runs the risk of rendering health education about everything and nothing, and being “for” health rather than “about” health (Fitzpatrick and Burrows, 2017; Quennerstedt *et al.*, 2010; Robertson, 2015). To exemplify this point: teaching about alcohol (mis) use. An “everyday” approach to knowledge might reproduce and perpetuate individualistic and risk-based messages. Applying a conceptual lens however, teachers might enable learners to explore connections between alcohol and wellbeing for self, others and society, determinants of health contributing to a binge drinking culture in Aotearoa and health promotion actions

involved in a harm minimisation approach to alcohol (mis) use. This then moves learning from a moralistic approach (Jensen, 1997; Leahy, 2014) to a socio-critical one.

This is one example to demonstrate how, without a conceptual lens through which to explore health-related contexts, learners may leave health education without having developed disciplinary and epistemic knowledge; and with it, the ability to critically interrogate health-related contexts and achieve deep learning (McPhail, 2020). Implications arise for initial teacher education and in-service health education teachers' professional learning and development (Robertson and Dixon, 2017). Here, opportunities need to be seized upon to not only shape teachers' disciplinary and epistemic knowledge but also their confidence and competence in enacting the pedagogies that are known to be effective in health education learning environments.

Navigate the world

The trouble is, well informed students who can see and understand the problems of the world (social and environmental) are feeling overwhelmed by it all and this is impacting their own wellbeing—so what is reasonable to expect young people to understand (and be able to do) without feeling the weight of the world on their shoulders? (Jenny).

I think some of the 'bigger picture' aspects of health education can be harnessed here. Developing understanding of how social determinants of health and world events contribute to a complex world for us all to negotiate. Fostering skills in searching for, accessing, (and then understanding) a wide range of health-related information and the ability to communicate this confidently and with meaning, so it can be understood to others (Rachael).

The elements of the compass combine to develop young people's ability to orient themselves towards a future for individual and collective wellbeing (OECD, 2019). Therefore, it is unsurprising that our online conversation about the compass and its connections to health education resulted in a theme to this effect. Our findings indicate that young people need to navigate different parts of the(ir) world. Knowledge, skills, attitudes and values can be developed through health education learning and can be transferred across the different parts of the world that young people negotiate. Connected to our finding in the preceding theme around the need to foster disciplinary and epistemic knowledge, the ability to apply health education knowledge and understanding across health contexts, environments and time, is critical.

Here, our conversation centred upon the connection between the transformative competencies of the compass and health education learning, perhaps because the competencies are highly transferable across a range of situations (OECD, 2019). The three competencies are: creating new value, reconciling tensions and dilemmas and taking responsibility. Our findings indicate that health education in Aotearoa is strongly framed around young people's ability to develop capability in these three areas. In our findings and discussion below, we explore one example of practice from health education to illustrate development of each of the three competencies.

The first part of the world in which young people negotiate is the local and (more) familiar: personal and home life, family, friends, own communities, own culture and some aspects of the digital world. In relation to these ideas, we discussed learning experiences across a range of health education contexts, which aim to enable young people to understand the complexity of the issues (through applying the conceptual lens of HPE in Aotearoa). Alongside, we acknowledged the need for young people to possess the resources in their basket to put into action when needed, including knowing how to access additional support when required. Links exist to the OECD's (2019) transformative competencies through the critical thinking required to attribute personal value to the issues explored, balancing sometimes competing ideas and demands placed upon them and taking responsibility for themselves. We discussed

goal-setting for personal wellbeing as an example of creating new value (and as a stepping stone to taking broader health promotion action in the future). Through student-centred learning experiences, young people can undertake a wellbeing needs analysis to plan, act and evaluate to enhance personal wellbeing.

The second part of the world in which young people traverse is the less familiar: future friendships and relationships, identities development, entering the world of work and higher education. Our online conversation indicates that health education learning is able to make a contribution to the development of capabilities congruent with the OECD's (2019) transformative competencies in this part of young people's worlds. For example, thinking critically and creatively to solve arising problems in new situations, balancing an increasing array of competing demands and pressures across all facets of life and reflecting on and learning from life events. As young people develop capability in these areas, they grow in confidence and competence in navigating the never ending situations that life brings. We discussed relationships and sexuality education (RSE) as a prime example of reconciling tensions and dilemmas (OECD, 2019). In RSE, young people negotiate attitudes, values and beliefs that may challenge those from their upbringing. They make sense of RSE learning in relation to their own growth and identities development. Finally, young people explore a range of relationships and sexuality-related situations, for some of which lines can be blurry, and learners will have different perspectives to others. Pedagogically-speaking, a socio-critical approach to RSE is meaningful and student-centred (Ministry of Education, 2019) and involves learning experiences with shared meaning-making and dialogue (Sanjakdar, 2019).

Young people must navigate through the unfamiliar: the wider world, other cultures, other walks of life, other ideologies, other knowledges. The net is cast further here, yet the three transformative competencies (OECD, 2019) again rise to the surface. Learners create new value by posing critical questions of health-related (ethical) issues. They reconcile tensions and dilemmas by understanding multiple perspectives and learning to live with multiple and disparate meanings about health issues, attitudes and beliefs. They take responsibility in a wider sense by understanding their own role in the creation of fair, just and sustainable societies. Once more, components of critical thinking are prominent, and alongside, the need for a socio-critical approach to pedagogical practice. For example, our conversation traversed the need to dig beyond surface-level understandings, challenge assumptions and the status quo, and unpack the source of one's own attitudes, values and beliefs about issues. The health education learning that we explored relating to learners' taking responsibility is closely connected to the "attitudes and values" underlying concept of HPE. Across levels of schooling, young people develop an increasingly sophisticated understanding of the different attitudes and values held by people and society, as well as develop an appreciation of the need for social justice, equity and equitable health outcomes for people in society. In reference to the unfamiliar, this might involve working with international material such as the sustainable development goals or World Health Organization data (for example) to explore attitudes, values and beliefs held by those outside Aotearoa in relation to a wide range of health-related issues. An appreciation of social (in)justices can be a springboard for young people to take critical action to change the(ir) world in a socio-critical health education; the final theme to which we now turn.

Change the world

A passion for health-related further study and careers. There is opportunity to strengthen the connection between health education at school and the tertiary sector, and the health-related workforce in Aotearoa. . . Activating in young people a passion for people and the world; a hunger for social justice, and the tools in the toolkit to be able to be advocates and activists, but also the ability to think, write, and speak with a critical mindset (Rachael).

Rather than a passion for health education, which positions interest in the subject emotively and personally (and is therefore subject to whims and changes), with a logical and rational approach [to knowledge], we could instead refocus the benefits of learning on a sense of giving back, contributing to society, and serving a greater good (Jenny).

