COVID-19 AND THE EDUCATIONAL RESPONSE: NEW EDUCATIONAL AND SOCIAL REALITIES

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COVID-19 AND THE EDUCATIONAL RESPONSE: NEW EDUCATIONAL AND SOCIAL REALITIES

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Assessing the Impact of the COVID-19 Pandemic on Student Wellbeing at Universities in the United Kingdom: A Conceptual Analysis

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Transitioning into the university environment can be both exciting and stressful for new and returning students alike. The pressure to perform well academically in an increasingly competitive environment, coupled with a vast array of lifestyle changes, can contribute to suboptimal wellbeing. Over recent years, uptake to wellbeing services within universities in the United Kingdom has grown given the concurrent rise in mental health difficulties reported. Higher education students now have to contend with a drastically altered learning landscape, owing to the discovery of novel coronavirus, Sars-Cov-2, otherwise referred to as COVID-19. In the United Kingdom, universities have moved to close their campuses to both students and non-essential staff in an effort to protect them from contracting the virus. The repercussions of these decisions have been monumental for the delivery of teaching, relationships and, importantly, the provision of student services. Ambiguity remains as to how teaching will be delivered for the forthcoming academic year. The uncertainty caused by the pandemic has yet to be considered in terms of student wellbeing and the new, mostly online, environments that students will be expected to navigate without their typical support networks. For the purpose of this paper, the concept of student wellbeing, a population-level term concerned with positive emotions rather than diagnosed mental health conditions, will be considered in relation to the COVID-19 outbreak. The current paper performs a conceptual analysis on student wellbeing in United Kingdom universities with a specific lens on the psychosocial impact of the global COVID-19 outbreak. Given the unprecedented world that students now learn in, considering the impact of the pandemic on psychosocial outcomes delineates the novel challenges that researchers and practitioners must consider when implementing student wellbeing initiatives moving forward.

Keywords: student wellbeing, universities, mental health, students, COVID-19

INTRODUCTION

Transitioning into the university environment represents a significant venture in an individuals' life with feelings such as excitement and, conversely, trepidation. Multiple facets converge during this life event that impact almost all elements of an individuals' life. Beyond the obvious change in academic challenge where students are expected to become more autonomous in their studies,

individuals may also relocate to another geographical location within the United Kingdom and, sometimes, internationally. This transition denotes a monumental shift in independence. For many new students, complete control over their behavioral choices becomes the norm for the first time with the potential for either positive or negative change (Mulye et al., 2009). The student solely decides all elements of their life such as diet, exercise, alcohol consumption and drug use. Previous research has illustrated how behavioral choices tend to cluster together in a student population, whether that be maladaptive or optimal behavior (El Ansari et al., 2018). For example, students who had a poor diet were found to be more likely to order takeaway food, smoke and engage in less physical activity (Sprake et al., 2018). These suboptimal choices tend to be compounded by the financial restraints felt by students upon entry, imposed by rising tuition fees and limited disposable income. Money and debt worries are described by students as being the main risk factor for exiting their degree prior to completion (Nevill and Rhodes, 2004), where financial concern can significantly impact upon social functioning (Jessop et al., 2020).The social implications of becoming a university student can be disruptive to the students' previous support networks. Moving away from pre-existing support networks that include both family and friends can be especially daunting. Forging new social connections can be exceptionally difficult for prospective students and can lead to periods of loneliness or feelings of disconnectedness. Loneliness in university students has been significantly linked to increased stress, anxiety and depression (Richardson et al., 2017). Synthesizing the above, the university experience presents multifaceted challenges to prospective students and has the potential to negatively impact upon student wellbeing. Despite this, entry levels to universities in the United Kingdom show no sign of waning. Record entry levels of 34.1% for 18 year olds into undergraduate study after year-on-year decreases (UCAS, 2020) demonstrate that many young adults still strongly consider Higher Education (HE) as a next step in their life. Adding into this already complex intersection of factors impacting upon student wellbeing, the exponential transmission of novel coronavirus COVID-19 has altered the HE landscape monumentally, from teaching delivery to campus closures. This conceptual analysis will illustrate the intricacies of student wellbeing in Higher Education, why universities interest in this concept has increased over recent years, and how COVID-19 has impacted student wellbeing through its' prodigious impact on both physical life and psychological outcomes.

Entry into HE in the United Kingdom has, historically, been limited to a privileged subsection of the general population. Higher socioeconomic status and previous university attendance within the family unit were strong predictors of entry into Higher Education owing partly to the substantial financial costs incurred across the academic journey. In the past decade, the opportunity for a wider range of individuals to embark upon an undergraduate course has grown exponentially aligning with the notion of social inclusivity (Gidley et al., 2010). The introduction of a now well-established student loan initiative, coupled with a growing economic need to acquire formal training within a specific domain (Clegg, 2017), has driven the increasing

diversity within a typical university in the United Kingdom. Individuals from various demographic backgrounds, such as those from lower socioeconomic backgrounds and mature students now have a greater chance of studying in HE. Whilst this is encouraging for the labor market in general, a range of associated issues has emerged as a result. Earlier work has established that those from lower socioeconomic backgrounds are more likely to withdraw from their studies (Smith and Naylor, 2005). University personnel now possess increasing and diverse workloads constituting a plethora of allocated tasks, such as teaching, marking and undertaking research, whilst supporting students during their academic journey has become less prevalent. Growing student numbers have impacted the personal relationships that staff and students hold, leading to a severe reduction in time devoted to pastoral support from academic staff (Heads of University Counselling Services, 1999). As support from academic staff has inevitably reduced relative to student numbers, student services assume the primary vehicle for student support. Services are typically segregated under the umbrella of student services into three main areas: counseling, wellbeing and disability services. Whilst this is the predominant framework, each university approaches student wellbeing in its' own way. Although HE has progressively expanded its' wellbeing provision, problems remain within this domain that impede both accurate measurement and positive impact on the student population. Recent calls have been made to better understand student wellbeing; synthesizing knowledge within the field is challenging owing to studies using terms such as "mental health issues," "psychological distress," and "student wellbeing" interchangeably (Barkham et al., 2019). The conflation of these terms in the academic literature serve to further complicate the collective understanding of student outcomes, with greater clarity required for the field to progress. For the purpose of this paper, the concept of student wellbeing will be addressed using a psychosocial lens.

The mechanisms of daily life changed significantly upon the discovery and subsequent exponential transmission of COVID-19. COVID-19 (or Sars-Cov-2) is a novel coronavirus initially discovered in Wuhan, China in late December 2019. Initially reported as a case of "unknown pneumonia", the escalation of worldwide response has occurred rapidly. COVID-19 can cause the infected person to experience a range of respiratory symptoms but the most commonly reported symptoms include a new continuous cough, fever and a loss of taste and/or smell (NHS, 2020). As COVID-19 has spread across the globe, the World Health Organization declared a Public Health Emergency of International Concern in January 2020 (World Health Organisation [WHO], 2020). Community transmission has led to an exponential growth in cases both nationally and internationally, bringing with it stringent new measures to curb the virus' impact. Each nation has approached the COVID-19 problem with varying degrees of zeal and a range of targeted interventions normally centered around social distancing. The most utilized approach has been quarantine or, as colloquially described in the United Kingdom, "lockdown." Whilst this has looked different in each of the devolved nations, the core element of "lockdown" has been the reduction in social interaction of

all forms, including typical working practices, shopping habits and education. Universities in the United Kingdom, and across the world, have closed their campuses to protect both their student and staff populations. Tertiary students have had to adapt to a completely novel learning experience as a result. COVID-19 poses both direct and indirect threats to student wellbeing; both as a direct contributor toward poor psychological outcomes and as the underpinning reason behind the stark reduction in social contact that students now cope with. Understanding how student wellbeing may operate during the global pandemic and post-COVID-19 is imperative to implementing new and adjusted measures to better support students in their academic journey. This paper will perform a conceptual analysis of 'student wellbeing' as it was first devised prior to COVID-19 and consider the impact of the 'new normal' on student wellbeing moving forward in the Discussion section. General research concerning wellbeing as a concept will first be considered before applying and synthesizing evidence in the tertiary student domain. One of the underlying principles of conceptual analysis is "the belief that to reach some agreement of that kind is a prerequisite for the development of useful (and/or interesting) knowledge. . ." (Furner, 2004). The impact of COVID-19 will be considered in alignment with wellbeing and how student wellbeing may be affected by the global pandemic. Scopus and Web of Science were searched for relevant papers, using a range of search terms and relevant variations such as: wellbeing, student, university, tertiary and concept. Online software was also used to identify pertinent articles within the domain[1].

THE EVOLVING FIELD OF WELLBEING

The concept of wellbeing has been extensively studied with competing arguments to its' true definition. The foundation of wellbeing discussion is embedded in the World Health Organization's (WHO) early definition that health ". . .is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' (World Health Organization [WHO], 1948). Despite early work discussing two separate approaches of the concept (hedonic (Young, 1952) and eudaimonic wellbeing (Rogers, 1961), it is now widely accepted that wellbeing is a multidimensional construct (Wills-Herrera et al., 2009). Derived in part from the eudaimonic approach to wellbeing, early seminal work by Bradburn (1969) stimulated conversation about the construct. Bradburn proposed that wellbeing was ultimately composed of both positive and negative affect. Agreement has been reached that positive and negative affect are not strictly orthogonal but rather two separate constructs that are independent of one another (Diener et al., 1995). Further research began to elucidate the underpinnings of wellbeing and 'ill-being' as two distinct constructs. 'Ill-being' was found to be driven by worry, somatic complaints and negative affect, coupled with a personal sense of low competence and external factors such as unfavorable socioeconomic factors. Wellbeing, on the other hand, was associated with personality

factors such as extraversion, optimism and an overall sense of personal competence (Headey et al., 1984).With inextricable links to the notion of wellbeing, happiness has also been explored as a core component. Resources, assessment of needs and comparison of life situation, the authors propose, all contribute toward human happiness (Shin and Johnson, 1978). Additionally, the notion of 'quality of life' was discussed in relation to happiness, whereby it is argued that true quality of life should be defined by the individual. A review of subjective wellbeing (SWB) illustrated to the author key components of the concept:

> ". . .the happy person is blessed with a positive temperament, tends to look on the bright side of things, and does not ruminate excessively about bad events, and is living in an economically developed society, has social confidants, and possesses adequate resources for making progress toward valued goals." (Diener et al., 1999, p295).

Whilst subjective wellbeing and psychological wellbeing differentiate, a common thread throughout the progression of the wellbeing literature clearly emerges: wellbeing is a multifaceted concept consisting of both internal and external contributors. An individuals' affect, attitude toward life events and general outlook on life, coupled with environmental factors, contributes toward an improved sense of wellbeing. Happiness and positive affect, as a core tenet of wellbeing, has been found to correlate with a multitude of culturally desirable successes in many core aspects of life, such as love, work and health (Lyubomirsky et al., 2005). The value of truly understanding, striving toward, and maintaining positive wellbeing is critically important to ensuring that individuals' within society thrive and flourish within their own right.

Attention in the United Kingdom has more recently focused upon the concept on a national level. Resulting from a 6-month National Debate, three domains of national wellbeing emerged: individual wellbeing (such as life satisfaction), factors that directly affect individual wellbeing (such as health, relationships, where we work and where we live) and contextual domains (such as the economy and natural environment) (Beaumont, 2011). This framework concisely captures factors of wellbeing that have been previously discussed within the academic sphere. However, it has drawn criticism for its lack of conceptual depth. The illusion that the framework creates is that each 'domain' is viewed in silo and without interaction with the others. The academic evidence to date refutes this proposition, as research has consistently demonstrated how individuals possess distinct subjective reactions to each of the domains (Cooper et al., 2011). Evidently, academic findings have yet to be effectively translated into real-world pieces that undoubtedly inform policy and practice within the United Kingdom.

The dynamic interactions that occur within an individuals' wellbeing are important to acknowledge. McNaught's (2011) definitional framework of wellbeing extends beyond the concept of individual subjectivity by including different dimensions of life. The four domains of the model are: individual wellbeing, family wellbeing, community wellbeing and societal wellbeing. It is stressed here that individuals should not be treated as passive actors who are the recipient of wellbeing from others around

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[1]www.connectedpapers.com

them. Individuals shape and mold their own wellbeing through their chosen actions and subsequent interventions. Importantly, McNaught's (2011) framework effectively pulls away from the view of wellbeing being solely related to health, but framing it within the context of one's life. The framework acknowledges that wellbeing is an existential experience subjective to the individual and not merely an operational definition that fits a multitude of personal situations, such as the definition generated by Dodge and colleagues (2012), Placa et al. (2013). The shift away from a hard and fast definition denotes an interesting take on the case of individual wellbeing, in that any number of factors can play a role in an individuals' wellbeing and that, ultimately, the individual shapes and determines their own wellbeing dependent on what matters most to them (Shin and Johnson, 1978; McNaught, 2011).

STUDENT WELLBEING: BEFORE COVID-19

The term wellbeing generally alludes to a range of factors in ones' life that contributes toward fulfillment and good physical health. It has a complex role to play as both a predictor of outcomes for students, such as their academic attainment (El Ansari and Stock, 2010) but also as an outcome in and of itself influenced by a variety of factors (Kim and Kim, 2017). An updated definition for wellbeing was generated recently, where it was defined as: '…when individuals have the psychological, social and physical resources they need to meet a particular psychological, social and/or physical challenge' (Dodge et al., 2012). As noted by GuildHE (2018), defining wellbeing within the Higher Education domain is a challenging prospect owing to the plethora of evidence available and the complexity of the concept. This echoes McNaught's (2011) proposition that wellbeing is a deeply personal, existential experience. The term student wellbeing can also be described as a population-level term encompassing positive emotion and the inner capacity for an individual to cope with the challenges of day-to-day life and their academic journey (Barkham et al., 2019). In recent years, the student wellbeing sphere has started to embrace core tenets of the positive psychology approach.

Positive psychology, as coined by Seligman (2004), denotes a paradigm shift from the previous model of mental ill health that permeated the psychological domain. Rather than an explicit focus on a deficit-based model of mental illness, positive psychology transmutes the perception that we must fix what is deemed as being 'wrong' with an individual. Instead, it posits three central pillars of wellness and wellbeing: positive emotion, positive traits and positive institutions. Emerging from this early work is the PERMA model of wellbeing (Seligman, 2011):

1. Positive emotion (P): refers to experiencing and retaining a positive outlook, focusing on life's events in a constructive manner.
2. Engagement (E): ensuring the opportunity for genuine engagement both professionally and personally with activities, adopting a state of flow and immersion in certain instances.

3. Relationships (R): possessing and nurturing a range of meaningful relationships with others and reducing the risk of isolation.
4. Meaning (M): feeling as if one is working toward something that transcends oneself, or believing in something that lends meaning to ones' life.
5. Accomplishment (A): whether in a personal or academic capacity, reaching a desired goal will lead to a sense of accomplishment and thus, contribute to a state of flourishment.

Oades et al. (2011) propose a conceptual framework for integrating PERMA concepts into the university environment, addressing areas such as curriculum, social aspects, faculty and residential domains to achieve a positive university. Similar to the early models rooted within the eudaimonic approach, the PERMA domains capture both internal and external components of ones' life reflecting the multifaceted nature of wellbeing. Recent research has demonstrated how each of the PERMA domains can be incorporated into teaching practices successfully, incorporating an innovative approach to supporting student wellbeing (Matthewman et al., 2018). Moreover, introducing a positive psychology course to students can improve the PERMA domains in turn, as compared to regular psychology students (Smith et al., 2020). The potential that the PERMA model holds in underpinning student wellbeing and subsequent services provided has yet to be fully realized given its' relative infancy within the student domain.

Pertinent within the student wellbeing literature is the role of resilience and how this contributes to elevated wellbeing. Resilience has been previously defined as:

> "…the process of effectively negotiating, adapting to, or managing significant sources of stress or trauma. Assets and resources within the individual, their life and environment facilitate this capacity for adaptation and 'bouncing back' in the face of adversity" (Windle, 2011, p163).

Being adaptable when faced with a range of challenges is largely determined by the assets and resources an individual holds, along with their life and environment. Conceptual models have been suggested specific to the role resilience has to play in the HE setting. One of note is the notion of a "coping reservoir" in medical students (Dunn et al., 2008). The authors suggest that each student possesses their own "coping reservoir" that has an internal structure, made up of the individuals' temperament, personality characteristics and preferred coping style. The "coping reservoir" is subsequently impacted by negative and positive inputs that either deplete or replenish the reservoir. This can lead to either positive or negative outcomes reflective of the students' wellbeing, such as resilience or burnout. It is noted however, that wellbeing is a lot more complex than inputs and outputs. Despite this, evidence supporting the "coping reservoir" model has illustrated its' utility (Heinen et al., 2017). Recognizing resilience as an outcome of optimal wellbeing is important to consider, as resilient individuals tend to cope with stressors more efficiently

which is particularly useful in the university environment. Further to this, elements of the 'PERMA' model of wellbeing have been found to significantly predict higher resilience (Abiola et al., 2017).

Resilience has also been discovered to be an antecedent of student wellbeing. It has been shown to have a positive relationship to subjective happiness as well as negative relationships with anxiety, depression and stress. Critical to developing resilience capability are the assets and resources that students access within the systems that they participate, such as university, home and work (Turner et al., 2017). This mirrors the ONS' domains of wellbeing fairly well, placing the individual within a particular environment that contributes toward overall wellbeing (Beaumont, 2011). The role of resilience as an antecedent and outcome of student wellbeing is important to consider and is captured loosely in Barkham et al.'s (2019) working definition, alluding to a students' inner capacity to cope. Interestingly, aside from the notion of a "coping reservoir," this has not been explicitly alluded to in more general models of wellbeing. Whilst individual wellbeing or personal characteristics frequently form the central pillar of wellbeing, it could be suggested that resilience contributes significantly to wellbeing and warrants greater acknowledgment.

Experiencing suboptimal wellbeing in any context can be challenging, but students at university often have to navigate a range of tasks and environments simultaneously with a range of onlookers, such as colleagues and academic staff. Accessing services whilst studying is normally physically easy due to services having close proximity to on-campus students, but the societal challenges that surround support are pertinent. Stigma has previously been defined as: '…a socially constructed mark of disapproval, shame or disgrace that causes significant disadvantage through the curtailment of opportunities.' (Martin, 2010). Students often feel they are unable to access services due to the fear of stigma, where 65% of students regret disclosing a mental health concern and would not advise others to do so (McClean and Andrews, 1999). The fear of stigma can ultimately prevent students from accessing services and addressing their wellbeing when they may be struggling. Not only are students reluctant to rely upon student services for support due to the social implications they perceive they will face, research has found that there is also apprehension around mental health disclosures to their social networks. Mental health disclosures on Instagram were considered not possible by college students, with stigma being cited as one of the main barriers to disclosure (Budenz et al., 2020). Self-stigma particularly has shown to lead to decreased feelings of self-respect and the "why-try" effect, coined to describe when individuals feel that their behavior is futile in achieving their personal goals (Corrigan et al., 2016a). Behavioral futility within the context of HE is extremely concerning, given the academic expectations placed upon students throughout their journey at university. Designing and implementing programs that encourage students to disclose, or make them feel more comfortable with disclosure, are posited as potential avenues to disarm stigma within the university environment (Corrigan et al., 2016b).

WHY ARE UNIVERSITIES INTERESTED?

Universities possess a unique organizational structure that incorporate a multitude of competing agendas concerning knowledge production, subsequent translation into real-world impact and financial stability. Ultimately, concentration must be placed on the university as a viable business and thus, means an increased pressure to run as a for-profit business (Taylor, 2017). The notion of "student wellbeing" therefore, has competed for resources and funding alongside other organizational factors that are often prioritized highly.

The settings-based approach to health and wellbeing encapsulates how the university setting can be critical in promoting improved student wellbeing. For students, university represents a community where they can thrive and hopefully flourish both socially and academically (Markoulakis and Kirsh, 2013). Embedding health and wellbeing promoting features within the university setting should be a priority given the unique opportunity that the environment offers to support better behavioral choices. The settings-based approach was initially derived from the World Health Organisation [WHO] (1986), where health was described as: "…created and lived by people within the settings of their everyday life; where they learn, work, play and love." Whilst the university environment in itself shares commonalities with other businesses in industry whereby it employs staff, it also possesses a range of unique roles within its' structure that generates a distinctive culture and mission (Dooris, 1999). The university environment plays a role as a "future-shaper" of students and is a platform for cultural, social and economic change, rendering it as a perfect setting to integrate health promotion (Cawood et al., 2010). The health-promoting university, otherwise known as the Healthy Universities initiative, draws upon the settings-based approach to embed health into the organizational structure of the institution and instill health into the daily operation. The Healthy Universities initiative aims to achieve key outcomes by:

- Creating healthy and sustainable learning, working and living environments for students, staff and visitors.
- Integrating health and sustainable development as multi-disciplinary cross-cutting themes in curricula, research and knowledge exchange.
- Contributing to the health, well-being and sustainability of local, regional, national and global communities (Dooris and Powell, 2012).

The Okanagan Charter (2015) has built upon the idea of health promotion infused within the university setting. By embedding health within campuses, universities serve to enhance the success of their institutions whilst promoting equity, wellbeing and social justice. Ultimately, this will strengthen communities economically, socially and ecologically. Through a recent reconceptualization, it was found that developing a supportive ethos and culture, embedding health, targeting the

entire university population, embracing challenges and building a broad understanding of health contributes to the status of being a Healthy University (Dooris et al., 2019). Similarly, students identified that a whole university ethos, coupled with access to health services, is imperative to the initiative (Holt et al., 2015). Becoming a Healthy University is intrinsically appealing owing to the clear relationship between wellbeing and academic attainment. Previous research suggests that health, health behaviors and health awareness hold relationships with key determinants of academic attainment, such as perceived importance of achieving good grades (El Ansari and Stock, 2010). The importance of promoting health within the university environment is therefore high, owing to the subsequent gains achieved resulting from improved wellbeing.

DISCUSSION

The global pandemic has shifted the student wellbeing domain considerably due in part to the extensive pragmatic changes that have been introduced to curb the spread of COVID-19. Education, across the board, has experienced drastic changes to teaching delivery. Transition into online learning has occurred rapidly and has presented a range of novel challenges both to staff and students. As noted by Burki (2020), the utilization of virtual learning may well persist until a suitable vaccine for COVID-19 has been developed. Navigating the vast array of technological platforms now being relied upon for telecommunication (such as Zoom, Skype for Business and Microsoft Teams), as well as becoming fully competent using platforms such as Moodle, also stimulates questions surrounding the pragmatic barriers that students may face when attempting to study, collaborate with peers and submit pieces of work. Computer literacy, for example, is understood to be fairly high with the student demographic (Link and Marz, 2006). Given that teaching has not been a strictly face-to-face endeavor for some time, it is assumed that students will engage with technology seamlessly and with little difficulty. However, it must be considered that a proportion of the student population will now encounter difficulties with the technology-heavy approach to learning. An individuals' sense of personal competence can contribute to suboptimal wellbeing and a perceived sense of decreased wellbeing should a student feel a loss of capability when it comes to their studies. Universities should strive to provide comprehensive support to their students in terms of navigating their new learning experience and extensive resources to underpin the transition to online learning.

Preliminary work has demonstrated that, even in simulation-based scenarios, it is possible to deliver functionally similar sessions that allow students to attain their educational objectives (Torres et al., 2020). Fully scoping the requirements for each individual session should be paramount to retaining similarity between an on-campus and online scenario, ensuring that functionality is truly aligned with the objective of each session. However, the authors do note that barriers do occur, with practical elements such as internet speed providing challenges to the learning experience. Conversely, Da Silva (2020) suggests that virtual learning could contribute to greater attendance

and participation with sessions, removing the anxiety associated with asking questions in front of course peers. This claim is corroborated by recent student surveys indicating that students value online learning for its flexibility and the ability to study at a time convenient to them (Lall and Singh, 2020). Interestingly, 10% of students surveyed described the lack of face-to-face contact as one of the main strengths of online learning. This could be linked to the idea of reduced anxiety surrounding learning in general but also highlights the importance of others in conceptual frameworks of wellbeing. The concept of others may not always refer to positive relationships held with others but the presence of social judgment, especially concerning perceived stigma relating to mental health. This is, however, counteracted by 26% of the sample disliking online learning as they are unable to meet with friends. Clearly, the transition to virtual learning and assessment comes with both advantages and disadvantages. The technological move could potentially compromise the notion of Accomplishment, one of the five tenets of Seligman's (2011) PERMA model. Each university has approached assessment differently as a result of the pandemic, deploying novel methods that many students have not experienced before such as open-book examinations. The uncertainty surrounding assessment will inevitably provoke anxiety within the student population. Coupled with this uncertainty is the anxiety of completing assessments in a completely novel fashion, where students may worry that the new forms of assessment used will not truly capture their ability, especially when compared to traditional methods. Graduation ceremonies were not exempt from cancelation, negating a significant life event that celebrates the student's achievements after years of hard work. This also calls into question the notion of Meaning stipulated in the PERMA model. Seligman (2011) posits that a state of flourishment can be attained by working for something that transcends oneself. Research has demonstrated that education and career are one of the main sources of meaning for undergraduate students (Hill et al., 2013). If students feel as if their work is not meaningful, especially given that their studies will occur in a predominantly isolated fashion, detrimental wellbeing could ensue. Ensuring that students are fully informed of new assessment protocols, as well as moving to celebrate their successes in an engaged way, could potentially mitigate the risk of suboptimal wellbeing in this instance. Institutions and, more importantly, researchers should consider the transition in a balanced fashion to truly understand the role virtual learning has on student wellbeing over the course of the COVID-19 pandemic and beyond.

The environment in which the student now resides and studies will provide unique barriers to a streamlined learning experience. Considering the drastic shift in environment that students have experienced, perhaps the biggest potential contributor to poor student wellbeing is the change in physical location. Currently, all academic content is delivered through technological means whilst campuses remain closed. The impact of this change is significant and far-reaching, deviating from the typical university experience that students have become accustomed to. A lack of physical contact with academic staff, coupled with their reduced capacity associated with the technological shift, has put students under increased pressure to meet deadlines without the typical

access to support that they would normally experience. Prior to COVID-19, students may have sought advice by physically meeting with a supervisor or module lead. Staff should, in the wake of the pandemic, consider offering virtual office hours to sustain and promote frequent engagement with students to mitigate the disruption they are experiencing to their studies (Zhai and Du, 2020). The absence of physical contact is not limited to teaching staff. Students are now faced with a prolonged period of time without their friends and course companions. Where group work and collaborative projects are now a mainstay of many university courses, the opportunity for students to work with fellow students has been reduced and become more challenging. The likelihood that students will experience more frequent and intense feelings of loneliness, anxiety and isolation is high, owing to the disconnectedness many will feel as a result of leaving the university campus (Zhai and Du, 2020). As previously stated, loneliness has been found to be significantly associated with stress, anxiety and depression in students (Richardson et al., 2017). In addition to education and career, undergraduate students consider relationships as a main contributor to meaning (Hill et al., 2013), considered integral to wellbeing according to the PERMA model. The importance of combatting feelings of loneliness should be considered owing to the highly detrimental effect this has on student wellbeing. For many, the university campus is home and moving away due to the COVID-19 pandemic represents a significant upheaval for the individual.

Wellbeing described more generally often stresses the importance of the individuals' lived environment and how this impacts upon individual wellbeing, such as the places that we work and live (Beaumont, 2011). In this instance, the place where students study, as opposed to work, has evolved considerably. The way in which the lived environment has interacted with how we experience relationships during the pandemic is important to note as access to friends and family has practically ceased due to nationwide restrictions to curb the spread of COVID-19. For some students, the ability to return to the familial home to self-isolate together has been near impossible, especially for international students. There are instances of students remaining in university halls or accommodation throughout the pandemic, living independently but without the social support networks they previously possessed as their cohabiting peers have returned home. The impact that this isolation has on student wellbeing is monumental, as the lived environment and accessibility to social support across the globe has ultimately nullified the possibility of physical contact with loved ones. Thankfully, the digital era that we now live in offers online methods of sustaining regular contact with those within our social networks. Paradoxically, early research suggested that increased engagement with the internet was to the detriment of social relationships, exacerbating feelings of loneliness and depression (Kraut et al., 1998). The use of social media specifically has been found to have both positive and negative effects on psychosocial wellbeing, identity and belonging in adolescents (Allen et al., 2014). In current circumstances where physical loneliness may be impossible to avoid, the positive elements of internet use and social media engagement should be considered. As long as social media usage is engaged with as a means to sustain existing relationships and

forge new connections, it can be a powerful tool in reducing an individuals' feelings of loneliness (Nowland et al., 2018). Whilst the lockdown measures continue to persist within the context of the pandemic, the use of social media will be key in maintaining appropriate support networks for students. In the absence of offline social activities, social media could play a crucial role in alleviating feelings of loneliness within the student population. Given the importance that social connectedness and relationships play relative to a students' wellbeing, digital solutions provide a good substitution for face-to-face interaction.

Whilst the COVID-19 pandemic has had pragmatic implications relating to campus closures and a transition to virtual learning, the virus itself creates a degree of uncertainty that is unprecedented. COVID-19, as a novel coronavirus, is being studied at a phenomenal pace with more scientific information becoming readily available with each passing day. Understanding the transmission, prevalence and symptoms of the virus is critical to keeping the virus under control but until that information becomes clearer, ambiguity surrounding the virus is high. Misinformation has been spread exponentially throughout the duration of the pandemic through a variety of mediums. Social media platforms such as WhatsApp have experienced an overwhelming level of viral messages, with one particular message purporting to contain the cure for the virus, which involved mixing garlic and boiling water (Clarke, 2020). A headline published in the BMJ in late April 2020 (Wise, 2020) is a prime example of how information can be taken out of context and contribute to elevated public anxiety and fear. The article headline stated: "A third of COVID-19 patients admitted to United Kingdom hospitals die," with a remark added when shared by the BMJ on Twitter that the fatality rate was "on par with Ebola." This information was disseminated widely in the United Kingdom press despite the Ebola claim being factually incorrect when case fatality rates (CFRs) are directly compared – Ebola's CFR is approximately 50%, whereas COVID-19's CFR is around 6.5% with significant underreporting of milder cases (Winters et al., 2020). Further to this, over 25% of COVID-19 related videos on YouTube were found to contain nonfactual information totaling over 62,000,000 cumulative views (Li et al., 2020). The infodemic that has ensued has been overwhelming for the general population and for students especially. Amongst the false information being circulated is legitimate scientific knowledge. Many news outlets are providing around the clock coverage of the pandemic and how it is affecting countries and communities across the globe. Accessing and assimilating information relating to COVID-19, whether factual or not, is incredibly easy. For students, relating this to their personal circumstances and how it impacts upon their studies can be detrimental to their wellbeing. Contextual domains are compromised where the economic and educational landscape are now unrecognizable. The unpredictability of the pandemic will undoubtedly contribute to suboptimal mental health outcomes for the general population (Zandifar and Badrfam, 2020). Tertiary students worldwide are facing unmitigated uncertainty in regard to their studies, ranging from fear of contracting the virus once campuses eventually open to the unknown quantity surrounding the completion of their

studies. A range of interventions have been posited thus far to combat the onset of poor mental health outcomes including the provision of online mental health resources, online provision of self-help and counseling services, and the deployment of online surveys to understand the prevalence of poor mental health outcomes (Rajkumar, 2020). Universities should consider their resources and provision throughout the pandemic and beyond. Not only in terms of content, but in their accessibility to students' from a variety of demographic backgrounds. The negative affect associated with the pandemic has the potential to impact on student wellbeing for the foreseeable future, therefore further research is required to understand what provision would be most suitable for the HE context. The use of newly produced psychometric measures with university students could facilitate greater understanding of the mental health impact of COVID-19, such as the Coronavirus Anxiety Scale (Lee, 2020) or the Fear of COVID-19 Scale (Ahorsu et al., 2020).

Physical access to wellbeing services offered by a university has ceased completely due to campus closures. Wellbeing and counseling provision are a critical component of student support where students can access varying degrees of support for both acute mental health issues and more chronic, long-term conditions. The absence of these services, and potentially students' lack of knowledge around online access, has the potential to compound existing issues that may have been further exacerbated throughout the pandemic. Students who experience mental health issues and access appropriate services are successful in attaining their educational goals in post-secondary education (Megivern et al., 2003), demonstrating the importance of providing support to the student population. The lack of physical access to services does present a significant barrier to the delivery of student services. Again, these services have transitioned into online consultations and sessions to ensure a continuation of care for those students who need it. The exact implications of this move, whether positive or negative, are yet to be fully realized or investigated. Examples of online interventions to better support student mental health outcomes have been previously described within the literature (Barrable et al., 2018; Farrer et al., 2020), with reference to made to the cost-effectiveness and efficiency associated with online provision. Whilst these illustrate the steps already taken prior to the pandemic to move services online, interacting with wellbeing/counseling staff in a live format, such as through Skype, had not been introduced. A recent review found a number of online interventions available for HE students, but none had included live consultations (Papadatou-Pastou et al., 2017). As the student population is often considered high risk for developing mental health issues, introducing accessible services quickly is imperative. There has been some reluctance for student support staff to provide online consultations. Staff have previously stated concerns over how authentic students would be in utilizing the service along with the legal and ethical conundrums posed by the online environment (Glasheen et al., 2013). Although these concerns will have pervaded throughout the unavoidable transition, universities are now having to become accustomed to a new way of working. The apparent barriers that caused staff concern are counterbalanced by the benefits that may be realized. As previously discussed, stigma plays a monumental role in a students' attitude toward seeking support from wellbeing services. The shift into an online environment could potentially remove the fear of being judged from peers and staff members, allowing a greater sense of anonymity not previously associated with on-site campus services.

There are limitations to this piece of work and the evidence synthesized. Mainly, research produced during the COVID-19 pandemic is sparse, varied and conducted within a plethora of different scenarios. Studies have originated primarily from Asia where the epicenter of the COVID-19 pandemic can be traced. Little research has been completed thus far within the United Kingdom specifically as Europe's peak of the pandemic arrived later than in Asia. The vast cultural differences observed, alongside the diverse set of methods deployed to explore the impact of COVID-19, means that it is difficult to extrapolate findings directly into the HE setting within the United Kingdom. Only as time passes and more research is conducted in relation to COVID-19 will more concrete conclusions be available. The long-term impact of the virus on student wellbeing, and wellbeing of the general population, is unknown.

Synthesizing the evidence to date in relation to pre-existing models of wellbeing suggests that the psychological impact of the virus will be far-reaching. Whilst students face an unknown length of time living with uncertainty regarding their studies, research teams should move quickly to understand student wellbeing in these unprecedented times and beyond. Considering the negative implications of COVID-19 is intuitive, however, small victories may emerge. The shift to virtual learning and student services could encourage greater participation now that stigma and peer judgment has been significantly reduced. The collective trauma experienced by the university community during the pandemic must not be underestimated, but the potential to rebuild stronger is now more likely than ever (Wilton, 2020). The lessons learnt during this period will undoubtedly contribute toward more online services, greater awareness of the impact of loneliness on the student experience and an increased need to diversify services to suit a variety of student demographics.

AUTHOR CONTRIBUTIONS

DB conducted the analysis and drafted the manuscript. ND and MH reviewed the manuscript and provided feedback prior to submission and formed the Ph.D. supervisory team. All authors contributed to the article and approved the submitted version.

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Facilitating a Path to New Teacher Certification Amid the COVID-19 Pandemic: Unpacking States' "Unchanged-New Flex" Guidelines

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In the United States, amid the COVID-19 pandemic, schools and testing centers were forced to close on-site locations. With teacher candidates no longer able to complete clinical teaching or take certification exams in person, states created new recommendations for facilitating a pathway to teacher certification. Specifically, 19 states provided guidelines that allowed educator preparation programs (EPPs) flexibility in how teacher candidates completed existing certification requirements. By analyzing summaries of these states' guidelines, themes of time, technology, flexibility/non-flexibility, and EPPs emerged. Using a comprehensive lens, this brief examines the role and implications of each of these themes in teacher certification during these unprecedented times.

Keywords: COVID-19, teacher education, clinical teaching, teacher certification, school closures, policy guidelines, pandemic, education

INTRODUCTION

Following the White House declaration of a national public health emergency on March 13, 2020 (U.S. President, 2020), educators across the United States scrambled to find innovative ways to complete the final months of the school year. Education programs and policies were either suspended or amended to meet the conditions of the health crisis, forcing educators to use virtual instruction and at-home delivery systems. This historic disruption impacted both K-12 and higher education, presenting unique challenges to teacher education. To address these challenges, educator preparation programs (EPPs) adopted remote systems as a means to help teacher candidates fulfill certification requirements.

Traditional teacher certification in the United States requires teacher candidates to have a college degree, education-related coursework, clinical teaching experience, and passing scores on Praxis exams (National Council on Teacher Quality, n.d.). While those completing teacher candidacy during the 2019–2020 academic year were able to continue their coursework during the pandemic, the availability of traditional clinical settings and testing centers changed. Therefore, states updated guidelines to address these two areas specifically. Thirty-three states fully or conditionally waived Praxis exam requirements for certification, with the rest either providing no guidance or no change in terms of certification exam requirements (Deans for Impact, 2020b). Additionally, many suspended traditional clinical requirements for candidates applying for certification in the spring of 2020. Nineteen states did not change on-site clinical teaching requirements for the 2019–2020 academic year (Deans for Impact, 2020b). Instead, they offered new flexibilities to support teacher candidates in meeting those requirements.

This brief synthesizes the policy guidelines these 19 states developed to maintain new teacher certification requirements during the pandemic, as summarized in the Deans for Impact COVID-19 Teacher Preparation Policy Database (2020a) listed on the Deans for Impact (2020c) page for educator preparation. In our analysis we examined the language in the embedded summaries linked to each of the states included in the Deans for Impact database. Throughout this brief, when we mention "teacher certification," we are referring to a teacher candidate's initial certification, rather than an additional certification. In this brief, we identify key themes in the guidelines, discuss major implications, and make actionable policy recommendations for sustaining quality teacher preparation in times of crisis and unpredictability.

STATES' GUIDELINES FOR MEETING EXISTING CLINICAL REQUIREMENTS: THE ROLE OF TIME, TECHNOLOGY, FLEXIBILITY/NO-FLEXIBILITY, AND EPPs

During the pandemic, states granted university-based EPPs more authority to modify their programs and determine teacher candidates' eligibility for certification (Education Commission of the United States, 2020). The Deans for Impact (2020b) teacher preparation guideline database labels the 19 states where existing on-site clinical requirements remained unchanged for 2019–2020, but teacher preparation programs were given new flexibilities to support candidates in meeting those requirements, as "Unchanged/New Flex."[1] **Figure 1** provides a map of the states that adopted these guidelines. Although this category implies a bit of an oxymoron, it also suggests that state policymakers wanted to keep their traditional standards; yet, they recognized that it would not be feasible for teacher candidates to complete on-site clinical teaching when schools were closed. In contrast, states that did not adopt unchanged, new flex guidelines instead waived clinical teaching regulations, conditionally modified clinical teaching expectations, or did not change any rules for on-site clinical teaching for the remainder of the academic year.

Time, technology, flexibility, and EPPs were recurrent themes in the clinical experience guidelines produced by the 19 states. **Supplementary Appendix Table 1** contains excerpts from the states' guideline summaries, provided in the Deans for Impact (2020b) database, which illustrate each of these themes. In the following sections, we discuss each theme and present related implications.

States in pink have adopted the new flex/unchanged guidelines. The authors used the Travelmapper mobile app (Bingkodev, 2020) to create this map.

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[1] 19 states classified as "unchanged/new flex" for the 2019–2020 academic year in Deans for Impact (2020b) database: Arizona, Arkansas, California, Colorado, District of Columbia, Idaho, Kansas, Kentucky, Louisiana, Maine, Maryland, Minnesota, Mississippi, Nebraska, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

Time

The importance of extending time limits to complete certification requirements is evident in the language used to discuss both testing and clinical experiences. In 16 of the 19 state guideline summary documents, several references were made to deferrals, extensions, and term waivers to adjust or expand time limits, typically between six months to a year. Three summary documents (Maine, Nebraska, and New Jersey) did not refer to extended time in completing certification. Instead, they described flexibility in other ways. Yet, these states maintained a flexible stance toward certification by accepting substitute qualifications as defined by "alternative experiences" or plans specifically designed for a given candidate.

Most of the guidelines explicitly mentioned time limits to open a testing window subject to the testing vendor's ability to provide at-home testing. Still, temporary certification extensions were also made to facilitate placing teacher candidates who were recommended by their universities or EPPs in a position to get hired by school districts, with the understanding that additional professional development and support might be needed during induction and their first year of teaching. Such hiring placements, however, do not appear to be made without restriction, as California's "variable term waiver," or Utah's alternate authorization for academic year one, are examples of provisional certification for an inductee during the first year of teaching.