The quotations above from our conversation encapsulate notions that resonate with aims of health education as a pathway to further study and a career in the health sector, the contested notion of “passion”, advocacy and activism and serving the greater good. This final point connects back to the discussion in the previous theme that young people negotiate different parts of the world. A vital part of being a human in our complex times is to take action to help shape the future for themselves, those with whom they interact and communities as a whole (OECD, 2019).

Early on in our conversation we discussed the importance of learners in health education having opportunity to engage in advocacy and health promotion actions to enhance wellbeing for self, others around them and the wider community. Connected to theme one in our findings was a question Rachael raised: “*What then can health education achieve in the limited time it has, to both provide understanding and knowledge around how the world works and then engage in health promotion actions?*” Our conversation traversed the importance of student-centred pedagogies. Here, teachers might provide a platform for their learners to think critically about local wellbeing needs, and support the planning, taking action and reflecting on impact for people’s wellbeing, in context of school and societal processes and structures.

We discussed the idea that activism and advocacy, components of health promotion more broadly, are under-done in health education in Aotearoa. This is despite health promotion being both a learning context and an underlying concept of HPE. In terms of connection to the compass we explored resonances between the Anticipation-Action-Reflection cycle (AAR) (OECD, 2019) and the process adopted in health education in Aotearoa for taking health promotion action: the action competence learning process (ACLP) (Ministry of Education, 2004). While other project-based learning, design thinking or inquiry learning processes are also relevant in learning contexts, both the AAR and the ACLP focus on wellbeing as a goal, and critical thinking as a mechanism by which action for wellbeing can be planned, taken and evaluated. The ACLP draws upon Jensen’s (1997) explanation of action competence and the IVAC model as connected to environmental and health education in Denmark. The ACLP is introduced in health education as a series of steps, each informing the next, to take health-promoting action. First, students think critically, and use evidence to brainstorm wellbeing-related needs in a population, the vision they have for the group, and the actions that could be taken to enhance wellbeing. From here, they create an action plan, take action and finally evaluate the impact of their action in relation to wellbeing. As an iterative process, the final step would likely provide recommendations for future action related to the health issue, thereby informing the next iteration of the ACLP.

To exemplify a socio-critical health education approach to health promotion in a school setting, we thought about examples that we have seen over the years from teachers in Aotearoa. The difficulty with which we found this task speaks to missed opportunities. Health promotion can bring health education learning to life outside the classroom for the learners, connect more closely and meaningfully with the school or wider community and promote the subject to those who may misunderstand the nature of health education (Dixon, 2020; Fitzpatrick and Burrows, 2017). This difficulty notwithstanding, examples we recalled spanned such actions as improving aspects of a school’s physical environment, critiquing a school policy and advocating for changes, working with aged care facilities to support older people’s social wellbeing, working with community groups on food insecurity issues and working with the local council to develop a traffic safety plan for a school and its surrounds.

Through our conversation, we came to the conclusion that there exists much scope to better seize upon opportunities arising from health education learning to contribute to career pathways in health-related fields, to practise taking action towards wellbeing within the health education learning environment and in the community beyond the school and to ignite in young people a passion (for want of a better word) for contributing meaningfully to the world.

Conclusion

The three themes arising from our deductive thematic analysis *understand the world*, *navigate the world* and *change the world* have enabled us to establish wide-ranging and meaningful connections between elements of the compass and a socio-critical approach to health education in Aotearoa.

Methodologically-speaking, our epistolary interviewing was a valuable data production method, especially in context of times where alternatives to face-to-face interviewing are needed. We view this as a strength of this small research project because it took place over time, which enabled us to think more deeply about our answers, seek evidence to reinforce (or refute) the points each other made and the fluidity of the approach allowed us to veer off on tangents. Limitations of our method connect to the homogeneity of the participants, as we noted earlier. We would be interested in exploring this method of data production with a range of teachers, over a longer period of time. In doing so, we would be able to get a glimpse into the ways in which the ideas we have discussed in this paper “play out” in the health education learning environment. An interesting avenue for future research internationally would be the relevance of the compass for health education and other school subjects to demonstrate how learning across the curriculum might make a contribution to preparing young people to navigate an uncertain world.

We now conclude with key questions to consider if we are to reimagine school-based health education in order for learning experiences in the subject to enrich learners’ understanding of how to navigate the complex and uncertain times they will face across their lives.

- (1) How can health education teachers and researchers capitalise on such frameworks as the compass to advocate for the potential of the subject?
- (2) To what extent do health education curricula across the world articulate disciplinary and epistemic knowledge (as opposed to “everyday” knowledge) and how does this work in practice?
- (3) What implications have our findings raised for initial teacher education, as well as in-service professional learning and development in health education?
- (4) To what extent is health education connected to other disciplinary knowledges, and how can the subject be integrated with these without losing its sense of purpose?

If the COVID-19 pandemic has taught us anything, it is that nothing in our world can be taken for granted. Multiple and flexible perspectives are needed to respond to a changing world: what we learned yesterday may not have relevance or be useful tomorrow. In order for curriculum understandings of health education to make a contribution to the wellbeing of individuals and the collective wellbeing of communities and nations, a socio-critical approach to health education is needed. Here, health education has the potential to enable young people to learn for purpose and take action to change the(ir) world, not solely learning knowledge for the sake of knowing. With a socio-critical approach to the subject, health education might be in a stronger position to harness its potential to make a meaningful contribution to young people’s understanding of how to navigate a dynamic, unpredictable and complex future.

Note

1. Respectively in relation to the [OECD \(2005\)](#) competencies: using language, symbols and texts, relating to others, participating and contributing, managing self and thinking.

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About the authors

Rachael Dixon is a lecturer in Health Education at the University of Canterbury. She completed her PhD on senior secondary health education in Aotearoa. Rachael Dixon is the corresponding author and can be contacted at: rachael.dixon@canterbury.ac.nz

Jenny Robertson is a teacher educator at the University of Auckland and a professional learning and development facilitator.

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Co-operation and consistency: a global survey of professionals involved in reopening schools during the COVID-19 pandemic

Re-opening
schools during
the pandemic

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Nicola J. Gray

*UNESCO Chair and WHO Collaborating Centre Global Health and Education,
Universite Clermont Auvergne, Clermont-Ferrand, France and
Department of Pharmacy, University of Huddersfield, Huddersfield, UK, and*

Didier Jourdan

*UNESCO Chair and WHO Collaborating Centre Global Health and Education,
Universite Clermont Auvergne, Clermont-Ferrand, France*

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Abstract

Purpose – During the 2020 COVID-19 pandemic, schools closed in haste and were expected to create virtual learning opportunities for their students while they waited to see when and how they might re-open. National governments issued reopening guidance at varying speeds. The purpose of this study was to invite health and education professionals to share what was happening in their country about school reopening in terms of the features and implications of the guidance issued.

Design/methodology/approach – A qualitative study. Initial interviews informed a semi-structured questionnaire distributed through the global community of UNESCO Chair ‘Global Health and Education’ and partner organisations. Its aim was to collect, analyse and share globally relevant knowledge and practices about school reopening.

Findings – There were 192 useable responses from 43 countries and territories and 1 multi-country region. 20 of these, mainly in the Global North, had received reopening guidance, 23 were still waiting and 1 had not closed its schools. Guidance prioritised public health measures like social distancing, with less emphasis on education impacts. Success came from partnerships between schools, families and local authorities, consistent guidance and enough time and resources for implementation. Fear of infection led to significant absenteeism among students and staff. Respondents waiting for guidance, mainly in the Global South, shared similar concerns and expectations.

Originality/value – Describing first-hand practices and perspectives of health and education professionals from diverse countries and territories about reopening schools.

Keywords Mental health, Schools, Child and adolescent health, Education, Public health

Paper type Research paper

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Introduction

During the first global wave of the COVID-19 pandemic, 90% of the world's student population, i.e. 1.57 billion children and young people in 190 countries, were deprived of their normal schooling (UNESCO, 2020a). It was a rapid response to escalating cases of infection, and schools closed in haste. Socialization and academic learning are equally important components of educational success, however, and in-person attendance at schools is the ideal situation for the health and wellbeing of all children and young people (Viner *et al.*, 2020a). Global commentators agree that bringing children into education, and keeping them in high-quality secondary education for as long as possible as young people, improves their health outcomes (Patton *et al.*, 2016). Models show that the impact of school closures on student academic achievement and inequalities has been significant (Kuhfeld and Tarasawa, 2020; Haeck and Lefebvre, 2020). For all these reasons, students need to return to school (Jourdan *et al.*, 2020; Viner *et al.*, 2020b).

But reopening schools after the pandemic closure, and while infections continue in waves, is a major challenge. Stephania Giannini, the UNESCO ADG, said in mid-May 2020 *"When and how to reopen schools is one of the toughest and most sensitive decisions on political agendas today. Is it safe to reopen schools or is there a risk of reigniting infections? What are the consequences to children's mental health and to the social development of young children? Are students engaged in remote learning actually learning? And when the time comes, how will schools ensure students return and help learners who have fallen behind during school closures?"* (Giannini *et al.*, 2020).

The problem is not new: earlier influenza-type pandemics prompted an article from eminent global infectious disease professionals that reflected on the judicious use of school closure: the authors reflected that *"Health officials taking the decision to close schools must weigh the potential health benefits of reducing transmission and thus case numbers against high economic and social costs, difficult ethical issues, and the possible disruption of key services such as health care. . . . Also, if schools are expected to close as a deliberate policy option. . . it is important to plan to mitigate the negative features of closure"* (Cauchemez *et al.*, 2009). Sadly, the debate proposed at that time was not developed in order that national governments might have been better prepared to act in 2020. Other papers reflecting on the possibility of such pandemics suggested the development of web-based instructional models as a contingency, recognising that this would be *"...important both for academic continuity, as well as for maintaining consistency, and normalcy through a routine, which is often credited with facilitating coping in times of high stress or emergency"* (Soloff and Thomas, 2007).

Anticipating that there would need to be support for school teams to contemplate how and when to reopen, from April to September 2020, United Nations organizations (UNESCO, UNICEF, WFP and World Bank) published guidelines on the safe reopening of schools (UNESCO, 2020b), unions developed tools to support teachers in the reopening process (Education International, 2020) and many countries and territories issued national guidelines. Because the pandemic evolved in an unpredictable manner, and also because school reopening was part of a wider process of restarting national economies, the instructions given to schools developed over time, with a considerable amount of negotiation and discussion. These guidelines ranged from very detailed instructions that were difficult to implement (e.g. *Ministère de l'Éducation Nationale, de la Jeunesse et des Sports, 2020*) to open documents that left most of the responsibility on the shoulders of local school officials (e.g. *Centers for Disease Control and Prevention, 2020*).

Taking a political decision to reopen schools is the first important step in this process, but the operationalisation of reopening schools – by overcoming fears, welcoming children, communicating with parents, reassuring the community and addressing many logistical and organizational issues – requires many other steps. A framework used to understand the enactment of guidance and procedures, which is very relevant to this situation, is the "double

translation” process where stage 1 is from international guidelines to the national level and the second from national to local level (Nordin *et al.*, 2019). This can be a very complex process.

There is an emerging literature reporting the perceptions and practices of teaching professionals during lockdown and as schools re-opened. For example, Marchant *et al.* surveyed primary school teachers in Wales in July 2020; their team reported that communication mechanisms between schools and families, and between government and schools, needed to be improved. Asbury and Kim (2020) contrasted the frustration that teachers in England felt about their portrayal in the media with their feelings that they were more valued than ever by students’ parents. In Chile, teachers challenged the national policy imperative that prioritised external control and academic attainment to reassert professional autonomy and highlight wellbeing issues (González *et al.*, 2020). Researchers in Fiji described the challenge of the pandemic to teachers’ personal and professional lives (Dayal and Tiko, 2020). Teachers in Italy reported a lower capacity to manage their own time while engaged in remote learning activities (Giovannella *et al.*, 2020). Thus the problems are very complex.

Context to the study

The global community of the UNESCO Chair ‘Global Health and Education (GHE)’ consists of organizational and individual members involved in the fields of education, social care and health who share a vision of better intersectoral working in schools. In May 2020, community members in countries and territories highlighted the difficulties encountered by students, families and professionals in the field to UNESCO Chair GHE leaders.

In order to have a better understanding of how guidelines were being implemented at local level, what impact the pandemic had had on local professionals who were expected to implement the guidance in schools, and thus to reflect on the best way to support schools in times of crisis, UNESCO Chair GHE launched a knowledge sharing process. The objective was to collect, analyse and share emerging knowledge and practices from a diverse range of countries and territories. The method chosen to deliver this objective was a survey of health and education professionals. The aim of this survey was to describe the actions and perspectives of health and education professionals in the field about the process of safe school reopening, and to give them a voice in a situation dominated by national policymakers who were creating guidance at distance from the schools that would impact on their everyday practice.

Methods

Survey construction

A qualitative approach using open questions was chosen to explore the meaning that a diverse range of individuals ascribed to school reopening as an important social phenomenon embedded within the pandemic (Creswell and Creswell, 2017). Anticipating that the language used by professionals would differ from one country and context to another, it was concluded that open questions would be the most suitable approach. This would allow community members to use the language and terminology that they associated with this fast-moving political and professional situation. Such a qualitative survey makes it possible to identify different perceptions and categorize them, but not to obtain data on their representativeness.