Technology

Technology emerged as an important means for supporting teacher candidates in their on-site clinical teaching experience. In 16 of the 19 state policy summary documents, references were made to using technology to facilitate certification, teaching, and professional development. The language used to name technology as a means for continuous learning included, "remote learning," "digital platforms," "online," "virtual," "non-traditional," and "alternative experiences." Although "non-traditional" and "alternative" experiences are not synonymous with the use of technology, additional information within selected states' guidelines implied technology was used (e.g., edTPA and KPTP). edTPA and KPTP are portfolio assessments requiring teacher candidates to submit video clips and analysis of their teaching performance in lieu of taking an exit Praxis exam. Minnesota, New Jersey, and New York included the educative Teacher Performance Assessment (edTPA) (Stanford Center for Assessment, Learning and Equity, n.d.) in their guidelines; whereas Kansas mentioned its assessment tool, Kansas Performance Teaching Portfolio (KPTP), which was described in the summary as an "innovative and adaptive opportunity for candidate learning" (Kansas State Department of Education, 2020, p. 11).

Based on this example, we determined that what state guidelines intended to say, but may not have explicitly specified, is that alternative ways of teaching and learning may include many forms of technology. Policy summaries that alluded to using creative technologies in the same document with another more specific reference to web-based technology (i.e., digital or
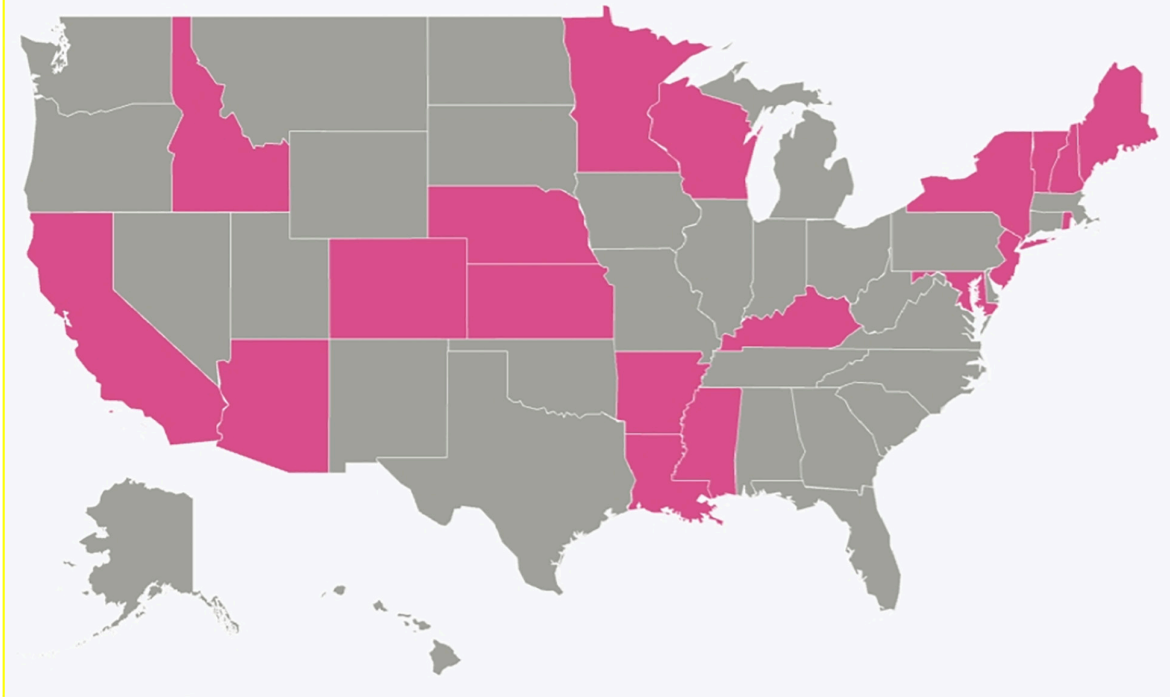
States in pink have adopted the new flex/unchanged guidelines.[2]

FIGURE 1 | Map of States that have Adopted Unchanged/New Flex Guidelines.

online), led us to interpret this language broadly, and include terminology such as "innovative," "alternative," or "creative" in the technology theme. Kansas, for example, identified their KPTP as "an innovative and adaptive opportunity," Maryland will accept a "creative initiative," California notes "atypical opportunities to connect," Kentucky mentions "non-traditional instruction," and New York uses the term "distance education" in similar contexts related to field experience. The vagueness of these non-descript phrases implies that technology is a broad category that includes many ways for teachers to experience clinical teaching and mentoring beyond video conferencing, for example.

Flexibility/No Flexibility

Flexibility emerged as a theme across the guidelines in two dichotomous, yet interrelated ways. Although Deans for Impact (2020b) created the category "Unchanged, New Flex" to illustrate states' attitudes toward clinical teaching during a health pandemic, our analysis of the language used across the summary documents reveals that some form of flexibility was implemented in other areas of certification across all 19 states. For instance, 14 of the 19 states' summaries mentioned some kind of limitation to flexibility, as indicated by the five states in our sampling that did not change their licensing requirements. California, Kentucky, Maryland, Mississippi, and New York modified their teacher license by adding provisions to accommodate first-year teachers under variable term waivers or short-term, non-renewable emergency certificates.

This contrast (flexibility vs. no flexibility) supports the idea that these 19 states chose to maintain their standard certification policies; yet, recognized the need to be flexible about how these policies were met. Their intent in offering EPPs and teacher candidates' alternatives for accomplishing the tasks required for teacher certification is communicated in various ways, but mostly in connection with adjusted timelines. The District of Columbia, for example, offered extended opportunities to find modified clinical teaching experiences. Arkansas and Colorado provided options for EPPs to evaluate candidates on a "case-by-case basis" and other states allowed candidates the opportunity to seek experiences comparable to on-site teaching and mentoring "in lieu" of the standard face-to-face classroom fieldwork. The conditional language used across the policy summaries for these 19 states further suggested that policymakers considered their certification requirements (i.e., assessment by Praxis or portfolio, mentoring, and clinical teaching) necessary and important elements of teacher preparation; yet, also recognized that the unusual and uncertain conditions created by school closures called for creative and innovative measures for accomplishing them. Flexibility is also supported by the use of conditional language (i.e., may, can, should), which implies that a guideline is suggested, or encouraged, but not enforced.

EPPs and Support

The role of EPPs is central to providing the support and flexibility called for in these state guidelines. These summaries

indicate that state education boards or teacher licensing agencies established the guidelines for testing and may determine the number of clinical teaching hours necessary to demonstrate competency in teaching. However, the language found in the summary documents indicated that EPPs and institutions of higher education (IHE) have full autonomy for fulfilling those expectations. All of the 19 states, except Maryland, identified EPPs or IHEs as the governing power in moving teacher candidates through the system. Instead of naming an EPP, Maryland specified working in partnership with "Professional Development and Partner Schools." Thus, EPPs were responsible for administering clinical teaching programs with whatever flexible decisions were necessary during the health crisis. This implies that EPPs must follow state regulations for certification; yet, have the power to modify these regulations with limited oversight in times of crisis.

We included support in this theme alongside EPPs because we noticed a close relationship between the kind of support named and the role that EPPs have in delivering services to support teacher candidates. Of the 19 states we analyzed, 11 states identified some form of support required to facilitate clinical teaching and/or training teacher candidates. In some cases, EPPs were named to support candidates through "remote options," help candidates apply for "alternative authorizations," or "help candidates meet expectations" during pre-service. However, Kentucky and Minnesota also named EPPs to work with teachers during their induction to teaching in their first year of service. Although the word "support" specifically appeared in approximately half of the summaries we reviewed, the overall themes of flexibility and time across the documents imply that teacher candidates require additional support completing certification during the unprecedented interruptions to their programs and that EPPs are instrumental to facilitating the transition to new or modified forms of training.

IMPLICATIONS OF STATES' TEACHER CERTIFICATION GUIDELINES

Based on guidelines from the 19 states that did not change their clinical requirements, but offered flexible ways to meet them, we have developed a list of implications affecting teacher candidates, new teachers, mentor teachers, administrators, and policymakers.

Path to Certification

The guidelines reviewed in this brief, given the context, have provided sufficient flexibility, thereby enabling teacher candidates to serve as teachers without delay. In this respect, these guidelines have been successful because they have, at the very least, facilitated the process and created a clear pathway to certification. The commitment to keeping standards for teacher certification in place, in spite of the challenges imposed by school closures, demonstrates a commitment to growing the body of highly qualified new teachers. Depending on the state, within 6–12 months, teachers will move from being provisionally to fully certified as they complete any remaining requirements. Enabling these new teachers to assume a standard teaching role will

undoubtedly help alleviate the current teacher shortage, which could be exacerbated amid uncertainties related to the COVID-19 pandemic (Griffith, 2020; Hunt Institute, 2020).

Our analysis of the flexibility these 19 states provided EPPs suggests that the clinical teaching experience is highly valued. To demonstrate how some states created alternative and creative methods for engaging pre-service teachers in meaningful clinical teaching experiences, we have provided examples from selected states. For instance, at the onset of the pandemic, the Kansas State Department of Education included a statement of obligation to student teachers in their Continuous Learning Task Force Guidelines, which explicitly recommended supporting the "newest members of the profession" by including them "as much as possible" in "innovative roles... through virtual meetings under the direction and supervision of the cooperating teacher" (Kansas State Department of Education, 2020, p. 10). This call for innovation and flexibility demonstrates an unwavering commitment to developing new teachers in spite of crisis conditions.

Several states allowed provisions for EPPs to evaluate the completion of clinical teaching requirements for their teacher candidates on a case-by-case basis. For example, according to the (Idaho State Board of Education, 2020) COVID-19 School Operations Guidance (2020), "students need to work with their postsecondary program providers on any remaining requirements they may need in order to meet their program requirement for this school year" (p. 2). Other states demonstrated flexibility by explicitly allowing remote or virtual opportunities to complete clinical requirements. Colorado, for example, required that "all hours must be met to achieve license" and allows EPPs the "flexibility to ensure continuity of instruction via online learning experiences, including video observation requirements" (Deans for Impact, 2020a). Likewise, the California Alliance for Inclusive Schooling (CAIS) provided teacher candidates a statewide series of "Active Education Webinars" on a variety of topics, not limited to, and including, positive behavior supports, culturally responsive teaching, evidence-based literacy practices, and differentiated instruction, to replicate face-to-face teaching experiences ordinarily developed by teaching alongside a mentor teacher (California Alliance for Inclusive Schooling [CAIS], n.d.).

Varied Teacher Certification Requirements

In allowing for flexible approaches to meeting certification requirements, states have increased EPPs' authority to interpret guidelines and act accordingly. This will certainly result in varied clinical teaching experiences. This variability is further compounded by EPPs' ability to alter requirements for each teacher candidate at their discretion. With few explicit requirements and limited accountability, this may lead to teachers with different levels of preparedness.

Clinical Teaching Gaps

Since teacher candidates were forced to use alternative means to fulfill part of their clinical teaching, some teachers may have

gaps that will need to be filled to become effective teachers and pass required certification exams. Having already completed their teacher preparation programs, EPPs will no longer be responsible for their graduates' success. Thus, the responsibility will fall largely on new teachers, teaching mentors, administrators, and other instructional support faculty.

A Trend Toward "Unchanged, New Flex" Guidelines

Currently, nearly half of US states have not yet adopted the "Unchanged, New Flex" guidelines which allow flexibility in achieving states' existing clinical teaching requirements. Instead, these states' clinical teaching guidelines remain unchanged, waived, or offer no guidance. These alternatives to "Unchanged, New Flex" have been applied as a means to allow teacher candidates to earn their certification when face-to-face clinical experiences and certification tests were not possible. While these responses have provided a solution for the time being, they may not be feasible long term or indefinitely. Over time, these responses may leave teacher candidates unprepared, and/or create teacher certification requirements which cannot be achieved. Consequently, if schools and testing centers do not open their doors quickly, more states will be forced to follow "Unchanged, New Flex" guidelines to allow teacher candidates flexibility in meeting existing teacher certification requirements. In fact, three states (Georgia, Illinois, and Texas), have already transitioned to "Unchanged, New Flex" guidelines for clinical teaching for the 2020–2021 academic year (Deans for Impact, 2020b).

RECOMMENDATIONS

States, districts, schools, and EPPs can help ensure quality teacher preparation during times of crisis or uncertainty by following the recommendations listed:

- Proactively designing quality alternative clinical teaching experiences. Although states are responsible for mandating alternative clinical experiences (Deans for Impact, 2020a), EPPs are charged with their implementation. EPPs can better prepare for such mandates by proactively developing virtual alternative teaching experiences for times in which in-person teaching is not possible (TNTP, n.d.). In doing so, EPPs should carefully consider how they can prepare teacher candidates using alternative means without compromising the quality of their clinical teaching experience. This will require, among other things, an understanding of best practices, thorough planning, and creativity. States can support the work of EPPs by creating databases to house, curate, and share best practices (TNTP, n.d.).
- Clearly defining terms and using shared language to articulate quality clinical experiences. Prior to the pandemic, the American Association of Colleges for Teacher Education (AACTE) called for the creation of a common language in teacher preparation and clinical

practice (American Association of Colleges for Teacher Education [AACTE], 2018). Given the new guidelines, states, districts, schools, and EPPs must work together to define what an "alternative" clinical experience is and looks like. Given the current language, this is clearly open to interpretation and can relate to different aspects of clinical experiences, such as guided student teaching, residency practice, and mentor coaching through digital connectivity. The use of shared language and definitions will help to reduce variability in the interpretation of the guidelines and teacher preparation quality.
- Supporting new in-service teachers. Once teacher candidates have become certified, schools and districts should quickly adopt a plan to address variability in teacher preparedness and to fill in any gaps. We should not assume teaching experiences alone will be adequate to prepare new teachers to pass certification exams and become effective teachers. Instead, an immediate and intensive approach will be needed to address teachers' areas of weakness. States can provide additional support through targeted professional development and induction programs (Deans for Impact, n.d.).

LOOKING TOWARD THE FUTURE

At the time of submission, numerous COVID-19 cases across the United States remain. While many school buildings and testing centers have reopened, we cannot predict if/when they will close again as a result of the current pandemic or due to a future disturbance. These obscure circumstances have highlighted the need for policymakers and EPPs to be prepared for any future challenges which may disrupt traditional teacher certification processes. To address these potential obstacles, the language in teacher preparation policies must allow the flexibility for teacher candidates to complete their clinical teaching and certification exams face-to-face or using alternative means, amid such disturbances. With so many unknowns, we anticipate guidelines nationwide will continue to change and will add language specifying how to meet teacher certification requirements. In turn, these guidelines may evolve into policies that will force us to reconsider how teachers are certified.

AUTHOR CONTRIBUTIONS

JR, KM, and LS conceived the presented idea. LS conducted the research and analysis. JR and LS wrote the initial manuscript. KM revised the manuscript for clarity, accuracy, and consistency. All authors discussed the results and contributed to the final manuscript.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2020.583896/full#supplementary-material

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The Phenomenon of Moving to Online/Distance Delivery as a Result of COVID-19: Exploring Initial Perceptions of Higher Education Faculty at a Rural Midwestern University

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The purpose of this study was to explore the initial perceptions and experiences of faculty whose classes were moved to an online/distance delivery as a result of the COVID-19 pandemic. Using mixed methods online survey methodology, the researchers sought to describe faculty perceptions relative to their response to moving all university courses online within the timeframe allotted by university leadership. Building upon this groups' previous research, which focused on the relationships among care and rigor in the online teaching/learning environment, the researchers designed survey questions to further explore these concepts during a time of chaos. The survey addressed faculty perceptions and lived experiences related to supporting this transition, previous experiences with online teaching, the role of rigor and care in course design and implementation, and opportunities for demonstrating care toward colleagues. Information gleaned from the study will help to inform university leadership, instructional design support personnel, and faculty. As the long-term economic, social, and academic effects are realized across the world, the researchers anticipate significant changes in higher education.

Keywords: emergency remote teaching, online learning, care, rigor, emotional intelligence

INTRODUCTION

Transitioning to teaching in an online environment can be a challenge for faculty in higher education. On Wednesday, March 11, 2020 at 6:34 PM, faculty at a mid-sized, rural Midwestern university were notified by email that face-to-face classes scheduled for Thursday, March 12th and Friday, March 13th would be canceled; all classes would resume on Monday through distance delivery. The following was communicated with faculty:

> All classes, labs, events and campus-wide meetings are canceled Thursday, March 12 and Friday, March 13. Campus will remain open. Face-to-face classes will resume in an online/distance delivery format beginning Monday, March 16 and continue through April 3. A decision concerning the rest of the semester and final exams will be made by March 30. Faculty will provide information before the first class meeting next week to let students know how course delivery will be handled (University President, personal communication, March 11, 2020).

Less than 24 h after this directive, an existing cross-disciplinary group of online scholar-practitioners invited faculty to share their initial reactions through an institutional review board (IRB) approved survey. The purpose of this study was to explore the initial perceptions and experiences of faculty whose classes were moved to an online/distance delivery as a result of the COVID-19 pandemic.

Building upon this groups' previous research, which focused on the relationships among care and rigor in the online teaching/learning environment, the researchers designed survey questions to further explore these concepts during a time of chaos (VandenAvond et al., 2020). The survey addressed faculty (n = 83) perceptions and lived experiences related to supporting this transition, previous experiences with online teaching, the role of rigor and care in course design and implementation, and opportunities for demonstrating care toward colleagues. Information gleaned from the study documents faculty perceptions of lived experiences during a global pandemic (World Health Organization [WHO], 2020). Findings will inform university leadership, instructional design support personnel, and faculty by providing a snapshot of participants' immediate responses within the first moments of the phenomenon. This study, therefore, serves as a potential foundational data point for responding to the long-term academic, social, and economic effects of this phenomenon and contributes to the larger conversation relative to the heretofore unknown impacts to higher education as they are realized across the world.

BACKGROUND

Institutional Context

Online courses and programs have increased with widespread internet availability. In our Midwestern, United States, primarily rural region, the university has pioneered an educational access network (EAN) and established LTE towers to provide educational internet access. The university simultaneously initiated their Global Campus programs to recruit students beyond commuting distance or who otherwise may not be able to or prefer not to attend on campus (Board of Trustees, Northern Michigan University, 2018).

In 2017, the Higher Learning Commission charged the university with establishing distance learning criteria and expectations for teaching, including evaluation of online courses, ensuring consistency of online course rigor, and maintaining consistency between online and on campus sections of the same course. Following this charge, the university adopted Quality Matters as the standard for quality assurance for online design and delivery. A team of university leaders, staff, and faculty worked to create a novel, voluntary training for faculty, beginning in 2017, and developed a long-term plan for defining and gradually increasing the criteria for demonstrating rigor as defined by Quality Matters course design principles (QM Higher Education Rubric, Sixth Edition).

Despite these ongoing university-wide efforts to implement standards relative to quality online design and delivery, the global pandemic necessitated the need for immediate emergency remote teaching (Hodges et al., 2020; O'Keefe et al., 2020). Thus the vast majority of faculty were unprepared to move to a distance delivery model at the time of this crisis, as exemplified by only 15% of faculty (n = 80) having participated in at least the first Quality Matters Online Teaching Fellowship Program facilitated by this university.

Research Group

As an existing long-time research group, the cross-disciplinary self-study of online teaching practices team of researchers, sought to support and challenge those who were teaching or preparing to teach online courses. The self-study inquiry group aimed to create a community of cross-disciplinary online instructors who both systematically studied their own online teaching in a supportive community while also collaborating, sharing ideas, and producing scholarship of teaching (Boyer, 1990) that could be shared with others. Our research group brought together seven faculty from the disciplines of literacy education, educational leadership, special education, nursing, developmental psychology, and behavior analysis. This group included faculty with varying levels of experience as online educators and researchers. The cross-disciplinary perspectives informed and influenced the construction of the survey and the framework from which data analysis occurred.

The morning after being notified of the transition to online/distance delivery, the research team met for a previously scheduled meeting. While working to support each other through what felt like a chaotic transition, the idea emerged that this could be an opportunity to research the phenomenon of moving to distance instruction during a global pandemic. Despite the uncertainty of the moment, the group embraced the momentum of this idea. Working together, a survey and a research proposal were constructed. Due to the institution's efficient institutional review board process, this proposal was approved through administrative review within two h of submission.

LITERATURE REVIEW

Defining Emergency Remote Teaching and Online Learning

Throughout higher education, there is concern about the inconsistent quality of online course design and course implementation. This concern aligns with Meyer (2002) argument that a widespread perception exists that the quality of online courses does not live up to the quality of on campus courses. The perception of lack of quality in online learning persists even after countless studies substantiated findings that there is no significant difference in the learning outcomes between online and face to face courses (e.g., Russell, 1999; Arbaugh, 2002; Finkelstein et al., 2005; Cavanaugh and Jacquemin, 2015; Driscoll et al., 2012). However, the hurried move to online learning in response to COVID-19 created a situation characterized by industry leaders as "emergency

remote teaching" rather than online learning (O'Keefe et al., 2020). It is important to note that there is a difference between online teaching and emergency remote teaching. Emergency remote teaching is a change in instructional delivery due to crisis circumstances, instructors may triage what is important to keep and what can be altered or eliminated (Brooks et al., 2020). Under this model, the purpose is to create temporary access to instructional opportunities rather than develop a robust online learning class (O'Keefe et al., 2020). Course development in the traditional online classroom is an intense and lengthy process and generally involves teachers and learners who have intentionally chosen this method of learning. With emergency remote teaching, time is not provided for thorough planning and teachers and learners may not be accepting of the abrupt changes to their learning environment. Bozkurt and Sharma (2020) explain that in the circumstances surrounding a pandemic, "emergency remote teaching is not an option, but an obligation (p. iii)." Thus, the classroom experience may differ significantly from the typical online learning experience.

Faculty Readiness and Responses to Emergency Remote Learning

Preparing a course to teach online takes a significant amount of time (Welker and Berardino, 2005; Davidson-Strivers, 2009; Hodges et al., 2020) and backward design planning (Wiggins and McTighe, 2012; O'Keefe et al., 2020; Wentworth Institute of Technology, n.d.). Taking the time to prepare an organized course with alignment among course objectives, content and activities involves aspects of both care and rigor (VandenAvond et al., 2020). The communication of care and rigor is possible and important in both emergency and prepared online course delivery. This study addresses care and rigor in the context of emergency remote learning due to a sudden university closure during a global pandemic.

Care

The ethics of care require an examination of stories and relationships in their context because doing so intensifies relationships thus resulting in potential new solutions to obstacles that might not have otherwise existed (Gilligan, 1982; Banks, 2004). In the context of nursing, the care dialogue approach requires that ethical issues be handled as a complex, inductive, and social process (Schuchter and Heller, 2018). Specific to the education setting, Deacon (2012) argued that "creating a context of care in a classroom creates a robust environment for student learning; it facilitates better dialogue between students and teachers and allows teachers to draw out individual students and help them achieve their potential" (p. 6).

Understanding the role of care in the classroom is helpful in both theoretical and practical ways. Specifically, care in the online classroom is demonstrated most clearly through personal attention to students: responding to emotional tones, accommodating individual differences, responding to student inquiries, checking and responding to emails, and promptly interacting with students (Dennen et al., 2007; VandenAvond et al., 2020). Because care has been found to facilitate student

learning (Deacon, 2012; Rose and Adams, 2014; VandenAvond et al., 2020), educators can include these interactions to foster care, and ultimately facilitate student success, in their online classrooms.

Rigor

A single shared scholarly definition of "rigor" appears to be lacking in the literature (VandenAvond et al., 2020). Rigor may be based on academic demands (Wyatt, 2005), time and energy expended (Winston et al., 1994), cognitive expectations (Braxton, 1993), or the amount of critical thinking required (Taylor and Rendon, 1991). Graham and Essex (2001) found that the same methods faculty used to ensure academic rigor in on-campus courses applied to online courses, with the caveat that clearer expectations and directions were required for the online course. Wyse and Soneral (2018) noted differences in student perceptions of rigor based on their academic classification: introductory students defined rigor based on workload, whereas upper class students defined rigor based on cognitive demand.

The existing literature also suggests that faculty and students have different perceptions of rigor in university courses. Wyatt (2005) quantitatively found that students perceived online courses to be more academically demanding than traditional courses. In follow-up interviews, Wyatt (2005) noticed that students suggested their online courses were intentionally requiring more work in order to defray criticism that online courses are not as rigorous as traditional courses. While not specific to online courses, Draeger et al. (2013) identified the various ways that faculty and students identified elements of rigor. Faculty defined rigor as being characterized by higher-order thinking, appropriate expectations, active learning, and meaningful content (Draeger et al., 2013). Some faculty feel rigor is the "fine line between challenging and frustrating a student" (K-12 Teachers Alliance, 2014). In contrast, students define rigor as being characterized by level of difficulty, grading standards, workload, perceived relevance to future goals, and level of interest.

THEORETICAL FRAMEWORK

Narrative Research

Narrative research studies how humans experience the world both as individuals and as a collective group (Connelly and Clandinin, 1990; Gudmundsdottir, 2001). Narrative research is characterized by three basic underpinnings. First, humans use narrative to document and understand their experiences. Second, these stories are rooted in the experiences, values, and contexts of the individual. Finally, narratives are multivoiced as the individual is connected to their social context. Vygotsky (1978) explains this as "an interaction between intermental and intramental processes. The notion of intermental processes refers to the social plane, and the notion of intramental processes refers to the inner psychological plane" (Moen, 2006, p. 60) As narrative researchers, we sought to collect the lived experiences from faculty in one specific moment in time and within one social context.

Narrative inquiry in educational research focuses on educational experience (Clandinin and Connelly, 2000; Clandinin, 2006). To study narrative is to study "the ways humans experience the world" (Elbaz, 1991, p. 2). People frequently recall experiences in terms of specific, narrative events, and people often recall past events as they adapt or apply strategies to new situations (Webster and Mertova, 2007). As researchers with a longitudinal interest in faculty teaching experiences in the online learning environment, we sought to understand this shared event of moving courses online from the perspectives of faculty.

Building from this narrative research perspective, we situated our study in transactional and adult learning theories as a way of representing our cross-disciplinary perspectives from education, nursing, and psychology. Epistemologically, transactional theory recognizes dynamic, ecological relationships between knower and their environments, both in what they know and how they communicate knowledge (Dewey and Bentley, 1949). This framework supported faculty researchers being active meaning-makers in a collaborative, scholarly community who could improve teaching practices, student learning, and contribute to the larger academic landscape, specifically, the university's shifting culture and expectations for online teaching.

Andragogy

Andragogy, generally defined as the scholarly approach to the learning of adults, was originally coined by Alexander Kapp in 1833 and later developed into a theory of adult education by Malcolm Knowles (Knowles et al., 1998). Andragogy includes five guiding principles: (1) self-concept – an adult learner views him/herself as a self-directed human; (2) adult learner experience – an adult learner accumulates experiences which becomes a resource for future learning; (3) readiness to learn – an adult learner's readiness to learn is oriented toward the development of skills related to social roles; (4) orientation to learning – an adult learner seeks knowledge for immediate application to a problem-centered issue; and (5) motivation to learn – an adult learner is intrinsically motivated (Knowles et al., 2005). Andragogy informed researchers' perceptions and interpretation of data; faculty participants were considered adult learners who also could communicate perceptions of their learning experiences as they responded to the mandate to move classes online.

Transactional Perspectives

Transactional theory suggests that learning occurs when people consider, discuss, and inquire into problems and issues of significance to them (Dewey and Bentley, 1949; Rosenblatt, 1978/1994, 2005). Individuals not only interact but also exist in a state of transaction with their environments (including their own knowledge and experiences), sources of knowledge beyond the self, and others. According to Rosenblatt (1978/1994), as individuals read texts, they both simultaneously form the meaning of texts through their interpretations and are changed by the texts. Learning occurs both from within the learner and from shared interpretations that expand the reader's questions and insights. Building from prior research (e.g., Edge, 2011;

Cameron-Standerford et al., 2013; Bergh et al., 2018; Edge and Olan, 2020), the research team viewed teaching and learning experiences, teaching practices, and teaching contexts as text-like objects. Inquiring into participants' perceptions of their experiences, can provide insights into faculty meaning-making in the context of a university event and in the broader context of a global pandemic.

MATERIALS AND METHODS

The purpose of this explanatory mixed methods study was to explore the initial perceptions and lived experiences of faculty whose classes were moved to an online/distance delivery as a result of the COVID-19 pandemic (World Health Organization [WHO], 2020). An explanatory mixed methods design is often used to explore a phenomenon (Creswell et al., 2003). IRB approval was obtained within a few h of the creation of the research proposal through an administrative review process from the mid-western United States public university where the study took place. Faculty perceptions were gathered through online survey methodology using Google Forms.

Constructing a survey instrument is an art (Synodinos, 2003). We sought to engage as many participants as possible by purposefully constructing a non-traditional survey. For example, one of the first questions on the survey asked faculty to identify their emotional response to moving classes remotely by choosing clipart representing an emotion based on the characters from the popular Disney Pixar children's movie, *Inside Out* (Docter, 2015). The survey also requested demographic information, previous experience teaching online, and competence with the learning management system. Additional open ended items addressed the concepts of care and rigor, which were of particular interest to ongoing campus developments and to the researchers' previous studies. Questions asked how faculty would communicate care and rigor to students, and how faculty might use this time of chaos to communicate care.

A convenience sample of faculty was obtained through the email listserv of the American Association of University Professors at a Midwestern United States public university. Through the email, potential participants were provided with a brief introduction to the study and asked to follow the survey link if they consented to participation. Data collection was conducted in March of 2020.

A descriptive approach was used to analyze quantitative data. Demographic data included items related to position, rank, and online teaching experience. Participants were also asked to share their emotional response to the transition to online emergency remote learning through a categorical item listing an array of potential emotional responses.

Researchers utilized phenomenological methods (Moustakas, 1994; Giorgi, 2009; Creswell, 2013) for analyzing qualitative data. Together, we read through the data to get a sense of the whole (Giorgi, 2009). In our Zoom meetings, we took turns verbally noting significant statements and key words participants used to communicate their lived experiences and making notes in a Google document. Our aim during this early phase was to gather

FIGURE 1 | Perceived faculty competence in using the Moodle based learning management system.
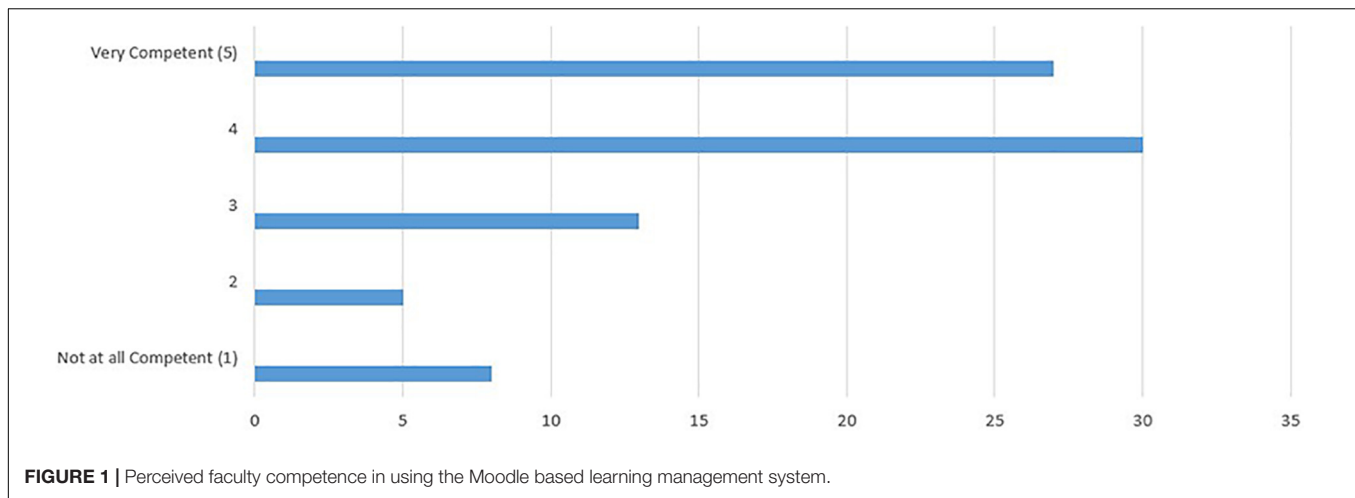
an initial understanding of the essence of faculty experiences, as expressed by participants, finding themes among participants to determine meaning units (Giorgi, 2009).

For each open-ended question, we developed textural descriptions of what participants explained happened. Next, we analyzed how participants described their experiences. Finally, we incorporated participant descriptions into essence statements. Below, we provide an essence statement for each open-ended question followed by an overall essence statement to describe the phenomenon of faculty perceptions and experiences having their courses moved online for emergency remote teaching during the initial impacts of COVID-19.

RESULTS

Quantitative Findings

Eighty-three faculty responded, 65% of whom were tenured full-time faculty members. The participants were distributed among the differing ranks with 34% (n = 28) Full Professors, 18% (n = 15) Associate Professors, 22% (n = 18) Assistant Professors, and 26% (n = 22) Instructors. Sixty-eight percent of respondents had not previously taught online.

Participants were asked "At this moment, which of the following images (Joy, Fear, Anger, Disgust, Surprise, and Sadness from the characters in the movie, *Inside Out* or the option to indicate Other) best communicates how you are feeling about moving your face-to-face coursework online?" The top three responses included surprise (29.3%, n = 24), joy (12.2%, n = 10), and sadness (9.8%, n = 8).

Faculty competence in using the online Moodle based learning management system was of particular interest. A Likert scale question asked participants to rank their competence on a scale of one through five where 1 = not at all competent and 5 = very competent was utilized. The mean level of competence was 3.76 with the majority of participants (68.6%, n = 57) ranking their competence highly (4 or 5 on Likert scale). Of note, a small portion of faculty (15.7%, n = 13) reported a very low level of

competence (1 or 2 on Likert scale) in regards to the learning management system. Faculty competence is outlined in **Figure 1**.

Qualitative Findings

List 10 Words

The survey posed a question to faculty in which they were asked to list ten words to describe the experience of moving their class to an online platform as a result of COVID-19. A content analysis resulted in 237 novel words/short phrases from participants (n = 78; see **Figures 2**, **3** for the most frequent words identified). Of these, 173 had an occurrence of one. Of the words most commonly indicated, *challenging* was reported 15 times while an iteration of *concern* was documented across 14 instances. *Anxious* was listed 10 times, and interestingly the opposing terms *stressful* and *relieved* were provided eight times. Initial *overwhelmed* as well as *hopeful* were described seven times. Frequency counts for repeated words were placed into a Word Cloud generator.

Faculty responses were constructed into a Word Cloud to illustrate key words across participants' responses. In a narrative framework, repetition emphasizes and can signal patterns and relationships between, as well as divergences between, individual participant's perceptions of their experiences (Bletzer, 2015). Word clouds have been used in survey research to communicate the relationship between mathematical proportions and a holistic perception (Ahearn, 2014; Bletzer, 2015). Participants' lived experiences were communicated in words, quantified by the researchers, and then qualitatively displayed as a means of representing the essence of the phenomenon (Giorgi, 2009).

Addressing Rigor

Participants were asked how they would maintain rigor during the transition from a face-to-face format to an online method of delivery. Participants, perceptions (n = 78) varied between certainty, uncertainty, frustration, and outright anger related to demonstrating course rigor when moving courses online. This question demonstrated the spread of emotions that participants were experiencing.

Those who communicated confidence and or hope addressed what they would do in terms of specific actions they were

FIGURE 2 | Top 10 novel words.

FIGURE 3 | Word cloud of most frequently used words across participants.
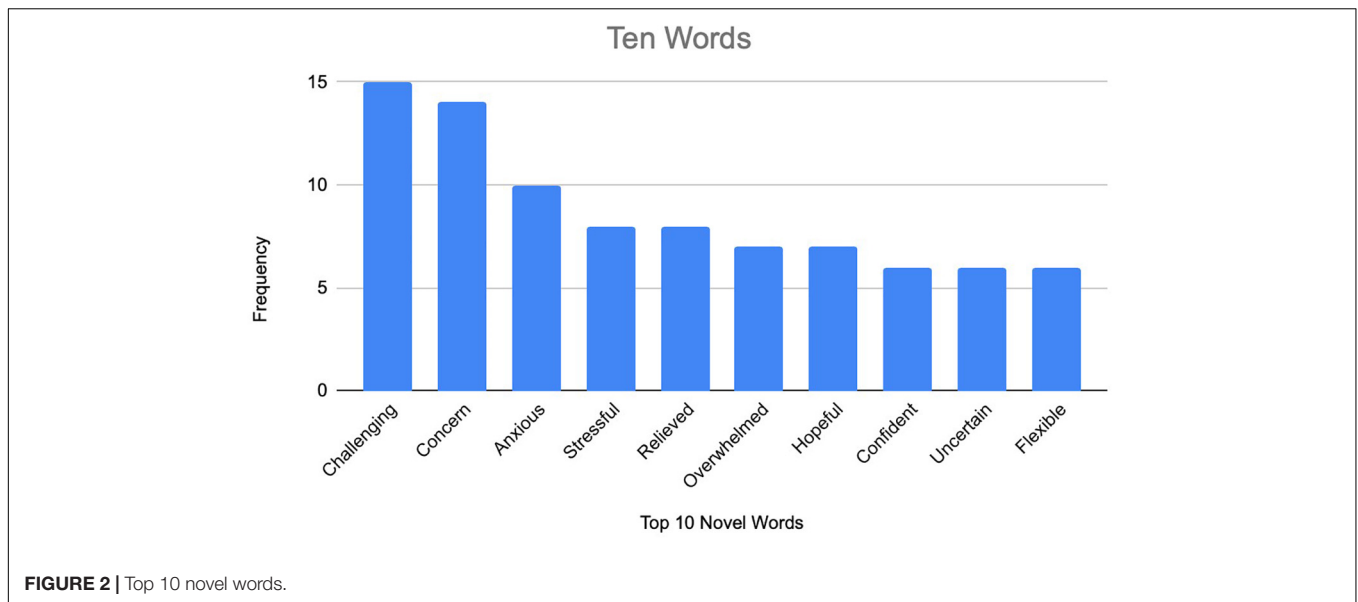
making or planned to make. These perceptions were expressed in relation to course design elements such as course objectives, assignments, clear communication, assessment, interaction, and communicating expectations. Additionally, some faculty members identified the need for possible modifications as they prepared for moving courses online. For example, altering exam/test delivery; increasing the amount of writing assignments; encouraging student-student interaction; and requiring or encouraging attendance during synchronous classes. Some faculty members indicated through their responses the need to maintain the *status quo* by maintaining already established

course objectives. Several faculty shared that rigor was not a priority concern during the time of transition. Three faculty members commented that asking about rigor at such a time was insensitive. For example, one response stated: "I am shocked by the insensitivity of this question, given that we have 4 days to prepare. How will the university demonstrate its rigor in helping faculty during this transition?"

One faculty member indicated that this was a time where prioritizing care over rigor was important and stated, "I care more about helping people feel comfortable during this time of crisis over the "rigor" of my class. It's disproportionate thinking to even

be worried about rigor now when we're on the cusp of a difficult world wide crisis".

Responses also communicated that expectations of quality teaching could be lowered with this transition to distance learning. One participant stated, "In times of crises we need to accept less-than-perfect teaching experiences. The sooner we accept that, the more we can help each other". Of note, many faculty stated they did not want to overwhelm the students and make things harder just because we were transitioning to the online environment.

Chaos as Opportunity to Demonstrate Care

Participants were asked to frame their experience of responding to chaos – the mandatory movement of all face-to-face courses to online – through the lens of opportunity to demonstrate care by responding to the question: What steps have or will you take to ensure your students feel cared for during this transition to online learning? Results from 67 open-ended responses from faculty fell into two broad categories: internal states of being and external actions taken.

Internal states of being

Faculty reported the following internal states of being: being available; choosing to help and/or to act; being appreciative; being confident; being empathetic; being willing; being thoughtful; being positive; showing solidarity; being unsure; being patient; being collaborative; being aware of what most matters; being connected with others; being content yet realistic; being open; being adaptive; being an example. The following direct quotes reflect examples of this finding: "We are all in this together. Given the short timeline, we can just reassure each other that our best efforts have to suffice."

External actions

Faculty reported the following external actions taken: helping others, specific mention of a desire to support younger or less experienced faculty members; reaching out to others; assisting others with setting up online courses, identifying how to access resources for support; sharing ideas about technology and online resources; assuring students and colleagues; saying and hearing messages of encouragement; communicating with students, faculty; leading. The following quote reflects an example of this finding.

I've also passed on my willingness to have a few minor "bloopers" in front of my students (in which I adapt and remind students that new software presents a steep learning curve to everyone) in the midst of what will be an imperfect semester for everyone.

Is There Anything Else to Communicate?

The final extended answer question provided participants the opportunity to share any additional thoughts by responding to the question, *Is there anything else you would like to communicate about your lived experience of classes moving to an online/distance delivery as a result of the COVID-19 pandemic?* Although the responses were diverse and delved into multiple areas of concern, three prominent themes emerged. These themes included: Words of Encouragement, Concern about Time Allotted to Transition,

and Concern about the Learning Management System and Technology Support.

Words of encouragement

The most common response to this question related to the theme of words of encouragement. Considering the unique nature of the phenomenon, respondents used the final survey question to recognize the ability and strength of the faculty to get through the move to online/distance delivery by drawing on characteristics of the faculty collectively, the cohesive community, and the support/strength evident with both groups. Feelings of being part of a collective where they could lean on each other and unite together was evident. One example comment was:

This is a time for Wildcats to step-up and show what it means to live in the U.P. We are resilient compassionate people who have always focused on community. Now it is our time to work together to get our students through the next 6 weeks! They are our concern!

Faculty recognized that although there was a challenge set before them, they possessed the wherewithal to persevere. This would be done while striving to maintain the academic rigor of their courses while showing care for their students who were also incurring a major shift in their college experience.

DISCUSSION

Discussion of Findings

Participants in this study included faculty of all academic ranks from one mid-sized Midwestern institution of higher education. This well-distributed sample lends to the generalization of findings to other universities of similar size who experienced an abrupt move to emergency remote learning. Of this faculty group, 15.7% ($n = 13$) reported a very low level of competence with the Moodle-based online learning management system used at the university. In contrast, approximately 15% of faculty ($n = 80$) employed at this institution of higher education previously participated in at least one Quality Matters Online Teaching Fellowship Program facilitated by this university. The varying degree of expertise among faculty with necessary technology used in online/remote delivery likely impacted faculty's emotional responses to this chaotic situation and to their ability to understand how to deliver a caring yet rigorous course. When viewed from the perspective of faculty being adult learners, readiness to use technology and course management systems is an important factor for continued research and professional development.

As mentioned earlier in this paper, a single shared scholarly definition of "rigor" appears to be lacking in the literature (VandenAvond et al., 2020). Responses to items regarding rigor highlighted the lack of a consistent understanding of this concept among faculty participants. Many faculty responses communicated a clear plan to maintain strategies aimed at creating rigor in face-to-face courses or to alter assignments slightly to involve more writing. These responses closely align with the idea that rigor relates to a focus on cognitive demand rather than on increasing the workload for students (Wyse and

Soneral, 2018). On the other hand, some responses indicated that maintaining rigor was no longer a priority concern and that asking a question about rigor may actually be insensitive at such a time. It is likely that differing responses from these faculty participants were related to a difference in their underlying thoughts on what rigor involves. Perhaps, this subset of faculty defines rigor more similarly to introductory students in that it relates most closely to the amount of workload within a course (Wyse and Soneral, 2018).

Overwhelmingly, elements of care were communicated throughout participant responses. Faculty shared how important they felt it was to care for students during this time and many faculty offered *caring* assistance to less experienced colleagues immediately after the announcement of the transition to emergency remote delivery. At times, faculty who communicated frustration or anger in their responses, mentioned they were seeking care during this time from both administration and colleagues.

The ability to navigate the unexpected and unknown is a challenge the world is collectively facing during COVID-19. Our research described the experiences related to the specific phenomenon of faculty being mandated to move face-to-face classes to the online environment. This change was unexpected and required faculty to quickly respond resulting in a multitude of emotions due to the pace of the change (Weberg, 2019).

Connections to Recently Published Literature

A number of authors have quickly published articles related to emergency remote teaching during a pandemic (Bozkurt and Sharma, 2020; Gares et al., 2020; Jeffery and Bauer, 2020; Osmond, 2020; Petillion and McNeil, 2020). Several key themes related to the challenges of emergency remote teaching are apparent in the literature and relate closely to the concepts in this paper.

Meaningful interaction among students, between faculty and students, and between students and course content impacts learning outcomes in all classrooms (Osmond, 2020). With emergency remote teaching, faculty were expected to revise courses very quickly and were allotted very little time to consider the development of teaching/learning activities that encourage all types of interaction. Individual faculty members' previous knowledge of such teaching/learning practices likely impacted their ability to create content that deliberately encouraged all forms of interaction under such urgent circumstances.

Relationships among students and faculty were vulnerable during this unexpected change. Gares et al. (2020) described an institution of higher education where faculty/student relationships were of high priority and noted the benefit of having already formed relationships with students before the campus was closed. As many institutions of higher education continue to utilize remote teaching months into the pandemic, students are faced with engaging in experiences where they have not had the opportunity to first develop relationships with faculty. The outcomes of these ongoing remote learning experiences may differ from those where face-to-face teaching allowed the development of faculty/student relationships prior to moving to a remote method of delivery.

Many schools implemented academic accommodations (Gares et al., 2020; Osmond, 2020) such as offering a credit/no credit grading option rather than using letter grades. This action is a positive step toward demonstrating empathy regarding the student experience and in turn communicating care. Other actions documented in published literature which communicate care during this time include; flexible deadlines, frequent faculty check ins with students, and opportunities for students to have open discussions with faculty (Gares et al., 2020). The impact of such academic accommodations on the sense of rigor in the classroom has been a concern for some faculty (Osmond, 2020).

Future Research

Future research should endeavor to determine methods for universities to establish methods of care for both faculty and students who are experiencing the stress of crises, such as a global pandemic. There are several therapeutic approaches that have shown success within the area of employee stress and burnout as well as student success that might offer guidance in this area. For example, Stress Management Interventions (SMIs) are typically found within Health Promotion Programs that strive to increase health and wellness of staff (HPPs; Ivancevich et al., 1990). Such interventions generally attempt to reduce effects of stressors as well as the negative psychological and physiological outcomes correlated to stress (see van der Klink et al., 2001).

Faculty responses to the move to emergency remote teaching varied greatly. The research team inferred that an individual's emotional intelligence may have impacted their response to the pandemic. Emotional intelligence describes the "capacity, skill, or self-perceived ability to identify, assess, and manage the emotions of one's self, of others, and of groups" (Serrat, 2017, p. 330). As a behavioral model, emotional intelligence includes five domains that work together to create personal and social competencies. These five domains include: self-awareness, self-regulation, self-motivation, social awareness, and social skills. Relative to Adult Learning Theory (Knowles et al., 2005) and survey results, those with strong self-regulation, self-motivation, and social awareness skills appear to have been better equipped to manage times of chaos. Specifically, competence in the domain of self-regulation can be described as self-control during times of pressure and the ability to adapt to rapid change while seeking innovative solutions. In tandem, those who demonstrate competencies in self-motivation seek to achieve by reducing uncertainty through information gathering, committing to the mission of the larger group, demonstrating initiative, and displaying optimism despite obstacles, setbacks, and fear of the unknown. Findings from this study indicated those whose responses demonstrated strong social awareness skills were also able to respond to others with empathy, seek ways to be service oriented, develop capacity in others, and leverage diversity (Serrat, 2017).

Participants in this study communicated concerns related to faculty and student stress, uncertainty, anxiety, and general mental and emotional health. As an approach to supporting mental health, Mindfulness-Based Interventions

have demonstrated success in areas related to stress, anxiety, and general mental health (Gu et al., 2015), in addition to reducing psychological distress and improvements in attention and working memory (Jha et al., 2010; Redick and Engle, 2006). Although mindfulness has origins in Buddhism, modern techniques do not necessarily have a religious affiliation (Keng et al., 2011), which allows for the opportunity of a large array of populations to benefit from the processes utilized by mindfulness-based approaches. Training that places emphasis on mindfulness tends to seek to increase the individual's ability to attend to stimuli in the present environment in a non-judgmental manner (Brown and Ryan, 2003). Mindfulness-Based Interventions or professional development may be particularly beneficial when managing significant situations, such as COVID-19. By developing the ability to notice stress as it arises in a non-judgmental way, individual faculty and students may be better equipped to direct their attention to the present moment rather than perseverating on the stressor at hand. Mindfulness-Based Interventions in higher education contexts offers a clear potential direction for researchers to determine a course of action in an attempt to reduce the stress associated with significant changes in the *status quo* not only for faculty, but for the students served by the universities who are navigating the crisis. Viewed ecologically from a transactional paradigm, there is a need to better understand, support, and care for how individuals experience teaching and learning in university and broader higher educational contexts.

This study was not without limitations. In an effort to capture faculty perceptions in the midst of the transition, survey development was completed in just a few hours. In reviewing the results, the research team realized that additional survey items may have provided further understanding. For example, although the researchers were able to discover how many faculty at the university had completed the institution's *Online Teaching Fellows* program, the survey in this study did not ask participants about the completion of this program. It is unknown what portion of the participants took part in this program. The methodology of this study involved survey research which in itself comes with some limitations as it addresses perceptions of participants.

CONCLUSION

Findings of this study contribute timely information regarding initial faculty perspectives when forced to move coursework to a model of emergency remote learning. Faculty participants had varying levels of experience with online course delivery and communicated a range of emotions related to this abrupt change. The world of higher education has experienced drastic changes as a result of the COVID-19 pandemic and results of this study can be utilized to inform university leadership, instructional design support personnel, and faculty as they navigate this new version of the university experience.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Institutional Review Board, Northern Michigan University. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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Teachers' Emotion and Identity Work During a Pandemic

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This piece is a conceptual analysis of the care involved on the part of teachers during the COVID-19 era and the relationship it has to teachers' identities. Using the authors' stories, we address how fatiguing care is on a normal day, not to mention what is involved during the COVID era. This care, and the emotions involved, is closely tied to teachers' identities, calling into question how teachers conceptualize their teacherhood during a pandemic. Our hope is that others will consider where they may have misunderstood teachers' work. We aim to raise awareness of the complexity of teaching and suggest how teacher education can address and support teachers' needs.

Keywords: relationships, care, identity, teacher education, emotion

"March 2020 will forever be known in the education community as the month when almost all the world's schools shut their doors" (Winthrop, 2020, para. 1). In response to the COVID-19 school closings, teachers all over were required to shift gears immediately to respond to students' and families' needs with synchronous and asynchronous virtual instruction. Teachers literally responded overnight to teach in new modalities. They have filmed themselves conducting experiments, hosted Zoom show-and-tell with Kindergarteners, prepared materials for students with variable Internet access, and even demonstrated concepts outside students' screen doors. There is no question that teachers of all grade levels, content areas, and in all sectors of education (i.e., public or private) are capable of incredible things. They have truly risen to this occasion.

Some teachers reported being busier than they were before the school buildings closed, as they were expected to be present and available, with office hours during lunch, and student groups arriving and leaving throughout the day. All of this took place while trying to simultaneously instruct their own children who were home (Strauss, 2020). Still others described attempts to track down the students they stopped hearing from (Sawchuck and Samuels, 2020). Understandably, teachers had significant concerns about these students. Schools can provide a predictable routine and a safe space for students, and when that goes away, "I'm calling and emailing them constantly," said a teacher in New York. "Maybe their parents are sick, undocumented or out of work. Some might not have a Chromebook or internet. They are literally MIA and may never come back" (Willen, 2020, para. 2).

Over the last several months, the COVID-19 pandemic has caused the nation's teachers to enter into a shocking, and at many times painful, natural experiment. Despite a slow march of policies and cultural practices that have chipped away at the professional status of teachers (Milner, 2013) and the resources they need to do their jobs, the sudden closure of the nation's schools has brought into sharp focus the true importance of teachers and the work most do every day on behalf of other people's children. However, this is not the first time many of the nation's teachers have found the capacity to do great things for and with students, families, and communities despite sparse resources and a pervasive lack of respect. In fact, as a result of COVID-19, we may be seeing the intensification of the professional marginalization that teachers have faced for decades.

Teacher education is at a crossroads. Rather than "doubling down" on the traditional pressures imposed on teachers and the profession, this could be an opportunity to consider a new path. It is time now to take a step back and reassess how mounting pressures have not attended to teachers' humanity. As teacher educators ourselves and with a nod to Nel Noddings, we would like to raise a critical question in this time: Who will care about and for the teachers?

This piece is a conceptual analysis of the care involved on the part of teachers during the COVID-19 era and the relationship it has to teachers' identities. The authors tell personal and composite stories of their COVID-19 professional and personal experiences, hoping that these narrative snippets will highlight the current clash between teachers' "out-of-classroom" and "in-classroom" experiences (Clandinin and Connelly, 1996). We address how care, while at the heart of all teaching, can be truly exhausting on a normal day. Added to this fatigue, teachers now work from home in front of their laptops, chart paper taped to the refrigerator behind them, their own families needing their time and attention. The point of this piece is to help others understand where legislators, community members, and even families may have misunderstood teachers' work. Our ultimate goal is to raise awareness of the complexity of teaching and to suggest how teacher education can address and support teachers' needs.

EMOTIONS AND CARE ETHICS

Nias (1996), a prolific author in the areas of the moral nature of teaching, teacher identities and relationships, and care in schools, wrote about "intrusions" into their professional territories:

> Far more intense was teachers' and headteachers' reaction to what they saw as "intrusions" into their physical or professional territories… Golby [Michael Golby, as in "Teachers Emotions, An Illustrated Discussion" (1996)] asked two experienced, committed women teachers in English schools, one primary, one secondary, direct questions about their emotional reactions to school life. The major source of their affective satisfaction and emotional security was what Golby describes as "the intimacy of teaching children." Problems arose when other people–colleagues, parents, OFSTED inspectors–breached, or threatened, the tight boundaries that they had drawn around this central area of their work. Then they felt anxious, impatient, distressed, depressed and angry (Nias, 1996, para. 26).

With the above quote in mind, we can begin to talk about the intense emotions felt by many teachers when it comes to the care they have for their students. *Emotion*, described by Koestler (1967) as, "mental states accompanied by intense feeling and (which involve) bodily changes of a widespread character" (p. 835) is a strong facet of teacher education literature. Keck (2019) described a reflective teacher as one who is "vulnerable and motivated by forces not entirely conscious or rational" (p. 1). Teaching on any day can be difficult and involves all of the teacher—their physical body, mind, and heart (Nias, 1996).

The global pandemic we face in 2020 has caused a huge intrusion into the special relationship between teachers and their students. Clandinin and Connelly (1996) described the "out-of-classroom" (e.g., policies, research, senior administration) and "in-classroom" (e.g., interactions with students, collaborative relationships) spaces in education. It is difficult to remember a time when the out-of-classroom space has ever intruded more on the in-classroom space. Teaching is an interaction (Jones, 2017), and COVID-19 has severely diminished this interaction; for example, students with limited internet access were not able to see one another on Zoom like many others, depersonalizing the "classroom" environment. While teaching was already a difficult, complex profession, COVID-19 has pushed aside some of the heartwarming, relational positives for teaching and replaced them with stress, increased demands, and worry about student safety.

WHAT DOES IT MEAN TO CARE?

Caring, kindness, and emotionality are necessary parts of teachers' work. This is both a choice and also part of a teacher's professional identity:

> Whilst this choice led them to sometimes "get exhausted and think about certain kids all night"… or be perceived in a disempowering way…all teachers in this study saw the caring work they were engaged in as being an integral part of their professional identity (O'Connor, 2008, p. 121).

O'Connor described caring as the emotions, actions, and reflection involved as teachers help their students in a variety of ways. While caring appears to O'Connor to be an action–we care for and about one another by completing caring actions–possibly the most prolific author on the ethic of care (Noddings, 1984, 2013) describes care as a relation. Caring is not to be considered a set of rules or actions, it is "a response to individuals with whom one is in relation" (1984, p. 497). We do not care because of our duty, we care through our attempts to institute and maintain a caring relationship. Though there is a "carer" and a "cared for," these categories are not fixed. Caine et al. (2020) move even beyond this ethic of care, and "note this shift from an ethics of care to include a *relational ethics* [italics added] in the shift to a 'becoming together' with responsibility to and for each other" (p. 272). The ethic of care is the solid foundation, but the relational ethic is how pairings consider less who is in the role of carer or cared for, and more about entering a transitional space where both parties attend to one another and their co-created space.

Noddings (2013) shared a story of a fictional young man responsible for the care of his mother. If this young man transfers his mother's care to a nursing facility, does he still care for her? What if he does not visit or call, but he pays the bills? What if he worries about her frequently? What if his mother experiences his acts as caring? Noddings stated that as opposed to depending on rules, as the ones who care for others, we can only decide what is and is not care if we receive *confirmation* from the cared-for. "Although I can never accomplish it entirely, I try to apprehend the reality of the other" (p. 14): We notice another person's need or their pain and are called upon to do something. We try to consider the reality of the other person and eliminate what is intolerable. When an individual has noticed,

considered, reflected, and kept the relationship at the forefront of their thoughts and feelings, they can be said to be in a caring relationship.

An example of Noddings's (2013) ethical and relational caring might look like this: A teacher education student is struggling with coursework as well as personal issues with her job and her boyfriend. She is up late either working or on the phone with him, which means she has little time left for the class readings and comes to class exhausted. She has begun falling asleep in class and her assignments are consistently late. Because the energy of the teacher in an ethical and caring relationship moves toward the student, the teacher in this case begins with the understanding that this student has the best of intentions; she wants to do well in class, but things are getting in her way. When preparing to have a conversation with this student, the teacher thinks less of the course content not being addressed in this student's life and more about the student and the student-teacher relationship. The conversation during office hours may begin with a general, "How are things going?" and move toward the more specific issue of missing work and mini-naps during class. "I know you want to do well in this class," "You have enormous potential as a teacher," and "How can I help you during this time?" are all parts of this caring conversation, designed to maintain the teacher-student relationship as well as move the student toward the best version of herself. The student must respond in some way that lets the teacher know that care has been received in some way; this may be a nod, a smile, or follow-up questions. "Teachers sometimes forget how dependent they are on the response of our students" (Noddings, 2012, pp. 772–3). The response of students (e.g., a smile, a nod, a furrowed brow, a laugh) is notably minimized or absent during remote instruction; if students make it to their virtual class meeting, attention and responses can be unfocused and diffuse. Alexis's son, for instance, has preferred to keep his Zoom camera off, so his teachers cannot see any of his non-verbal responses to instruction.

O'Connor (2008) described how exhausting teaching can be for those who make the choice to teach in a caring manner:

Being able to act as a professional and still sustain a sense of self within the [teaching] role has emotional implications for teachers, and [her research participant] made frequent comments about the level of "emotional energy and sheer adrenalin" which she felt she needed to maintain whilst teaching (p. 122).

Because good teachers naturally invest pieces of themselves in their work, their personal and professional identities are interrelated. The teacher quoted in the O'Connor snippet above described the need to separate her work from her personal life, something that in the COVID-19 era teachers have been increasingly unable to do.

CARING DURING COVID-19

Our news and social media feeds are filled with stories of the lengths some U.S. teachers will go to care for their students. When a student did not understand her mathematics, one teacher visited the student's house and explained it with a glass door in between them for safety. More than one teacher parade has gone through student neighborhoods, teachers honking their horns, signs draped on their cars, letting students know they were still with them in spirit though the school doors were closed (Krasinski, 2020). These are quite obviously the caring behaviors of teachers who want their students to understand the content and feel secure in their relationship.

However, it is difficult to have the conversation about emotions and care when students are missing from synchronous online classes, email exchanges, or physically distanced home visits. O'Connor (2008) is correct that these behaviors are ones teachers would do for children they *care about*, but whether or not the teachers are able to *care for* their students at this time is up for discussion. After all, Noddings (1984, 2013) conception of care is dependent on the relationship, and what relationship do students and teachers have when communication is minimized or even absent? Teaching turns into less of a negotiated partnership and becomes more of an "assignment," quite literally in low-internet areas that require packets of printed work for students because synchronous online instruction is not feasible.

As well, while some teachers are demonstrating these caring actions for students in unique and superhuman ways, many of them also have caring relationships in their own households. Consider those teachers with children: If I displace my motivation toward my assigned students as Noddings (1984, 2013) would suggest, how am I able to also care for my own children in this manner? In Alexis's own experience as a teacher educator, she had this exact tension in play at her house between March and May 2020. At the same time her 5th grader came home with a variety of virtual learning experiences from which to choose, she was switching her face-to-face course to become virtual only, no small feat when she was previously preparing to send students into the K-5 schools for field experiences as opposed to continuing with direct instruction. Alexis, her son, and her husband made a family workplace at the dining room table so the adults could work while encouraging their son to complete reading, math, science, and social studies work online. Alexis's privilege at this time cannot be ignored; as difficult as it was to get research, writing, and teaching done while directing the learning of an 11 year old, she admits that in a two-parent household, she was able to "escape" to a room alone when thoughtful, quiet work was required. Their son received good grades and required no special services. Alexis's position was easier to transition to remote learning than a plumber, nurse, or Kindergarten teacher's job, so her salary was not affected.

However, who can Alexis and her husband be said to have cared for at this time? Both their son *and* their respective students? Our motivation can only be displaced toward the cared-for so much; at some point, someone we care for becomes ignored or temporarily put to the side. At times, this was Alexis's son; at other times, Alexis's students may not have received her full attention. She worried constantly about both. She received Noddings' confirming response from her son because they were constantly together; a few of her students kept in touch via email and she could see their faces during class instruction, but if students were not able to make it to synchronous classes or were not comfortable with technology, she rarely heard from them.

Mentioned above, Noddings (1984, 2013) concept of confirmation is especially important to consider in the COVID-19 era. How well are teachers able to apprehend their students' reality when they do not see them in person every day? In the horrible but very real instances of child abuse, can I as a child's teacher see what they are going through if I do not see their face or bruises on their arms? The authors of this article are not the first individuals to worry about instances of child abuse (Substance Abuse Mental Health Services Administration., 2020) increasing when mandated reporters and children are physically separated.

What if students' internet access is limited, and they never make it to my Zoom classroom? How can I receive that confirmation of care that completes Noddings' cycle of the caring relation? I cannot see them, I may not hear from them, and their instruction, packets of worksheets due to the area's limited internet, is essentially a shot in the dark toward addressing their instructional needs. The teacher's *actions* are truly caring: She is attempting to keep students engaged and learning something during a crisis, she is making concerted efforts to see students' faces on Zoom, Blackboard Collaborate, or Google Meet, she is sending notes home, driving by homes, etc. While O'Connor (2008) would certainly consider these actions caring ones, Noddings (1984, 2013) could disagree that this arrangement is an example of *relational caring*. Noddings' conception of care is not based in action, it is based on the negotiation of the relationship. It is based on a cycle of caring action, confirmation, negotiation, and reflection. It is more about the relationship than the intention or action.

SUMMARY: TEACHERS' ABILITY TO CARE

In summary, teachers' *tendencies to care* have not changed during the sharp transition from traditional schooling to pandemic schooling. Teachers still felt worry, frustration, overwhelm, and many other emotions during their planning and instructional efforts. However, if we consider care as a relation, where a caring teacher requires confirmation the care has been received and interpreted as such, COVID-19 has been a massive interruption. Since being a caring individual is a basic expectation of teachers, their identities are shaped by how well they see themselves caring for their students. What must be considered is whether the changes in teaching required by COVID-19 have made it more or less possible for teachers to care for their students; as a result, how has this impacted teachers' identities? If teachers are struggling with maintaining caring relations with students, how will this influence how they feel about themselves as teachers?

TEACHER IDENTITY IN THE PANDEMIC

Teachers' personal and professional lives have now been fully integrated in response to COVID-19 and the emergency transition to virtual learning. Teachers are now attempting to teach Common Core math over Zoom to a group of students *and* parents while simultaneously parenting their own children and caring for their homes and other loved ones. This mash-up of lives brings to light a reality that has always been present for teachers: the separation between the personal and professional self is somewhat of a fallacy. This is a lovely but messy and challenging reality for teachers, especially in the current context. The emotional challenges associated with this drastic change also relate to teacher identity. The following section will discuss the theoretical and empirical definitions of teacher identity that are relevant here and interrogate this research through composite examples from one of the authors.

WHAT MAKES UP A TEACHER'S IDENTITY?

The literature and theories of teacher identity are vast. However, the authors of this paper understand teacher identity as socially constructed and in interaction with varied discursive elements. Scholars have asserted that teacher identity is fluid and socially constructed and remains loosely defined due to the myriad of facets embedded within (Beijaard et al., 2004; Alsup, 2006; Rodgers and Scott, 2008; Beauchamp and Thomas, 2009; Akkerman and Meijer, 2011; Izadinia, 2013). Other research has found that teachers' identity work is implicated by perceived future events. New teachers, in particular, consider their possible selves when forming their identities within the domains of relationships, management, instruction, and professionalism (Hamman et al., 2010). These future selves are also imagined during conversations with mentors (Urzúa and Vásquez, 2008) and when new teachers reflect on past practice and plan for the future (Lutovac, 2020). Similarly, new teachers' reflections on past imaginations of what it may be like to become a teacher influence the shaping of contemporary teaching selves (Lortie, 1975).

Zembylas (2003), in particular, advocates for a *post-structuralist* conceptualization of identity that accounts for the ways in which identity work is *felt, embodied, and discursively constructed*. From this perspective, emotion is "inextricably" linked to identity, and emotional experiences are an important component of self-knowledge. Citing Haviland and Kahlbaugh (1993), who call emotions the "glue" of identity, Zembylas points out the role of emotion in helping individuals assert meaning to experience and identity. If one takes this discussion a bit further, a post-structuralist perspective would also explain the role of emotion in identity formation as something that is influenced by the discourses of power and knowledge that surround teachers.

In particular, Foucault (1979) argues that selves do not develop within a vacuum; they are implicated by exterior structures and regulatory forces. For teachers, these discourses include beliefs about what teachers are or are not, relations between teachers and students, and the function of schools in society. Indeed, teachers are situated within layered interpretations and demands about their work, which puts them in a position of constant negotiation and enactment. From this perspective, "identity formation is a by-product of power/knowledge within a context of normalized institutional codes" (Zembylas, 2003, p. 224), and teachers are compelled to construct their identities from the discursive materials that are made available to them. Teachers

also construct identities through discursive *acts*, and their agency to do so is constituted of the knowledge and power that acts upon teachers (Foucault, 1979). To extend this point, Butler's (1999) discussion of *performativity* in the creation of gender identity can be applied to further elucidate the role of power in the construction of self. Butler asserts that gender is an element of identity that is stylized and performed; individuals are only able to work with the tools that are laid out for them by the regulatory influences present in their lives. In similar ways, the teacher self may be stylized and performed according to or in defiance of the normative definitions of the profession Therefore, teachers' identity work is done within a specific frame of possibility; "authority is attributed and installed … the very expectation [of being] ends up producing the very phenomenon that it anticipates" (pp. xiv–xv). Although these are dense concepts to consider, they are helpful for interrogating the complexity of teachers' selves and realities during the COVID-19 pandemic.

To summarize, teacher identity is socially constructed (involving institutions, discourses, relationships), impacted by discourses of power and knowledge (communicating what teachers should be and should do), connected to and enacted via emotions (which communicate import), dynamic (in constant negotiation with aforementioned factors), and reflective yet forward-thinking. These elements of teacher identity are heavily implicated by the shifting sands of the COVID-19 pandemic.

REMAKING TEACHER IDENTITY DURING A PANDEMIC

Long before COVID-19 and widespread school closures, one could argue that there has existed a prevalent discourse about the key role of teachers to support the academic, social, and emotional well-being of students. Images and stories of well-loved, inspiring teachers permeate popular media, and school-wide intervention programs ask teachers to demonstrate evidence that they can construct learning environments and lessons that address the needs of the *whole* child. These messages become the stuff from which teachers construct their concepts of self, facilitating in many teachers an identity deeply rooted in providing the very care that was discussed in the previous sections of this paper.

As teachers work to construct their identities, they have no choice but to pick up the discursive tools that are available to them. Therefore, many teachers define their core motivation for becoming or remaining in the profession as the capacity to make a difference in the lives of children and help individuals achieve lifelong success. Teacher organizations like the National Education Association amplify such discourses in their mission statements, including ideas such as the role of schools to further democracy, equity, and justice (National Education Association (NEA), 2019). Even Meghan, one of the authors of this paper, wrote in her undergraduate teaching philosophy statement about the importance of attending to the "academic *and* personal needs of *all* students in and outside of the classroom." Although Meghan now understands the many political and social factors that complicate such work, it is still something she believes

(to a certain extent) to be possible and discusses it with her preservice teachers. In this way this kind of commitment often results in teachers leveraging agency toward enactment of their commitments as a means of performing their identity daily. Yet, this agency can be complex.

Zembylas (2003) describes agency as the connection between identity and emotion. The enactment of emotions in the construction of teacher identity constitutes agency; yet Zembylas asserts that this connection is dependent on the "viability of teacher agency" (p. 224). Taken from a post-structuralist perspective, teacher agency is contingent upon the cultural, historical, and policy dynamics in which a teacher is situated. The viability of teacher agency impacts teachers' capacity to enact their commitments and, therefore, feel that their identities are being realized. This has certainly been severely impacted by COVID-19.

To illustrate, one may consider the tensions produced for a teacher when teacher agency compromised. In Meghan's teaching of preservice teachers after the outbreak of COVID-19, she experienced tension between her desire to attend to both the personal and professional needs of her preservice teachers. She instituted several new Zoom sessions and assignments, but these soon became difficult for her students to complete. It seemed that these two commitments were more at odds with each other than they had previously been due to the constraints of technology and the new personal challenges her students were facing. These tensions soon left Meghan feeling that she had less agency in enacting the kind of truly responsive instruction she had prior to the pandemic. Her colleagues in PK-12 settings likewise felt frustration and fear over the lack of face-to-face connection they were able to maintain with their students, which removed a core opportunity to realize their commitment to their students' academic and holistic needs. In the sudden need to adapt their view of work and self during the pandemic, Meghan and many of her PK-12 colleagues were left feeling uncertain and inadequate.

Although the influence of a global pandemic on teacher identity and agency has not yet been studied in its current iteration, prior research can provide some clues into the experiences that may be realized by many teachers. For instance, Connelly and Clandinin's (1999) collection of narrative explorations of teachers and schools offers particular insight into current tensions. They assert that teacher identity and practice is interwoven. So much so, that major reforms or changes in teaching expectations can cause a feeling of loss for teachers, necessitating changes in their "stories to live by," and resistance when changes are at odds with a teacher's efforts to maintain their constructed stories of teacher self. Further, Clandinin and Connelly conceptualize a teacher self can be conceptualized as a *storied landscape* (Clandinin and Connelly, 1996, 1998), something dynamic, interconnected, and influenced by the native and the foreign. The storied professional landscapes of teachers have often long been considered by scholars in relation to policy change or reform (e.g., Tyack and Cuban, 1995; Fullan, 2007). Taking a beautifully metaphorical approach, Craig (2002) conceptualizes the knowledge and powers that influence and shape on teachers' selves and work as *conduits*, pointing out that these represent "school districts, pouring twice

and thrice-removed imperatives originating in the academy into schools, greatly shaping practitioners' work and attempting to impact student learning," or the "multiplicity of competing and conflicting forces trying to define educational reality through filtering information" (p. 199).

Clandinin and Connelly (1996) point out that while others may see teachers as simply resisting or subverting new knowledge or reform, teachers are instead reacting according to their narrative understandings of selves, schools, and students. To engage in true change means to shift how one knows their classrooms and professional selves. To take this apply this point to the changes being wrought by COVID-19, teachers are now dealing with a complete disruption of their storied professional landscape and, therefore, their sense of how they know themselves and their students. Formerly, "changes ripple[d] through the school and influence the whole web of stories" (p. 160), now the changes have come as something akin to a forest fire, requiring a full remaking of the landscape and teachers' stories of self.

More recently, researchers have found that reform and policy shifts create identity tensions for teachers, especially when high-stakes accountability or testing is involved (Cross Francis et al., 2018), which can have implications on teachers' feelings of efficacy and commitment within the profession (Day et al., 2005). Take, for example, Ball's (2003) discussion of teacher performativity within the context of neoliberal education reform in England. Ball argued that teachers experienced contradictory values during the advent of high-stakes accountability policy. Testing and evaluation measures caused many teachers to set aside their personal values and investments (and therefore the cornerstones of their teaching identities) for the new accountability measures. Others remade themselves and their teaching according to the discourses of teacherhood and quality that were being enforced, either cynically or with resignation. Tensions were experienced by many teachers, and some engaged in resistance against those accountability requirements they felt were most at odds with their individual teaching values. In every case, the influence of power as a regulatory force was at work on many teachers, and as Ball put it, "New roles and subjectivities [were] produced as teachers [were] re-worked as producers/providers, educational entrepreneurs and managers [...] subject to regular appraisal and review and performance comparisons" (p. 218). Taking a more narrative approach, Craig (2001) illuminates the ways in which top-down school reforms can impact teachers' understanding of self, school, students, and statute. Teachers articulated the ways in which "state-interpreted, national reform movement did not resonate with the current version of the story of school [they] had come to know... [and a] lack of fit between and among stories of school and stories of teachers" (p. 324). The language of reform carried implications for how teachers interacted with colleagues, how or whether they had assimilated the appropriate knowledge (as defined by the state-directed reform agency), and practices; all of which "bore consequences for their identities" (p. 325).

This remaking of teacher selves is similar to that which is taking place in the COVID-19 era. As this paper is being written, a tense and politicized debate over the reopening of schools is taking place. Teachers are therefore being put in a complicated position: to weigh the commitments associated with their identities as carers of other people's children against their commitments to care for themselves and their loved ones. For some teachers, this is an impossible decision. Local, state, and national policies or recommendations are in constant flux, creating uncertainty and instability for teachers who are attempting to negotiate the relative weight and import of each component of their identities.

Ruohotie-Lyhty's (2018) model of *identity-agency* further examines this process of negotiation. When teachers' identity-agency work is characterized by tensions, a teacher may engage in *defensiveness* (protecting their identity through action) or *renegotiation* (reconsidering their identity in light of new demands). Depending on the contextual changes at hand, teachers may find themselves resisting or readjusting their identities. In either case, this work is emotionally taxing.

The tensions associated with this can also be discussed within the theoretical constructs of the aforementioned post-structuralist theory of teacher agency. If cultural and political discourses set the boundaries for what is possible, "teachers learn to internalize and enact roles and norms assigned to them by the school culture through what are considered 'appropriate' expressions and silences" (Zembylas, 2003, p. 225). Teachers' identities, and their agency to act within existing frames of possibility or appropriateness, are determined by the "discursive environments [that]... set the conditions of possibility" for those actions and identity work (Zembylas, 2003, p. 226). Furthermore, a teacher's identity is more than just the sum of their practices, interactions, and institutional expectations; identity—and the emotions therein embedded—is the enactment of a teacher's *investments* or feelings (Britzman, 1993).

Similarly, during the pandemic, the entire landscape of teachers' realities has shifted. Initially, this took place overnight, while public discourse continued to demand their accountability. While attempting to adapt her practices and materials for virtual teaching in March of 2020, a teacher's identity may have undergone one round of renegotiation, reconceptualizing her teaching values or commitments for a new modality. Take for example, an advanced placement teacher who leveraged strong relationships with students during history lessons. This teacher likely maintained a figurative (if not literal) map of each student's needs, and worked hard to address these needs through relational knowing and a caring environment (Noddings, 1984). This responsiveness was not only a means-to-an-end for getting through to students, but likely a core piece of how the teacher saw herself. Furthermore, the teacher balanced these concerns with an appreciation for the expectations of administrators and other stakeholders. Therefore, the teacher also took deliberate steps to become informed about trends in curriculum and practices in order to be an accountable steward of the community's most precious assets.

This teacher's conception of self would be challenged as she struggled to maintain relationships virtually during the school closures, even when only 30 percent of students were consistently engaging with online material. Meanwhile, this teacher was still

under external pressure from administrators or family members to maintain "rigorous" instruction in line with the AP test. This teacher may be renegotiating whether relationships are indeed as integral to working with students. Or, to take the emotional element of identity into perspective, the teacher may be experiencing shame, feeling that they are powerless, personally inadequate (Batarky, 1990), or "lack these abilities or that their aims are not worthy" (Zembylas, 2003, p. 228) according to the dominant discourses of power influencing that teacher's context. Feelings of shame and doubt are documented in the literature as common in teachers' experiences and enactment of identity. In particular, teachers can feel shame when their own socioeconomic class and obligation to carry out hierarchical policies is at odds with the classed identities of their students (Van Galen, 2017). If not able to produce the academic gains some reformers associated with educational equity, teachers may feel that they have fallen short. Further, the work of conforming to social constructions of teacher "effectiveness" can breed shame or a sense of doubt in teachers (Edgington, 2016). Therefore, the tensions associated with reassessing and renegotiating elements of her teacher identity would be understandably taxing.

SUMMARY: IDENTITIES FACING CONTINUOUS CHANGE

Tensions like those described above are likely to continue to mount as the 2020–2021 school year is underway. While the lives of some teachers are literally on the line, economic and political arguments seem to barely acknowledge, if not completely ignore, this reality. Consider the likely impacts of a teacher's attempts to predict or prepare for the 2020–2021 school year with so much fear, uncertainty, and threat of shame hanging in the balance. The aforementioned domains embedded within teacher identity (relationships, management, pedagogy, and professionalism) are all impacted by the pandemic.

With the above theories and research in mind, consider the additional discursive (and emotionally relevant) elements that may influence a teacher's re-construction of identity in the era of COVID-19. It is not uncommon for teachers to center their sense of self and value within relationships with students (O'Connor, 2008). Safe interactions are only available by internet, and in many areas this internet access is unreliable; consequently, this identity may undergo a shift. Additionally, teachers' senses of self are also constructed within somewhat rigid policy and reform discourses that enforce technical-rational definitions of quality, enforcing the idea that a teacher's work and worth are tied to the outcomes they produce in student learning (Mockler, 2011). Therefore, a teacher's self post-pandemic will be a complex quilt, patching together concern for self, concern for one's teaching values or commitments, and concerns for one's community with little information about how things may look in the future.

Regardless of the time spent in the classroom prior to the pandemic, the foundational pieces of teachers' identities have been significantly altered, if not removed entirely, due to COVID-19. Relationally centered instruction was moved online, hampering many teachers' capacities to each day realize their sense of self as mentor, helper, and nurturer of students. Yet, the parts of the teacher's identity that were attuned to accountability and stakeholder interests were still present, intensifying the pressure to uphold academic success.

SIGNIFICANCE

Many readers are aware of the time it takes to write and have an article accepted for publication. In the best of worlds, several months are involved (It can take over a year at times). While this piece can be considered the former as opposed to the latter example, the COVID-19 era has already changed so much for teachers that an additional article on this topic is needed. In March and April of 2020, much of the country appreciated the work of teachers because it had been outsourced to the home, and families who were unaware of the hard work involved in teaching playfully and desperately offered teachers increased salaries. By July 2020, however, the tone had changed. Repeated calls for children to go back to school came from the federal government and several state and local governments (Goldstein and Shapiro, 2020), with teachers' questions about their own safety and that of their students falling on deaf governmental ears.

So what? Why is it important to consider the emotions and caring involved in teachers' identities during a time like this? We would argue that calls for considering teaching a complex and difficult profession have never been needed more than they are during the COVID-19 era. The fact that families are finding it necessary to go back to work does not mean that teachers should provide the necessary childcare (Chiu, 2020; Meckler, 2020). Teachers are not the nation's babysitters. It is not incumbent upon them to care enough to provide not only childcare, but thorough, challenging instruction to EC-12th graders at a time when they are quite literally putting their lives on the line. We would ask governmental bodies making these decisions, especially our Secretary of Education, how many teachers were involved in the decision to go back to school? Or are teachers (again) being asked to follow the decisions others have made without being included in the conversation?

It is also important to the authors to consider the implications of what this country has asked of teachers between March 2020 and August 2020. From March to May 2020, the nation's teachers immediately switched gears between in-person and remote instruction. Because of the urgency of the situation, the plans and types of instruction varied widely around the country, but it cannot go unnoticed that teachers remained responsible for student learning. In June and July of 2020, just as U.S. cases began to steadily increase (Centers for Disease Control, 2020), conversations began about reopening began: How could it be done, how many children might become ill or die, how many school days are required for in-person instruction, etc.? Teachers seemed missing from the conversation, *but they were still tentatively hoping to interact with students again* (Goldstein and Shapiro, 2020). Teachers' care for and about

students remains; governmental assurances of teachers' safety does not.

COVID-19 has laid bare issues that have been present in teaching and teacher education for decades: the need to care, the emotions wrapped up in teachers' identities, and the frustration with small or significant interruptions to their important work. It is important to remember that it is nurturing, face-to-face interactions with the students that are so central to teachers' work, yet so risky during this pandemic. Danielewicz (2001) notes that teachers' sense of self is implicated by their enactment of reciprocal care (Noddings, 1992). For teachers, the "self is fully invested in teaching and caring" (Danielewicz, 2001, p. 165), and as teachers extend care to students, the students' acceptance of or response to that care matters greatly. Pre-COVID-19, engaging in reciprocal care-based interactions with dozens to tens of dozens of students each day was incredibly demanding work that required teachers to maintain a sharp focus on students' reactions in order to interpret their concerns, needs, and engagement throughout the day. In turn, students' sense of being known impacts their own senses of self and efficacy. This is precisely why teachers dedicate the first several weeks of the year to establishing relationships, positive procedures, and methods of communication. Yet, when this intensive, responsive interaction is inhibited through virtual teaching or complicated by physical distancing and personal protective equipment (all while being hotly debated by community members and politicians), teachers' work and sense of self-worth are going to be challenged.