During the week of 4th May 2020, 10 exploratory telephone interviews were conducted with professionals involved in the UNESCO Chair GHE community to ask them what was happening, what were their concerns and whether a survey to share practices would be useful. Rumours, fears, questions and technical challenges at the local level meant that schools and communities appeared to be struggling. Depending on the context, school staff

and local health authorities were coping with the situation in different ways and, moreover, showed differences in understanding the situation and guidelines. The translation from guidelines to actual practice, and thus the implementation mechanism for the public health measures, did not seem to be straightforward (Nordin *et al.*, 2019). Based on these interviews, a survey was devised to enable health and education professionals to share what was happening at national and local levels in their country. To facilitate a rapid review of first-hand accounts that would not cause undue burden to professionals working in the field, but would allow them to share their hopes and concerns from wherever they were practising or locked down, an online survey promoted through social media was considered the most appropriate option.

The first question was in Yes/No format to determine whether the respondent had guidance available to them about reopening schools. The subsequent questions were open-ended. All questions could be answered by the respondent, regardless of whether they had answered “Yes” or “No” to the first one, if they felt they had a relevant comment in anticipation of the guidance. The topics included:

- (1) Source (national organisation/s involved) and nature of the guidance;
- (2) Communication methods used to disseminate the guidance;
- (3) Perceived success and difficulties associated with reopening schools, including absenteeism;
- (4) An invitation to contribute their own suggestions about the process.

In line with the UK Policy Framework for Health and Social Care Research [1], the survey described the practice of professionals related to the extraordinary circumstances of the COVID-19 pandemic and did not seek to derive generalisable or transferable new knowledge. It was not thus subject to ethical review. It was vital, however, to adopt good research practice principles in terms of managing data. Respondent identifiers were removed from survey responses before analysis, and each respondent was given a unique code. Separate Microsoft Excel® spreadsheets containing (a) the anonymised results and (b) personal data of respondents (name, email and linking code) were password-protected and only available to the research team.

The survey was not driven by a specific theoretical underpinning. It was an urgent response to a global pandemic and was a means of rapidly sharing experience and good practice among health and education professionals in the UNESCO Chair GHE community. To this end, preliminary findings were shared on the community website in July 2020 so that community members could read out, and hopefully learn from, each other’s experiences [<https://unescochair-ghe.org/resources/about-covid-19/preview-survey-school-reopening/> and <https://chaireunesco-es.org/ressources/theme-covid-19/rapport-preliminaire-sur-la-reouverture-des-ecoles/>].

Participants

The link to an online survey was placed on the English and French UNESCO Chair GHE websites, on 10th May 2020 and 14th May 2020 respectively, and shared on social media platforms with our community (Twitter, LinkedIn). Emails in English to people within the [anonymised – organisation] were sent on 11th May 2020 and 18th May 2020 to a total of 617 contacts. An email in French was sent to 474 Francophone contacts within the UNESCO Chair GHE community on 19th May 2020. Many organisations involved in the community shared the link through their newsletters and social media during May and June 2020: EuroHealthNet; Schools for Health in Europe (SHE); UNESCO associated schools network; French National Federation Of Education And Health Promotion (FNES); International

Francophone Network For Health Promotion (REFIPS); French network “Pratiques en Santé”; Education and Solidarity Network; RADIX Foundation Switzerland; School21 Network; International Union for Health Promotion and Education (IUHPE) and European Public Health Association (EUPHA). The survey was also translated into Russian and sent by the UNESCO Chair on Healthy Lifestyle Promotion to regional school administrators in the Russian Federation on 1st June 2020. The regional administrators contacted their schools and/or completed the questionnaire themselves. The survey links on both websites were closed on 22nd June 2020.

Analysis

The survey was conducted using Google Documents, and data were exported to a MS Excel® spreadsheet for analysis. All identifiers were removed, stored in a separate password-protected spreadsheet and substituted with a participant code in the dataset for analysis.

French and Russian language surveys were translated into English using online translation tools Google® Translate (FR) and DeepL® (RU) before analysis as one English text corpus. Qualitative analytical procedures were used, consistent with “directed content analysis” (Hsieh and Shannon, 2005). The survey questions (Table 1) provided a clear source of categories with which to organise participants’ responses, whilst allowing other themes to emerge; themes included the measures implemented, autonomy, communication, successes and difficulties. NJG undertook the primary analysis of coding the qualitative responses and defining overarching themes. A sub-sample of the dataset was independently analysed by DJ. Any difference in interpretation was resolved by discussion.

Results

Profile of respondents

The English (EN) version of the survey received 60 responses from 36 countries and territories and 1 multi-country region; the French (FR) version of the survey received 56 responses from 8 countries and territories, and the Russian (RU) survey received 78 responses from one country. The overall dataset consisted of 192 useable responses from 42 countries and territories and 1 region (Figure 1). For direct quotes used in the results section, the country of the contributing respondent is indicated in square brackets. Quotes from respondents in countries still waiting for guidance will be denoted by an asterisk (*) next to the country name. The respondents were not asked to describe their specific role, so we

Country and region?

Do you have a national/regional/local strategy of reopening schools?

What kind of guidelines targeting reopening schools were produced by the Ministry of Education, the Ministry of Health, local and/or regional authorities?

What modifications are implemented in school transportation, organization of the lessons, the breaks, the canteen, etc.?

What educational strategy is implemented (about social distancing, knowledge about the virus, fake news, well-being...)?

How was communication organised before and during the reopening?

Do schools have to implement precise guidelines, or do they have a lot of freedom to decide?

What are the main successes for reopening schools in your country/region?

What are the main difficulties for reopening schools in your country/region?

Do you miss any guidelines and resources?

Do you have any absenteeism (students and staff) in your schools?

Your suggestions...

Table 1.
Questions asked in the survey

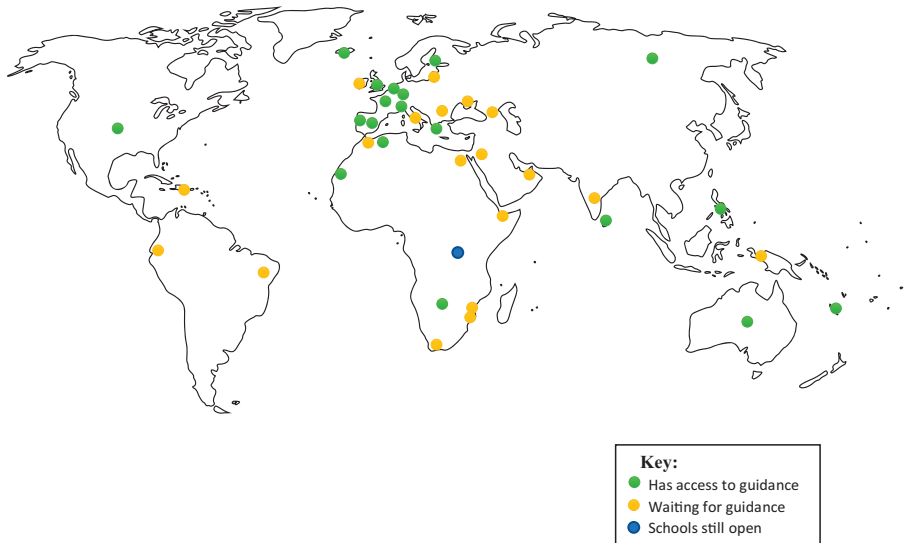


Figure 1.
Country responses to
the survey

Source(s): By Skimel - This file was derived from: World map without Antarctica. svg, CC0, <https://commons.wikimedia.org/w/index.php?curid=62612166>

cannot report the background of the participants. Considering the professional backgrounds of the members in organisations who shared the survey invitation with their networks, we can state with confidence that these comments represent the collective experience and perceptions of a group of professionals who included teachers, school managers, public health and health promotion experts, and healthcare professionals.