CONCLUSION

The point of this piece was to help readers understand the emotional complexity and issues of identity involved in truly relational teaching. The work great teachers do with students involves caring for and about them; responding to all sorts of academic, physical, and emotional needs; and designing instruction to meet frequently changing legislation and high-stakes assessments. The COVID-19 pandemic and the resulting conversations about education, both how teachers' work is incredibly hard (e.g., the March national narrative) and how dare they not get back to the classrooms so we can stimulate our economy (e.g., the June national narrative), have highlighted some of the public's misunderstandings about the work teachers actually do. Being asked to teach without Noddings (1984) confirming response and without the facets of the profession

teachers align themselves with has created something of a crisis of identity.

These are difficult times for everyone. There are a number of notable authors and speakers who might suggest that every difficult situation is an opportunity for growth. An especially poignant quote:

> Do you become discouraged easily, or do you bend to your advantage even the apparent ills of life? It is the difference between the pessimist and optimist: "The pessimist chews his quinine pills; the optimist, when chased up a tree by a bear, sits calmly and admires the view." Be an optimist; make reverses and rejections redound to your advantage (Holmes, 1915, p. 194).

The authors confess more than a bit of a discouraging attitude. While in March or April of 2020, we might have considered the immediate homeschooling taking place as a wake-up call to communities, "Oh, teaching is *hard*!" we are afraid we have returned to a place with which teachers are quite familiar: being asked to enact plans made by those with less experience and definitely fewer consequences, and to fix societal issues (e.g., the economy) they had nothing to do with breaking. As a PK-12 colleague said to one of the authors, it seems that the "Weight of all of this will fall on the shoulders of teachers, just like everything has up to this point."

Therefore, it is imperative that teachers, teacher educators, policymakers, and others advocate on behalf of teachers. Guidelines for reopening schools, for example, should weigh equally the concerns of teachers *and* community members. This work is hard but impactful on every level of society. Now, more than ever, we must be mindful of the outsized expectations that may be placed on teachers, and the resourcing necessary to support them. Anything less would undermine teacher emotions, agency, and identity, and their capacity to take action on behalf of their most beloved commitments. The professional knowledge, practical experience, and voices of teachers should not be discounted, lest teachers be left disregarded and disposable.

AUTHOR CONTRIBUTIONS

AJ and MK wrote the piece together. There were equal contributions with the theoretical framework and personal examples included. AJ developed most of the work on emotions and care, while MK developed and wrote most of the teacher identity sections. All authors contributed to the article and approved the submitted version.

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Cultivating Teachers When the School Doors Are Shut: Two Teacher-Educators Reflect on Supervision, Instruction, Change and Opportunity During the Covid-19 Pandemic

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Seven weeks into our Spring 2020 semester, the Covid-19 pandemic was wreaking havoc on the world. The pandemic caused immediate shutdowns to schools and universities fundamentally changing how we plan for, teach, guide, and work with students. This paper explores how two first-year Assistant Professors navigated the challenges we faced and the learning opportunities we embraced while continuing our work as teacher educators amid a pandemic-induced shutdown. We employed collective self-study to examine our experiences while transitioning to remote learning with pre-service teachers using Moore's (2012, 1993, 1989) transactional distance theory as an analytical framework to review our work as teachers in an online setting. We found that educators need to be open to continuous enhancements of instructional practices, there is a need to develop ways to equalize positions between the instructor and students, and we need to be conscious of opportunities students have to demonstrate creativity in their work. As part of this review, we developed and used a Four R's Professional Inquiry Model (Recognition, Reflection, Reaction, Results) based on Moore's work to help make meaning of our findings and recommendations for other practitioners.

Keywords: Covid-19 pandemic, theory of transactional distance, online teaching, online student teaching, collective self study, teacher education, reflective teaching

INTRODUCTION

Seven weeks into our Spring 2020 semester, our university shifted to "alternate modes of instruction for the remainder of the semester." While the Covid-19 pandemic was wreaking havoc on the world medically, it had also reached the classroom door, fundamentally changing how we plan for, teach, guide, and supervise our students. This paper explores how we, Crystal and Mike, both first-year

Assistant Professors, navigated the challenges we faced and the learning opportunities we embraced while continuing our work as teacher educators amid a pandemic-induced shutdown.

Although much is written about educational change, schools' and universities' professional culture has remained static (Cuban, 1993; Fullan, 2016; Ryan, 2017; Delpit, 2019). However, the immediate change imposed on the world by the Covid-19 pandemic forced all educators to act and react instantaneously. As we experienced the wrath of the shutdowns created by the Covid-19 pandemic, we both noted how this impacted our work as teachers and teacher educators, changing everything about our day to day work. It created a critical incident that caused us to change our teaching practices and the way we fostered our student teachers' work. With this inquiry, we explore what we can learn from our experiences through the following question: What can we learn about our practices as teacher educators and student teaching supervisors by using distance learning theory to examine our work as schools moved to remote learning during the Covid-19 pandemic?

As experienced educators, we feel adept at integrating technology into our typical face-to-face teaching. Additionally, we understand that integrating technology creates opportunities for educators to examine their work and how different tools and resources can enhance learning (Ruggiero and Mong, 2015). However, despite increased professional learning, additional professional resources, and access to technology resources, we understand progress in this area has been slow as a result of individual teachers' willingness, aptitude, and attitude toward technology (Brandao, 2015; Ruggiero and Mong, 2015; Farjeon et al., 2019). The pandemic has caused educators at all levels to make immediate and drastic changes to our practices. We were no longer integrating technology; instead, we had to rely on technological tools and applications to provide us with new learning spaces. We could no longer enter our schools, universities, and classrooms. Moore's theory of transactional distance (2012, 1993, and 1989) provided us with a means to examine our understandings and perceptions regarding this sudden transition to remote learning.

THEORETICAL FRAMEWORK

In this paper, we use Moore's transactional distance theory as an analytical framework to review our work as teachers in an online setting. Transactional distance theory addresses teaching and learning in contexts other than typical face to face classrooms (Garrison, 2000; Gorsky and Caspi, 2005; Moore, 2012; Huang et al., 2015). In particular, Moore (2012) challenges us to look at and think about teaching and learning in separate locations "as a significantly different pedagogical domain" (p.67). Transactional distance theory asks us to consider the interplay between teachers, students, and content in environments where the teachers and students are physically separated from one another (Moore, 2012). While the "distance" between students and instructors may be far apart, Moore's theory looks at the perceived psychological distance that is created by the interplay

between the structure of a course and dialog with and among the students and instructors (Moore, 2012; Huang et al., 2015). As Gorsky and Caspi (2005) put it, "the essential *distance* in distance education is transactional, not spatial or temporal" (p.2). This emphasizes the teaching that occurs in an online space through three facets of instruction, including dialog, structure, and learner autonomy.

Moore notes that the pedagogical constructs of structure and dialog are critical to diminishing students' perception of transactional distance in online courses (Garrison, 2000; Shannon, 2002; Falloon, 2011; Moore, 2012). Structure connotes how the course is designed, including objectives, teaching strategies, presentations, materials, and assessment (Garrison, 2000; Moore, 2012; Huang et al., 2015). The course structure can be rigid or flexible or move between the extremes based on the content, interactions between the student and or the needs of the students (Huang et al., 2015; Moore, 2012; Shannon, 2002). In order to offer variety and individualization that will best support each learner, the structure must be more forgiving (Huang et al. (2015). In addition to structure, Moore's theory talks of the importance of dialog or constructive interpersonal exchanges that helps the learner solidify their understanding of the content (Gorsky and Caspi, 2005; Moore, 2012). There is no one fixed conception about how dialog occurs, and given that there is an ever-increasing amount of tools teachers and students can use to communicate online, it is critical to ensure that the opportunities for interaction are promoting student understanding (Garrison, 2000; Gorsky and Caspi, 2005; Moore, 2012). The level of interaction between teacher and learner will determine the degree of learner autonomy (Garrison, 2000). Ultimately, productive dialog lives in the learning spaces between the conversations students hold with one another and those students have with their teachers (Gorsky and Caspi, 2005; Moore, 2012).

According to Moore, the interplay between structure and dialog and transactional distance are also mediated by the student's ability to exercise learning autonomy (Garrison, 2000; Moore, 2012; Huang et al., 2015). "The greater the transactional distance, the greater responsibility is placed on the learner" (Garrison, 2000, p.8). Here the instructor needs to consider the learner's ability to manage their learning, recognize if the format is working or not for students, and make meaningful adjustments to promote student learning (Garrison, 2000; Shannon, 2002; Moore, 2012). At one end of the spectrum, the student would be driving their learning, while at the other end, the teacher would have complete control over the way students experienced content delivery (Garrison, 2000; Moore, 2012). Transactional distance theory informed our practice as we adopted new methods to compensate for imposed distance constraints. In particular, we used it as a lens through which we could examine our work when all teaching and supervision moved online due to the Covid-19 pandemic. It was essential that we examine the degree of learner autonomy that resulted when student teachers were removed from the classroom environment and placed in remote learning rooms. This online learning atmosphere required new methods for communicating with our students, as well as newly learned online pedagogy for

both the professor and students, ultimately creating unforeseen structural barriers.

LITERATURE REVIEW

Online Learning

Online learning is increasingly becoming a popular educational option for students at all levels. It encompasses a multitude of learning platforms, instructional delivery methods, and media to engage students with the content (Keengwe and Kidd, 2010; Salmon, 2011; Moore, 2012; Korhonen et al., 2019). While "technology" itself is often associated with innovation, the literature suggests that as we are moving into the third decade of the 21st-century technology is a critical factor in innovative online learning and related to instructional practices (Salmon, 2011; Moore, 2012; Black, 2013; Shearer, 2013; Arason, 2019). Instructional decisions determine how students will interact with the content and with each other to promote learning (Falloon, 2011; Salmon, 2011, 2019; Shearer, 2013; Huang et al., 2015). Given the self-directed nature of online learning, instructors must ensure that they have established clear goals and expectations to scaffold students' learning as they interact with assignments (Falloon, 2011; Salmon, 2011; Huang et al., 2015; Delen and Liew, 2016; Kim et al., 2019; Korhonen et al., 2019). The literature also notes the challenges some students face with being fully responsible for regulating their learning online (Falloon, 2011; Salmon, 2011; Delen and Liew, 2016; Kim et al., 2019; Korhonen et al., 2019). This requires instructors to be mindful of concepts of time and motivation related to online learning (Salmon, 2011).

A key aspect of designing effective online learning involves providing ample opportunities for collaboration and communication between students as they work with and process new content (Moore, 1993, 2012; Falloon, 2011; Salmon, 2011; Kim et al., 2019). Carefully designed collaborative learning opportunities allow students to interact with each other creatively as they explore and process the content (Moore, 1993, 2012; Salmon, 2011; Kim et al., 2019). These types of experiences promote meaningful dialog amongst students, creating virtual connections that can push and nurture each student's learning (Moore, 1993, 2012; Falloon, 2011; Salmon, 2011, 2019; Shearer, 2013; Huang et al., 2015). In particular, instructors want to create open-ended spaces where students can explore concepts, share their thinking or emerging understanding and receive timely feedback from their peers and the instructor (Falloon, 2011; Salmon, 2011, 2019; Huang et al., 2015). Facilitating an environment where students are free to and expected to communicate with one another helps students who are learning remotely develop relationships and a sense of community, thus lessening the sense of distance in an online environment (Falloon, 2011; Salmon, 2011, 2019; Moore, 1993, 2012).

Supervising Student Teachers and Online Supervision

Student teaching is the culminating experience for all pre-service teachers allowing them full-time experience within a school to try and test what they have learned about teaching in practice (Cuenca, 2013; Feher and Graziano, 2016). University supervisors play an essential role in helping to negotiate a space that connects the university to the school, all the while helping to facilitate the students' process of understanding, learning from, and making meaning of their daily work (Cuenca, 2013; Elfer, 2013; Thurlings et al., 2014; Graziano and Feher, 2016; Diacopoulos and Butler, 2020). Relationships are critical to gain the trust of the student-teacher and their school mentor teacher (Cuenca, 2013; Elfer, 2013; Liu et al., 2018). Investing in a relationship with the student is essential as part of the feedback process that supervisors employ will guide student teachers as they reflect on and learn about their work as teachers (Thurlings et al., 2014; Liu et al., 2018; Diacopoulos and Butler, 2020). This process also involves helping teacher candidates learn to make sense of their teaching within a particular environment and recognize the different pulls and pressures that may impact the way they are performing in the classroom (Diacopoulos and Butler, 2020).

When looking at supervising student teachers in the online environment, some structural barriers need to be considered. Until the Covid-19 pandemic, there were no universal online teaching experiences that all teacher preparation programs provided for their students and supervisors. Most programs do not provide students or supervisors with any exposure to or experience teaching online (Feher and Graziano, 2016; Graziano and Feher, 2016; Rice and Deschaine, 2020). This becomes critical while working to provide feedback in an online learning environment. These environments require a different way of thinking about planning lessons and engaging students, highlighting a lack of knowledge and experience university supervisors possess (Feher and Graziano, 2016; Graziano and Feher, 2016; Rice and Deschaine, 2020). In online settings, instruction and supervision rely on clear and consistent communication, a focus on how the learner may be receiving and interpreting content, and ways to help students see the responsibility they have in online settings in processing their learning (Graziano and Feher, 2016; Liu et al., 2018; Rice and Deschaine, 2020). The key is to discover and use methods that help both the supervisor and pre-service teachers look at and explore the lesson and its impact using all tools available in a virtual setting (Liu et al., 2018).

METHODOLOGY

In this paper, we employed "collective self-study" (Samaras and Freese, 2006; Samaras, 2011) to examine our experiences while transitioning to remote learning with pre-service teachers. This form of systematic inquiry allowed us to look critically at our work during this challenging time, generate knowledge about our teaching, and transform our practices (LaBoskey, 2004; Samaras, 2011). During this research, Crystal and Mike were both first-year assistant professors at a large public university located just outside a major city. While we taught some different courses during the semester, we both were supervising student teachers during the time of the shutdown. Self-study allowed us to share

and compare commonalities in our work as well as provide objective feedback on the work we did in different courses. We were both the researchers and the researched, allowing us to engage in individual and collaborative inquiry simultaneously (LaBoskey, 2004).

To critically examine our practices, we used a variety of qualitative methods to generate and collect data. Our data included: reflective narratives about our experiences, a review of evaluations of online lessons, reflective journals kept during the semester, documents we created and shared for our class sessions, and several virtual meetings where we discussed our insights into our work. Additionally, we both completed a written reflective interview in response to prompts that asked us to examine our work as teacher educators and student-teacher supervisors during this global shutdown. Each of these captured the complexity of our work, allowed us to interrogate our practices, examine them critically, and identify places for improvement and a more profound understanding (LaBoskey, 2004).

We analyzed the data inductively using the constant comparative method (Glaser and Strauss, 1967) and looked for emerging themes (Bogdan and Biklen, 1998). As part of this review, we developed and used a Four R's Professional Inquiry Model (Recognition, Reflection, Reaction, Results) based on Moore's (2012, 1993, 1989) work to help make meaning of our findings. In this model, teachers **recognize** students' needs and adjust instruction, **reflect** on lesson components, structure, and learning environments, **and react** by adapting and modifying practices. Through those actions, we see **results** that demonstrate ways we moved our practice to work toward a common goal with clear learning intentions. This model helped us make meaning of our data by examining the challenges we faced, the decisions we made, and the ways we found growth opportunities. Garrison (2000) might see this as a way we used theory to understand our practice better and make thoughtful and meaningful teaching decisions. As we worked to understand our teaching during this time, we noted ideas that could enhance our work as teacher educators. Additionally, based on our experience, we posit that this same model could be used by other educators to evaluate their work in both virtual and face to face settings.

For this paper's intent, we wanted to obtain an informed understanding of the learning environments created and presented by the challenges of Covid-19. The Four R's model, as shown in **Figure 1**, helped us to process our thinking during the semester and examine further the core themes that emerged from the analysis of our journals, student work, lesson plans, reflections, and collaborative reflective interview.

As part of our review, we examined ways our lesson planning process evolved, responding to successes, challenges, and student needs during continuous changes. We also noted how our supervisory practices developed, working to support student teachers as they, too, made this immediate transition to remote teaching. In particular, we note a deepening understanding of what it means to teach and learn. Throughout our paper, we interweave our narratives to describe our findings. This is deliberate as it allows us to authentically share our work as

FIGURE 1 | Four R's professional inquiry model.
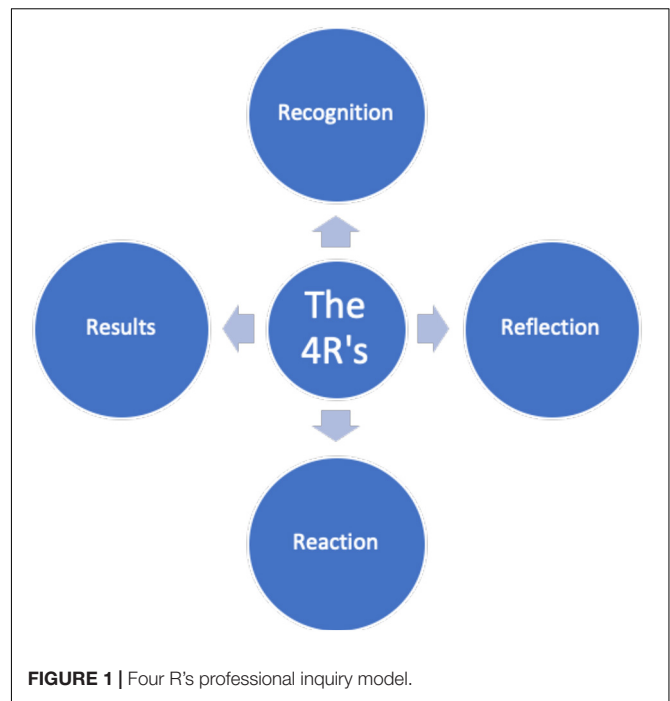
teachers during this challenging time and helped us to grow our understanding of our practices.

FINDINGS

Moore's (2012, 1993, 1989) pedagogical theory in distance education influences the understandings and perceptions regarding remote learning. Moore's original model examines (1) dialog between the instructor and the learning, (2) flexibility of structure, and (3) learner autonomy. We needed to consider the pedagogical theory of transactional distance or communication space as we examined the impact of the Covid-19 shutdown on our work as educators. Huang et al. (2015) expanded Moore's work by including interpersonal closeness among learners and between the instructor and learners when examining transactional distance. Using this to structure our inquiry, the following themes emerged from our data: Innovation in Survival Mode, From Supervision to Collaboration, and Igniting Creativity.

Innovation in Survival Mode

Changing instructional methods can be a daunting task, especially when face to face teaching is the preferred method of delivery. Not only did this create panic among education students, but professors as well. We all went through a process that included feelings of doubt, anxiety, and panic (Crystal's Reflection, June 2020).

On March 10, 2020, we all received an email from our university president that stated that our university would close and we would move to alternate modes of instruction for the remainder of the semester. As Mike reflected, "On March 10, 2020, I don't think that I really knew what was happening and

how it would impact my work and my life." When examining our thoughts and work just as things were shutting down, we noted a theme emerging that we simply call "Innovation in Survival Mode." This theme reflects our feelings of uncertainty, doubt, and fear related to our teaching and the many other factors that were impacting our students and ourselves as we just tried to make things work during this critical moment. This theme highlights the need for innovation, reflection, openness, and understanding as educators during times of significant change. In particular, we had to find ways we could reimagine instruction and connection during these unprecedented times. Moore (2012, 1993, 1989) might see this as our way of reacting to the great transactional distance caused by the circumstances imposed on our work and lives by trying just to make everything continue to function.

Reimaging Instruction

During this time, we had to be okay not knowing how things would work out, and not knowing how to answer almost any questions. As Mike reflected, "How do I take my EGP 400 course that I worked so hard to make interactive and push it online? and How can I support and supervise my student teachers?" Crystal noted, "Not only did students need to transition from campus housing to home environments, they had to wrap their heads around not being within a campus setting nestled among academia support systems." The rapid shutdown indeed increased the distance everyone perceived at this time. Despite all of the changes, we felt a responsibility and saw an opportunity to innovate to help keep things functioning for our students and us.

We had to process uncertainty quickly, evaluate how it could work with our students, and make rapid adjustments to our practices. The rapid changes caused us to actively tinker with our understandings, beliefs, and practices (Martinez and Stager, 2013). We were testing and iterating all in real-time, challenging the way we approached our work. Mike journaled.

> All of this is causing me to think about the value of learning activities and makes one wonder if you really do need to do everything in person all the time. Is there a place for sharing information and having students do something with it on their own time? Can learning only happen in the set period we give them? (April 2, 2020).

During this period, students shared feedback, challenges, and successes with us, helping us reimagine and refine our work. Moore (2012, 1993, 1989) and Shannon (2002) might say we worked to develop flexible structures that were responsive to our students' needs, ourselves, and ultimately met the goals of our courses. While teaching in survival mode, we noted an increase in our willingness to make rapid changes rather than when we were teaching in a traditional model. The circumstances caused us to invite more feedback and ask how things were going, more than we had previously. In this sense, survival mode teaching appeared to decrease transitional distance in some instances.

We had to accept that our teaching methods had to change immediately to accommodate student learning online. Remote learning required a shift to asynchronous learning or some form of hybrid instruction. This required us to learn about the potential of new technology applications that might motivate our students (Salmon, 2011). However, there were glitches, as Mike wrote in his journal on April 3, 2020,

> There were the technology glitches related to the asynchronous portion of EGP400. Apparently, Edpuzzle was freezing for some students, and the Discussion board was not operating - I guess when you put conditions on it like they have to respond to 3 others, D2L won't allow students to respond first. Live and learn. I resolved the issue with the discussion board, but Edpuzzle was a mystery because it worked for me, and it appears as if some students were able to complete the work.

Our class structures needed to be flexible enough to allow for rapid changes when what we had planned fell flat or simply did not work. Moore (2012, 1993, 1989) might see this is a way we tried to mitigate any distance that may have been unintentionally created by design decisions we made as we transitioned to remote teaching.

The immediate shift to online instruction made us feel as if we were building the ship as we were flying it. Mike reflected, "Small tasks like having students turn and talk or talk around the table were seemingly impossible. Anything that took 5 min in the classroom would take 15 online…." When teaching in a more traditional classroom, the instructor can continuously read the room and drive the pace, guiding students to move on or change course immediately; this is impossible to do as students are working autonomously. Plans we had that we knew would be successful in a face to face setting would simply not work online. Structuring online courses requires a thoughtful design that ensures that all tasks and assignments are purposeful and framed explicitly.

As everything changed, we both found that we needed to be mindful of essential learnings as we worked on lessons for our courses. Online learning places much responsibility on the learner. It is critical that we, as instructors, know what experiences will support students in developing the essentials skills and knowledge for our courses. To do this, we had to identify clear goals for each class session, work ahead to create content, video recordings, and ensure all assignments were posted and ready for students. Being prepared and ready to teach looked different, just as the learning experience looked different for our students. Garrison (2000) might see this as a way we started to reimage our role as teachers in online instruction.

The changes we made required that students take greater ownership of their learning and the ability to monitor, manage, and process remote learning experiences. This shifted the learning structure that a majority of our students had come to expect in their college courses. In survival mode teaching, self-directed learning became an essential component. Students needed to examine assignments, allot time for completion, and study outside of the classroom without direct access to or supervision by a professor. Giving students autonomy did not prepare them for additional responsibility (Moore, 2012, 1993, 1989). Mike journaled, "I had them (students) work in breakout rooms on a collaborative jigsaw activity, but I noticed some confusion over the directions and the students' ability to process and make sense (of directions and content)" (April 1,2020).

These students then opted to do nothing, rather than try to problem-solve or ask for help.

Additionally, students who were accustomed to face-to-face learning immediately had to adjust to new structures online. Crystal reflected, "In this age of technology-rich environments, one might assume that all students like to learn through digital activities, but many students commented on their dislike of such engagement methods." Moore (2012, 1993, 1989) might see this as a way our structures were not working for our students. Whereas we assumed "digital natives" would figure things out quickly, we found that we needed to be extremely specific and explicit in our directions to guide students through remote learning. Being open to this need led us to refine the ways we presented learning activities and reevaluate the specific value of each to ensure it met particular goals.

Reimagining Connection

Crystal and Mike also both taught and supervised student teachers during this semester. Survival mode supervision required us to modify everything that previously worked in the brick and mortar classroom environment. As Crystal reflected,

> Before Covid-19, we used the Danielson Framework to evaluate student teachers in the classroom setting. Feedback, a tool used in classrooms through direct conversations, had to move online . . . Not only was this a change in the process, but it also now involved feedback on remote learning sessions through Zoom or other online platforms.

In order to survive the moment and help our student teachers, we collectively explored ways to create digital learning opportunities for K-8 students. This created a space where we were simultaneously learning with our students and providing feedback to them on their remote teaching. Survival mode encouraged us to create spaces where student teachers could share, reflect on, and talk about their work with K-8 students. We started to look at lessons in a 360-degree fashion, talking about the planning process, how it was presented to students online, how students reacted and responded to the online assignments, and examine samples of student work. While all of these things should happen in theory, the circumstances created by working in survival mode seemed to give us more opportunities to dig into each student's work. As Mike noted, "I am enjoying the ability to spend some more one on one personalized time with each intern talking about their teaching, how they are thinking through their plans and the ways that they are managing their relationships with their mentors and other colleagues" (personal journal, April 10, 2020). Moore (2012, 1993, 1989) might see this as another way we minimized transactional distance with our student teachers while supporting them in learning from their experiences as virtual educators (Cuenca, 2013).

We could spend time facilitating this work in our seminars; however, that individualized support was difficult to provide in our other courses, each with approximately 30 students enrolled. Mike wrote about this challenge in his journal on April 10, 2020,

> The university talked about academic integrity and rigor while also trying to be sympathetic to students' needs. The challenge is when I reach out to students, I only hear back from a few . . . but if I do not

hear anything, I am not sure what to think - especially if they submit "work" that checks the box but really doesn't meet expectations.

Many of our students were not prepared to manage their learning in a space that provided them with less everyday interaction with their peers and their professors. Mike reacted to this in his journal, noting, "I am struggling with knowing if I am giving too much work, not enough work or just work . . . but I sense that my students are struggling" (April 14, 2020). We needed to reinvent ways to check in with students, get more specific feedback, and invite opportunities for them to seek out assistance as needed. Moore (2012, 1993, 1989) would note that we needed to adjust the structure of our courses to try and match the needs of our students and their ability to manage and regulate their learning.

We recognized that our roles had to change to support students as they rapidly moved to remote learning. Students, too, were just learning to survive these new educational and life conditions. We had to facilitate spaces where students could learn to become comfortable with different ways of interacting with the content, their classmates, and their professors. The new methods of instruction and supervision resulted in us finding ways to increase collaboration among student groups during each of our class sessions. We used Zoom Breakout Rooms, discussion groups, Google Docs, Padlet, Flipgrid videos, and other tools to promote collaboration with peers or teachers. Moore (2012, 1993, 1989) might see that by doing this, we made changes to our structures that helped support students as autonomous learners by encouraging dialog in multiple ways. Crystal put it this way in her reflection:

> When asking questions in class, it is rare to hear from all 30 students. However, when using a discussion board online, we were fortunate to read and receive insightful comments regarding readings and discussion posts. This allowed a majority of our students to have a voice, something that did not happen in face-to-face situations. Shy students that often did not participate flourished in this environment.

Rethinking ways students could communicate and share their learning demonstrated a growth opportunity for our teaching. Some online tools like Flipgrid allowed us to see and hear more students' voices and ideas than we would typically in a more traditional setting. As Mike reflected, "While the students did not seem to interact as positively in breakout rooms - often complaining about work or their lives, they did respond to each other on the Discussion boards and Flipgrid." Students' responses to one another demonstrated that they had actually "heard" what their classmates said, which is also often lacking in discussions in face-to-face settings. It was necessary to take advantage of this promising aspect of online instruction and infuse these types of learning opportunities creatively into our teaching.

As we worked to recreate communication spaces in our online learning environments, we recognized the importance of the types of questions we asked and the directions we gave. In a face to face setting, teachers can ask quick check questions or walk around the room, scan student work, listen in to groups, and monitor progress to assess how things were going for students. Teachers and students both had to make sense of this new

environment and construct new ways of acting and interacting with each other to develop new knowledge (Martinez and Stager, 2013) and successfully survive our current circumstances. Moore (2012, 1993, 1989) might see the challenges in the format as a factor that increased transactional distance, while our efforts to use multiple platforms to support connections was a way we reviewed our structures to decrease the transactional distance. Survival mode teaching required that we were comfortable with continuous learning and iteration, understanding that our students had to be open to these factors as well.

From Supervision to Collaboration

Reimagining our roles as student teaching supervisors occurred in many phases, beginning with the responsibility of counseling our students to remain calm and try to make sense of the situation. Mike wrote, "In my conversations with the interns, many are really experiencing a loss related to schools closing until June, not having the 'solo' week they had thought about and then all of the changes to graduation, etc." (personal journal, April 21, 2020). This required additional conversations with our students and their mentor teachers to create and facilitate new learning spaces and opportunities. However, not one of us had ever truly experienced anything like this before. Students, mentors, and professors were figuring this out together, changing the dynamic from one of mentoring and supervision to one of collaboration between all parties.

The transition to remote learning environments required a shift in thinking for student teachers, classroom teachers, and professors. As Crystal reflected, "I recognized the necessity to support student teachers as they . . . developed lessons that would typically be taught face-to-face. Together, we had to search for platforms that would support learning among elementary students." This takes creativity, time, and task management; three areas that are not always accessed because of other commitments. Ted Dintersmith (2018) might see this as a way the circumstances forced us to challenge the rigidity of practicing what was always done in schools. Many use technology in their instruction, but not as a full-blown pedagogical method of delivery. However, as Mike noted, our student teachers faced these challenges boldly, "I am super impressed with the work that the majority of them are doing, how they are supporting their mentors and the creative ideas they have come up with for engaging their students in the online environment" (Journal, April 2, 2020). Our students were not dancing around technology or using it to add pizzazz to a lesson. They were using technology as a tool to create authentic online learning opportunities for their students. In fact, during most conversations with mentor teachers, they noted ways that the student teachers were helping and supporting the "mentors" as everyone was learning together. Typical dynamics between the supervisor, mentor teacher, and student-teacher were shifting as we were all collaborating and learning from our practices together.

Transitioning to a remote learning classroom made us realize that we needed to support student teachers as they transitioned to online teaching. Together we had to explore ways to create online lessons that helped K-8 students to be self-directed learners. Something new to all of us. As Crystal reflected,

"To ensure students were rewarded with appropriate lessons during remote teaching, pre-service teachers had to take a deep dive into pedagogical elements that supported online learning. Furthermore, in order to support student teachers, I had to become familiar with pedagogy that would engage student learning on digital devices." We worked with our students to search for applications that would support learning among elementary students. These interactions yielded productive discussions over email, text, phone calls, and Zoom meetings.

Student teachers needed to feel comfortable taking risks as they challenged their conventional thinking about classroom lessons and their position as student teachers. Mike reflected, "Most of the interns were trying to make sense of this experience based on where they had been in a typical Face to Face setting - for ex. to take over reading, or math, etc., I felt as if they now needed to have a chance to find spaces for themselves, highlight their talents, and take on the challenge." Through our work, we encouraged students to be comfortable with learning from their practice, which we encouraged all the time but seemed more natural now since everyone involved was in the same boat. Our students were on an equal footing with their mentors and us as we explored how to move all types of learning experiences online. Moore (2012, 1993, 1989) might see that being collaborators impacted the way we structured our seminars, communicated with each other, and certainly helped to lessen the transactional distance between our student teachers and us.

Supporting these types of shifts required an open dialog exploring questions related to pedagogy, reaching students, core instructional goals, and learning. We had to be comfortable and prepared to work with our students in this new setting, acknowledging the challenges and knowledge gaps that our students experienced (Feher and Graziano, 2016). As Mike wrote,

> I have really enjoyed these conversations with the interns, as I feel like they are demonstrating some creativity and real willingness to try and think outside of the box, given the circumstances. But this one was - well - depressing. While there was nothing inherently wrong with her lesson, and everything she shared made sense and demonstrated the best that she could offer to her students, given all of the constraints, she was still upset. She said, "I feel like I'm not teaching them. I could be doing so much more. I should be doing so much more" (personal journal, April 14, 2020).

We could relate to these feelings deeply since we, too, were experiencing this with our classes. While it was clear we were all working autonomously to meet the varied needs of our students, the communal bonds we formed with our student teachers promoted a more in-depth exploration of our practices and what it means to be a teacher.

Online learning provided more opportunities for professors to engage in conversations (virtually) with students and hear more directly from each student about what they were experiencing, thinking, needing, and wondering. In a way, these conversations strengthened our connections and allowed us to become thought partners as we grappled with challenges and questions together. In this scenario, no one had the "right" answers or any answers at all. This helped to create safe spaces to try and test ideas, admit when things were not working, explore why, and make

the necessary changes. The honest dialog we had was not as students and professors but as fellow teachers. This allowed us to lessen the transactional distance we were all experiencing and better individualize to meet the needs of all of our students (Huang et al., 2015).

What resulted from this collaborative adventure was a new fondness for online learning, a willingness to take risks, and the recognition that we need to try to help our student teachers develop a greater sense of agency. Pre-service teachers had to shift their mentalities from face-to-face instruction and the rewards that come with it to an online environment where one had to motivate students through a screen. We all had to reimagine what teaching could and should look like in this new environment. Mike reflected, "I had to be okay with the fact that the interns may not be 'taking on the whole day' and be supporting students by holding office hour (tutoring) meetings, creating online asynchronous activities, or virtual Morning Meetings." By working together with our students, we encouraged each other to try new methods and collectively reflect on our teaching, which would not have happened in a typical semester. This is another example of how pedagogical changes we made helped reduce the transactional distance between and among our students and us. In viewing student teachers as collaborators Garrison (2000) might say we implemented changes to our structures that promoted productive authentic dialog that was driven autonomously by students' immediate needs and interests related to their online teaching. Ultimately, this process helped us understand that it is possible to create a learning community online and focus on content delivery (Kim et al., 2019).

Igniting Creativity

Most student teachers did take opportunities and run with them. Many demonstrated creativity and boldness in the lessons they worked on, creating videos, interactive presentations, virtual field trips, and ongoing connected virtual learning experiences. The student teachers used presentation tools, virtual experiments, videos, Nearpods, Flipgrids, Educreations, screencasting applications, and many other tools. The teachers recorded audiobooks and also facilitated virtual read alouds (Mike's reflection).

As we processed Moore's (2012, 1993, 1989) theory of transactional distance, we noted that one way to lessen transactional distance in online teaching was to look at the interplay of structure, dialog, and learner autonomy through the lens of creativity. This involved the way we looked at our teaching and how we worked with our student teachers as they developed lessons for K-8 students. Crystal reflected, "Remote learning strategies can be engaging activities that would not work in a face-to-face environment." The immediacy of the changes required us to change our thinking as we were tinkering with our online teaching practices. It also created a space for our student teachers to demonstrate a level of creativity and autonomy that did not exist when working with their mentors and students in the typical classroom.

Creativity and variety were crucial to the establishment of an online learning community with all of our students.

Rice and Deschaine (2020) note that when guiding pre-service teachers, we need to think about instructional design rather than instructional delivery and focus on how we will build relationships with students in the online space. Crystal reflected, "The technologies available to today's online teachers are varied and robust. However, students can become dissatisfied with their screen-mediated conversations." As we examined our online instruction, we noted how this experience challenged our conceptions of teaching and learning. We had to identify critical skills and knowledge while exploring different modes of communication and interaction using various online applications.

While teaching never seems static, making this immediate shift to online instruction created a vibrant opportunity for authentic professional inquiry. Through this process, we had to explore what was truly meaningful to help our students learn. As veteran educators, we both had lots of knowledge of what works in a face to face setting, but little idea of how this might be designed expertly for online learning. We questioned our work and needed to construct answers swiftly to best support student understanding and growth. Mike reflected, "I had to think about what assignments were critical to helping students construct knowledge. Is busy work important just to have students identify what they "know," or should I stick with process-oriented assignments?" Given all the uncertainty, we noted that we were generating and testing new ideas more than we ever would have during a typical semester. When looking at our plans and class structures for each week, we had to be creative and adapt to respond to the results of previous class sessions. Our student teachers were experiencing the same thing, as they worked to find ways to reach their young students and help them continue to learn. As instructors, we all needed to be thoughtful and creative about the opportunities we provided for students to interact with the content and each other.

Remote learning offered a more significant opportunity for our student teachers to demonstrate creativity and boldness in their teaching. Earlier in this article, we noted how positions equalized as we all switched to remote learning, meaning there was indeed a sense of collaboration between us, our student teachers, and their mentors. We were all working together to make things work for children. Our typical "seminar" sessions became collaborative brainstorming sessions, where students and professors shared ideas, challenges, and successes. These were truly spaces for authentic inquiry that led to creative ideas that we all felt would try to meet the needs of our students, no matter their age. In a sense, we created teaching playgrounds where we all played with different ideas, tools, and structures. As we reflected on this experience, we both noted that even though there were so many challenges and constraints, there was a sense of liberation, creativity, and opportunity that this time presented, something that we noted had not existed during previous semesters.

Additionally, our student teachers benefited from the fact that schools and districts were freed from the constraints of standardized testing. This freedom provided mentor teachers with the opportunity to allow their student teachers to be more creative and thoughtful about the types of lessons that they were

preparing for their students. We noted that when we spoke with students during this time, they told us that some mentor teachers shared that they were now able to create units and learning opportunities that would have been restricted by the time given to test preparation. When reviewing our reflections on our interactions with our student teachers, while all lamented the loss of "what could have been," they also felt that this time allowed them to explore and be more creative than they had been during the first part of the semester. As Mike journaled after a lesson conversation with a student teacher, "I have really enjoyed these conversations with the interns as I feel like they are demonstrating some creativity and real willingness to try and think outside of the box given the circumstances." Moore (2012, 1993, 1989) might see this as a way we need to work to create more flexibility in our typical structures to motivate creative, autonomous learning.

DISCUSSION

In this paper, we used Moore's (2012, 1993, 1989) theory of transactional distance and a tool we call the 4 R's to examine our work as teacher educators when the doors of schools and our university shut and all of our instruction moved abruptly online. In this model, teachers **recognize** students' needs and adjust instruction, **reflect** on lesson structure, **and react** by adapting and modifying practices. Through these actions, we see **results** that demonstrate how we moved our practice. For our work, we looked at Moore's (2012, 1993, 1989) critical elements of structure, dialog, and learner autonomy as we looked at our online instruction through the lens of each of the 4 R's construct.

As a result of our examination, we found it is especially important that educators recognize ways that online teaching should be and is different from face-to-face instruction. Instructional design is instructional delivery in online education (Moore, 2012; Huang et al., 2015; Rice and Deschaine, 2020). We need to purposefully design structures that focus on relevant content and the importance of community building. Additionally, we need to provide varied opportunities for students to demonstrate personal and collaborative autonomy in their learning. However, the online learning environment cannot be static. Instructors need to be alert, responsive, and open to innovation to support online learners. This means that while there may be a plan or design for a course, especially one designed for asynchronous learning, the educator needs to check in, evaluate how things are going and be willing to change if the existing plan does not seem to be working. While we talk about being responsive and innovative in education, at times, we often do not enact these types of responsive practices in our teaching, no matter the format.

While continuous innovation and responsiveness can help to try and support students as they move through any class, we must also think about how changes impact and are received by our students. Communication is crucial to support students in online learning environments (Garrison, 2000; Falloon, 2011; Salmon, 2011). To truly be responsive, we need to engage in dialog with our students (in any format) to get a better sense of how things are progressing for them. If we modify a structure, we need to communicate our thinking to help foster learning and understanding. While this dialog is meant to keep students informed, it also reminds us of the importance of equalizing positions and fostering interactions between students and the instructor (Dewey, 1938; Lave and Wenger, 1991; Moore, 2012). While we know that sharing specific guidelines for assignments and learning activities will help ensure that teachers get quality work, it is also critical that students have voice and agency. Concerning our work, it reminds us that we need to allow pre-service teachers to have and learn to use their professional voices.

Moore (2012, 1993, 1989) reminds us that learner autonomy helps to promote self-directed learning and responsibility for learning goals. We came to see providing opportunities for autonomy also opened spaces for students to demonstrate creativity in ways that a more controlled or directed space had not. While Moore (2012, 1993, 1989) might suggest that greater autonomy increases transactional distance, we saw that, at least for our student teachers, greater autonomy spurred creativity that opened a space for professional sharing and dialog.

The autonomy that encourages creativity is not always easy for students. We know that autonomy implies increased choice; however, autonomous learners must take responsibility for their learning (Moore, 2012). Since most students are normalized to typically getting all directions and instruction from the "teacher," self-directed learning can be very challenging for some. Students need to be self-motivated, engaged, and dedicated to learning without the direct presence of their peers or instructors to be successful in these environments. We learned that we needed to provide more scaffolds for students who were less comfortable with autonomous learning opportunities. Additionally, we noted that we needed to try and create more of these types of spaces for students in our courses so that they could come to be more comfortable with taking chances and risks while taking charge of their learning.

Implications for Practice

As we all prepare for more online learning opportunities, we must reflect on our previous experiences and look to expand our practices. When considering distance learning theory, dialog, flexibility, and learner autonomy all surface as a means for helping students self-regulate their learning. Through conversations, instructors can gage learner interest and understanding of content. Flexibility is necessary when designing learning environments; teachers will need to scaffold for learners with poor self-regulation, while also challenging learners who embrace independent learning opportunities. We feel that the 4R's Professional Inquiry Model might provide a structure for others to reflect on their practices as well. The school shutdown experience created opportunities for us to learn about ways to integrate online learning opportunities into our teaching more effectively and be a bit more prepared for what is to come.

Educators must recognize the necessary changes in pedagogy as transitions are made from face-to-face to remote learning environments. Strategies to create community-building

opportunities will help students feel connected with peers in the remote classroom environment. Additionally, students need practice with the digital tools used to foster learning; it cannot be assumed that digital natives come equipped with navigation skills. Equally important is the element of communication vital to the support of all learning environments; it has to be specific and frequent. Finally, collaboration both in the remote learning environment and among professional colleagues will encourage learning opportunities that lead to student success.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

MR and CL worked collaboratively to explore our practices using the 4 R's and Moore's theory of transactional distance. Both authors contributed to the article and approved the submitted version.

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Preservice Teachers' Mathematical Mindsets During Pandemic-Induced Pivot to Online Learning

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Many preservice teachers (PSTs) enter mathematics methods courses with fixed beliefs about teaching and learning mathematics and their own abilities as doers of mathematics. Using a repeated measures design, I examined changes in PSTs' beliefs about mathematics teaching and learning at three separate time points-at the beginning of the first semester of a growth mindset-oriented mathematics methods course, midway through the treatment at the end of the first semester, and at the conclusion of the treatment at the end of the second semester of mathematics methods that was forced to pivot to online learning due to the COVID-19 pandemic. Results showed that explicit teaching of growth mindset principles coupled with participation in growth mindset-oriented mathematics methods courses yielded statistically significant improvement for PSTs' beliefs about Rules and Procedures, Process of Inquiry, Active Learning, and Fixed Ability as measured by the TEDS-M instrument and did not appear to be impacted by the pivot to remote learning. Comparison of a pre-pandemic cohort with the pandemic-disrupted cohort showed no statistically significant difference in Fixed Ability. These findings suggest that resilience, one of the hallmarks of the growth mindset, may serve as a protective asset during periods of profound stress.

Keywords: mindset – an established set of attitudes held by someone, teacher – education, math-positive mindsets, teacher beliefs and attitudes, mathematics education, teacher research, online instruction and learning

INTRODUCTION

Fixed mindsets about mathematics teaching and learning held by preservice teachers (PSTs) can impede their developing content and pedagogical knowledge. Dweck (2006) defines mindset as a self-perception people hold about malleability and their brain's ability to grow and improve. Like all people, a PST's fixed mindset about mathematical abilities may limit achievement. Many PSTs do not consider themselves to be "good at math." Research has helped to debunk many myths about who is or is not a math person. For example, neuroscience reveals that the brain's plasticity allows for growth and change in response to appropriate stimuli and experiences (Maguire et al., 2000). Also, a growing body of research on mindset shows that learning and achievement improve when people transform their perception of themselves as math learners from fixed to growth (Aronson et al., 2002; Blackwell et al., 2007). Students possessing what Boaler (2016b) terms a mathematical mindset achieve at higher levels than those with a fixed mindset (Claro et al., 2016). Differences in achievement may stem from how individuals with differing mindsets respond to mistakes in mathematics. Brain research shows that when confronted with a mistake, synapses in a fixed

mindset individual's brain fire less frequently that those in the brain of a growth mindset individual. The growth mindset individual's brain engages with the mistake, trying to understand and learn from the error, but the fixed mindset brain remains comparatively static. Simply put—fewer neural connections means less learning (Moser et al., 2011). Thus, adopting a growth mindset increases our brain's ability to understand mathematics by persisting when it becomes challenging. Another area of research indicates that expanding students' beliefs about the nature of mathematics itself has positive effects on learning and achievement. Boaler and Zoido (2016) reported that students whose mathematics experiences moved beyond rote procedures and memorization to include grappling with challenging ideas, deep conceptual learning, and creative thinking showed higher achievement than those who characterized mathematics as a series of rules, formulas, and procedures. Most significant to teacher educators, explicit teaching of mathematical mindset principles can alter mindsets (Boaler et al., 2018).

Design

This paper describes the results of a repeated measure design examining the impact of participation in growth mindset-oriented mathematics methods courses coupled with explicit teaching of growth mindset on PSTs' beliefs and mindsets as measured by the *TEDS-M 2008 User Guide for the International Database: Supplement 3* (Brese and Tatto, 2012). The **Supplementary Material** contains the full survey instrument. PSTs selected responses using a 5-point Likert scale for items from the following categories:

- The Nature of Mathematics – Rules and Procedures (5 items). Example: Mathematics is a collection of rules and procedures that prescribe how to solve a problem. The Nature of Mathematics – Process of Inquiry (6 items). Example: Mathematical problems can be solved correctly in many ways.
- Beliefs about Learning Mathematics – Teacher Direction (8 items). Example: Hands-on mathematics experiences aren't worth the time and expense. Learning Mathematics – Active Learning (6 items). Example: It is helpful for students to discuss different ways to solve particular problems.
- Mathematics Achievement – Fixed Ability (8 items). Example: Mathematics is a subject in which natural ability matters a lot more than effort.

The study, conducted at a large urban university, included PSTs ($N = 86$) who were enrolled sequentially in two elementary mathematics methods courses required for their undergraduate elementary teacher certification program. I taught the methods courses concurrently with the PSTs' two-semester student teaching internship in public prekindergarten through sixth grade classrooms. PSTs spent 4 days a week in field work and 1 day in methods classes at the university. I taught the first semester classes face-to-face, providing PSTs with 42 h of instruction. PSTs received 24 h of in-person instruction during the second semester until the COVID-19 pandemic required transition to online instruction for the remaining 6 weeks of

the course. The majority (58%) of participants were Hispanic females. Sixty percent of participants were first generation college students. The mean age of participants was 23 years. **Tables 1**, **2** provide additional demographic information for participants including parental educational levels.

The elementary mathematics methods courses followed recommendations from the Essential Elements of Effective Mathematics Classrooms as outlined in the National Council of Teachers of Mathematics (2014) Principles to Actions. These elements include the following practices:

- Establish mathematics goals to focus learning.
- Implement tasks that promote reasoning and problem solving.
- Use and connect mathematical representations.
- Facilitate meaningful mathematical discourse.
- Pose purposeful questions.
- Build procedural fluency from conceptual understanding.
- Support productive struggle in learning mathematics.
- Elicit and use evidence of student thinking.

As part of their coursework, PSTs completed field-based assignments for inquiry-based instruction implementing the 5E Instructional Model (Bybee and Landes, 1990) and 3 Act Tasks (Meyer, 2015; Fletcher, 2016). They conducted a whole-group discussion with a Number Talk (Parrish, 2014) and a small-group lesson guided by Math Workshop (Lempp, 2020). They also assessed an elementary student's mathematical thinking using a Cognitively Guided Instruction interview (Carpenter et al., 2015). Though not commonly classified as growth mindset-oriented, these teaching experiences provided PSTs with opportunities to enact feedback, language, and expectations for learners that aligned with growth mindset principles.

Preservice teachers also received explicit instruction in growth mindset through a series of six 45- to 60-min lessons spread over the two semesters. The **Supplementary Material** addendum includes the complete Growth Mindset Curriculum. These lessons sought to help PSTs become familiar with mindset research, examine the effects of mindset on learning, and explore ways to adopt growth mindset language and behaviors in classroom scenarios. In lesson one, PSTs learned about malleability and contrasted traits such as height (not

TABLE 1 | Participants' demographic information.

	University (%)	College (%)	Department (%)	This group (%)
Hispanic	33.5	38.3	47.1	58.1
White	23.3	24.5	28.2	17.4
Asian	20.2	14.6	9.6	5.8
Black	11	16	8.3	10.5
Multiracial	3.1	4.4	4.4	
Native American	0.1			
Hawaiian/Pacific Islander	0.1			
Unknown	1.9			8.1
International	6.7	2.2	2.4	

malleable) and mathematical ability (malleable). PSTs watched and discussed Jo Boaler's TEDx Stanford Talk "How You Can Be Good at Math and Other Surprising Facts about Learning" (Boaler, 2016a, May). PSTs recorded personal math anxieties on paper and symbolically shredded the papers before tossing them in the trash and pledging to adopt a growth mindset while in math methods classes. In lesson two, PSTs watched Carole Dweck's TED Talk "The Power of Believing You Can Improve (2014)." They collaborated to contrast characteristics of growth and fixed mindsets. Lesson three placed PSTs in small groups to create posters focused on prompts related to attitudes, goals, and behaviors of fixed and growth mindset individuals. For example, one group discussed the following equity statement from the National Council of Teachers of Mathematics (2014) Principles to Actions: "An excellent mathematics program requires that all students have access to a high-quality mathematics curriculum, effective teaching and learning, high expectations, and the support and resources needed to maximize their learning potential" (p. 59). The group then wrote If/Then statements to explore the relationship between equity and mathematical mindsets. For example, if schools track second language learners into lower math classes, then those students miss out on math curriculum at higher levels. Lesson four focused on teacher language to support mathematical mindsets in the elementary classroom. PSTs revised fixed mindset phrases like "You're so smart" with alternatives such as "You should feel proud that you stuck with the assignment even though it was tough." PSTs designed posters with growth mindset phrases and read their posters aloud to create a video shared on social media. The posters were displayed on the classroom walls and the instructor's university office door. For lesson five, PSTs applied growth mindset actions to challenging classroom scenarios and student teaching obstacles. Working in small groups, they brainstormed growth mindset responses to common challenges such as a university supervisor giving critical feedback or elementary students giving up on extended math problems. Lesson six was completed virtually as the pandemic necessitated moving from face-to-face to remote learning. PSTs watched videos of a math class where Dr. Deborah Ball promoted productive struggle through classroom discussion (Mathematics Teaching and Learning to Teach, 2010) and Angela Duckworth's TedTalk "Grit: The Power of Passion and Perseverance" (2013). PSTs then reflected on ways in which mathematical mindsets were supported or inhibited by policies, procedures, and expectations in their field placement. Debriefing this lesson was completed via the discussion board feature of Blackboard. PSTs uploaded their observations and reflections after which classmates and the instructor responded to the posts.

Changes in Beliefs About Mathematics Teaching and Learning

Using a repeated measures design, I explored changes in PSTs' beliefs about mathematics teaching and learning at three separate time points. PSTs completed the survey at the beginning of the first semester of math methods (Time 1), midway through the treatment at the conclusion of the first semester (Time 2), and at

TABLE 2 | Highest level of education completed by participants' parents.

	Mother (%)	Father (%)
Elementary school	17.7	19.6
Middle school or junior high	11.8	15.7
High school	21.6	19.6
Some college	13.7	25.5
Graduated from college	33.3	15.7
Unknown	1.2	3.9

TABLE 3 | Mean composite scores for survey categories.

	Time 1	Time 2	Time 3
Rules and procedures	10.1	16.6	18.0
Process of inquiry	25.1	27.5	28.3
Teacher direction	31.0	36.1	37.1
Active learning	23.9	26.1	27.8
Fixed ability	32.6	37.3	38.3

TABLE 4 | Grand mean composite scores for survey categories.

	Time 1	Time 2	Time 3
Rules and procedures	2.0	3.3	3.6
Process of inquiry	4.2	4.6	4.7
Teacher direction	3.9	4.5	4.6
Active learning	4.0	4.4	4.6
Fixed ability	4.1	4.7	4.8

the conclusion of the treatment at the end of the second semester (Time 3). PSTs completed the three administrations of the survey as part of the regular course activities using a Google form. I reverse coded survey items as necessary prior to data analysis. For example, the Teacher Direction survey item that states, "Hands-on mathematics experiences aren't worth the time and expense" was reverse coded to ensure correct scoring of the Likert scale responses. I carried out this study according to the university's Institutional Review Board guidelines.

Table 3 contains descriptive statistics for survey results from Time 1 to Time 3. Since the five survey categories (Rules and Procedures, Process of Inquiry, Teacher Direction, Active Learning, and Fixed Ability) included different numbers of questions, I used mean composite scores to explore the topics broadly. These mean scores comparisons showed that from Time 1 to Time 3, PSTs made the largest gains in Rules and Procedures and Teacher Direction. To examine the categories individually, I used grand mean composite scores across time. These results, summarized in **Table 4**, indicate that PSTs made the most improvement in Rules and Procedures and held steady in their growth in all areas, with Fixed Ability showing the highest outcome when compared to other categories.

As shown in the results of the Time 1 survey, PSTs entered mathematics methods courses with fixed views of mathematics teaching and learning, particularly in the area of Rules and Procedures. They thought mathematics involved remembering and applying definitions, formulas, and mathematical facts and valued the application of procedures to find quick solutions to problems rather focusing on processes. While PSTs scored lowest initially on Rules and Procedures, they made the largest gains in

TABLE 5 | Summary of *p* values for linear regressions by survey category from Time 1 to Time 2 with Time 2 as the dependent variable.

	Rules and procedures	Process of inquiry	Teacher direction	Active learning	Fixed ability
Constant	0.139	0.000	0.000	0.000	0.000
Age	0.097	0.350	0.674	0.070	0.331
Sex	0.240	0.633	0.338	0.110	0.741
Ethnicity	0.621	0.863	0.864	0.053	0.962
Mother Ed level	0.497	0.962	0.095	0.064	0.019
Father Ed level	0.630	0.238	0.433	0.163	0.206
Time 1	0.155	0.035	0.676	0.000	0.016

this category over time. Linear Regression from Time 1 to Time 3 showed statistically significant effects for Rules and Procedures ($p = 0.023$) when controlling for students' ages, ethnicity, and parental education levels. **Tables 5**, 6 provide summarized reports of *p*-values for Linear Regressions performed comparing Time 1 to Time 2 and Time 1 to Time 3.

Process of Inquiry centered on the relevance of mathematics to real-world problem solving as well as the process of discovery as a valid means of building understanding in mathematics. PSTs' scores increased statistically significantly from Time 1 to Time 2 ($p = 0.035$) and from Time 1 to Time 3 ($p = 0.028$) in Process of Inquiry when controlling for age, ethnicity, and parental education level. PSTs showed gains in understanding that mathematics includes elements of creativity and that focused engagement in mathematical tasks leads to personally constructed understanding.

Results for Teacher Direction did not produce statistically significant results; however, single item analysis showed that in Time 1 PSTs responded overwhelmingly that students "need to be taught exact procedures for solving mathematical problems" and would "learn best by attending to the teacher's explanations." By Time 3, PSTs showed softening of their Teacher Direction views. All PSTs either Disagreed or Strongly Disagreed with the survey items that stated: "Hands-on mathematics experiences aren't worth the time and expense." and "To be good in mathematics you must be able to solve problems quickly."

Active Learning showed statistically significant differences when controlling for ethnicity ($p = 0.053$) and mother's education level ($p = 0.022$). Active Learning explored PSTs' beliefs about how teachers should engage students in problem solving and divergent thinking. PSTs made strides in their attitudes about teachers' support of productive struggle and allocating class time for investigating why solutions work. For example, in Time 3 nearly all PSTs either Agreed or Strongly Agreed with the statement, "Teachers should encourage students to find their own solutions to mathematical problems even if they are inefficient." The Active Learning category was the only area that yielded statistically significant differences between Hispanic and non-Hispanic participants.

Changes in Beliefs About Mindset

Linear regression showed statistically significant changes in PSTs' Fixed Ability beliefs from Time 1 to Time 2 ($p = 0.016$) and from Time 1 to Time 3 ($p = 0.014$). Particularly interesting was the finding that mother's education level had a higher impact on Fixed Ability than father's education level when comparing the

standardized coefficients (beta = 0.35 vs. beta = -0.27 from Time 1 to Time 3). See results in **Table 7**. Mother's education level was predictive of outcomes on the Fixed Ability measures from Time 1 to Time 2 ($p = 0.019$) and from Time 2 to Time 3 ($p = 0.05$). This finding could be interpreted to mean that if a PST's mother had attended some college or graduated from college, the PST's responses on survey items related to Fixed Ability were 2.7 points higher than PSTs' whose mothers had no college experience. Fixed Ability was the only category where mother's education level impacted beliefs.

The Time 3 survey included an open response item where PSTs responded to the following question: How do you feel being in this class has affected your thinking about math and teaching math? A future study will code these responses; however, a few preliminary observations follow. The term "mindset" appeared in 77% of the responses and "growth mindset" appeared in 43%. Many students mentioned they had once believed they were "not a math person" but had come to understand that was a myth. One PST wrote: "I was guilty of labeling people as a 'math person' or not a math person, and this class helped me realize that this was not valid, and that it could actually be detrimental to students' learning and mindset. Every student is a math student, and effort should be praised! The teacher needs to have a growth mindset about each student and the students will reap those benefits. Loved everything I learned in this class!" Another PST explained how the class affected their views on mathematics teaching: "I feel like I have more of a growth mindset. I believe I can teach math in a more interactive way by having meaningful discussions, hands-on activities, and using manipulatives."

Attrition among participants may have affected outcomes of this study. Time 1 and Time 2, which occurred prior to COVID-19 forced instruction to move online, included 86 participants. Time 3 was conducted 6 weeks into the pivot to online instruction and included only 51 participants. The attrition in the study was largely due to COVID-19 related challenges. When I followed up with PSTs who did not complete the Time 3 survey, several indicated that the pandemic disrupted regular routines for daily living as well as for completing school work. PSTs reported difficulties managing heavy workloads related to student teaching and college course requirements along with increased family and home responsibilities.

This raises important questions about the mindsets of PSTs who did not complete the Time 3 survey. How would their responses have affected outcomes? Where did these non-responders fall on their growth mindset continuum as shown in Time 2 results? Could the stressors of COVID-19 have

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TABLE 6 | Summary of p values for linear regressions by survey category from Time 1 to Time 3 with Time 3 as the dependent variable.

	Rules and procedures	Process of inquiry	Teacher direction	Active learning	Fixed ability
Constant	0.321	0.000	0.000	0.000	0.000
Age	0.347	0.158	0.386	0.657	0.747
Sex	0.290	0.976	0.832	0.031	0.554
Ethnicity	0.600	0.583	0.996	0.202	0.706
Mother Ed Level	0.780	0.070	0.128	0.022	0.050
Father Ed Level	0.713	0.682	0.296	0.993	0.131
Time 1	0.023	0.028	0.081	0.000	0.014

TABLE 7 | Linear regression Time 1 to Time 3 with fixed ability as the dependent variable.

Coefficients

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. error	Beta		
Constant	31.857	4.073		7.822	0.000
Age	0.036	0.111	0.046	0.325	0.747
Sex	−1.313	2.202	−0.090	−0.596	0.554
Ethnicity	0.360	0.947	0.062	0.380	0.706
Mother education	1.976	0.979	0.348	2.018	0.050
Father education	−1.564	1.015	−0.271	−1.540	0.131
Fixed ability	0.194	0.076	0.360	2.556	0.014

TABLE 8 | Mean composite scores for fixed ability pre-pandemic cohort (Spring 2020/Fall 2019) and Pandemic Cohort (Fall 2019/Spring 2020).

	Pre-pandemic cohort Time 1 (N = 48)	Pre-pandemic cohort Time 2 (N = 48)	Pre-pandemic cohort Time 3 (N = 48)	Pandemic cohort Time 1 (N = 86)	Pandemic cohort Time 2 (N = 82)	Pandemic cohort Time 1 (N = 51)
Mean composite score	31.7	38.2	37.8	32.6	37.3	38.3
Standard deviation	5.7	3.2	3.4	5.5	4.3	2.9

presented as fixed mindset triggers (Dweck, 2006) that made PSTs less willing or able to share their views? Was the pandemic challenging the growth mindset PSTs had developed during the previous semester but not serving as a protective force during a time of significant emotional trauma?

Without the insight provided by missing survey data, I could not determine if the mindsets in the pandemic cohort were influenced by the abrupt pivot to remote learning caused by COVID-19. However, by comparing survey results from the pandemic cohort with survey results from my PSTs in the pre-pandemic cohort (Spring 2019/Fall 2019, N = 48), I was able to further explore of the effects of the pandemic on mindset. Since mindset was most closely examined in the Fixed Ability section of the survey, I concentrated on survey responses for only those items. Based on mean comparisons, I found no statistically significant difference between the Fixed Ability responses from the pre-pandemic cohort and the pandemic cohort. See **Table 8** for descriptive statistics. Though these findings are preliminary and will require further analysis, they seem to indicate a relationship between mindset and the coping mechanisms employed during a pandemic. Learning about productive struggle and ways to respond to challenges may sustain math-positive mindsets in the face of unprecedented challenges. More fully examining the full survey data from the pre-pandemic cohort and making comparisons with the pandemic cohort in a future study will further inspect the effects

of the pivot to remote learning on PSTs' resiliency in periods of profound stress.

CONCLUSION

Explicit instruction in growth mindset principles and applications positively affected PSTs' views of mathematics teaching and learning. These findings were most significant for improvements in PSTs' beliefs about mathematical Rules and Procedures, Process of Inquiry, Active Learning, and Fixed Beliefs. PSTs appeared to set aside initial views of mathematics as a series of steps to be applied in prescribed ways in favor of what Boaler (2016b) calls an active approach to mathematics knowledge emphasizing understanding and sense making. The positive effects on PSTs' views on fixed versus growth mindsets confirm studies undertaken with middle school and high school students (Blackwell et al., 2007; Boaler et al., 2018) and clarifies some of the findings among PSTs (Schmude et al., 2017).

This study's high number of Hispanic PSTs provides particularly important information in light of continued concerns about equity and access in US mathematics classrooms. In their joint position statement, the National Council of Supervisors of Mathematics and Todos: Mathematics for All (2020) encouraged schools to discontinue mathematics course "tracking" that institutionalized fixed mindsets about students'

capacities in mathematics, particularly among students of color. In schools where mathematics is treated as a gateway rather than a gatekeeper to educational advancement, all learners must receive strong support and high expectations for their success. Equipping Latina teachers with mathematical mindsets may assist in disrupting patterns of inequity in mathematics opportunities, expectations, and supports.

The evidence from this repeated measures design shows the impact of changing fixed mindset beliefs and limited views about the nature of teaching and learning mathematics among PSTs. The iterative nature of teacher research allows me to further refine my mathematical mindset curriculum to improve outcomes for the area of Teacher Direction and compels me to connect with former students who are now teachers to explore the longevity of their math-positive mindset views in the face of the complexities of teaching in the midst of a pandemic.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because as a condition of the study's ethical approval data can not be made publicly available to outside researchers. Requests to access the datasets should be directed to corresponding author.

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ETHICS STATEMENT

The studies involving human participants were reviewed and approved by University of Houston, IRB. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc. 2020.595264/full#supplementary-material

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What Really Changed? Environments, Instruction, and 21st Century Tools in Emergency Online English Language Arts Teaching in United States Schools During the First Pandemic Response

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In this article, a teacher educator and two veteran teachers of 9–12 English Language Arts (ELA) inquire into the opportunities, challenges, and lessons learned from the abrupt transition to online learning caused by the COVID-19 pandemic. The shared setting was a major metropolitan area. The fundamental question addressed is *What really changed?* In ELA classes that were already rich in digital resources, and where assignments were regularly submitted using internet-based learning management systems, the Spring 2020 school close-down and move to online instruction nevertheless meant profound changes to the authors' teaching lives. In this article they investigate the approximately 12 weeks that concluded the first pandemic semester, focusing on the impact on teaching and learning environments, instructional purposes, and 21st century tools. The authors believe these changes will have consequences in future classrooms, in whatever physical or virtual contexts teachers find themselves delivering instruction.

Keywords: self-study, narrative inquiry, COVID-19, pandemic, online teaching, remote teaching, English Language Arts instruction

INTRODUCTION

As United States schools finished instruction for the spring of 2020, policymakers, teachers, administrators, parents, and students endeavored to understand the impact of the COVID-19 shutdown of in-person teaching and learning, and many contemplated what would happen next. In this article, a teacher educator and two veteran teachers of 9–12 English Language Arts (ELA) report on the opportunities, challenges, and lessons learned from their approximately 12 weeks of emergency online teaching. Their fundamental question is *What really changed?* Together they considered the impact of the new context for teaching and learning on their well-practiced instructional strategies and curriculum decisions; on their purposes for teaching; and how they

used 21st century digital tools. The researchers followed a self-study process, drawing on narrative inquiry methodologies, to better understand what felt like profound changes to their teaching lives.

Through articulating their stories and examining their multifaceted narratives together, the authors have identified and explored three complex areas of change:

- *Changed environments*: How do veteran teachers employ their hard-won expertise for creating and managing dynamic places for learning when the schoolhouse is disbanded and home schooling becomes a norm? If the brick-and-mortar building no longer organizes time and relationships, how do routines and rituals change for teachers and students?
- *Newly focused purposes*: When new strictures on time, scheduling, and curriculum alter priorities for student assignments and assessments, must instructional purposes change?
- *Twenty-first century learning at last?* When the pandemic hit, the authors were teaching classes that were already rich in digital resources, and students were regularly submitting assignments online. Nonetheless, when tools that had supplemented their classrooms became the medium for instruction, emergency online schooling gave the authors insights into their practices as ELA instructors.

METHODOLOGY

Thinking as both teachers and researchers, the authors examined their teaching during the approximately 12 weeks of ad hoc teaching made necessary by the COVID-19 pandemic. Through collaboratively interrogating their individual narratives and shaping a rich common one, they sought to understand how and whether they were able to promote sophisticated reading and writing, and independent student performance (key goals for ELA) despite the emergency move to online teaching.

The three teacher-researchers were in collaborative relationships with each other before the pandemic, largely focusing on strategies for teaching Shakespeare plays. Throughout Spring 2020 they had extensive conversations about what was happening beyond that specific curricular focus. They were keenly aware that changes were happening fast, and that administrators and whole systems were improvising to meet the challenges. It was exhausting: only after grades were submitted and the semester ended could they catch their collective breaths and begin to systematically interrogate the changes in their teaching lives, as well as speculate as to whether there would be lasting differences in their professional practices. To formalize a collective research endeavor, the authors agreed to follow narrative research processes in order to articulate their "embodied knowledges" and to create a "stage for narratable selves to make connections" (Andrews et al., 2011, p. 28) in the newly isolated and virtual education world. The three authors agreed to listen and think carefully in order to find expression of their commonalities: it was good, they agreed, not to feel so alone.

In the beginning, despite being established professional friends, the authors were nervous about taking on a research process: sharing personal writing meant learning to collaborate in new ways. The first two authors had previously co-authored one scholarly paper, and this was a first paper for the third author. While the first author had experiences that could generally guide the process, she was determined to find a way that all three voices and perspectives could be represented in their collective narrative. Following Clandinin (2006), she knew that narratives would enable them to create a three-dimensional inquiry space in which they could co-construct what had happened in their teaching lives during this historically strange and difficult time.

As a first step, the three authors brainstormed a list of topics pertaining to school environment and high school ELA instruction. The conversations, carried out using Zoom, were recorded both by individual notetaking and as videos, and were reviewed to capture the evolution of ideas and the emergence of themes (Schaafsma and Vinz, 2011). Because, initially, the authors felt that *everything* had changed, they worked to catalogue the intertwining personal and professional situations that the pandemic had brought. Common truths that emerged early included their shared commitment to ELA teaching and shared exasperation over the disruption to what were usually well-oiled classroom functions. Because these were broad categories, they worked to break down the topics into categories of "time, person, and place" in order to communicate about the nuances of their individual situations (Hamilton et al., 2008, p. 20). They learned to be comfortable with asking clarifying questions of each other to capture differences as well as similarities, and these conversations became the basis for understanding each other's unique professional landscapes (Craig, 2004).

Following Lyons and LaBoskey (2002), the researchers tested the validity of their claims through telling their virtual school and classroom stories to each other as expert ELA practitioners. This meant working to understand each other's commitments and choices: "Do you mean that they did this?" "Wow: I would have loved for that to have happened in my school" "What is the university thinking?" Such questions allowed them to align their teaching situations in ways that helped to uncover their assumptions and decisions. The authors turned to the rhetorical question of audience and determined that it was helpful to think of their research as "for" the student teachers and new teachers who were experiencing the pandemic and its aftermath without a repertoire of strategies that could be adapted. They hoped their efforts would "prompt reflection and resonance" (Chiu-Ching and Chan, 2009, p. 21) in future colleagues.

After several hours of focused and recorded discussions, the researchers decided they would write detailed individual narratives to articulate their beliefs about the topics they had chosen together, and thereby create a more intentional process for finding commonalities (Lyons and LaBoskey, 2002; Berry, 2009). After writing and then reading each other's narratives, they critiqued and combined those stories to further delineate and provide examples for what they identified as three emerging themes within a story of change: (1) how important the brick-and-mortar school was (is) to student relationships, parent relationships, and professional relationships; (2) the instructional

designs and purposes that still mattered most to them, even in online teaching; and (3) the 21st century digital tools that had moved from supplementing their teaching to becoming the medium of instruction. These categories became the lenses for further analyses of their experiences.

Thinking as both ELA teachers and social scientists, the three authors employed the power of the mirrors and windows (Bishop, 1990; Woodson, 2014) that their narratives could provide to each other's practices (Connelly and Clandinin, 2006). They found a common language in ELA teaching practices. They analyzed their instructional designs and decisions, especially where they were puzzled about their students' responses to more-or-less familiar assignments. They reviewed Fisher and Frey's (2013) model for instructional design and its framework for how teachers gradually release responsibility for learning to students. Drawing on both Fisher and Frey (2013) and Hattie (2009) they worked to shape a collective narrative that located "what changed" within (a) how they had provided explicit instruction and articulated learning goals, (b) how they had guided instruction and checked for student understanding, (c) how they had structured collaborative learning and provided a range of feedback on student work, and (d) how the independent tasks they assigned did, or did not, result in demonstrated student learning. The authors also wondered about the new roles digital tools played in these instructional processes. They realized that the majority of their students were born in this century and that while the popular press might describe them as "digital natives," such a designation obscures the different levels of access to and adeptness in online learning (Thompson, 2013).

From this common framework, the authors each developed one section of the narrative to combine their different perspectives. The researchers engaged in focused dialog to make meaning of new individual and co-constructed experiences (Hamilton et al., 2016). They found it difficult to write faithfully about each other's experiences, even after working together on the preliminary organization. They felt the challenge of capturing the needed information in detail without putting a "spin" on one another's experience. They were cautious in decisions about how much to reveal about individual school and student situations, so that no one needed to feel vulnerable. Overcoming these challenges, the authors followed Bohm (1996) in endeavoring to co-create meaning without imposing individual perspectives as if speaking for the group. Loughran and Northfield (1998) similarly would identify the authors' work to check one another's interpretations as an essential dimension of self-study.

The categories for analysis often felt intertwined and overlapping as the authors sought to identify *change* as something more than inconvenience or unfamiliarity. As the authors note in the conclusion to this paper, this painstaking process of shared meaning-making proved difficult and yet powerful as professional development.

Teaching Contexts as the COVID-19 Pandemic Began

The analysis in this paper focuses on teaching and learning environments, instructional purposes, and 21st century tools during the Spring 2020 COVID-19 pandemic, and the academic contexts of the teachers/researchers are presented here as organized by these topics.

A long-time ELA teacher educator at a local public university, the first author taught an online cross-content area course, *Introduction to Teaching*, before and during the pandemic. For her, the "schoolhouse" was already virtual and asynchronous. Her students were undergraduates who either sought teacher certification or considered other careers that would intersect with schools and adolescent lives. Many of her students were parents of young children, and many lived in multi-generational households. Her purposes in teaching the course included introducing future teachers to multiple digital tools that they could use for communicating with students and parents and might themselves adapt for teaching a wide range of content. She was further intent on guiding future teachers to use digital collaborative tools for sharing ideas and facilitating projects, including creating presentations and videos to organize and deliver information. Digital tools already in use in the *Introduction to Teaching* course included Canva, Smore, Padlet, Coggle, and Flipgrid; all materials and assignments were housed in a Blackboard learning management system shell. Students were expected to independently access Blackboard multiple times a week. The only synchronous requirement was for students to manage and complete assignments in small groups, with optional "live" office hours regularly offered for students who wanted immediate feedback.

A veteran ELA teacher, the second author taught in a suburban district outside a major metropolitan area. Her four reading/writing intervention classes and two Gifted and Talented (GT) English classes were governed by the state curriculum standards and the district's instructional model of reader's/writer's workshop. Prior to the pandemic, all her classes, set in the traditional schoolhouse, were aimed at mastery-based learning: lessons were driven by specific learning goals; students received actionable feedback with opportunities to revise their work; they were encouraged to reflect on and fine-tune their reading and writing processes; the emphasis on grades for motivation was minimal. Student ownership of learning was fostered, and students routinely engaged in conversations both with each other (during turn-and-talks, peer reviews, small-group and whole-class discussions) and with the teacher (during student-teacher conferences, small-group and whole-class discussions, and one-on-one tutorials). In the intervention classes, students completed most assignments using pen and paper, though in the quarter preceding the pandemic, online tools (Office 365 and *Itslearning*) became part of instruction. In the GT classes, the same online tools were routinely used to communicate assignments, share resources, and facilitate group work.

A decade-long ELA educator, the third author taught in a large school district at an inner-city, single-gender, magnet school with an exclusive focus on Pre-AP and AP curriculum. Set in a traditional schoolhouse, all classes had a "college feel" in terms of rigor, with expectations and standards higher than in a typical high school in the district. The AP English Literature class (twelfth grade) was finishing a study of *Othello* and moving toward metaphysical poetry and *Frankenstein*, as

well as preparing for the AP exam in May. His Pre-AP English I classes (ninth grade) were finishing a study of *Lord of the Flies* while transitioning to the quintessential work of ninth grade: *Romeo and Juliet*. He also taught an AP Research class and served as class sponsor, supporting student extracurricular activities like My Sisters, My Tribe Mentors and Rose Runners, the school's running club. Prior to the pandemic, the district's learning management systems, digital resources, and Google classroom were all in regular use for student access, completion, and submission of assignments.

DISCUSSION OF THEMES

Changed Environments

How do veteran teachers employ their hard-won expertise for creating and managing dynamic places for learning when the schoolhouse is disbanded and home schooling becomes a norm? If the brick-and-mortar building no longer organizes time and relationships, how do routines and rituals change for teachers and students?

In thinking about changes to their teaching environments, the authors first describe how the transition of course content happened when the pandemic forced abrupt school closures. They then discuss specific changes in the school day that resulted (bell schedules, instructional spaces, classroom routines). Finally they consider home-based learning and grading: how the new environment for teaching and learning led to changes in assessment and the communication of student progress.

Transitioning "Leftover" Course Content to the Online Environment

As veteran teachers, the authors each had hard-won expertise for creating and managing dynamic places for learning. The shift to emergency online teaching stretched them by requiring new routines and the deployment of new digital tools for communications with individuals and classes. Because the brick-and-mortar building no longer organized time and relationships, routines and rituals changed for teachers and students. Established strategies for funneling student energies and requiring student engagement had to be reconsidered.

In the beginning of the move to remote teaching, the fact that teachers were physically removed from their students had an immediate effect on what happened instructionally. In the second author's reading/writing intervention classes, designed to help students improve their performance on the state assessment, it quickly became clear that the distance learning format was challenging for many students. While some students produced thoughtful, well-written compositions, others never completed or even attempted the essay.

In contrast, the second author's students in the GT track quickly adapted to the new instructional mode. They independently engaged in a discussion-board assignment, posing thoughtful questions about a book review by Jennifer Szalai of Patrick Boucheron's *Machiavelli: The Art of Teaching People What to Fear*. The instructor saw most students engage in layers of sophisticated text analysis online, drawing on previously learned skills of discussion and interpretation.

The first author's students were midway through a collaborative digital project on "Big Ideas in Education Policy." Whereas the class normally required teams to work together closely, it became clear that many students were now in complicated family situations and under work and other time pressures because of the citywide closedown. In collaboration with instructors of other course sections, the requirements were truncated, and students created short individual presentations covering sections of the original assignment. In self-evaluations of their efforts and learning, students reported new understandings of their specific topics, but to the instructor they had missed a broader perspective on why the "Big Ideas" might matter to them as future teachers.

The move to remote digital learning seemed to go smoothly for the third author's students, as laptops were already a part of the district's one-to-one initiative at the secondary level. Also, digital tools and resources were commonly woven into lessons and curriculum prior to the pandemic, so the students were familiar with certain aspects of such online learning platforms as Google Classroom and *Itslearning*, while other platforms like Microsoft Teams were newly explored. In the ninth grade Pre-AP English I course, students turned in a mandala project for their formative assessment of *Lord of the Flies*, using an assignment feature in Google Classroom. In virtual department meetings, some of his colleagues wondered aloud about whether it was appropriate to assign creative projects for their courses, even though an online learning platform like Google Classroom allowed teachers to create and assign assessments that have such components. The third author advocated for keeping creative assignments because they could help students cope with stress and isolation.

Thus in the early days of emergency teaching, students and teachers alike were generally able to jump into the new situation with some known procedures and tools. Students could be seen making progress toward course goals, but their participation was uneven. Being familiar with digital tools and resources prior to the transition saved some troubles, like difficulties with logins and basic functionality that usually accompany new software. But the authors sometimes felt teaching was like operating a customer service or tech troubleshooting hotline. With a constant flow of new administrative decisions, the teacher-researchers found that their teaching needed to adapt as quickly as they would have in a physical classroom where a fire drill or unscheduled assembly or pep rally can upend careful planning. Students also suffered from tool and resource overload as every course and teacher increased their uses of what was familiar or adopted new strategies.

Bell Schedules

A high school's bell schedule governs the allocation of time for everything that happens on the campus. Without such a common organization, each instructor's school determined new patterns of time to support synchronous or asynchronous instruction. Student and teacher internet access and connectivity were also an

important part of the challenge. Some schools required students to be online and "in class" for extended periods of time every day. Others followed a freer model, having students turn in worksheet packets or other assignments as they finished, with no virtual meeting component. Of the two high schools represented in this paper, one decided on a weekly structure that included periodic synchronous class meetings using Microsoft Teams, while the other allowed teachers to hold synchronous meetings as long as students attended on a voluntary basis.

The authors each adopted strategies of office hours and other informal meetings in order to explain upcoming assignments, answer questions, or offer tutorials. They sought to create a measure of predictability and offer teacher availability, using time in ways that could support student progress. Each of the authors used digital tools and the online learning platforms for one-on-one conferences and consultations with students. The second author found herself spending hours every week on communication with individual students and their parents. In fact, her main approach for helping students who lagged in completing assignments was one-on-one tutorials: by email, through *Itslearning* messenger, in Zoom, or via Jabber (a district-approved phone app). She was able to walk the students, in need of help, through the necessary steps in completing assignments, although she was not always able to get in contact with students who might have benefitted, or their parents. For the third author's AP Research course—in which students were at the point of gathering research and developing their academic papers—the Microsoft Teams video feature allowed one-on-one conferences with students about their writing projects. Individual conferences were already an instructional practice in the course but holding these digitally allowed the students to maximize their time. The first author found her students made increased use of her online office hours once the pandemic shut-down seemed to keep them from easy access to peers who might have advised them or clarified assignments. All three authors struggled with maintaining consistency with time allotments for students when there was no longer the structure of a bell schedule or other indicators to delineate school hours and the working day.

Instructional Spaces

Expert teachers have many ways to use the physical environment to support the learning in their classrooms. High school classrooms are often as unique as the personality of the teacher who occupies the room, arranged to facilitate instructional activities and minimize distractions. Online spaces were not so easy to adapt or to recreate as virtual learning facilities.

While creating a mostly asynchronous learning experience for her students, the second researcher delivered explicit instruction through video, PowerPoint, and learning paths (a feature of *Itslearning*), and facilitated asynchronous student collaboration through discussion boards. She spent multiple hours every week communicating with students through email, *Itslearning* messenger, and Zoom tutorials, and with parents by email and Jabber.