Access to reopening guidance

At the time of the survey, in May–June 2020, COVID-19 had spread through Asia, was particularly rife in Europe but only just penetrating Africa and the Americas. Respondents collectively provided perspectives from all world regions.

A first group of respondents (138 from 20 countries and territories) reported having access to published guidance for the reopening of schools at national, regional or local level. This did not necessarily mean that schools had already reopened – although in some countries this was the case – but that some form of official guidance or strategy had been published and was available for consideration.

Another group (44 respondents from 24 countries and territories) reported that they did not yet have access to school reopening guidance. One country – Burundi – had not needed to close their schools at that time. Respondents from 20 of those countries without guidance shared some insights or hopes/concerns about what it might contain.

Respondents from most countries with guidance reported that it was nationally produced. There was variation in the reports of the involvement of health and education ministries/bodies in the guidance, but most of the participants considered that health advisers had played a leading role (10 health/education both involved; 5 health-led; 3 not specified; 1 education-led; 1 security council-led).

A survey question explored perceptions of school autonomy with regard to the guidance. Perceptions varied widely, even within countries with more than one respondent. Most felt that there was some flexibility within the national guidance for schools to implement the

measures according to their context, many replied that they must be implemented precisely as written, and a minority had great flexibility.

They [schools] must follow the health protocols and can interpret other actions depending on their size, location, staff profile educational priorities etc. [Australia]

There is absolutely no freedom to deviate from the set guidelines. [Namibia]

A lot of freedom to decide. CDC [national public health authority] does not have enforcement authority. States have some enforcement authority. [USA]

Communication about guidance

Responses to the survey question concerning national communication about the guidelines drew mixed responses, some of which described the communication methods operating nationally about the guidance itself, and others about the general communication between schools and families during closure and reopening. Communication among education professionals about the guidance and reopening was through the usual channels: phone, email, meetings using virtual platforms (such as Skype®) and social networks. Television, radio and social media channels were also being used to reach families.

Some respondents described the double implementation process – a multi-step implementation pathway of national guidance being communicated to schools through state, cantonal or other local intermediary networks and then from schools to students and their families. In parallel, national public briefings were also available to all and sometimes the reopening of schools was referenced in those as well. Many felt that the use of all possible communication channels was needed, combined with sufficient resources and training.

- Maximize utilization of radio broadcasting instruction
- use of community loud speakers to promote messages
- maximize utilization of social media for consultation meetings
- promotion of [Information, Education and Communication] IEC materials and training. [The Philippines]

Guidance content

Respondents were asked to describe the content of their national guidelines. Their responses reflected their engagement with the guidance, and their prioritisation of different public health measures. The team did not consult the official guidance to check respondents' understanding or accuracy. [Figure 2](#) shows the number of countries and territories where respondents described a certain public health measure contained within the advice.

Class size reduction was the most often reported element in the guidance (17 of 20 countries and territories), in order to achieve spacing between students that reflected acceptable social distancing. The description of these measures varied; examples included creating groups of 5 in preschool groups (Iceland); a 50% reduction from 30 to 15 students (England, France, Greece), and an upper reported group limit of 20 (Senegal, Iceland older students). Social distancing was highlighted in most countries and territories (17 of 20), although some respondents who were well into the return reported that this applied only to teachers (Australia) or to older students (Iceland upper schools).

Hygiene measures (frequent handwashing, toilet arrangements) were commonly reported, but school cleaning less so. Some countries had stopped school transport (Belgium) or were running it at half capacity to achieve distancing (Portugal, Senegal). Wearing a mask was described in guidance for 11 countries and territories, but in England the guidance specified that masks would *not* be mandated. Most countries describing canteen changes said they would be closed (Germany, the Netherlands): some countries had asked parents to bring lunches for their children (Philippines, France).

Circulation changes (10 of 20 countries and territories) and scheduling changes (13 of 20 countries and territories) were aimed to achieve spacing and distancing for students.

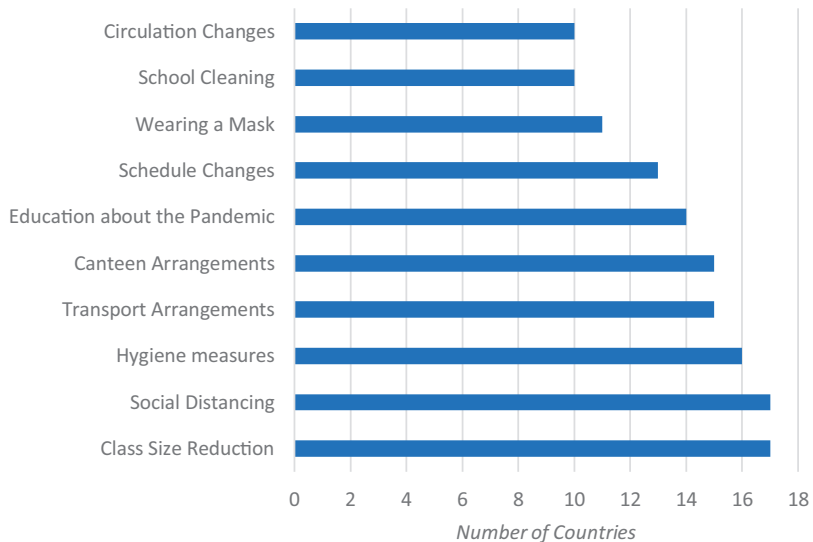


Figure 2.
Guidance elements
described by country
respondent/s ($n = 20$)

Strategies included rotating smaller groups in for 1 or 2 days each week (Belgium); staggered start and finish times (e.g. Portugal) to avoid travelling at rush hour; and staggered break and lunch times (Tunisia). Reducing movement of students round schools (Australia), barring parents from being on-site (The Netherlands) and implementing a one-way system (England) could all help to sustain distancing.

Attitudes towards the reopening of schools

There was a general acknowledgement that many people had safety concerns about a return to school – parents and teachers alike. “Fear of infection” was a common response regarding the challenges of reopening, and a reason given for seeing significant absenteeism of students and/or staff where schools had already re-opened.