The third author's school district chose to widely adopt Microsoft Teams, which was already available on student laptops.

Teachers were required to meet with classes using the video conferencing function, so that students could still feel connected to and engaged with them. Screen sharing capabilities allowed for instruction that would have used a document camera in a physical classroom. Chat room features allowed students who did not want to be on camera to have their words still read and heard through class discussions.

Other routines of the school environment included protocols for protecting student privacy, and these too proved complicated during emergency online teaching. Some promising instructional tools were disallowed because they lacked security.

Conferencing platforms like Zoom and Microsoft Teams gave students the option of showing their faces. While teachers had to be on camera during the virtual class, students were not necessarily required to show their presence: they could put up avatars or pictures of themselves, in keeping with school privacy regulations.

One school developed a virtual etiquette PowerPoint presentation with tips on how to navigate distance learning. In another school, the teachers could not require the students to attend video conferencing sessions, much less students' video presence in the meeting. In both cases, teachers were not certain whether students were actively participating when they did not have to show their faces. This also raised questions of attendance and presence. Transactional relationships between the teacher and the student became severely disjointed when the student's face was concealed and the teacher could not read facial expressions or observe gestures.

Classroom Routines

Teachers typically design their classroom spaces to reinforce routines (for turning in papers or holding conferences) and norms (for small-group collaboration or whole-class discussion). From the first weeks of school, teachers invest time and effort in building these routines, adhering to Wong et al. (2009) dictum that "readiness is the primary determinant of teacher effectiveness" (p. 92). While recognizing that routines and procedures are central to maximizing learning and minimize discipline problems, the three authors typically begin their courses by describing and modeling different classroom procedures to ensure students have a clear understanding of how the classroom is set up for their success. Even in online courses, students learn habits for submitting work and norms for working together and holding each other accountable.

For veteran teachers, who for years have been fine-tuning classroom tools and routines, classroom management skills become almost automatic—in fact, they become second nature. That is why and how veteran teachers can accomplish so much. But not all these skills could make the transition to online teaching.

One area that was profoundly affected by the new emergency online teaching, especially for the high school classes, was submission of assignments. The teachers had to translate the usual procedures for assignment submission and follow-up into a digital format administered at a distance. While "the dog ate my homework" might no longer work as an excuse, teachers found that tracking student work involved new routines and

unfamiliar processes. They lost a fundamental "control" by no longer being able to track down students, hand them assignments, and confront or cajole them—directly communicating about what was due, what was late, etc. In the emergency online environment, the greater control of the use of online learning platforms, like Google Classroom or Microsoft Teams, gave students many more ways to hide, to procrastinate, and to avoid responsibility altogether.

To translate her physical classroom into online format, and hopefully anticipate the challenges that come with greater student autonomy, the second researcher invested time in designing a landing page that was straightforward and attractive, strategically using images and fonts to make page content self-explanatory, so the process of accessing and submitting assignments would encourage student participation. At the end of each week, she archived old assignments (while making them easily accessible) and prominently posted the upcoming assignments. She maintained this practice throughout the semester, understanding the students' need for both clarity and stability at a time of confusion and uncertainty.

At the administrative levels of each of the authors' institutions, decisions were made about instructional expectations in the new emergency context, and these shaped the instructors' decisions about their class assignments and teaching practices. For the first author's class, the established weekly rollout of assignments with a collaborative synchronous component changed to a list of assignments required for course completion posted all at once: students were thought to be more likely to be successful if they were working independently and at their own pace. For the second author's classes, school administrators imposed limitations on weekly expectations: asynchronous learning tasks could take no more than three hours of work for "on-level" classes, or four for advanced ones. All deadlines were set to Sunday night, which meant that only one lesson cycle could reasonably take place during each week. In the third author's case, the limitation of two 30-min synchronous lessons per week made the previously planned rich instruction difficult to deliver as lessons became rushed. However, he found the real difficulty came from a weekly one-hour limit on homework, which made it impossible for students to engage at length with texts of any level of complexity.

Online Resources and Instructional Tools

All three authors were used to teaching in places where both they and their students would have easy access to resources. For all of their students, the authors needed to be sure that digital collections were accessible through school systems or the local public libraries, even as the buildings were also closed. They found that some families had home libraries or other resources to support their students, but there were significant disparities within class groups.

The authors realized that there were powerful online teaching tools available, even if not all students embraced or benefitted equally from them. Each author searched for new tools to meet a wide range of instructional needs, and they discovered options that they had not known were already available to them through

their schools. The authors found it was sometimes difficult to compare the utility of different programs and platforms because of the way each had been customized by the administration in their individual settings. Yet they found many tools to be worth sharing with each other for supporting ELA instruction.

The first author felt new appreciation for the move the *Introduction to Teaching* instructional team had made to open access resources in a previous semester. Through the established Blackboard course shell, students had all the reading materials they needed to complete the assignments of the course. The authors recognized the useful immediacy of digital texts, and their important ability to ensure students had access to readings and materials. As his twelfth grade AP Literature students were preparing for the AP exams, the third author assigned digital texts in the district's *Itslearning* system so that students could access the materials and prepare for discussion in the virtual classroom. He was able to pull up the text and have it accessible in Microsoft Teams to allow for better student participation in the discussion and better visual connection with the text. He also used a timed writing assessment feature in *Itslearning* that allowed him to set testing parameters. This tool was particularly valuable for helping the students prepare for the upcoming AP exam, as the College Board announced it would administer these tests in a digital format.

Prior to the pandemic, instruction in the second author's classes relied heavily on visual elements: PowerPoint's features that enabled the use of text color, graphics, images, and videos— ushered in through the animation feature—supported the presentation of mentor text excerpts, anchor charts, and teacher's models; the lessons' visual components were accompanied by in-person think-alouds and explanations. Once remote teaching began, the written components of lessons seemed easily translated into virtual format; in some cases, think-alouds and explanations were recorded in PowerPoint notes. The second author also used select Study.com videos to supplement instruction presented in written form. Voluntary 30-min Zoom meetings on Fridays allowed the second author to provide students with an explanation of assignments, answer questions, and offer tutorial help when necessary.

In order to help his students to prepare for the AP exam, the third author scoured the internet looking for digital resources so that students could practice their analytical skills and review topics in AP Literature. College Board not only released content-specific information for the upcoming testing season, they also created daily master-teacher led live YouTube videos for students to watch and participate in content-specific assignments and activities for the newly adapted-to-online exams. Another resource the third author found for his students was a "choice-board" for assignments that prepared students for specific question types on the AP Literature exam. These choices of different mini-assignments were aligned to the questions students were told to expect on the exams.

Learning From Home

Sending students to their homes while continuing their education redefined learning spaces in entirely new ways. Even for the first author's class (already online), the new necessity that

whole families shared physical learning spaces made for new challenges for students. Bedrooms and closets and couches became classrooms; dining room tables became workspaces; and kitchens for some were simultaneously lunch lines, teachers' lounges, and study spots.

While the authors recognize that even in normal circumstances the learning contexts for students are not uniform, the move to online teaching meant maintaining one school classroom culture in a multiplicity of home classrooms (more than a 100 different homes for each instructor). The home learning of every student changed, even if the course was already online. Rules and guidelines govern many houses: chores and standards are in place to make children successful members of society. When school went home, it seemed that some parents and students lost a clear division between educational rules and procedures and home rules and procedures. Student success became more obviously the responsibility of the parents and guardians of households, and inevitably some students were left to fend for themselves. There were all the usual pressures on families, and in addition the pandemic situation did not uniformly impact workers with children.

Because the students were at home, the online emergency classroom was sometimes strangely public. University students sometimes inadvertently revealed more of their homes than they intended, especially when their realities now included children suddenly at home and other family obligations. One student who contacted the first author for help on assignments described how she and her husband were housing elderly cousins who had been kicked out by other family members. As she FaceTimed with the instructor, she wrangled her small daughter and wondered aloud how the family could figure out a way for everyone to get along.

The instructors also found they were sometimes teaching to an audience that included siblings or parents, sometimes oblivious that a teacher in the middle of instruction should probably not stop to answer a question—especially a confidential one—specific to one student's progress. Other times the instructors worried about what aspects of class might be overheard and judged out of context.

Consequences of the Emergency Learning Environment for Grades and Expectations

The institution of each author enacted new policies for grading in order to be fair to students who were suffering from the pandemic shutdown and its multiple effects on employment, family situations, and health. The emergency online teaching situation highlighted differences between student compliance and student learning as grade policies changed and revealed multiple dimensions to what motivated students to complete work.

The third author was determined to maintain the integrity of his classes, especially in terms of expectations for his students. He felt keenly that there were still 12 weeks of school left, and that this meant there could be a lot of learning—especially because state testing requirements were dropped, and so formal test preparation was unnecessary. His school district determined that students would receive completion grades for the last part

of the school year. District leaders decided that students would still receive numeric grades (for the determination of GPAs): students were not to have their averages harmed in any way. There were to be no penalties for missing or late assignments once online teaching began. Thus the third author was stunned to be called into the virtual principal's office to hear about student and parent complaints about the work he was assigning. He was exhorted to show students "more grace," but that seemed to be mostly a demand for lowered expectations. He had given students a calendar of assignments from March to May that closely mirrored what his normal curriculum would be. The instructor did not want learning to end: this was an extension of his normal "bell to bell" classwork attitude, part of why he had been recognized as "teacher of the year" two years prior. His determination to maintain high expectations did not mean he was any less interested in his students' challenges. He was used to listening to their woes and anxieties and determining when it was reasonable to give them "grace" on late assignments. But now he felt his teaching expertise to be under attack. He felt that his campus, one that touts the pursuit of excellence, with goals of college readiness and becoming global citizens, was losing its way in trying to respond to the pandemic and keep everyone happy.

For the first author teaching at the local university, the Provost determined that students would decide for each course whether a posted final grade would be replaced by a credit that would not impact their GPA. The first author's grading policy endeavored to be both fair and simple: she posted all the remaining work for the semester and told students they could complete the assignments for an *A* or just the final paper for a *C*, which they could then change to credit. Ultimately she struggled with her own policy, because she wanted to reward quality efforts and acknowledge those who had worked hard from the beginning of the semester. The first author felt conflicted. New policies for grading and "grace" in the face of the incredible pressures of the pandemic meant working for as much student success as possible. As a result, a student who would likely have failed in a different semester, who turned in a largely plagiarized final paper, received credit because of the original introduction and conclusion. Another who admitted she thought she had "dug a hole way too deep" and had quit on the course hacked out a final paper in 24 hours in order to complete enough to earn a *D*.

The second author employed digital rubrics and checklists to provide feedback and assess student learning. The second author's district decreed that failing grades could not be given for the first progress report, and only *Pass* or *Fail* were to be entered for the fourth quarter of the school year, with 60 being a passing grade. As teachers who had taken pride in their status as professional decision makers and educational leaders, it was difficult to take part in the administrative decisions that were being made largely without them.

Newly Focused Purposes

When the new strictures on time, scheduling, and curriculum alter priorities for student assignments and assessments, must instructional purposes change?

Articulating Learning Goals/Purposes for Learning

The articulation of learning goals in an ELA classroom was made even more difficult in the emergency remote-teaching situation. The recursive, organic nature of ELA standards meant that decisions about sequencing, specificity, the number of goals in a unit of study, what to include, what to not include were complicated by new restrictions to time and interaction with students. Even in familiar teaching situations, teacher scope-and-sequence choices are an art, as some goals may need to be added in the process of teaching when a new direction for learning emerges.

In face-to-face ELA teaching, goals and purposes must be constantly communicated to the students so that they can have a clear understanding of the instructional direction. During emergency online teaching, a weekly overview meeting in Zoom allowed the second author to communicate her purposes for the learning activities she was requiring. She also posted one or two specific learning goals on each course home page weekly. Without regular in-person communications to explain and reinforce these goals, students came to believe that some work was only assigned to keep them busy. It was possible that a combination of too many discussion boards and not enough communication about their purpose may have resulted in this perception.

As his ninth-grade students began their study of *Romeo and Juliet*, the third author's primary goals were expressed in his anticipatory set of activities that asked students to explore William Shakespeare and his influence in the twenty-first century. In one assignment, students used the Folger Library's podcast series *Shakespeare Unlimited* to expand and share new knowledge about the life and works of William Shakespeare. To further his student's exploration into Shakespeare's current influence in society, the instructor created an *I-Spy Shakespeare* assignment, where students looked at photographs of extensive Shakespeare memorabilia and adaptations (statuettes, an "insult generator," children's editions, graphic novels, "to thine ownself be true" lip gloss, etc.) and answered questions in a Google Form. Thus he recreated online the kind of opening purpose-setting activity that required students to engage in the question of why Shakespeare is still studied in schools and continues to influence society.

When the pandemic altered the semester by canceling whole weeks, the first author needed to rethink the project and research expectations for her students. Her purposes for activities were also less clear when she could no longer expect students to report on observations from visits to schools, which were now closed. Prior to the pandemic, the cornerstone of the course was at the intersection of her students' previous school experiences, their review of peer-reviewed research, and their new adventures visiting classrooms and observing from the perspective of a future teacher. The course seemed off-kilter when the very definition of school and classroom had to incorporate the reality of emergency online teaching.

For all three authors, emergency online teaching changed their abilities to reinforce course expectations and remind students of the goals and purposes for what they were required to do. In addition to thwarting the way teachers could communicate *about* goals, the change to online teaching further challenged teachers who wanted to utilize explicit instruction and group work to *reach* those goals.

Explicit Instruction

The first and second authors, who taught asynchronously, delivered explicit instruction primarily in written form, at times supporting it with video resources available on the web. The third author delivered English literature curriculum with oral instruction using virtual live lectures, feedback, and commentary in real time using Microsoft Teams.

Already teaching online, the first author had developed an extensive collection of materials to support students as they learned to consult peer-reviewed research in online databases and make sense of it in light of topics related to teaching which they had chosen to know more about. These materials included readings and videos to view, with expectations that students would use online discussion boards and other digital platforms in order to share what they had learned and work systematically toward a final paper.

In her reading/writing intervention classes, to guide the students toward writing a book review, the second author used Gary Paulsen's *The Island.* Over the course of several weeks, she guided students' reflections about their self-selected books by sharing weekly models of her thinking about different aspects of her book and asking the students to do the same for theirs. To scaffold the students' reflections on their books, she shared simple sentence starters including "When I started reading, . . ."; "I realized that . . ."; "What I found especially fascinating was . . ."; "I am happy to finally get to the part where . . ." She also supported student review of literary content with Study.com videos on topics like archetypes, and static and dynamic characters. At the end of the unit, the instructor supported student use of genre-specific language as she shared her book review about *The Island* as a model, accompanied by a list of sentence starters—like "When readers enter the world of . . ."; "This choice by the author . . ."; "One interesting feature of . . ."; mirroring those used for the reflections written throughout the unit. Each digital lesson was housed on its own web page linked to the course home page. Students submitted their reflections through a Microsoft Form linked to the home page, and their book review through an *Itslearning* assignment portal.

In the GT classes, the second author delivered explicit instruction in PowerPoint. She used the notes function to provide instructional commentary. She had planned to record a voiceover for this lesson, but then decided to try it in a written format only, thinking it would be easier for students to navigate. This was a lesson on employing rhetorical moves in an opinion piece, an exploration of Martin Luther King, Jr.'s "I Have a Dream" speech. In the PowerPoint lesson, she combined excerpts from the speech with instructional commentary that highlighted King's use of repetition, metaphor, allusion, and antithesis to convey his vision for a just and free America.

As his twelfth grade AP Literature students were beginning their study of *Frankenstein*, the third author provided them with PowerPoint notes about Mary Shelley, Romanticism, and other topics students would encounter throughout their reading and

study of the novel. His being able to present PowerPoint lessons through screen share in Microsoft Teams gave students a sense of normalcy under these new conditions. The platform's video conferencing function even enabled all students to be seated in the "front row" of the classroom.

Collaborative Learning Supported by Feedback From More Than the Instructor

Student peer-to-peer interactions often felt curtailed in the online teaching environment. Even as students could be potentially connected through Facebook or a wide range of social media apps, teachers felt constrained in requiring peer work or other synchronous interactions between students during synchronous class times. They used discussion boards and other digital tools to facilitate small-scale informal one-to-one sharing of ideas or work between peers. All three authors struggled with how much to trust that learning was happening in the different online discussions, and how much to monitor and perhaps to give feedback or grades for collaboration. In addition, all three authors typically employed different peer-critique strategies so that students would read and learn from one another's work. This too was made more complicated by the online learning situation, although the reasons for the problems were sometimes more a result of lost student motivation rather than technical or scheduling difficulties.

In the first author's original plan, the arrangement of course assignments guided students through learning while collaborative assignments were intended to provide opportunities for small groups to construct deeper learning. Changing this so that all assignments were posted at once and the collaboration requirements were removed, the student workload definitely became more manageable. Student reliance on the instructor increased, where they asked for clarification and assistance which was previously provided by peers. Without peer feedback and commentary required on written assignments, students lost the opportunity to hear from a wider audience than just the instructor. Instead of consulting with the small groups of classmates they knew well and shared interests with, the students were on their own. Although they were encouraged to stay in connection with their assigned groups from before the pandemic, it seemed that when the course no longer required collaboration, the students largely wanted to be independent and self-pacing in their work. While this may have felt more efficient in the strange times that they were in, their instructor felt they were losing out on a lot of potential learning.

In the second author's classes, students' collaborative learning using discussion boards did not usually receive individual teacher feedback. While she specifically commented on certain features of the quality of the discussion, this feedback did not extend to small groups—all discussion boards were set up as whole-class conversations. Individual students received feedback on their discussions via a rubric that included checks or check minuses for each performance descriptor, and a numerical grade. Because there were two similarly styled discussion boards exploring text content, the assessment of the first discussion served as feedback in preparation for the second. For writing assignments (argumentative essay, book review,

opinion piece, literary analysis essay, and creative response), individual feedback prior to grading was provided by the teacher in Zoom tutorials at student request, or sought by students from peers. This meant that feedback was not provided systematically to all students during the collaborative learning phase. In the GT classes, students did receive feedback on their opinion pieces from their peers in a formal discussion-board assignment.

The third author's AP Research class used video conferencing to provide virtual face-to-face peer revision and editing during the last stage of writing their academic paper. This allowed students to schedule their own conferencing with their peers, as well as to provide live commentary to each other, rather than simply emailing papers and providing written feedback. This collaborative experience allowed students to receive multiple perspectives and viewpoints because of the quicker response time, which became time well spent in the crunchtime of submitting final papers. Because these students have been introduced to the revision and editing process in their formal ELA courses, their collaborative experience showed a new way they could independently use this tool for similar assignments. The students were given the resources that allowed them to take the initiative in their own use of digital tools in the future.

The authors found that online teaching exacerbated the contrast between students who work because someone is watching them, "making" them work, and those who engage in a topic or task because the social dynamic makes the work matter to them at some level. This question of not only motivation but the teacher's role in generating engagement also impacted student reading and writing.

Online learning seemed to heighten student desires to work through materials at their own pace, focused on individual progress and completion. Such preferences seemed to work against meaningful collaborative work. When asked about their workload, the second author's students told her they objected to her setting a midweek deadline for an assignment that had to be completed before she posted the next assignment. Some students wanted to finish faster. The second author explained that certain assignments had to be completed as a prerequisite to others. For instance, a peer-review discussion board needed to be completed before students could move on to taking their pieces through the rest of the process she scaffolded for them. Similarly in the *Introduction to Teaching* online course, the first author had designed assignments to take advantage of peer interaction, and thus demand what might be called semi-synchronous attention for discussing readings and viewings. When these were no longer mandated, in the name of the pandemic and the hard situations of many of the students, the established groups disbanded and students seemed relieved.

Students in all of the classes described in this study seemed to want more independence and autonomy in their online learning, and as a result they seemed impatient with collaboration even when they were happy to connect with and hear from their classmates informally. Their instructors worried about the diminished quality of student engagement in work when the only

audience was the teacher and the only motivation was sufficient compliance to earn a grade.

Independent Tasks and Evidence of Learning

All three instructors struggled with the fundamental ELA work of interaction with texts: of students not only reading but expressing their understanding through discussion and writing. The new virtual timelines and expectations altered the pace of reading texts. Students were required to do more reading on their own while teachers had fewer opportunities to check for their understanding. This was the case for the third author's twelfth-graders and their reading of *Frankenstein*. Because the campus is STEM-focused, when students recognize themes about the nature and limit of science, these usually had led to rich in-person discussions that could branch and merge into much longer, deeper explorations of the text. But virtual class discussion lost the richness and variety and ended up more streamlined and focused on basic clarification of content, with class sessions feeling rushed.

While the second author's flipped lessons guided students through a series of complex steps, and were intended to supply necessary information gradually, she found it difficult to include consistent checks for understanding. This seemed especially problematic in her reading/writing intervention classes, where the content was largely new and she chose (in contrast to the GT classes) not to use *learning paths*—a tool in *Itslearning* that allows the teacher to control the order in which students complete tasks—deeming this tool confusing to the students who had not used the online learning platforms in her class most of the year.

Before the pandemic, the first author's students were expected to discuss readings and share their understanding with each other in required small group interactions. As assignments "opened" each week, students had to connect with their classmates in order to complete short reflections and other collaborative responses to readings or viewings. Without that structure for some synchronous learning, students may or may not have needed to do the readings in order to complete the work. The instructor would have needed to create new quizzes or other kinds of independent accountability assignments to make up for this lost collaborative meaning-making, and of course the broader goal of changing expectations during emergency teaching was to lessen the pressures on students.

In the second author's intervention classes, independent reading was required to complete assignments; however, a student could have completed all assignments and gotten a passing grade with minimal reading. Students' writing assignments, completed without the teacher's help, for the most part, and assessed with rubrics, revealed a wider range of achievement: some pieces showing a weak grasp of expected skills and others a stronger hold on new content. In the GT classes, students also had to complete at least some reading in order to be able to work on writing assignments, but how much they read exactly is difficult to tell. They also independently completed a literary analysis essay on a scene from *Hamlet* and responded to the play by means of a creative piece (poem, story, mini-drama, letter, etc.). These compositions were assessed with

rubrics, to which the students were introduced earlier in the year. The assessment of the analytical essays was very encouraging: student writing demonstrated sophisticated understanding of the play, application of the material from the PowerPoint lesson, and generally strong command of the conventions of the genre. Unfortunately, not all students submitted this assignment because at the time their attention was diverted by AP exams.

As an ELA teacher, accustomed to communicating instructions and analyzing models in person through discussion, the third author's characteristically dynamic instruction— supported by movement, conversation, and writing on the whiteboard—was difficult to translate into a remote-teaching mode. The third author's district limited his delivery of synchronous direct instruction to two weekly 30-minute lessons. In general, the third author found that it was difficult to get students to read. He equipped his students with reading guides to help them independently track their own understanding of the particular novel they were studying. Typically, students completed study guides as they were discussing texts in class, adding to their notes and gaining annotation skills and learning to provide evidence of the transactional relationship between the text and the reader. During in-person instruction, teachers are able to check for understanding and comprehension in efficient ways using a combination of written work and discussion. The instructor was worried that as the students were disconnected from the physical classroom, they also lost out on seeing his visible excitement and expressed passion for the literature.

Dynamic personal relationships with the teacher matter in making the hard work of learning possible. Instruction changed in the way goals and purposes were communicated, in the ways explicit instruction could be delivered, and in the ways specifically ELA teaching of reading and writing and collaborative meaning-making could happen successfully. Literacy and meaning-making felt like less of a school priority. Before the pandemic, teachers could lead discussions, demanding student engagement and skillfully managing their attention to texts and complex ideas. Even in the online *Introduction to Teaching* course, the presumed "real world of teaching and learning" was always described as a physical space. Much had changed.

Twenty-First Century Learning at Last?

When the pandemic hit, the authors were teaching classes that were already rich in digital resources, and students were regularly submitting assignments online. Nonetheless, when tools that had supplemented their classrooms became the medium for instruction, emergency online schooling gave the authors insights into their practices as ELA instructors.

The authors felt confident in their working knowledge of a range of digital tools: they regularly utilized learning management platforms as well as individual applications and websites in their teaching. What changed — what made the familiar glaringly unfamiliar — was the lost ability to introduce, discuss, troubleshoot, and adapt the tools to a particular classroom group. The teachers became exhausted by the need to add a layer of "digitizing" to their planning, preparing documents and assignments and discussion prompts and more. The second author felt this meant that she was preparing materials as if

constantly writing for publication — immediately and every day. In part this was because of the presence of family members who were far more involved in some students' online lives, but the pressure also came from the need for clarity and completeness. Some of the pressure was a usual dimension of teaching, but the authors noted that the room for error was greatly diminished because of the limited time in direct contact with students. Verbal directions and modifications were now difficult, and there were significant time demands for creating videos, recording presentations, and otherwise moving digital tools into asynchronous instruction.

Whereas before the pandemic the authors could choose to adopt new tools and had some opportunities to try them out as supplements to instruction, it felt as if now each online interface had to work immediately and even seamlessly in order for a class session to move forward. As each teacher understandably uses the platform that is most familiar for them, students (and parents) can experience a barrage of different tools/expectations about how to access and use what they need. Some tools turned out to be better than expected — more versatile and more engaging — while others had more ways to fail when students were on their own and not necessarily motivated to figure it out. The authors were all perplexed as they realized that "digital native" students, quick to try new social media and experiment with any number of ways to connect with their friends, were far less eager to troubleshoot a digital problem in order to complete a homework assignment.

The authors also noted that the tools that became the medium of instruction: Microsoft Teams, Zoom, and others in their districts/institutions (as discussed above) were fundamentally office or business tools, and their use needed modification to be appropriate in educational settings. Students were often expected to be silently attentive and focused on information in ways that would be unrecognizable in a physical classroom.

Robb (2019) studied student use of devices for virtual social connectivity and the degree this connection feels essential to adolescents, many of whom literally sleep with their phones. Even before the pandemic's enforced isolation highlighted the importance of social connectivity, the authors believed that being in a physical classroom together helped to focus students on learning rather than their devices. But schooling-related online work was only one dimension of students' digital learning and lives. In thinking about the changes brought by emergency online teaching, the authors believe there were profound differences because technology and digital tools were no longer supplemental and instead became central to course delivery and teaching. The authors felt the loss of the centrality of the physical classroom. Prior to the pandemic, no matter how many digital distractions were available to students, high school teachers could largely manage student use of devices during classroom time.

Student Feedback on 21st Century Tools

In a time of change, it seems especially useful and important for teachers to hear from students about their preferences and concerns—and to pay attention to signals from them that might be indirectly communicated. As part of an examination of their collective teaching practices, the researchers considered the evidence they had of students' perception of remote learning. In reflective commentaries. the second author's students reported they preferred those discussion boards that were driven by their own questions—there were two discussion boards of this type. Since some of the discussion board assignments involved peer review and publishing, the second author wondered if the students were less motivated by these assignments because they were focused on assignment completion. While the second author thought that student participation in all discussion boards documented successful response to and analysis of texts, she wondered how to communicate with students more systematically about the purpose of different discussion-board assignments, such as publishing, for instance, where students would benefit from collaboration. The second author also found that her advanced students did not share her excitement about the possibilities of Zoom for virtual class-times. During Zoom meetings, usually with twelve to fifteen attendees (about half of the class), students did not significantly engage in conversations, and asked questions only occasionally. She wondered if this lack of participation had something to do with the fact that all Zoom meetings were recorded, following administrative guidelines. In contrast the virtual meetings in the intervention classes, although usually attended by only three to five students, were energetic and interactive. Although few attended, those who did received focused individual help from the teacher.

The first author's online class was designed to include multiple opportunities for students to reflect and give the instructor feedback on their working processes and course assignments. She used this feedback to understand how to clarify assignments and where she might need to referee conflicts between students in small groups. When her course assignments were re-arranged and some processes compressed to finish off the semester, she discovered students needed her online office hours and frequent email queries to gain information and clarification on requirements. Several commented that they were now needing to navigate online requirements in all their classes, and how different instructors had made the transition with different levels of success. They may not have always loved the online design of the course, but it was familiar in the face of significant, even overwhelming change.

The first author gained new perspectives on the cost of digital tool use to the students. One told her it took him 27 attempts to record and not delete a 2-min Flipgrid video to post. Another decided to revise a pre-pandemic assignment on which she had scored poorly and sent in draft after draft of new material for an online newsletter. Another student gave up on a digital mind-mapping tool and created a huge handwritten version, painstakingly documenting each section on her phone's camera. Yet another student texted the first author at all hours because of Ramadan and when it was possible for her to work. It was gratifying that after many questions answered, and clarifications offered, this student finally realized she had more to write about than she had believed.

The third author sought feedback from students as part of their reflection on studying *Romeo and Juliet* online. One student expressed a kind of love/hate relationship with online learning, which she appreciated for the resources while greatly missing the chance to act out parts of the play. Another student, writing in a "coronavirus journal," commented on missing her teacher and not having a sense of completion for her high school ELA experience.

As researchers, the authors considered how they could create future opportunities for students to communicate their views on what happens in the virtual classroom, and what can be gleaned from levels of participation and engagement about student feelings of comfort and even success in the new virtual classrooms. From the authors' perspectives, the loss of common physical space and increased student autonomy made distractions more difficult to navigate. The lost classroom culture for speaking and listening in an organized but dynamic way was a loss for teachers trying to scaffold meaning making through discussion: despite some rich potential for digital tools, the quality of classroom conversation often suffered. While the teachers wanted to support more student discovery and exploration, students sometimes lacked digital competencies to do so independently. Student fears of being wrong or feeling lost that might be recognized in a face-to-face classroom were more difficult to address online. With the decrease in collaborative learning, reliance on the instructor increased, and communication with individual students and sometimes their parents became more time-consuming.

By gathering feedback, the authors learned about student perspectives on the emergency online teaching and their use of digital tools. Students wanted and valued autonomy, preferring virtual discussions that were open-ended and student driven. They appreciated the variety of online tools but missed face-to-face classroom activities such as acting out a play. While the teachers believed that the student workload was substantially decreased, some students considered it too high given the circumstances of the pandemic and the pressures being felt on many fronts. The authors suspect that students often missed the "normal" days of school, and their classmates and even their teachers. Unfortunately some of the strategies they knew, as teachers, that could have recreated in the online learning that would have seemed more like the usual functioning of their classrooms in terms of expectations for collaborative work and work production were believed to be too stressful or demanding for students during the pandemic, and these sometimes had to be abandoned.

CONCLUSION

The three authors understand that what they thought they knew about students and teaching, when they largely left the physical space of schools on March 12, 2020, has been challenged if not changed. As the 2019–2020 academic year continued through May and June, with proms canceled and graduations and other rites of passage celebrated mostly on screens, it was clear that they had completed a very *different* year. The rapid change from physical to virtual teaching caused educators across the nation to reconsider their vocations. Before, while each classroom was to some extent an autonomous island, physical proximity meant something: students and teachers and staff could freely walk and collaborate side-by-side. For many teachers, school resembled a close-knit hub, a hive, of education and learning. Losing the face-to-face, transactional relationships that are established in a school building truly altered the professional landscape. Even as digital tools are ubiquitous and the selfie, Youtube videos, TikTok, and other social media are central to the personas and personalities student create for themselves, many students chose not to engage in online learning, and hid their faces and home lives from their teachers and peers.

Years of technology-focused professional development and training have been tested on a massive, previously unknown scale and "wait, *what* are we doing?" has become a catchphrase. The sense of perpetual improvisation has not abated. The flexibility and adaptability of a teaching veteran that was once appreciated within a physical institution may now seem disorganized or random online to an exasperated parent or student. Administrators continue to make decisions and determine policies, but they can no longer draw from their own teaching experience or even observations of teaching from literally walking the halls of a school building.

To tell experienced professionals that "we're all first-year teachers" because of the mysteries of whole-scale online education is to give insufficient attention to how teachers are applying their best judgments and expertise as they work to make virtual learning possible. As this research demonstrates, educators are learning and adapting and improving what they can, as fast as they can. By focusing on teaching and learning environments, instructional purposes, and 21st century tools during the Spring 2020 COVID-19 pandemic, the authors explored how their experiences will have consequences in their future classrooms—in whatever new contexts they find themselves delivering instruction. Policymakers, administrators, and teacher educators should recognize the important questions raised here as local, national, and international conversations continue about online teaching and learning.

DATA AVAILABILITY STATEMENT

The data analyzed in this study is subject to the following licenses/restrictions: the article includes references to and materials from teaching in the Spring of 2020 by the three authors. Requests to access these datasets should be directed to laura.turchi@gmail.com.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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Virtual Teaching in the Time of COVID-19: Rethinking Our WEIRD Pedagogical Commitments to Teacher Education

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Teacher Educators confront a professional future in which online instruction will play an increased role in student learning. As instructional activities are delivered online, a critical challenge for teacher educators will be to continue supporting those ideals key to the missions of many Schools and Colleges of Education—the creation of an instructional environment that is culturally responsive, committed to equity and inclusion, and able to support a diverse and "well" student body.

INTRODUCTION

Shifting to virtual instruction during the COVID-19 pandemic has forced a rethink by teacher educators who do not normally teach or design online course content. As educators in professional schools, we teach in settings where learning is not an abstract art. It is a professional endeavor marked by State and National standards, field experiences, and standardized professional exams, and our students enter our courses with scripts, schemas, and imagined notions of what it means to teach and foster learning. Thus, as the global pandemic accelerates a continued rise in virtual learning, teacher educators must re-examine what it means to (1) be responsive, equitable, and inclusive to the individual needs of a diverse pre-service (undergraduate) teacher population and (2) attend to the collective professional needs and imagined identities of these students as these pursue their initial degrees online.

To this end, the following manuscript details my personal reexamination and process of coming to know the personal, practical, and pedagogical needs of my pre-service students as learners—and in particular as virtual learners—during the Coronavirus pandemic. I present the results of a "Wellness Check and Online Feedback Survey" (**Figure 1**). I created and administered this survey to two sections of my undergraduate TESOL methods course 4 weeks into our shift to virtual learning. The survey encompasses several pedagogical commitments important to the mission of my School and to my work with students—a commitment to "*w*ellness," "*e*quity, *i*nclusion, and *d*iversity," with a healthy dose of "culturally *r*esponsive pedagogy" added to the mix. I refer to these practices by the memorable, even if a bit pejorative, acronym—WEIRD. Through the survey, I inquire into my students' experiences of being sheltered in and completing my course online. Adopting a thematic analysis of the data, I present the results of the survey along with their implications for virtual pre-service teacher education.

To contextualize this work and its findings, I begin with background literature on the three conceptual frameworks that undergird my WEIRD pedagogical practice. This literature draws

This is a 9 question, graded task (4pts). The survey is confidential and anonymous. If there are questions you do not wish to answer, simply tick "not applicable". Submit surveys by Sunday 4/19 at 11:59 pm. You can find this survey under Post-Spring Break Online Content-->Week of April 13. (Survey Instrument).

Q1	I am coping *fairly well* with the pace of academic life (i.e. the move to online instruction) during this time.
Q2	I am coping *fairly well* with being "sheltered-in" during this time.
Q3	You have been sleeping *fairly regularly* during this time.
Q4	I have found the annotated readings of Fenner and Snyder (2017) *fairly useful* during this time.
Q5	I have found the video lectures and their accompanying PowerPoint *fairly useful* during this time.
Q6	I have found the Moises "Immersion" (2009) video *fairly* thought-provoking in terms of thinking about the pedagogical and socio emotional needs of English Learners.
Q7	What have you been doing to stay active and engaged with others during this time?
Q8	Is there anything about this experience of being on the receiving end of "going online" that you wish to comment on? Does it challenge you to think about teaching in a new way?
Q9	Is there anything else that you wish to share?

FIGURE 1 | Wellness check and online feedback survey.

primarily from the field of Self-Study with its emphasis on the personal, practical, and relational nature of professional practice (Hamilton and Pinnegar, 1998; Pinnegar and Hamilton, 2009). Next, I introduce three frameworks from the field of virtual education: Principles of Instructional Design, Community of Inquiry, and Role Theory. I present literature on these frameworks, incorporating scholarship that similarly adopts WEIRD pedagogical practices. I then discuss the professional tensions that drove my online course design and instructional approach during that pandemic semester. Finally, in the spirit of reflective scholarship, I present this research from the first-person ("I") perspective. In doing so, I emphasize the situatedness of these findings to my work as a teacher educator and my

attempt to "respond to the current and emergent needs of [my] constituencies" (Hamilton and Pinnegar, 2000: 234) during this specific moment in history.

BACKGROUND

The following section "introduces, clarifies, organizes, and establishes the purpose and focus of" (Hamilton et al., 2020: 319) the survey I administered to my pre-service teachers in April 2020. The purpose and focus, as well as the interpretation of the survey results, are in dialogue with (1) my WEIRD pedagogical frameworks, (2) instructional theories drawn from the field of

TABLE 1 | Wellness check and online feedback survey (closed-ended questions).

	Q1	Q2	Q3	Q4	Q5	Q6
11 a.m. and 2:30 p.m. classes combined						
Strongly disagree (1)	6	5	10	0	0	0
Disagree (2)	20	16	16	4	6	4
Neither (3)	18	27	3	21	24	6
Agree (4)	64	56	64	80	80	84
Strongly agree (5)	0	10	15	45	35	65
$M =$	2.8421	3	2.842	3.947	3.816	4.184
$SD =$	25.116	20.29	24.25	33.1	31.75	39.61
11 a.m. class						
Strongly disagree (1)	3	3	6	0	0	0
Disagree (2)	4	5	5	0	0	0
Neither (3)	3	6	0	4	4	2
Agree (4)	12	8	9	12	13	15
Strongly agree (5)	0	0	2	6	5	5
$N =$	22	22	22	22	22	22
2:30 p.m. class						
Strongly disagree (1)	3	2	4	0	0	0
Disagree (2)	6	3	3	2	3	2
Neither (3)	3	3	1	3	4	0
Agree (4)	4	6	7	8	7	6
Strongly agree (5)	0	2	1	3	2	8
$N =$	16	16	16	16	16	16

virtual education, and (3) professional tensions that shaped my move to virtual teaching.

WEIRD Pedagogical Frameworks

My WEIRD pedagogical frameworks consist of instructional and curricular commitments to Diversity, Equity, and Inclusion, Culturally Responsive Pedagogy, and "Being "Lazy" and Slowing Down" (Shahjahan, 2015). A brief overview of each framework follows.

Diversity, Equity, and Inclusion (DEI)

Through commitments to DEI, teacher educators seeks to address barriers to access and achievement in institutional spaces. Traditionally, these commitments have focused on historically marginalized groups—students of color, first-generation students, low-income students, and differently abled students. Increasingly, commitments to DEI have included addressing education's "moral and legal obligations" to LGBTQ (Kitchen and Bellini, 2012: 209) and visible religious minority students (Lumb, 2016). These commitments have encompassed also the work to internationalize educational institutions in ways that honor and support the linguistic diversity on campus and within classroom spaces for learners who are speakers of additional languages, as well as dialect and vernacular speakers (Cruickshank, 2004; Barton et al., 2015; Dunstan and Jaeger, 2015).

Teacher educators signal their commitment to DEI in a number of ways. They adopt a Universal Design of Learning (Evmenova, 2018) and enact pedagogical practices that connect with students on the level of identity and well-being. They take up instructional activities that engage students in critical discussions of "authentic" and "brave" texts that connect to the lives and foster "higher-level thinking" (Ballentine and Hill, 2000: 11). They even bring into their course curricula material that "challenges, confronts, and disrupts misconceptions, untruths, and stereotypes that lead to structural inequality and discrimination based on race, social class, gender, and other social and human differences" (Nieto, 2006: 2).

Culturally Responsive Pedagogy (CRP)

Through commitments to CRP, teacher educators work to improve the learning outcomes of students historically marginalized within the U.S. (Ladson-Billings, 2009; Gay, 2018), as well as manifestations of this marginalization experienced by multilingual, multiliterate, and transnational learners within the U.S. and around the globe (Thomas and Carvajal-Regidor, 2020).

Additionally, CRP advocates for teaching that is supportive of students' linguistic heritage. Such advocacy may include adopting a participatory approach to student learning, one that draws upon students' cultural and linguistic resources as a point of reference for instruction. Moreover, it is an approach that works to raise the critical consciousness of students, to empower them to engage with and push against the dominate ideologies that erase, exclude, or negate their lived experiences and personal knowledges. In adopting a culturally responsive approach to pedagogy, teachers authorize and legitimize these resources in ways that are linguistically and culturally sustaining (Paris, 2012) and revitalizing (McCarty and Lee, 2014).

Finally, CRP encourages a relational approach to pedagogy that, for some educators, embraces emotional vulnerability (Coia,

2016). Acts of self-disclosure may entail, for example, delving bravely into the pedagogical tensions that surface in one's own practice. Through these acts, educators model an "ethos of care" that works to create an instructional space capable of "establishing flexible and supportive relationships with students" (Han et al., 2014: 299).