Parents’ reluctance. Fear of being infected. [Senegal]

Staff that are vulnerable stay at home, as well as students. Some schools have to deal with anxiety amongst parents, that are scared to send their children to school. [The Netherlands]

In the prevailing language of waging a “war” against the virus, the balance of risk and benefit of reopening schools had not been discussed in some countries and territories at national level.

The language of the pandemic so far has been in terms of a war against the virus and the population in general is still in fear of personal risk as there is no vaccine and no treatment. A national discussion about the balance of benefit and risk has not taken place effectively here. [England]

Mental health difficulties for teachers were described, including mental fatigue from the rapid switch to remote learning, and anxiety about the complicated return and uncertainty about the future.

We are in a transition phase without knowing very well how the next phase will be, education is being prepared for the opening of centres, with many uncertainties and the theme of conciliation is being prioritized more than the educational measure. [Spain]

Many respondents referred to the adaptability that they had seen among teachers and school teams in creating remote learning methods during closure, and in the preparation for reopening. Some believed that this had not been widely recognised or praised.

Recognize staff at their fair value, because they are exhausted and sometimes discouraged. [France]

Impact upon inequalities

Respondents also shared their concerns about a worsening situation for some students and families while schools remained closed. There was a recognition that some students did not have a home environment conducive to quiet effective remote learning – this might be due to lack of space, equipment, Internet connection or family support.

Only about 50% of urban households have Internet, and about a quarter have a computer at home. If there is no access to computer, online education is conducted through cell phones using WhatsApp. This has some limitations. [India*]

The pandemic had made visible long-term lack of investment in education, and broader long-term national economic and social problems disadvantaging many families and schools – especially for students with special needs.

Low economic standards and lack of funds for education for the past decade have resulted in vast social differences between families, or even schools. The majority of schools lack the necessary infrastructure to cope with such a crisis. Even more, children with special needs or educational disabilities of any type seem that are even more left behind now. [Greece]

Wider economic impact might force families to remove adolescents from school to find work in the informal labour market.

In most LAC countries, the economic crisis following lock-down will prevent many families that are already stressed from sending kids back to school, they will enter the informal market. Particularly secondary school age adolescents. [Latin America and the Caribbean*]

There was concern that children needing the most support had not yet returned, because parents had been given the right to choose whether to send their children back or not.

The return of children with academic difficulties would have been beneficial, but due to the volunteering of families, it is these children who do not return for the most part. [France]

Some expressed their fears for the future if a generation of students had their education interrupted and inequality gaps continued to widen.

Please consider that no country, state or government should end up with poorly educated masses to handle in the future. There are some devastating examples in our days of what can happen when public education fails to produce educated citizens. [Greece]

Enablers for reopening schools

There was a strong theme within the responses that school reopening would work best where the school teams, local authorities and students/families were communicating well and cooperating to make the return happen.

The support of the teams facilitates setting up the protocols. The involvement of primary school heads and middle school principals is crucial to the success of practical implementation and the resolution of practical difficulties. Another determining point is the collaborative work with the local authorities responsible for the premises, in particular the town halls. [France]

Cooperation of all, wide dissemination of information, provision of procedures and hygiene materials [New Caledonia]

Consistent and timely information, relevant training and provision of appropriate equipment – leading to good adoption of the measures within the school – were considered very important. Indeed, over-complicated or confusing guidance was interpreted by some as a means of the Government protecting itself from challenge, whilst not helping those who needed to implement it.

The state is too much in covering itself that it is impossible to work out well. 54 pages with so many complicated guidelines and rules that it does not give you really the wish to open schools. [France]

A combination of modification of premises and changes to the patterns of circulation in schools was described by many as the way to prepare for a successful return (Table 2).

Barriers to reopening schools

Whilst respondents recognised that public health measures were consistent with national public health guidance, some were concerned about the practicalities of implementation in schools. Some premises did not have adequate space for distancing. They saw a need for extra teaching staff, but no resource for hiring them. They were concerned about the lack of equipment needed, including masks and deep cleaning tools, and even a reliable water supply.

We are a large school with little room for manoeuvre while respecting the protocol: narrow corridors, one floor, few stairs. [France]

Portable water provision to some schools in selected regions remains a challenge and the Ministry of Education, Arts and Culture is currently working on that with the Ministry of Agriculture, Water and Forestry. [Namibia]

A number of respondents were anxious about receiving inconsistent and changing guidance. Others were concerned that the time given for preparation was not sufficient to implement all the necessary measures.

Orders and counter-orders, lack of communication from representatives of the ministry. [France]

Too little time to organize from the moment decisions are made by the National Security Council. [Belgium]

Respondents still waiting for guidance had practical concerns that it would be issued just before the planned reopening dates, many of which were expected to be the normal start of the new academic year, and that there would not be time to implement them satisfactorily. They wanted clear and flexible guidance, adapted to the local context, and sharing of good practice.

Give freedom to the decision-making for each school, in function of what they have as resources. We need to open for social, psychological and economic issues. GIVE independence for each Region in Italy because the needs and culture are different from one area to another. [Italy*]

Modification of premises	Changing patterns of circulation
Reducing the number of desks in a classroom	Introducing a one-way system in corridors
Adding handwashing/sanitizer stations	Keeping students in the same classroom, even for lunch
Marking out areas in school yards where single-class groups can be separated from other groups	Staggering start/finish times, breaks and lunchtimes
	Asking parents not to come onto the premises

Table 2.
Logistical measures reported by survey respondents

It will be important to maintain flexibility and modify approaches as needed, and to ensure learning and sharing of good practices. [Republic of Moldova*]

Some felt that those who created the guidance needed to improve their understanding of the education sector.

More communication and awareness of the educational community. [Senegal]

Education about the pandemic

Respondents from 14 countries and territories described education provision about the pandemic and how it related to schools. Many countries had general population education hubs about COVID-19 that could be used by schools, but some education systems were specifically developing their own materials and approach. This might be devising games/videos for young children to convey handwashing messages (England, Switzerland), or adapting the content of the existing health curriculum to tackle pandemic-relevant topics (Finland, New Caledonia). In Namibia there was a concerted effort to provide an education hub to combat fake news and this would form part of their strategy. Only respondents from France described the contribution of school nurses to discussions about COVID-19 with students and staff.

Preparation for future crises and closures

Comments about the impact of closures on education, and the need to sustain a hybrid model of learning, featured in many responses. Some anticipated an ongoing complex schedule of hybrid learning where students would be attending school for part of the week and continuing to learn from home for the rest of the time. Some respondents reflected on the impact of the health measures on their educational approach – such as the reduction of class sizes, part-time attendance and the coherence needed between in-school and remote learning.

The physical infrastructure is not prepared for partially reopening; hosting only so many students at once; parents availability to adapt to the different requirements are not guaranteed due to their working and living conditions... also there is need for new educational methods and communication techniques that ensure that most school work in relation to reduced physical classroom time can be done at home. [Germany]

Beyond difficulties in connecting to remote learning platforms noted earlier, some students were not engaging with these assignments and adequate supervision was difficult.

Not all students are disciplined in online learning, and there is less room for supervision. [Russian Federation]

Several respondents concluded that there was a need to adapt the curriculum to prepare students for future crises in order to have a resilient national population.

Develop a real program around executive and communication skills (not the use of the Internet but knowing how to communicate with others) for the children of today so that the adults of tomorrow can better cope collectively with the crises of all orders that they will inevitably live through. [France]

One respondent also saw an opportunity to introduce deeper, often neglected life themes to students, including death, mourning and the student's own place in their social world.

We must take advantage of the circumstance to introduce other essential themes to pupils through non-formal education: meditation, death, mourning, the meaning of life, philosophy seen as a way of life, to be happy and useful to his community and to the world. These themes have been neglected for too long, in favour of other issues ... [Haiti*]

There was a call for empowerment of teachers and to have trust in teachers to make the right decisions for their schools. A new vision of education might create specific expertise in remote learning, with the right resources and motivations.

We need more funds, better educated teachers with better working conditions, differentiated teaching positions, including distance teachers with full professional rights, guaranteed working hours and earnings and more research on how contemporary education with the use of ICT should be: less paper, new content, new curricula. [Greece]

Discussion

The data from this survey have provided the experience and perspectives of health and education professionals in the field regarding guidance for re-opening schools, which we need to understand to optimise existing guidance and to prepare for future crises. The countries and territories reporting access to national reopening guidance largely represented Global North, and the countries still waiting were mainly from low- to middle-income countries in the Global South. At this relatively early stage in the pandemic (May-June 2020), some of the countries and territories were quite advanced in their preparation for school re-opening.

It was reported that health policymakers had taken a lead role in the guidance for many countries and territories. The public health measures were described in great detail, and the educational impact much less so even though, in some territories, educational resources have been created [2]. Guidance for schools mirrored the wider public health measures taken nationally – principally social distancing and close attention to better hygiene. Depending on the countries, there was wide variation in the perception of stakeholders in the autonomy of schools to implement these regulations according to their context: most felt that there was some flexibility, but all appreciated the seriousness of adhering strictly to hygiene measures.

Respondents showed that they were affected like the general population in their response to the pandemic, with concerns for their own safety as well as that of other stakeholders. Mental health challenges were reported. The urgency of the closure had demanded a quick response in terms of filling the education gap with virtual learning options. The flexibility and adaptability of teachers – with scarce recognition – were praised by respondents (Asbury and Kim, 2020). In effect they were still rapidly innovating for the home school situation whilst being asked to also plan a return to a very different school environment. There was much concern about the plight of students in difficult home conditions and the impact of extended closure on their education. They were mindful that some students might not return, if they were forced to seek work on behalf of the household in regions where the economic impact was very severe. Some respondents reflected further on the long-term national impact on a generation failed during this crisis by the education system. For all these reasons, and also the symbolism of school reopening as a general herald of national recovery, there was an appetite to return.

In terms of describing concrete enablers, obstacles and solutions for school reopening, and identifying resources still needed, consistency of information and sufficient implementation time was felt to be an important enabler. Positive partnerships between schools, families, local authorities and teaching unions also needed to be nurtured. Significant barriers to reopening at the level of the individual premises included lack of distancing space available, water shortages, staff shortages and equipment shortages. Inconsistent guidance, issued just before reopening, was a fear expressed in countries still waiting for their national response. Respondents also described the ongoing need for a hybrid approach to learning that did not disadvantage children and youth living in difficult circumstances, because the pandemic was far from over and part-time physical attendance for students was the only way in which distancing could be achieved in many schools. Some respondents saw opportunities to strengthen the skills of education professionals in hybrid pedagogical methods and to introduce

subjects like life and death – that had been long neglected in the curriculum – to create resilient adults who could face future crises. To do this, they asserted that policymakers must empower and trust teachers to do the best for their students and schools. This is consistent with [Kim et al.'s \(2020\)](#) and [González et al.'s \(2020\)](#) reflections on teachers' needs for autonomy and their anxiety about uncertainty. Examples were given of materials that had been created or adapted to educate children and youth about different aspects of the pandemic and the return to school, including better handwashing, wellbeing strategies and critical media literacy ([Tessier et al., 2021](#)).

This summary of the main findings offers further reflections on issues of global impact and relevance that will benefit from further research.

Implications of findings for global inequalities

The variation in access to school reopening guidance reported from Global North and Global South signals that a global effort is needed through UN agencies to promote equality of access to trustworthy and evidence-based information for schools, wherever they are located. Whilst the evidence still suggests that transmission within school communities is low ([Viner et al., 2020](#)), adult transmission in the surrounding community has been causing further disruption worldwide. Lockdown reversals (e.g. [Victoria Government Australia, 2020](#)) confirm that the turbulence and uncertainty of the pandemic mean that schools will continue to be vulnerable to periods of closure. It is vital that subsequent closing and reopening of school premises is done in a thoughtful manner and that effective education strategies are formulated that will not further widen the inequalities laid bare by the pandemic. Canadian researchers, for example, reported in July 2020 an estimate that the socioeconomic achievement gap between the most and least deprived 15-year-old Canadian students could increase by 30% with the long duration of this interruption to their education ([Haack and Lefebvre, 2020](#)). Moreover, it could affect students' ability to complete high school qualifications. The advice of commentators following earlier pandemics ([Soloff and Thomas, 2007](#); [Cauchemez et al., 2009](#)) to weigh school closures against other measures and to secure viable web-enabled remote learning methods remain pertinent to current ongoing challenges.

Implications of findings for guidance implementation – the “double translation” process

As previously observed in the literature, there are two different, although interconnected processes of translation ([Nordin et al., 2019](#)). The first one is from international guidelines to the national level. At the date of this survey, more than half of the countries had not received guidelines for schools. For those who had received them, guidelines ranged from very detailed instructions (e.g. [Ministère de l'Éducation Nationale, de la Jeunesse et des Sports, 2020](#)) to simple and open documents (e.g. [Centers for Disease Control and Prevention, 2020](#)). Not all of them referred to relevant UN documents. During the COVID-19 crisis the translation process between the global and the national level seemed to be impaired by the fact that the fight against the epidemic was seen as a national/regional, rather than a global, issue ([Paul et al., 2020](#)). Further analysis of the national/regional guidelines after the reopening of schools in all countries will be needed to see in what way global guidelines influenced the national documents.