Being "Lazy" and Slowing Down (BLSD)

While concepts of wellness vary in higher education, Shahjahan's call to "be lazy" and "slow down" (2015: 488) offers a different notion of wellness. BLSD attempts to address the impact of "neoliberal values of competition, privatization, efficiency, and self-reliance" (Hartman and Darab, 2012: 52) on the mind, body, and spirit of those within Higher Education. These neoliberal values privilege the embodiment of knowledge in the mind and at the exclusion of the body and spirit (Shahjahan, 2015). In contradistinction, BLSD advocates for pedagogy that engages learners in knowledge production through "deliberate and meaningful" bodily rituals (Mayuzumi, 2006: 9), "deep reflection, experiential learning and reflexivity" (Hartman and Darab, 2012: 58), and building relationships and nurturing creativity (Shahjahan, 2015).

Together, these WEIRD pedagogical frameworks anchor my curriculum-making and instructional practice. Similar frameworks have been adopted by scholars in the field of distance and virtual education. In the next section, I introduce three theories that play important roles in virtual education scholarship, and I provide example of how these concepts have been WEIRDly adapted for the virtual learning environment.

Virtual Education Instructional Theories

In this section I discuss three theories drawn from virtual education instructional literature: Gagné's Principles of Instructional Design, Community of Inquiry, and Role Theory.

Principles of Instructional Design

Richey (2000) categorizes principles of instructional design as consisting of both macro- (site design) and micro- (instructional design) elements. The latter, the micro-design elements, hold pedagogical import for educators. Moreover, these micro-design elements traditionally have been grounded in the instructional design theories of psychologist Gagné (2000).

For Gagné, "learning is fundamentally viewed as an internal process," one that is facilitated by attention to learning hierarchies, design and sequence, as well as learners' background knowledge and the input given to them during instruction (Richey, 2000: 255, 256). Fundamental to Gagné's work are nine external instructional actions that must occur in order to activate the internal processes that will foster student learning. These actions or "events…serve as a conceptual model for the design of lessons, the selection of instructional strategies, and the sequencing of instruction" (Richey, 2000: 269). The nine events include stimulating or gaining attention, informing, recalling, presenting, guiding, eliciting, providing feedback, assessing, and arranging (Gagné et al., 2005: 192).

The confluence of Gagné's principles of instructional design with WEIRD pedagogy is reflected in Compson (2017). Through instruction designed to promote "significant" and "deep" learning experiences through contemplative practices, her course "Philosophy, Religion and the Environment" critiqued the role of technology in human lives (2017: 108, 107). The course alternatively created opportunities for students to disengage from their computers, engage with the natural world, and partake in practices of deep reflection through artwork, photos, poetry, and/or video (Compson, 2017: 107). As students moved through the semester, they would recall and recycle the contemplative skills learned earlier in the course (prior knowledge), increasing their proficiency in these practices "through the processes of differentiation, recall and transfer of learning" (Gagné, 2000: 44). Instructional practices adopted in the course mirrored the kinds of external instructional events that Gagné posits spark internal learner motivation.

Community of Inquiry (CoI)

Fostering a sense of community is important to learning; it can generate an emotional connection or sense of belonging with fellow learners that "increase[s] the flow of information, the availability of support, commitment to group goals, cooperation among members, and satisfaction with group efforts" (Rovai, 2000: 286). In virtual spaces, where learners are not co-present, scholars promote a "Community of Inquiry" (Garrison et al., 2000). This inquiry-based approach to online pedagogy provides students with the cognitive and social opportunities that foster critical thinking, deep and meaningful learning, and internal motivation in text-driven and asynchronous spaces (Fiock, 2020).

CoI promotes three types of online interactions or presences— cognitive, social, and teaching. Cognitive presence is fostered through pedagogical activities that create cognitive dissonance for learners around a problem or topic of inquiry, a "triggering event" (Garrison, 2007: 65). The triggering event is used to guide students to explore, integrate, reflect on, and reconstruct "new meaning around that topic through sustained communication" (Garrison et al., 2000: 89). Social presence is afforded when instructional activities allow learners to establish a personal, expressive, and cohesive group self online. These activities draw students into a "shared experience for the purposes of constructing and confirming meaning" (Garrison et al., 2000: 95). Finally, teaching presence encourages both cognitive and social presence through the design and facilitation of online teaching. Facilitation incorporates such activities as modeling discourse and providing feedback through "short messages acknowledging a student's contribution" (Garrison et al., 2000: 96).

The importance of cognitive, social, and teaching presence on learning and community, and the challenge for virtual learning when these presences are not cultivated, can be seen in Tan et al. (2010). While Tan and her colleagues do not use a CoI framework or make reference to these three presences, their work nonetheless demonstrates the impact on learning and community when these presences are absent. Through interviews with international graduate students for whom English is a Foreign Language (International EFLs), the scholars found that the online classes taken by these students were embedded with technical, linguistic, and cultural practices that assumed universal knowledge and practices. These include use and familiarity

with course management systems, acronyms and vernacular phrases, and comfort levels with self-disclosure of "personal experiences, feelings and opinions" (Tan et al., 2010: 12). Without appropriate instructional intervention, the virtual environments failed to provide these International EFLs an inclusive, equitable and culturally responsive online space. As a result, these students were unable to negotiate the cultural, linguistic, and technological skills needed to learn and cultivate community with their peers.

Role Theory

Role Theory highlights the varied and shifting roles individuals can assume in an interaction or task. The roles reflect the "social positions" and the accompanying "scripts or expectations for behavior" (Biddle, 1986: 67, 68) required of the role bearer. While roles are not fixed, established roles may diversify or shift as the context of instruction necessitates over the course of a semester, unit, or even a class.

Several role shifts for teachers have been documented in their move to virtual instruction (Coppola et al., 2002; Walker and Shore, 2015). One such shift occurs in the diversified pedagogical (cognitive) role assumed by instructors. This shift includes facilitating teacher-to-student and peer-to-peer dialogue, responding to questions, and providing feedback (Dunn and Rice, 2019). These roles are present in face-to-face teaching, but must be carried out differently in the virtual space. Social roles may shift as teachers and students work to negotiate interactions virtually and asynchronously. Further, instructors may encounter significant shifts in their managerial role as they attempt to structure online pacing for student progress and success. This managerial role may even overlap with a diversified technical role and need to facilitate new uses of technology, first by the instructor and then by the student (Keengwe and Kidd, 2010). Finally, an expanded affective role (Coppola et al., 2002) requires of teachers new ways to manage, transpose, and use oral, non-verbal, and paralinguistic cues to negotiate meaning-making, the up-take of knowledge, and provided supportive and effective feedback.

Positing the need for an intentional shift in pedagogical and social roles in virtual learning environments, Knowlton (2000) advocates for an instructional shift from teacher-centered to student-centered pedagogy. Such a shift requires a diversification in both the teacher and student roles (Walker and Shore, 2015). Knowlton explores this diversification of roles through Connelly and Clandinin (1988) categorization of classrooms into things, peoples, and processes. He contrasts the roles and behaviors enacted in a student-centered vs. teacher-centered engagement with classroom things, peoples, and processes. In doing so, Knowlton foregrounds the agentive part students can play in incorporating knowledge and developing ways of knowing that are meaningful to them and reflective of their interests.

In introducing the frameworks that undergird my WEIRD pedagogy, and by foregrounding the aforementioned theories grounded in virtual education, I have established the scholarly foundation on which the survey and results are to be understood. I next introduce the context that gave rise to the survey.

The Shift to Virtual Learning During COVID

In March 2020, my University shifted to 100% virtual instruction. At the time, I was teaching two sections of a required TESOL methods course to Middle/Secondary Pre-service Teachers. Course instructors were given a week to prepare for the shift online. While the limited turn-around time given to adapt our classes for virtual instruction was stressful, I felt particular tension about my ability to attend to the WEIRD needs of my diverse student population. Tensions, according to Berry, are "feelings of internal turmoil experienced by teacher educators as they [find] themselves pulled in different directions by competing pedagogical demands in their work and the difficulties they experience[] as they lear[n] to recognize and manage these demands" (2007: 119). Berry takes up the notion of tensions as "a conceptual frame and analytic tool," presenting tensions "in terms of binaries in order to capture the sense of conflicting purpose and ambiguity held within each" (2007: 119, 120).

In a similar fashion, I present the tensions that accompanied my shift to virtual teaching. For example, as colleagues were planning to hold synchronous meetings with their students, I experienced tensions related to "space" and "place." Although some of my students were headed home to places as close as the neighboring county, others were returning to spaces located in different time zones and on different continents. In addition, I experienced tensions concerning "the written" and "the read" word. Folk perceptions of online learning call up images of students spending significant time in front of a screen as they attempt to negotiate and communicate meaning through reading and writing. I feared the overreliance on these two modalities would create an unequal cognitive load for my international EFLs and contribute to screen exhaustion and eye fatigue. Moreover, I experienced tensions around "access" and "engagement"; not all University students have access to personal laptops and computers. Some students rely on computer rentals from the University Libraries and use campus computing stations to access specific software programs (like SPSS). Finally, while WIFI is available readily on campus, students living off campus may have limited or no internet access beyond their mobile phones.

To accommodate these tensions, I designed my virtual course as a self-paced learning module designed around a triggering event (Garrison, 2007), a short fiction film titled, "Immersion" (Levien, 2009). This 12-min video follows several days in the school life of an immigrant child. The student, Moises, excels at Math. Yet, due to his novice-level proficiency in speaking and reading English, he struggles academically and socio-emotionally in class. The specific triggering event for this film centers on an upcoming standardized test and the frustration experienced by Moises's teacher to provide him with the pedagogical supports he needs to demonstrate his content knowledge rather than his English language proficiency.

The self-paced module provided students with a clear pedagogical challenge. Moreover, this was a challenge in which negotiation of meaning was not based on reading proficiency or comprehension, but on the ability to critically look, observe, and listen to the video. In addition, the module included annotated weekly readings. I highlighted key sections of the texts and I

provided hand-written comments in the margins to facilitate meaning-making. I created audio-recorded PowerPoint lectures that accompanied each week's activities. The aim was to provide students with a respite from reading, while also supporting development of English listening skills for my international students. Finally, I designed our virtual classroom space with the most basic computing and internet access in mind—the cellphone. Tasks were designed to be downloaded and accessed offline, video streaming was limited, online quizzes were designed with clickable true or false responses, and students were given the opportunity to audio/video record (rather than write) their assignments.

Four weeks into our new virtual and sheltered-in reality, I decided to check on students' well-being and gauge their perceptions of aspects of the self-paced learning module. Guided by my WEIRD commitments to pedagogy, a rudimentary knowledge of virtual instructional theories, and several tensions related to curriculum-making, I created and administered an online survey. The survey was designed to assess student (1) well-being under the pandemic and (2) perceptions of the pedagogical supports implemented to foster learning in this new virtual setting—the text annotations, a central text based on a triggering event, and audio-recorded video lectures.

MATERIALS AND METHODS

Wellness Check and Online Feedback Survey

The survey consisted of six closed-ended (5-point Likert scale) and three open-ended questions (**Figure 1**). Using my University's course management system (CMS), the survey was distributed to two sections of my undergraduate middle/secondary TESOL methods course. The CMS survey design grants a relative degree of anonymity. Although the system identifies which students have not responded to the survey, it does not provide information on individual survey responses. Instead, the system generates raw and percentage aggregates of the results. To encourage student submission of the survey, course activities were suspended for the week during which the survey was open. In addition, students received a completion grade for submitting the survey, resulting in a response rate of 92% for the morning section ($N = 22/24$) and 89% for the afternoon section ($N = 16/18$).

As the survey was not originally designed for research purposes, the instrument was not pre-tested or validated beforehand. Following data collection, IRB approval was acquired to use the previously collected and de-identified survey data, and the survey was forwarded to colleagues for validation. In particular, construct validation was sought to determine the survey's ability to assess student cognitive, socio emotional, and physical well-being (pace, emotional stability, and sleep), as well as elicit student perceptions about the pedagogical adaptations made to the course. Positive feedback was provided on the question (item) design, clarity, and construct validity; while caution was noted toward the use of a fifth and neutral category ("neither agree nor disagree"), as such responses are "more

difficult to endorse" (Nemoto and Beglar, 2014: 5) and can present challenges to data analysis.

The Analyses

Table 1 presents the raw data from the closed-ended questions (Q1–Q6). The raw data for both classes was combined and the Mean (*M*) and Standard Deviation (*SD*) were calculated (1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, and 5 = Strongly Agree) (see **Table 1**).

Responses to the open-ended questions (Q7–Q9) for the two classes were combined and then analyzed using a thematic analysis (Braun and Clarke, 2006; Clarke and Braun, 2017). Adopting a semantic approach to coding (Braun and Clarke, 2006), each data set was examined for repeating patterns of words, phrases, and even metaphors. The data was reviewed multiple times, initial codes and coding categories were identified from these word patterns, and overarching themes drawn. The data then was reanalyzed across all data sets (Q1–Q9) to determine if any differences in core themes surfaced across the combined data sets.

The analyses were conducted in conjunction with a graduate student who completed his college teaching experience under my supervision in both sections of the course. Individually we coded, shared, and discussed the data and analyses, while together we discussed and refined our respective analyses to add trustworthiness to the results. The final results were triangulated with my end-of-course evaluations and with current scholarship from the field.

RESULTS

Within the Data Sets
Closed-Ended Questions (Q1–Q6)

In terms of how well students were faring under COVID (Q1–Q3), less than half, 42%, agreed ($n = 16$) they were coping "*fairly well*" with academic life (Q1: $M = 2.84$, $SD = 25.12$); while 26% disagreed ($n = 10$) and 16% strongly disagreed ($n = 6$) with this statement. In addition, less than half of students, 42%, agreed ($n = 14$) or strongly agreed ($n = 2$) that they were coping "*fairly well*" with being sheltered in, while 34% disagreed ($n = 8$) or strongly disagreed ($n = 5$) with this statement (Q2: $M = 3.00$, $SD = 20.29$). While 50% agreed ($n = 16$) or strongly agreed ($n = 3$) that they were sleeping "*fairly regularly*," 47% disagreed ($n = 8$) or strongly disagreed ($n = 10$) with the statement (Q3: $M = 2.84$, $SD = 24.25$). The results of these three questions suggest less consensus amongst students in their responses to living and studying under COVID—while some students were coping, others were coping less well.

In terms of the instructional adaptations for the class, 76% agreed ($n = 20$) or strongly agreed ($n = 9$) the annotations were "*fairly useful*" (Q4: $M = 3.95$, $SD = 33.10$), while 71% agreed ($n = 20$) or strongly agreed ($n = 7$) the video lectures were "*fairly useful*" (Q5: $M = 3.82$, $SD = 31.75$). Finally, 89% agreed ($n = 21$) or strongly agreed ($n = 13$) that the triggering event, "Immersion," was "*fairly* thought-provoking" in terms of considering the pedagogical and socio emotional needs of English

Learners" (Q6: $M = 4.18$, $SD = 39.61$). The results of Q4–Q6 suggest there is more consensus amongst students in their responses to my pedagogical adaptations, than to their responses about how they were faring (Q1–Q3) under COVID.

Open-Ended Questions (Q7–Q9)

In response to Q7, *"What have you been doing to stay active and engaged with others during this time?"* ($n = 37/38$; 1,524 words), three themes were drawn—working, recreating, and reconnecting. Working includes schoolwork ("building my teaching portfolio"), but also employed work where students acquired new jobs, picked up extra hours (afforded by asynchronous course structures), or worked jobs where they were deemed "essential workers." Recreating—as in participating in recreational activities—encompasses technology mediated activities ("watching movies", "video chatting," "playing video games," "making TikToks," "reading," and recreational "cooking"), indoor ("working out in my basement," "playing board games," "clean[ing] house," doing "relaxing yoga videos online") and outdoor activities ("skateboarding," "running," "hiking," and "going on walks," either alone, with dogs, with family, friends, and/or significant others), and creative pursuits ("painting," "singing," "playing guitar," "embroider[ing]," and "doing house projects"). Reconnecting highlights themes of engaging with and returning to people (family, friends, and significant others) and activities ("running outside").

In response to Q8, *"Is there anything about this experience of being on the receiving end of "going online" that you wish to comment on? Does it challenge you to think about teaching in a new way?"* ($n = 35/38$, 2,354 words), three themes were drawn—pace, space, and face-to-face. Pace refers to the perceived load of working online. For some, this pace of online work was increased intentionally by instructors ("as an excuse to assign more work") or as a by-product of simply working online ("extra time needed to do my work," "takes me much longer," "easy to get behind"). For others, a positive awareness of the impact of the change in academic pace was noted ("a lot can be done on your own," "I can work at my own pace"). Space references concerns about "lost access" to University spaces, such as "a study space" (like those provided by the "libraries" and "dorms"); as well as "campus resources" (such as technology "capable of handling [one's] workload"), engagement with peers, and loss of what one student called, a "productive environment."

The theme of face-to-face is associated with a variety of student phrases— "normal direct-teaching," "human connection," "in the classroom with hands-on learning," "lessons in real time," assignments that "seem[ed] more real" and were viewed as "more effective," and that "provided deeper" and more "meaningful" learning. Several students commented on a class that used "weekly Zoom meetings to carry out discussions," with one comment stating that the Zoom course was "more productive than a video recording" as it allowed students to receive "instant feedback" and "more deeply analyze the content with…peers."

Finally, these three themes of pace, space, and face-to-face were frequently accompanied by boulomaic modals ("I hate," "I hope," "I miss," "tripled in ferocity," "thrown in the garbage," "don't like," "and quite negative") and adjectival ("harder to learn," "hard to stay focused," "hard for the learner," "hard for the teacher," "normal…teaching," "lost out") expressions.

In response to Q9, *"Is there anything else that you wish to share?"* ($n = 24/38$, 1,535 words), three themes were drawn: thinking, thanking, and struggling. Thinking is associated with a variety of modal expressions to describe the emotional (boulomaic modality) and knowledge stances (epistemic modality) of self or others. Through statements such as "I fear," "I feel," "it just is sad," "I miss," "I hope" and "I do not think" or "I should," students demonstrate their reflection on, rather than anxiety about, their lives under COVID. Thanking—expressed by both the verbs "thank" and "appreciate" —represents expressions of gratitude for the flexibility of my course as it moved online, for the time I took to check on their well-being, and "for being so understanding during these times." Thanking further includes expressed appreciation ("thankful") for their life and health (and that of their family) and for marginalized students "who struggle to find resources" to pursue their educations. Finally, struggling reflects students' attempts to keep up with course work and/or to manage their mental health, anxiety, and depression during this time.

Across the Data Sets

Below, I highlight themes shared across Q1–Q9, drawing out commonalities that surface as salient when compared across the data sets. Three overarching themes were identified: (1) coping with the shift to online learning and the disruption caused by the pandemic, (2) missing and mourning the loss of structure and support the University provides, and (3) lamenting lost connections to people, resources, ideas, and educational content that in-person teaching affords.

Coping

Across the data sets, the concept of coping surfaced, but in different ways. For some students, the pandemic and shift to fully online classes provided opportunities to reconnect with family and friends and/or work increased hours due to the cancellation of in-person classes. This positive sense of coping is reflected across the open-ended responses, as well as the closed ended-responses through agreement or strong agreement for the questions posed. For others, "struggle" marked the early days of sheltering in and studying online. Struggle was a result of increased workloads, financial insecurity, and contact with the public as an "essential worker." Struggle was a consequence of the stress of managing pre-existing and chronic conditions, such as "anxiety," "depression," "ADD" and "asthma." Struggle was a reflection of the socio emotional challenges of adapting to new ways of engaging with course material, taking up knowledge, and living through the new reality of their college experience. This negative sense of coping— "trying to make it, day-by-day" —is reflected across the open-ended responses, as well as the closed-ended responses where disagreement or strong disagreement for Q1–Q3 were expressed.

Structure and Support

Across the data sets, students referenced and mourned the disruption to their accustomed academic support structures due to the shift to virtual instruction and subsequent campus

closure. Their responses highlighted the routine (the regularity of "going to class"), support and motivation (through "in-class reminders"), and access (to a "distraction free and academically oriented environment") campus life provides. They further commented on the loss of support and access to mental health the University provides, both in terms of campus services and the regular social connections and interaction campus life provides. These two factors, access and interactions, were cited by students as increasing motivation and fostering "self-responsible" and "accountable" behaviors. Finally, while the self-paced class allowed needed flexibility for some students, for others the absence of interaction in the self-paced environment felt like "a lack of support."

Connection

Across the data sets, students lamented the loss of several connections due to the shift online. This loss included connections to people, expressed through such phrases as "human connection," "in person interaction," "in person lectures," and "hands-on learning." Loss also included a deeper connection with course material through instructional activities. This latter sentiment was echoed in my course evaluations, with one student calling for "fun activities, authentic videos, and virtual supplementary resources that help with instruction." Loss also included connection to campus resources, such as access to computers, the internet, and spaces to study. Yet, while most references to connection were associated with loss, some were associated with gains. A number of students expressed a deeper appreciation for the ways one's "socioeconomic" and "socioemotional" environment can negatively affect student learning and academic success. They also expressed appreciation for teaching that is student-centered instruction, interactional, and engaging.

DISCUSSION

The "Wellness Check and Online Feedback Survey" provides important insights into the cognitive, socioemotional, and physical well-being of my students during the first wave of the Coronavirus pandemic. In the section that follows, I explore three implications that findings from the survey have for my professional practice and for teacher education. I discuss these implications in relation to the WEIRD pedagogical practices and virtual education theories introduced previously and to the pedagogical activities I carried out that spring.

Mastery

The first implication of the survey findings is that virtual pre-service teacher instruction ought to attend to student fears about losing out on experiences associated with attaining professional mastery— "student teaching," "hands-on learning," and "creative…instruction.". While the aforementioned experiences imply an active student presence, they also imply an active teaching presence, one that requires a shift and diversification in the enactment of the teaching roles traditionally taken up in support of student professional mastery.

In my traditional face-to-face role as more knowledgeable other (Vygotsky, 1978), I attempt to foster student mastery in working with English Learners by modeling the "competencies and technical skills associated with performing specific tasks required by the discipline or profession" (Anderson, 2001: 31). This modeling includes presenting methods of planning, adapting, and using language in instruction and asking questions in order to probe student thinking about the appropriateness of different pedagogical actions. In virtual education, however, this teaching role is diversified to include pedagogical actions such as pointing out, highlighting, and hyperlinking to the things, peoples, and processes in the virtual space that can assist students in accomplishing these same goals. Moreover, this pedagogical role overlaps with a new "technical role" where I am responsible for designing a virtual learning environment that "make[s] explicit and visible what was formally invisible" (Anderson, 2001: 30).

Stepping into these diversified and new pedagogical roles means that the self-paced module I designed around the fictionalized film, "Immersion," required clear instructional and technical interventions to be built into the design and implementation of the course. For example, I needed to clearly and systematically guide students' attention to the "things" (bilingual dictionary, instructional materials hanging on the classroom walls), "people" (bilingual peers; a willing, albeit questionably capable, teacher), and "processes" (paired classroom seating that could have turned into a think-pair-share activity) that appeared in the film and that could inform pedagogical action in that learning context. This is a technical role I would have taken up in an impromptu fashion in a face-to-face classroom, but I would need to plan in advance in the online setting. Such online guidance could have been facilitated by the use of video annotating software like *VoiceThread*. With this software I could provide voice-over annotations to accompany specific scenes in "Immersion" that guide, point out, and make pedagogically relevant connections between teaching and the ecological context of learning. This act of increasing my teaching presence by modeling the "artistry" of my practice (Schön, 1987: 13) encourages an active role for students in their knowledge-construction process and in the development of their teaching mastery.

Motivation

The second implication of the survey findings is that virtual pre-service teacher instruction needs to address student motivation. For my students, lowered motivation that spring was a result of a number of factors—stress, anxiety, and uncertainty. However, it was also due to a lack of intellectual and interactional engagement with the asynchronous classroom space I had designed. As Gagné et al. (2005) point out, deep learning is tied to student engagement with meaningful activity, and both learning and engagement play a significant role in sustaining internal motivation for learners. Design of virtual spaces must take these factors into account. In particular, instructional design of virtual instructional activities must draw upon cognitive and teaching presences to activate the external actions that could lead to internal motivation. These activities must also reflect that

peer-to-peer interactions, supported by instruction that allows for social presence, positively influence student motivation in online learning.

Thus, to activate internal motivation across an inclusive range of students, I needed to create my self-paced course as a Community of Inquiry (CoI). This CoI would be designed around student-centered activities that afforded an interplay of engagement between cognitive, social, and teaching presences. Activities in this CoI would engage student cognitive presence through activities that draw out student background knowledge and interests. Such activities include instructional practices that foreground the learning objectives for each activity, make explicit connections between new and previously learned topics, provide explicit guidance, and enhance knowledge retention and transfer (Gagné et al., 2005). Rather than relying on self-grading reading quizzes to support this last goal of knowledge retention and transfer, I could have followed up the annotated reading assignments by having students discuss the readings in small groups—either synchronously in Zoom breakout rooms or asynchronously via discussion boards on our course management system. Both spaces provide opportunities for dialogue, interaction, and social presence. These opportunities not only foster internal motivation but also support my international EFLs' opportunities to engage virtually with their U.S.-based peers.

Additionally, I needed to address the heightened anxiety experienced by some students concerning the feared impact the virtual experience would have on learning, course grades, and upcoming field experiences. To address this anxiety, I could have extended the notion of peer-to-peer interactions to include contact with an imagined community (Anderson, 1983) of professional teachers and through extension, their students. For example, I could have recorded informal interviews with in-service teacher I knew who were working with English Learners and shared their on-the-ground challenges with my students. The recorded interviews could have been followed up by student searches on the internet to find and share new stories and video clips of K-12 teachers and English Learners across the globe—English as an Additional Language and English as a Foreign Language—facing similar challenges. Such instructional engagement would afford students the opportunity to discuss as a community the experiences their imagined community of fellow teachers and their students were encountering in virtual learning and perhaps even relate these experiences to their own. In this way, students would be engaged in meaningful actions that could potentially stimulate and support their internal motivation.

Mythology

The third implication of the survey findings is that virtual pre-service teacher instruction should support student mythology surrounding the collegiate experience. By mythology, I refer to the imagined and anticipated expectations of what undergraduate life should entail. The existence of this mythology is reflected in respondents' expressions of longing and angst about loss in the shift to online learning—the lost semester, lost interactions, lost experience. It is also reflected in expressions about feeling cheated of the college experience. To support the *esprit de corps* that fosters the mythology of undergraduate life, virtual instruction must attend to the individual and collective student mind, body, and spirit through support of both student and teaching online presences.

My self-paced module failed to account for this loss or to incorporate these two presences in dynamic ways. For example, I created weekly video lectures to guide students through each weekly lesson. However, the lectures were perfunctory and my delivery was robotic, serious, and tentative—a stance in contradistinction to my face-to-face teaching presence. Before the pandemic, I had never video- or audio-recorded a course lecture. I needed time to develop a level of comfort with the technology so that my delivery would reflect the embodied verbal and non-verbal cues my in-person teaching (spirit) would have readily communicated. Further, not only was my teaching presence not dynamic, but the design and implementation of the module was very teacher focused. Even when I attempted to create student-focused spaces, they were still initiated by me and reflected my ideas of what students might wish to discuss.

Nonetheless, many students persisted. One place in the self-paced module where student engagement surfaced was in the bonus activity discussion board spaces I set up. These extra credit tasks were designed for students to upload images of themselves engaging in various activities during our sheltered-in phase and to comment on the images of their classmates. While these bonus activities provided some interaction, what was needed were pedagogical activities that incorporated embodied and spiritual (reflective) aspects of learning into the virtual classroom space. Similar to the activities proposed by Compson (2017), learning needed to be reembodied and it needed to be spiritual, or to use a more secular term, "significant" (Fink, 2003: 7). For example, I could have hosted Zoom watching events for students who wished to lead and participate in group activities that provided an opportunity to be lazy and slow down, such as knitting, doing yoga, and sharing recipe ideas as a student community. I attempted to foster similar interactions through the discussion board asynchronously; Zoom would have allowed for synchronous and embodied interactions, even for students who were only able to watch the recorded videos later.

These three themes—mastery, motivation, and mythology—hold important insight for me in terms of understanding the ways in which my self-paced instructional module attempted to meet my WEIRD pedagogical goals. While this discussion actively reflects on, contextualizes, and critiques my pedagogical actions during this time, underlying this discussion is a great deal of compassion for myself and my ever-developing teaching practice. The first wave of the coronavirus on U.S. soil, sheltering-in, and managing grocery store and pharmacy runs, was an incredibly stressful period for all—for students and for instructors as we worked to maintain a degree of normalcy for students. With the immediacy of the initial wave of the pandemic behind us, the ongoing engagement with virtual teaching in the field of teacher education lies ahead.

Limitations

The survey provides valid insights into student well-being and pedagogical interactions, and the joint process of data analyses

adds an element of trustworthiness to the results. However, this study does pose some limitations. For example, more direct and explicit questions could have been included in the survey that addressed the tensions I felt—the issues of space and place, the written and the read word, and access and engagement—and whether these tensions accurately expressed challenges students faced. While the survey results confirm somewhat the underlying assumptions that marked my initial pedagogical tensions, the assumptions themselves were never tested. It would have been useful to know to what extent these concerns were valid. Second, even though incorporating my spring semester course evaluations into the interpretation of the study results provided an added level of trustworthiness to the analyses, conducting student interviews would have provided an additional level of validation.

Despite these limitations, the thematic analysis allows for an intimate inquiry into the personal, practical, and pedagogical experiences my students faced in the shift to a virtual environment. The themes foregrounded by the analyses provide directions to me in moving forward pedagogically in virtual learning. In addition, this data provides a snapshot of a specific point in time, one filled with great uncertainty and fear. It is a reminder of the mood of this period, our response to the unknown, and our struggle to move through this opening phase of the COVID crises. It is in this spirit, that I lay bare my pedagogy in order to reflect on my actions (my tensions). I do so in a way that is systematic, allows for a pedagogically oriented shift in my practice, and "stands as an embodied testament to [my] beliefs" (Hamilton and Pinnegar, 2000: 238).

CONCLUSION

As teacher education moves deeper into the twenty first century, it appears virtual learning in K-12 as well as post-secondary settings will become a marked feature of our time. Our online pedagogy will need to reflect our core commitment to diversity, equity, and inclusion; culturally responsive pedagogy; and being lazy and slowing down. In addition, the virtual environment should also foster in pedagogically sound ways the mastery, motivation, and mythology that pre-service teachers have come to expect of a teacher education program. Finally, while the voices within this survey reflect the very real emotions, concerns, and lived experiences of a select group of students during a very specific point in history—the first wave of the COVID-19 pandemic on U.S. soil—the analysis of and reflection on these experiences have opened up a space for me and presumably others to reconnect with pre-service teachers as simply undergraduate students.

DATA AVAILABILITY STATEMENT

Because the data includes personal/individual disclosures by participants, it will not be shared publicly. Thematic data codes could be shared upon request. Requests to access the datasets should be directed to M'Balia Thomas, mbthomas@ku.edu.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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College Student Meaning Making and Interest Maintenance During COVID-19: From Course-Based Undergraduate Research Experiences (CUREs) to Science Learning Being Off-Campus and Online

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In response to the outbreak of COVID-19 the national landscape of higher education changed quickly and dramatically to move "online" in the Spring semester of 2020. While distressing to both faculty and students, it presents a unique opportunity to explore how students responded to this unexpected and challenging learning situation. In four undergraduate STEM courses that incorporated course-based undergraduate research experiences (CUREs)—which are often focused on discovery learning and laboratory research—we had an existing study in progress to track students' interest development at five time points over the Spring 2020 semester. Via this ongoing study we were able to investigate how students stay engaged in their college science courses when facing unexpected challenges and obstacles to their learning. Longitudinal survey data from 41 students in these CURE courses demonstrated that students' situational interest dropped significantly when their CURE courses unexpectedly shifted from hands-on, discovery-based, and laboratory-based instruction to online instruction. Although we observed a dramatic decline in student interest in general after the CURE courses moved fully online, the decline rates varied across students. Students who were able to make meaningful connections between the learning activities and their personal or career goals were more likely to maintain a higher level of interest in the course. Implications for practice are discussed.

Keywords: COVID-19, course-based undergraduate research experience (CURE), meaning making, interest, higher education

1. INTRODUCTION

With the outbreak of COVID-19 in the Spring semester of 2020, the national landscape of higher education changed quickly and dramatically to move "online" with limited opportunity for advanced planning. While unprecedented in recent times for college and university students, this situation presents a unique and urgent opportunity to explore how students respond to unexpected and challenging learning situations.

For the Spring 2020 semester we originally designed a longitudinal study to track students within four course-based undergraduate research experience (CURE) courses by measuring their interest development at multiple time points. Normally, CUREs are an excellent context in which to study student interest, as evidence suggests that CUREs benefit college students' STEM knowledge, motivation, and academic plans more than do traditional learning contexts (Graham et al., 2013; Dolan, 2016; Hanauer et al., 2017; Corwin et al., 2018). In response to the COVID-19 outbreak, however, all four CURE courses that we were investigating had to shift to online learning environments for the rest of the semester. Although we were not able to explore student interest development within CUREs over a regular semester like we originally planned, the circumstances presented us with a unique opportunity to explore how the interest levels of students enrolled in CUREs—which are often based in discovery learning and laboratory research— evolved in a newly online environment. Student interest is essential to consider when investigating learning experiences in CUREs because it is the basis for which these types of courses are purported to be more engaging. This is due to CUREs having more authentic research elements when compared to typical college science, especially traditional laboratory and lecture-based courses (Auchincloss et al., 2014). Additionally, the psychology and education literature has shown that both situational and individual interest positively impacts learning (Hidi and Renninger, 2006; Renninger, 2010). Situational interest refers to a temporary psychological state of heightened motivation characterized by increased attention, effort, and affect (Schraw and Lehman, 2001). In contrast, individual interest refers to an enduring predisposition to re-engage with a topic over time (Renninger, 2010).

Previous work on the impact of undergraduate research on interest has suggested student interest fluctuates over the course of a research experience. Hernandez et al. (2018) measured undergraduates' interest in STEM at the beginning, middle, and end of a formal, non-course mentored summer research program. They found that for some undergraduate researchers (those with a low level of project ownership) interest was elevated at the start of the experience, declined at the midpoint, and then rebounded to the original level by the end. A similar fluctuation in student interest could be posited for course-based research—as occurs in CURE courses—conducted during a regular, uninterrupted academic year.

While there are a number of perspectives to view student interest development and maintenance, such as self-regulated learning (Wolters and Pintrich, 1998), the current study focuses on college students' tendency and capability of *meaning making*.

Meaning Making is a potential factor explaining why students perceive the learning environment differently even when they sit in the same classroom and study with the same teacher (Wang, 2019). Making meaningful connections between learning and personal goals has been shown to increase college science students' perceptions of value for the learning task which, in turn, leads to increases in their interest (Hulleman et al., 2010). For example, in an introductory college biology course students who articulated why course material was useful to them personally were more likely to achieve a higher course grade, enroll in another biology course, and persist in a STEM major, as compared to students who only summarized course material (Canning et al., 2018). More generally, Wang (2019) investigated the impact of meaningfulness on students' learning experiences through a survey of 263 undergraduate and graduate students. Correlational analyses indicated that students who reported being able to bring value to learning and make learning more relevant tended to view their learning experiences more positively, perceive higher- level of needs satisfaction, and show adaptive motivation (Wang, 2019).

The present investigation focused on two key research questions (RQs). First, how do rapid course changes due to COVID-19 affect CURE students' various feelings (specifically interest, challenge, frustration) about their learning experiences (RQ1)? Second, we asked what factors affected students' changes in situational interest (RQ2)? We focus on situational interest in the present study and consider it an outcome variable because it is sensitive to the changing activities and features as a course progresses (Hulleman et al., 2017) and therefore capable of capturing fluctuations in students' interest over a semester. In order to capture the range of impacts on students in the target courses, we also included the additional variables of situational challenge and frustration.

For the first research question (RQ1), we collected longitudinal student data from four CUREs in the STEM fields to explore how students' situational interest, challenge, and frustration change over a semester, especially after the courses have been moved fully online due to institutional policy changes prompted by COVID-19. In the current study, all four CURE instructors had to adjust their course activities and assessments in the middle of a semester due to COVID-19. For instance, instead of providing students with hands-on research experiences, two of the modified online-version CUREs focused on professional scientist activities, such as writing and presenting research/grant proposals. Although instructors did their best in incorporating students' opinions into the modifications of the course, the modified courses still differed from what the students had originally enrolled in—a hands-on, authentic laboratory-based research experience. Therefore, we expected to observe a significant decrease in student situational interest, and a significant increase in frustration after the rapid online transition due to COVID-19 (Hypothesis 1).

For the second research question (RQ2), based on the literature in educational psychology we proposed that meaning making would play a role in student interest development during the transition to online learning (Hypothesis 2), especially given the unexpected mid-semester transition in the courses. Although

student interest in the CURE course would be expected to decline in general due to the unexpected online transition, it is possible that some students could maintain a high level of interest in the course if they were able to perceive the adjusted CURE course as relevant to their academic and career goals. Therefore, we also posited that positive student perspectives on online-transitioned CUREs would mediate the association between meaning making and situational interest (Hypothesis 3).

2. MATERIALS AND METHODS

2.1. Participants

Participants in the study were undergraduate students at a research university in the northeast United States. They were recruited from four semester-long CURE courses across three disciplines: biology, anthropology, and computer science. The course sizes ranged from 9 to 32 students. Students who enrolled in these courses were contacted at the beginning of the semester via email and invited to participate in a series of online surveys. Out of the 63 students enrolled in these four courses, 41 students agreed to participate and completed at least one online survey. Among the 29 students who provided demographic information, 14 students (48%) identified as male and 15 students (52%) identified as female. The average age of these participants was 19.42 years ($SD = 1.47$), most of whom were first-year and sophomore students (83%). Fourteen participants (48%) identified as White, followed by Asian ($n = 13$; 45%), Hispanic ($n = 3$; 10%), and Native American ($n = 2$; 7%). Students were offered nominal course participation credit (less than 1% of final grade) for completing the survey. In addition, students who completed the surveys and agreed to include their data in the study were entered into a lottery for an electronic gift card valued at $100. This project was approved by the institution's IRB Human Subjects Committee.

2.2. Procedures and Measures

Student data was collected at 7 time points via online surveys administered with Qualtrics survey software. **Table 1** presents an overview of the data collection process, including the

research contexts, the variables measured, as well as the response numbers and rates. We have included all survey questions in the **Supplementary Material**.

2.2.1. Initial Individual Interest (Time 1)

At Time 1 (see **Table 1**), we used six items from the Initial Individual Interest Questionnaire (Harackiewicz et al., 2008) to assess students' interest. This served as a covariate when analyzing situational interest changes in the current study. These items were rated on a 7-point scale (1 = not at all true of me, 7 = very true of me). Sample items included: *"I chose to take this class because I'm really interested in the topic."* Internal consistency reliability was acceptable (Cronbach's alpha coefficient = 0.77).

2.2.2. Situational Interest, Challenge, and Frustration (Times 2, 3, 4, 5, and 6)

In order to investigate the changes in student learning experiences across the semester, students' situational interest, perceived challenge, and perceived frustration were assessed at five time points occurring approximately every 2 weeks. Three items assessed students' current levels of interest. Scale points ranged from 1 "extremely low" to 7 "extremely high." Sample items included: *"Rate your current level of interest in this class."* Internal consistency was good for the measure of situational interest across the five time points (Cronbach's alpha coefficients ranged from 0.82 to 0.97). Single-item measures were used to assess students' current levels of challenge (*"Rate how challenging the class is at the current moment"*) and frustration (*"Rate how frustrating the class is at the current moment"*), with the scale ranging from 1 "not enough" to 7 "too much." Therefore, internal consistency reliabilities for challenge and frustration were not available.

2.2.3. Positive Perspective on Online-Transitioned CUREs (Times 5 and 6)

In response to COVID-19, the four CURE courses that we investigated moved fully online at Week 9 of the 15-week semester. To understand students' perspectives on the unexpected changes in their courses, we asked students to

TABLE 1 | Overview of data collection.

	Time 1 (week 3)	Time 2 (week 4)	Time 3 (week 6)	Time 4 (spring break)	Time 5 (week 11)	Time 6 (week 14)	Time 7 (week 15)
Individual interest	X						
Situational interest		X	X	X	X	X	
Situational challenge		X	X	X	X	X	
Situational frustration		X	X	X	X	X	
Meaning making							X
Positive perspectives on online-transitioned CUREs					X	X	
Response numbers	32	28	35	24	27	27	29
Response rates	51%	44%	56%	38%	43%	43%	46%

Shift online at Time 4. Shift to Pass-Fail grading system at Time 5.

comment on the online version of their CURE courses at Times 5 and 6. Students' responses to the open-ended question (i.e., *"In a few sentences, please tell us how you currently feel about the online version of this course"*) were coded and scored to identify positive and non-positive (i.e., negative or neutral) aspects of their newly online CURE courses. If a student's comment contained any positive wording or expression, the response was coded as 1; otherwise, it was coded as 0.