The second translation process from national/regional to local also appeared to be anything but linear. Some respondents were not aware of the existence of such guidelines, which questions the communication process between central administrations and the local level. In addition, respondents said in many cases national rules did not fit the local context because people issuing guidelines needed a better understanding of the education sector. At the local level, the reopening process is very complex and includes social and educational issues in addition to health challenges. Guidelines appear to be only one ingredient, among many others, within the school ([Jourdan, 2011](#)). From our findings, we hypothesise that the

enactment of the reopening guidelines as reported by our participants can be characterised as a non-linear and complex process of double translation (Nordin *et al.*, 2019). Further qualitative ethnographic research will be needed to specifically document the enactment processes in schools.

These translation issues have to be considered seriously because coherence of actions at different levels of governance – transnational, national, regional and local – is considered critical for the effectiveness of policies enhancing health and wellbeing as well as reducing inequalities (Marmot *et al.*, 2010 p. 34). There is a need to find a good balance between guidelines, which make people feel secure, and local adaptations; there are important differences from one school to another because of the facilities, staff and the number of students. Further studies are needed to analyse the trajectories between international guidelines, national and local policies related to these reopening support documents. We agree with Marchant *et al.* (2020) that better communication on the COVID-19 epidemic between governments and schools, and then on to families, is needed.

Implications for the wellbeing of the school workforce

Respondents reported that the mental health and wellbeing of teachers was affected by the personal and professional effects of the pandemic; this was reported in terms of fatigue, anxiety and uncertainty. This was consistent with the findings of Marchant *et al.* (2020); wellbeing check for students and teachers was their first recommendation. Allen *et al.* (2020) described the spike in work-related anxiety among English teachers in the week before lockdown, particularly among head teachers, and in the week before re-opening. Based on teacher interviews, Kim *et al.* (2020) showed that teachers were anxious about current and future uncertainties while navigating school re-openings, and how the COVID-19 pandemic has affected their personal and professional lives. Supportive group interventions may be needed to increase resilience in school teams and – through that increased compassionate capacity and strength – to support students and families. We might also learn from the use of drama and instructional technology interventions for teachers to enable expression and promote resilience through pedagogical support and personal wellbeing (Tam, 2020; Roman, 2020). Close links with healthcare professionals at school level could facilitate counselling and advice.

Implications for intersectoral working in schools

There was scarce reporting of any input of school nurses or other local health professionals to schools during the pandemic. This was considered surprising, knowing the impact of school nurses on the schooling of students with specific educational needs and on health promotion in schools (Kirchofer *et al.*, 2007; Lineberry and Ickes, 2015). Noting this relative absence of school nurses – or indeed any other locally based healthcare professionals – from the reports, we feel there is a real opportunity to increase intersectoral working. A representative of school nurses reflected on the activities that they could do during the pandemic in schools, equipped with local knowledge, such as assessing the data available, assisting in emergency preparedness planning and advocating for equitable distribution of services (McDonald, 2020). Closer connection of school staff with public health and healthcare professionals at the local school level during the pandemic might also have facilitated access to personal protective equipment and hygiene products. This is a time to review how health professionals can create a new vision of their engagement with schools in their community, as a trusted advisor and advocate who can build health and wellness capacity within school teams (Jourdan *et al.*, 2021).

Educational International published “Forward to School” in July 2020, which was informed by insights from educators in a variety of contexts all across the world; we believe that our findings are consistent with the five essential areas they asserted governments needed to focus on to ensure a safe transition back to onsite education and to mitigate the impact of ongoing cycles of closures on students and educators (Table 3).

Table 3. Consistency of findings with “Forward to School” (Education International, 2020)

EI policy point	Examples of consistent survey findings
Engage in social and policy dialogue	Acknowledging the reopening of schools as part of a wider process of social recovery
Ensure the health and safety of education communities	The significant ongoing fear of infection from teachers and families leading to absenteeism Co-operation between local authorities, schools and families leading to success in implementing measures
Make equity a top priority	Global variation in the availability of guidance about safe school reopening Concerns about the widening education gaps for students who cannot engage with remote learning
Support physical and emotional well-being and recovery	Reports of teachers feeling exhausted and under-valued Creating resilience in students through better communication, curriculum addressing pandemic-relevant topics e.g. nature of life and death, rejection of “fake news”
Trust the professionalism of educators	Variation in the autonomy given for implementation of measures Reports that the authorities creating the guidance did not understand the school context

We were able to elicit a rapid global response from education and health professionals, but the study has significant limitations. The survey was a cross-sectional study during a one-month period during the pandemic, and so it could not follow the evolving experience of all the countries and respondents who replied. Many partner organisations distributed the survey link globally, so we are unable to specify the nature of the sample frame. It relied on respondents’ reports of the contents of their national guidance, rather than accessing and content analysing the actual guidance, but this was done purposefully to gauge their engagement with – and priorities from – the documentation. Respondents will have been responding by assimilating knowledge gained as both professionals and as parents and grandparents – it is difficult to separate out these roles in an emotive situation. We did not ask respondents to describe their professional background, and we would recommend that this be done in future work.

Conclusions

This work contributes to a better understanding of professionals’ views of safe school reopening during the COVID-19 pandemic. The survey offered a unique opportunity to reflect deeply on the perspectives of professionals working in the field, who do not create national guidance but have to implement it locally. Understanding the way in which education and health professionals were trying to make sense of the guidance at the beginning of the pandemic – and to implement it against a backdrop of serious concerns for themselves and the families and communities they serve – should inform political decisions and promote capacity-building at the local level. The survey findings underpin the need to ensure that professionals are actively involved in conversations about future resilience in schools, and that decisions are communicated to them in a prompt and clear way. Whilst the difficulties reported were inconsistent information, lack of implementation time and lack of resources, our findings suggest that effective partnerships between stakeholders at local level – families, school teams, local authorities and unions – can address concerns and facilitate safe reopening.

Notes

1. http://www.hra-decisiontools.org.uk/research/docs/DefiningResearchTable_Oct2017-1.pdf
2. An example can be seen at: <https://covid19.rebee.chaireunesco-es.org/>

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About the authors

Nicola J. Gray is a Senior Lecturer in Pharmacy Practice at the University of Huddersfield, UK, and an Affiliated Researcher with the UNESCO Chair "Global Health and Education" group in Clermont Ferrand, France. She is a Governing Council Member of NCD Child and chairs their Task Force on Essential Medicines and Equipment. She is a Trustee of the UK Association for Young People's Health and Vice-President (Europe) of the International Association for Adolescent Health. Nicola J. Gray is the corresponding author and can be contacted at: nicola.gray@unescochair-ghe.org

Didier Jourdan is the chair holder of the UNESCO Chair "Global Health and Education" and head of the WHO collaborating centre for "Research in Education and Health". He is a full Professor, former Dean of the Faculty of Education and Vice-President of Blaise Pascal University in France. He used to be President of the "prevention, education and health promotion" commission of the French High Council for Public Health and Director of the Health Promotion Division of the French National Public Health Agency. Personal website: <http://didier-jourdan.com/>

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