An example of a positive perspective on online science learning during COVID-19 was *"I think it's going fine. The professor's slides are pretty well illustrated, enough to understand the content."* An example of a non-positive perspective on online science learning was *"Going online is annoying for all classes but for this one it's particularly disappointing since we were planning projects for weeks before break that we can't do anymore."* Some students expressed mixed feelings about the online version of the course. For instance, one student stated that *"I feel less interested in the class than before, maybe due to the transition online that made it impossible for us to complete our individual projects. I think Dr. XX [the instructor] did pretty well in finding activities for us to do online."* Students responding in this way were given a score of 1 on this variable because they identified at least some positive aspects of the current course. Two researchers independently coded and scored all students' comments. The intercoder agreements were 0.96 and 1.00 at Times 5 and 6, respectively. All disagreements were resolved through discussion. Students' online science learning perspective scores were calculated by averaging the scores of Times 5 and 6.

2.2.4. Meaning Making (Time 7)
In the post-survey administered at Time 7, we assessed students' meaning making in three ways at two levels, namely meaning making in the course (at the contextual level), meaning making during in-person CUREs (at the situational level), and meaning making during online-transitioned CUREs (at the situational level). Meaning making in the course was assessed with four items from Wang (2019) rationale generation orientation scale. Internal consistency reliability was satisfactory in the present study (Cronbach's alpha coefficient = 0.86). A sample item is: *"In this course, I strived to make whatever I was learning as useful as possible."* Single-item measures were used to assess students' meaning making during in-person CUREs (*"During the in-person lab before Spring Break, I was able to see the connections between learning and my academic or professional goals"*) and meaning making during online-transitioned CUREs (*"During the online course after Spring Break, I was able to see the connections between learning and my academic or professional goals"*). Scale points ranged from 1 "never" to 5 "always" (Note that the online transition happened to coincide with Spring Break, so students tended to use "Spring Break" as shorthand for the change).

2.3. Analysis
To explore how students perceived the learning environment shift due to COVID-19 (i.e., RQ1), we first assessed their situational interest, challenge, and frustration across five time

points from Week 4 (Time 2) to Week 14 (Time 6) in a 15-week semester. Repeated measures ANOVA was used to examine the changes in situational interest, challenge, and frustration across four time points of the semester, two before (Times 2 and 3) transitioning online, and two after (Times 5 and 6). All dependent variables were found not to violate the assumptions of normality and sphericity. To investigate individual factors influencing the changes in situational interest, a repeated measures ANCOVA was conducted with situational meaning making during in-person (Times 2 and 3 average) and online-transitioned CUREs (Times 5 and 6 average) as independent variables, initial individual interest and meaning making in the course as covariates, and levels of situational interest as the dependent variable. To further understand the psychological mechanism of meaning making's impact on students' situational interest, we also tested a mediating effect of positive perspectives on online-transitioned CUREs.

3. RESULTS

3.1. Students' Interest Decreased After Moving Courses Online Due to COVID-19
As shown in **Figure 1**, students demonstrated a relatively high level of situational interest in the CURE classrooms at the beginning of the semester, and the level of interest remained steady until the university announced courses would be taught online due to the COVID-19 pandemic. After moving the CURE courses fully online, there was a sharp drop in the level of situational interest. Whereas, we observed a slight rise in the level of situational interest at the end of the semester across courses, it did not reach the same level that it was during the first half of the semester.

To examine whether the changes in situational interest before and after transitioning online were significant, we conducted repeated measures ANOVA using the data of students who had completed situational surveys at Times 2, 3, 5, and 6 ($n = 22$). We found significant differences in situational interest across the four time points [$F_{(3, 63)} = 16.24$, $p < 0.001$, $\eta^2 = 0.44$]. Pairwise comparisons suggested that levels of situational interest in online science learning after the online transition were lower than those before the transition. There was no significant difference in situational interest between Times 2 and 3 ($p = 0.23$[1]). Similarly, no difference in situational interest was found between Times 5 and 6 ($p = 0.65$).

In terms of the level of challenge, students reported moderate levels of challenge across the whole semester. No significant difference was found across Times 2, 3, 5, and 6 [$F_{(3, 63)} = 2.37$, $p = 0.08$]. Students' self-reported level of frustration was relatively low as the mean of frustration at Time 2 was 3.04 and a score of 4 indicates that the level of frustration is "about right;" however, there was a steady increase in the first half of the semester that peaked just as courses were transitioning online. A gradual decline in feelings of frustration was observed after the online transition. Although the result of repeated measures ANOVA suggested that there were significant differences in frustration

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[1]Dunn-Sidak correction was used for multiple comparisons in the current study.
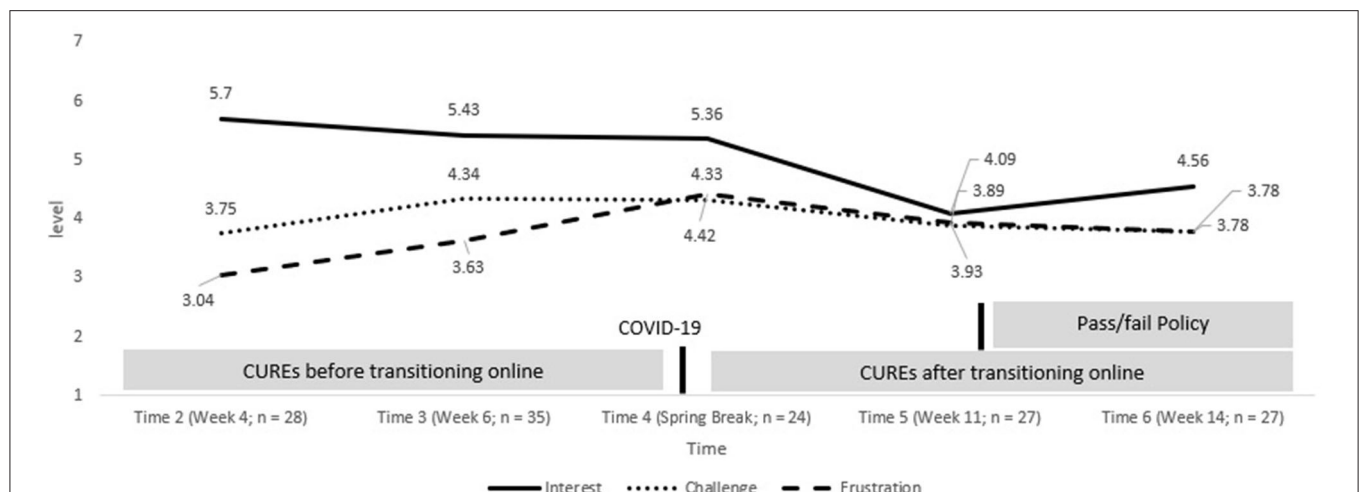
FIGURE 1 | Trends in students' situational interest, challenge, and frustration over a semester across five time points. The solid line represents the development of situational interest; the dotted line represents the development of situational challenge; and the dashed line represents the development of situational frustration. During Spring 2020, the use of the term "Spring Break" was synonymous with "beginning of COVID-caused course transitions to online instruction." For the solid line of situational interest, for the students who had completed surveys at Times 2, 3, 5, and 6 ($n = 22$), the ANOVA showed significant differences across these four time points [$F_{(3, 63)} = 16.24$, $p < 0.001$, $\eta^2 = 0.44$]; pairwise comparisons suggested that situational interest after the online transition were lower than before the online transition; no significant difference in situational interest between Times 2 and 3 or between Times 5 and 6.

across the four time points [$F_{(3, 63)} = 3.15$, $p = 0.03$, $\eta^2 = 0.13$], *post-hoc* tests with Dunn-Sidak correction did not detect any differences between any two time points.

3.2. Meaning Making Helped Mitigate the Decline in Situational Interest

As previously stated, students' overall level of situational interest dropped dramatically after moving the CURE courses online. Since we found no significant difference in situational interest within in-person CUREs and online-transitioned CUREs, we decided to reduce the number of time points from four to two, which may help increase the statistical power as the student sample size increased from 22 to 29. Specifically, we calculated a "before transitioning online" score by averaging the scores of Times 2 and 3 and an "after transitioning online" score by averaging the scores of Times 5 and 6. Repeated measures analysis showed that students' self-reported situational interest after transitioning online was significantly lower than the situational interest before transitioning online, $F_{(1, 28)} = 38.69$, $p < 0.01$, $\eta^2 = 0.58$.

To investigate factors influencing the changes in situational interest, we added the three variables of: (a) meaning making in the course; (b) meaning making during in-person CUREs; and, (c) meaning making during online-transitioned CUREs, as well as the initial individual interest variable into the repeated measures model. Although the three meaning making variables were positively correlated with each other ($r = 0.52$–0.61), the range of variance inflation factors (VIF) was between 1.69 and 1.97, suggesting that some multicollinearity (i.e., overlap among variables) was present but not enough to cause problems (O'brien, 2007).

After controlling for initial individual interest and meaning making in the course, we found a significant interaction
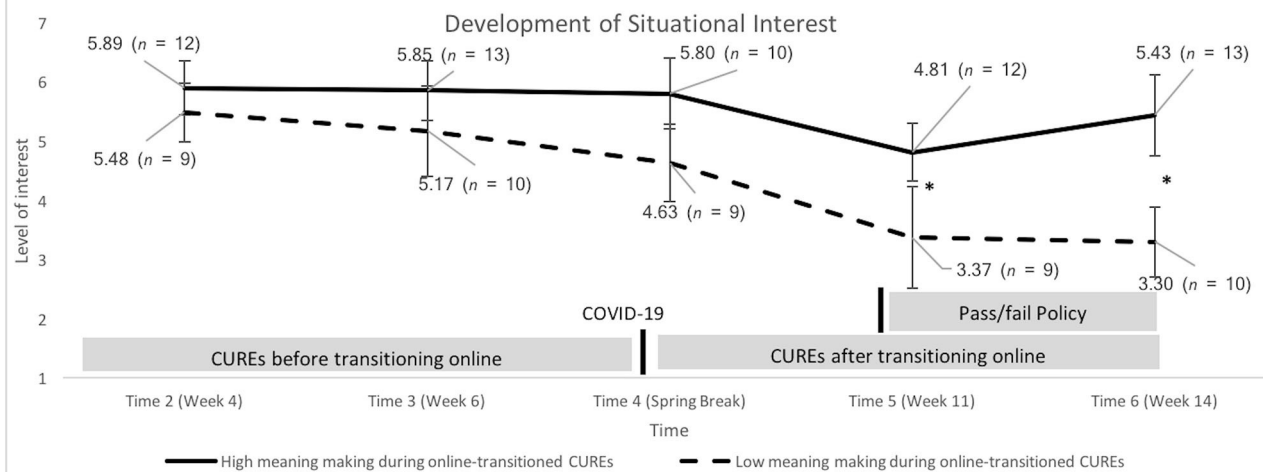
between meaning making during online-transitioned CUREs and time points, $F_{(4, 13)} = 5.41$, $p = 0.009$, $\eta^2 = 0.63$. This result suggests that meaning making during online-transitioned CUREs significantly influenced the changes in situational interest. None of the remaining interaction effects were significant, including the interaction between meaning making in course (i.e., contextual meaning making) and time points [$F_{(1, 13)} = 1.46$, $p = 0.248$], the interaction between meaning making in in-person CUREs and time points [$F_{(3, 13)} = 0.57$, $p = 0.648$], and the interaction between individual interest and time points [$F_{(1, 13)} = 0.38$, $p = 0.548$].

To better understand the interaction effect between meaning making during online-transitioned CUREs and time points (i.e., before and after transitioning online), we identified two groups of students from the dataset based on their responses to the item of meaning making during online-transitioned CUREs. Specifically, students who self-reported "never" or "sometimes" seeing the connections between learning and their academic or professional goals during the online course were labeled as the low meaning making group; in contrast, students who self-reported "always" or "most of the time" were labeled as the high meaning making group.

After shifting online and to Pass-Fail grading, the low meaning making group had a steeper decline in situational interest compared to the high meaning making group (see **Figure 2**). This result suggests that situational meaning making (i.e., post-shifts) may have buffered against the negative effects of transitioning online on students' learning experiences. **Figure 3** shows the students' situational interest over a semester was higher for the high meaning making group compared the low meaning making group, which further supports the result of repeated measures ANCOVA from **Figure 2**.
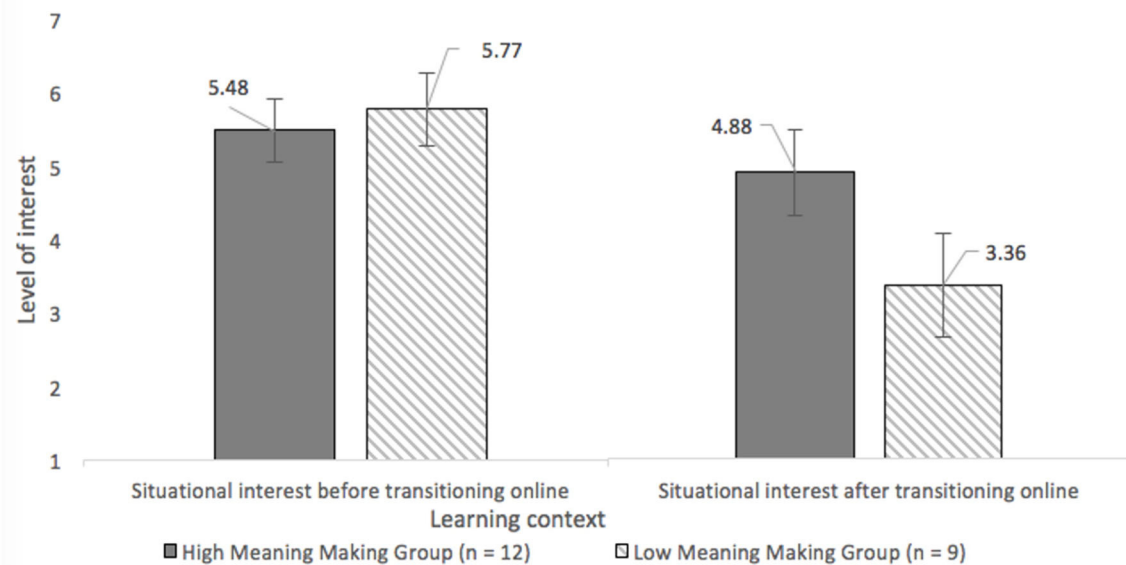
FIGURE 2 | Students' situational interest as a function of students' meaning making during online-transitioned CUREs. Covariates appearing in the model are evaluated at the following values: meaning making in the course = 3.86, individual interest = 5.37. Error bars represent 95% confidence intervals. High meaning making group: students who self-reported "always" or "most of the time" seeing the connections between learning and their academic or professional goals during the online course. Low meaning making group: students who self-reported "never" or "sometimes" seeing the connections between learning and their academic or professional goals during the online course.

FIGURE 3 | Trends in students' situational interest for the high meaning making group and the low meaning making group during online-transitioned CUREs. Error bars represent 95% confidence intervals; astericks (*) represent significant group differences with $p < 0.05$.

3.3. Positive Perspectives on Online-Transitioned CUREs Mediated the Impact of Meaning Making During Online-Transitioned CUREs on Student Interest

To further understand the psychological mechanism of student meaning making's impact on students' situational interest, we tested a mediating effect of attitudes toward their online-transitioned CUREs. Before testing the mediating model, we first checked the bivariate correlation coefficients among variables (see **Table 2**). All correlations were statistically significant and in the expected direction, which indicated that the data is appropriate for mediation analysis. We then continued to build a mediating model to examine the relationships among these variables.

To examine the degree to which positive perspectives on online-transitioned CUREs mediated the impact of meaning making on student situational interest, we employed a series of regression analyses. Based on the procedure outlined by Baron and Kenny (1986), we first tested the direct effect of meaning making on students' situational interest after transitioning online. After controlling for students' pre-COVID-19 situational interest, meaning making was still significantly associated with students' situational interest after transitioning online (standardized coefficients $\beta = 0.625$, $t = 5.14$, $p < 0.001$). The path from meaning making to positive perspectives on the online portion of their CUREs (i.e., the mediating variable) was also significant, with a standardized beta of 0.587 ($t = 3.64$, $p = 0.001$). Finally, the path from meaning making to situational interest after transitioning online was significant ($t = 3.09$, $p = 0.005$); however, the value of the standardized beta reduced from 0.625 to 0.361. The mediation model is shown in **Figure 4**.

TABLE 2 | Descriptive statistics and partial correlations among the variables of interest ($n = 27$).

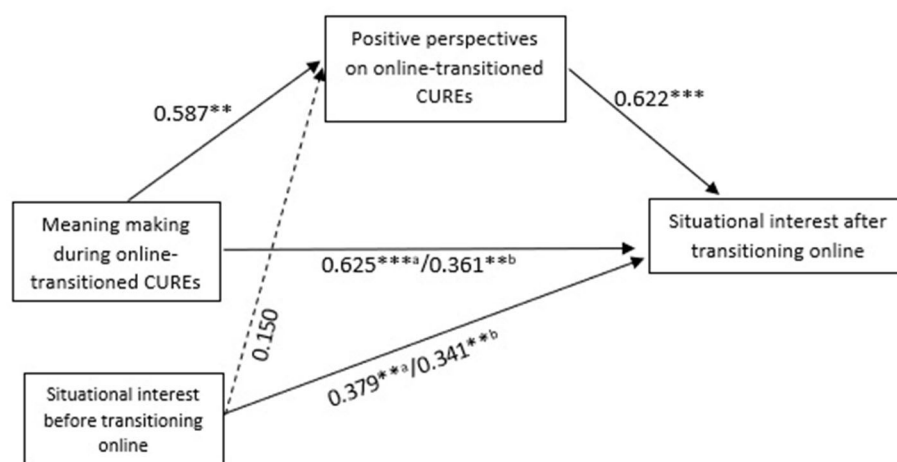|	1	2	3	Range	Mean	SD
1. Meaning making during online-transitioned CUREs	-			1–5	3.22	1.22
2. Positive perspectives on online-transitioned CUREs	0.60**	-		0–1	0.65	0.41
3. Student interest after transitioning online	0.74***	0.78***	-	1–7	4.23	1.35

*Scale ranges for meaning making and student interest are consistent with the original publication. **p < 0.01, ***p < 0.001.*

This result suggests that the relationship between meaning making during online-transitioned CUREs and situational interest after transitioning online is partially mediated by students' positive perspectives on online-transitioned CUREs, after controlling for pre-COVID-19 situational interest. Bootstrapped mediation analyses with 5,000 samples also supported the partial mediating effect of positive perspectives on online-transitioned CUREs (indirect effect = 0.299, 95% C.I. = [0.120, 0.470], $p = 0.004$). During online-transitioned CUREs, positive perspectives on the transitioned CUREs explained about 42.7% of the total effect of meaning making on situational interest.

4. DISCUSSION

We investigated how students' situational interest changed over the Spring 2020 semester within the context of several CUREs and the shift to online learning. The present study contributes to our understanding of how abrupt, unexpected changes in college science courses impact student motivation and interest, specifically due to the outbreak of COVID-19. Our findings provide preliminary insight about how we can help students stay engaged in their education when facing unexpected challenges and obstacles in learning.

In the current study, one finding was that students' situational interest dropped significantly when their CURE courses shifted from in-person instruction to online instruction (see **Figure 1**). For instance, students expressed disappointment for losing the opportunity to carry out their planned laboratory experiments. But for students who were able to find sudden online learning to be personally meaningful, another finding was that they were able to maintain a similar level of situational interest when measured prior to the rapid course transition (see **Figure 2**). Finally, the

FIGURE 4 | The mediation model with standardized regression coefficients. Student meaning making during online-transitioned CUREs serves as the independent variable, positive perspectives on online-transitioned CUREs is the mediating variable, and situational interest after transitioning online is the dependent variable. "a" is the standardized β before including the mediating variable. "b" is the standardized β after including the mediating variable. All simple linear regression models include students' situational interest before transitioning online as a controlled variable. **p < 0.01, ***p < 0.001.

high meaning making group was more likely to express positive perspectives on online learning as compared to the low meaning making group. For example, for the high meaning making group there was a 92% rate of reporting a positive feeling within the context of online learning; in contrast, there was only a 35% rate for the low meaning making group.

This study of college student meaning making during the COVID-19 transition to online learning adds to the growing body of research that indicates the positive effects of meaning making on student learning (Hidi and Renninger, 2006; Hulleman et al., 2008, 2017; Heddy et al., 2017; Canning et al., 2018; Wang, 2019) and appears to be one of the first attempts to examine the influence of meaning making on student learning at this time of national and international crisis caused by COVID-19.

In terms of implications for practice, one question from the COVID-19 transition is how can we promote student meaning making in instances where students are challenged by external events that diminish their educational experience? Utility-value intervention has been confirmed to be an effective approach to promote student meaning making by a number of correlational and experimental studies (Hulleman et al., 2010, 2017; Canning et al., 2018). In those studies, the intervention was manipulated through a writing task in which participants are asked to explain either how the learning materials are relevant to their lives or why the learning tasks are important or useful to them. A recent study showed that simply providing students with opportunities to generate rationales for their learning behaviors could also help students identify the personal meaning of learning (Wang, 2019). In that study, students in the intervention group spent, on average, 112 s on generating rationales, which significantly enhanced their motivation with a decent effect size. It is feasible to conduct the same intervention in real classrooms. For example, instructors could give students 3 min to write down their reasons for taking the course at the start of each lecture. This may help students discover personal significance for completing such activities. In addition to utility-value intervention, evidence from self-determination theory research suggests a couple of other approaches to foster students meaning making, such as providing rationales (Reeve et al., 2002) and facilitating autonomy orientation of students (Ryan and Deci, 2017). When people have to do some activities that are not intrinsically motivated, providing a meaningful rationale can help them identify the value of doing those activities (Deci et al., 1994; Reeve et al., 2002; Jang, 2008; Legault et al., 2011). Autonomy orientation helps to explain why some people are more healthy, effective, and happy than others even when they are in the same social context (Ryan and Deci, 2017). It describes the degree to which people orient toward their environments by treating them as sources of relevant information (Ryan and Deci, 2017). A strong autonomy-oriented person tends to engage in challenging situations more congruently and openly and with less defensive responding.

Although we observed a decline in student interest in general after the CURE courses moved online and shifted to Pass-Fail grading, the rates of decline varied across students. It is intriguing that being able to see connections between their course activities

and personal goals may help mitigate the impact of the rapid transition online on student interest; however, there may be alternative explanations based on other theoretical frameworks that future research needs to explore.

Student meaning making was examined at both contextual and situational levels. As expected, student situational interest was mainly influenced by student meaning making at the situational level, which is consistent with the framework of hierarchical model of motivation (Vallerand, 1997; Vallerand and Ratelle, 2002). Different from situational meaning making (i.e., meaning making after transitioning online), we did not detect significant association between contextual meaning making (i.e., meaning making in the course overall) and situational interest, it is possible that the rapid changes in course activities and learning environments amplify the differences between students' learning experiences at the contextual and situational levels. This limitation should be explored in future research.

It is important to note that our findings are situated in the context of laboratory-based CURE courses at a single research university. Furthermore, the university moved to a system-wide Universal Pass/Fail grading system soon after moving online, and this which could further modify students' interest, positive feelings, and experiences. This policy also limited our ability to assess course performance in terms of final grade. All four CURE courses involved in the current study were also elective courses and students reported initially high motivations to learn. Together, these common variables may explain the low variances in student interest (see **Figure 1**). Moreover, the findings about the changes in situational interest need to be interpreted with caution, as we do not have a comparison group showing how students' situational interest evolves in a regular CURE context. Further quasi-experimental investigations are needed to determine the impact of unexpected online transition on the development of situational interest.

Additionally, our small sample size did not allow us to employ a more advanced technique, such as latent growth modeling, to estimate longitudinal growth trajectories of situational interest. Instead, we employed repeated measures ANOVA and repeated measures ANCOVA, which allowed us to gain insights into the current study's research questions. Finally, several variables, namely situational challenge, situational frustration, and meaning making in online science learning, were assessed with single-item measures. Therefore, internal consistency reliabilities of these variables were not available in the current study. Although previous research suggests that single-item measures generally perform well when gauging a holistic impression or a global perception (Youngblut and Casper, 1993), as is the case here, multiple-item scales would be necessary if researchers intend to obtain better estimates of the constructs by specifying the measurement errors associated with them.

5. CONCLUSIONS

We documented the impacts of rapidly transitioning in-person laboratory-based CUREs into fully online courses. This unprecedented situation provides insights into how teaching

practices and course activities interact with student expectations and perspectives in a learning environment. We observed a drop in the level of student situational interest after moving the CUREs online due to the pandemic of COVID-19. We further found that meaning making may help explain differential student responses to the disrupted course plans. Students who were able to make meaningful connections between the learning activities and their personal academic or career goals were more likely to view the online-transitioned learning experience more positively. In turn, these attitudes helped students maintain a higher level of situational interest despite a mid-semester shift to fully remote learning due to COVID-19. These results provide insight into how to help students manage their own resilience during unexpected learning conditions and obstacles.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Yale University Institution Review Board. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

CW, MB, AB, and MG designed the study and collected the data. CW, MB, and MG formulated the hypotheses. CW and MB coded the qualitative data. CW performed the statistical analyses and drafted the manuscript. CW, MB, AB, DH, and MG revised and edited the manuscript. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2020.590738/full#supplementary-material

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Factors and Recommendations to Support Students' Enjoyment of Online Learning With Fun: A Mixed Method Study During COVID-19

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Understanding components that influence students' enjoyment of distance higher education is increasingly important to enhance academic performance and retention. Although there is a growing body of research about students' engagement with online learning, a research gap exists concerning whether fun affect students' enjoyment. A contributing factor to this situation is that the meaning of fun in learning is unclear, and its possible role is controversial. This research is original in examining students' views about fun and online learning, and influential components and connections. This study investigated the beliefs and attitudes of a sample of 551 distance education students including pre-services and in-service teachers, consultants and education professionals using a mixed-method approach. Quantitative and Qualitative data were generated through a self-reflective instrument during the COVID-19 pandemic. The findings revealed that 88.77% of participants valued fun in online learning; linked to well-being, motivation and performance. However, 16.66% mentioned that fun within online learning could take the focus off their studies and result in distraction or loss of time. Principal component analysis revealed three groups of students who found (1) fun relevant in socio-constructivist learning (2) no fun in traditional transmissive learning and (3) disturbing fun in constructivist learning. This study also provides key recommendations extracted from participants' views supported by consensual review for course teams, teaching staff and students to enhance online learning experiences with enjoyment and fun.

Keywords: COVID-19, online learning, fun, higher education, academic performance, epistemic views, responsible research and innovation, recommendations

INTRODUCTION

Online learning has been considered vital in 21st century to provide flexible education for students as well to address the gap between demand for higher education and supply. Governments have advocated increasing rates of completion of secondary and higher education in the face of rapid population growth. However, they face financial pressure to support these larger numbers directly through additional infrastructure, in addition to scholarships and student loans (Cooperman, 2014:1).

In recent years, there has been an increasing interest in distance online learning not only to educate students who work but also who live too remotely or cannot access traditional campus universities for other reasons. However, literature shows that online distant education has dropout rates higher than traditional universities (Xavier and Meneses, 2020). Studies also suggest that the students' level of satisfaction about their online learning and own academic performance have significant correlation with their level of persistence toward completion (Gortan and Jereb, 2007; Higher Education Academy (HEA), 2015).

Understanding components that influence students' enjoyment in distance higher education is fundamental to promote student retention and success (Higher Education Academy (HEA), 2015) during and post COVID-19 pandemic. There is a growing body of research about students' engagement in virtual learning environments (Arnone et al., 2011). However, there are key issues that whilst extensively researched in traditional teaching, remain relatively absent from research into distance education. For example, a long established body of research exists that demonstrates a link between students' epistemological beliefs and their study, engagement, and outcomes (Rodriguez and Cano, 2007; Richardson, 2013). The types of epistemological beliefs typically examined fall into two broad categories. The first is derived from Schommer's research (Schommer, 1990), in which she elicited dimensions that reflected students differing beliefs. This included "simple knowledge" (knowledge as isolated facts vs. knowledge as integrated conceptions) and "innate ability" (ability to learn is genetically determined vs. the ability to learn is enhanced through experience). The second category of research is more directly aligned with pedagogy. This has positioned epistemological beliefs in relation to traditional or constructivist beliefs. Traditional views of learning see learning occurring via the non-problematic transfer of untransformed knowledge from expert to student (Chan and Elliott, 2004). This contrasts with constructivist beliefs in which knowledge arises through reasoning, which is facilitated by teaching (Lee et al., 2013). This type of framing can be seen in large scale international comparative research, such as the Organization for Economic Co-operation and Development's survey of teachers' epistemological beliefs across 23 countries (Organisation for Economic Co-operation and Development (OECD), 2010, 2013). However, in relation to online and distance higher education, epistemological research is relatively absent (Richardson, 2013; Knight et al., 2017). Given the impact of epistemological beliefs on students' study experiences there is a need for greater epistemologically focused research in the context of online education.

Another underrepresented research area concerns fun in online learning; in particular, because the meaning of fun is unclear and controversial. There is no consensus about the value of fun in learning and what a fun learning experience means in higher education (McManus and Furnham, 2010; Lesser et al., 2013; Tews et al., 2015; Whitton and Langan, 2018). Tews et al. (2015) argue that fun is a term used regularly in various contexts including

education. Yet there is no clear agreement about its role and relationships with students' learning experience. Congruently, McManus and Furnham (2010) highlight that fun has different meanings for different people and literature is limited about what generally comprises fun for learners. Similarly, Lesser et al. (2013) indicate that views about fun among educators are ambivalent as fun is perceived as too difficult or time-consuming to be implemented and it may distract students from serious learning. These three studies indicate that evidence about fun and learning are circumstantial and subjective for teaching staff to consider it as a compelling component for making their students' experience more impactful. So that, further studies would be worthwhile to examine the practical meaning and educational value of fun on Distance Higher Education with a systematic and rigorous methodological approach.

To explore this challenge, this paper investigates students' reflective views about fun and online learning and whether fun and enjoyment are interconnected components to enhance enthusiasm to learn and excel in online distant education. This investigation considers a critical question framed by the authors from Whitton and Langan (2018:11)'s work. How can we explore the impact of fun in higher education in view of the complexity of factors involved? To explore this question, this work is based on Responsible Research and Innovation (RRI) approach to understanding the what, how and why fun might be a valuable key in education with and for distinctive representatives: learners, educators, researchers, consultants, and policy makers. "For pedagogic innovation to succeed, learners must personally perceive the benefits of learning activities" designed to be fun and also "these gains must be translated into outcomes that are viewed positively within the institution quality monitoring by teaching staff." Whitton and Langan (2018) also explain that there is a negative influence from the competitive job market that values "serious" performance – as the opposite of fun – so potentially this make course teams less likely to embed playful and fun approaches in the higher education curriculum.

The RRI approach implies that community-members and researchers interact together to better align both its process and outcomes with the values, needs and expectations of society (European Commission, 2013; von Schomberg, 2013). The purpose of RRI is to promote greater involvement of societal members with research-authors in the process of research to increase knowledge, understanding and better decision-making about both societal needs and scientific research through eight principles: diversity and inclusion; transparency and openness, anticipation and reflexivity, adaptation and responsiveness (RRI-Tools, 2016; European Commission, 2020). These principles were used to adapt, implement and refine a self-reflective instrument about learning and fun. So that, the following section-"Previous Studies about Fun and Learning" present Learning and Fun views from literature. Section-"Methodology" shows the self-reflective instrument, which was used integrated with the methodological approach. Section-"Findings" shows the

findings and section-"Discussion and Final Remarks" discussion with final remarks.

PREVIOUS STUDIES ABOUT FUN AND LEARNING

Studies that appear to research fun and learning, typically focus on types of activity and the extent to which these are seen as enjoyable and indicated as being fun, rather than drilling down to examine or define fun. While fun is consistently recognized as an important part of the lived experience of children, youth and adults, relatively few seek a deeper understanding of what the construct of fun means (Kimiecik and Harris, 1996; Harmston, 2005; Garn and Cothran, 2006). This situation is in stark contrast to how fun is generally positioned with regard to the domain of learning and education.

There are different views in the literature about fun and learning, in terms of meanings and its effects. Negative perspectives describe fun as the opposite concept of meaningful "work" and consider it as an unnecessary distraction for learning.

Fun is a term that has changed over time. In the 1900s, it came to indicate an absence of seriousness, work, and labor. "Fun can be seen both as a resistance to the rigid demarcation between work and leisure and also as a means of reproducing that dichotomy" (Blythe and Hassenzahl, 2018, p92). As it took on these meanings, fun became a loaded term that challenges the *status quo* (Beckman, 2014). It can be positioned as a challenge to the traditional split between fun and learning; welcomed by those who embrace social views of the learning process but seen as an unnecessary distraction for those who hold a traditional transmission view of how learning takes place.

The etymological meaning of fun (*fonne* and *fon* from Germanic), which refers to "simple, foolish, silly, unwise" (Etymonline, 2020) have still influence on the meanings attributed by people and researchers nowadays. The argument that fun can have a negative influence on learning was highlighted in newspaper reports of research by the Centre for Education Economics (CEE): "Making lessons fun does not help students to learn, a new report has found. The widely held belief that learners must be happy in order to do well is nothing more than a myth" (Turner, 2018). Likewise, Whitton and Langan note in their analysis of fun in United Kingdom that many educators believe fun to be unsuitable in the "serious" business of higher education (Whitton and Langan, 2018, p3). They also highlight a need to research whether students believe that there is any place for fun in their university studies. So, for many, fun is seen as having little or no place within learning. Within the context of education, "fun" is often a derogatory term used to refer to a trivial experience (Glaveanu, 2011).

Some researchers have identified a more positive relationship between fun and learning for children and adults. An analysis of outcomes from the United Kingdom's "Excellence and Enjoyment" teaching initiative concluded that "Learning which is enjoyable (fun) and self-motivating is more effective than sterile (boring) solely teacher-directed learning" (Elton-Chalcraft and Mills, 2015, p482; Tews et al., 2015). In the context of informal adult learning, fun has been linked to positive learning outcomes, including job performance and learner engagement (Francis and Kentel, 2008; Fine and Corte, 2017; Tews et al., 2017). This raises the question of why this conflict and controversy might exist.

The positive effect is not due to fun being an integral part of the learning process, but rather because it has physiological effects such as reducing stress and improving alertness which enhance "performance" (Bisson and Luckner, 1996).

Similarly, Whitton and Langan (2018) describe fun as a "fluid state" (Prouty, 2002) which makes learners feel good (Koster, 2005: 40) to engage with learning. This fluid state allows learners to take healthy risks beyond existing personal boundaries (Ungar, 2007). This is because learners are attracted to participate in learning activities that they enjoy and can "fail forward" and feel safe. In addition, Feldberg (2011:12) indicate that fun has a positive effect on the learning process for creating a state of "relaxed alertness" (Bisson and Luckner, 1996) which enables the suspension of one's social inhibitions and the reduction of stress. The author highlights fun may contribute to the maintenance of cognitive functioning and emotional growth (Crosnoe et al., 2004 cited by Feldberg).

Dismore and Bailey's (2011, p.499) study indicates positive feelings associated with enjoyment, engagement and optimal experience. The authors described fun and enjoyment underpinned by the concept of "flow" (Csikszentmihalyi, 2015) which refers to "*an optimum state of inner experience incorporating joy, creativity, total involvement and an exhilarating feeling of transcendence.*" The optimum state is a key component to lead students to enjoyable accomplishment and optimal learning when their perceived skill and challenge are balanced and suitable. Flow is an important concept for educators to be aware that students' anxiety caused when their challenge becomes higher compared to their skill, and boredom when challenge becomes too little compared to their skill will reduce their enjoyment and have a negative effect on their learning. Fun learning with flow experiences is relevant for learners to grow with positive opportunities where their skill meets their effort producing intrinsic rewards (Dismore and Bailey, 2011; Chu et al., 2017; Whitton and Langan, 2018).

Literature about the meaning of fun in online learning is very limited. A set of studies about engaging e-learning games highlight that fun and challenge are essential for promoting students' enjoyment and making them want to learn (Fu et al., 2009). An engaging e-learning game facilitates the flow of experiences of students by increasing their attention, achieving learning goals and enjoyment with their learning experience (Virvou et al., 2005; De Freitas and Oliver, 2006).

This study focuses on fun and learning in the context of Distance Higher Education supported by RRI. To explore what fun is, its meaning and the effects of the phenomenon need to be understood with learners. As a first step, there is a need to identify how the relationship between fun and online learning is conceived by learners based on their own learning experience. A second step is to examine whether this relationship connection has any connection with their epistemic views.

The aim of this study is to address the following questions:

- What are the **relationships** between fun and online learning practices identified by students?
- What are the connections between students' **epistemic views** about online learning and fun?
- What are the **recommendations** for students, teaching staff and course teams?

METHODOLOGY

This work is part of a research program OLAF – *Online Learning and Fun* led by Rumpus Research Group. The methodology used in this study adopts the established epistemological questionnaire approach (Feucht et al., 2017), and provides an opportunity to facilitate participants epistemic reflectivity (Feucht et al., 2017). In this way the study is underpinned by the concept of reflective practitioners, by which participants "think in action" about principles and practices to share their reflective views (Schon, 2015).

This study is based on a mixed-method approach. Quantitative and qualitative data were generated through a self-reflective instrument (Feucht et al., 2017) constituted by two parts, both developed in Qualtrics. The first part was a Likert-scale survey with 25 statements about learning and fun. The second part was an open question (see "Instruments").

The approach used for qualitative analysis was a systematic and novel multi methodical procedure that combined: word cloud visualization in Qualtrics (**Figure 2**); automated thematic analysis map (**Figure 3**) and sentiment analysis (**Figures 4–6**) in NVivo 12. This integration of visualizations enabled us to identify seven themes to analyze the value of fun; and 26 themes of relationships between fun and learning. The quantitative analysis was supported by PCA – Principal Content Analysis (see "Relationships Between Fun and Learning Supported by Quantitative Analysis"). This approach enabled us to group our – multi-method qualitative analysis categorized by themes – into three groups (see "Relationships Between Fun and Learning Supported by Quantitative Analysis") as well present our findings (section-"Findings") with global recommendations underpinned by students' needs, priorities and expectations, which were revealed in the qualitative data and grouped by quantitative analysis.

This study acknowledges 8 principles (**Box 1**) of RRI (von Schomberg, 2013; RRI-Tools, 2016) in the context of open educational research (Okada and Sherborne, 2018) by which all participants reflect about practices and beliefs for better alignment between learners' needs and research-based recommendations. The instrument with a special code to allow the withdrawal of participation without the collection of personal data was approved by the Ethics Committee and the Student Research Project Panel of the Open University-United Kingdom.

Participants

The OU offers flexible undergraduate and postgraduate courses and qualifications supported distance and open learning for 174,898 people from the United Kingdom, Europe and some worldwide. Approximately 76% of directly registered students work full or part-time during their studies; 23% of Open University United Kingdom undergraduates live in the 25% most deprived areas and 34% of new OU undergraduates are under 25, 14% with disabilities and 32% with lower qualification at entry.

This study focused on one of the largest introductory modules offered by the Wellbeing Education and Language Studies – WELS Faculty of The Open University. Currently this module has more than 4,300 students and is part of various qualifications. So that, participants were students from all levels and qualification' interests with different occupations, include novices, undergraduates who had just completed secondary education, pre-service and in-service teachers; as well professionals interested in Education, Psychology and Social Care.

A balanced and representative sample were constituted by a total of 625 students who participated in this study as volunteers, 551 completed a self-reflective questionnaire to reflect about fun and learning and 206 provided their reflective views by answering an "optional" open question. The response rate (40%) for the open views about fun and learning was higher than expected.

In terms of students' previous study experience 48.55% students completed pre-A levels or equivalent (secondary school), 26.81% had already finished other OU course modules (level 1, level 2, and level 3) and 24.64% reported other different experiences. In terms of qualification pathway targeted by students: 28.80% are interested in childhood studies; 34.24% in psychology; 27.17% Education primary, 4.53% Open and 1.81% do not know and 3.44 other qualification such as Social Care.

BOX 1	RRI in the context of open education (Okada, 2020).			
Prinicples	**Recruitment**	**Implementation**	**Analysis**
Diversity and inclusion	Voluntary basis with no personal data requested	Completely anonymous	Diverse participants (SEND, workers, novices, teachers, …)
Transparency and openness	Objectives and process open to all participants	Open Online data	Open access to results In Open Repository (ORO) and OpenLearn
Anticipation and reflexivity	No implications for participants' studies	Reflexive instrument with open question	Peer-reviewers with distinctive roles were co-authors
Adaptation and responsiveness	Variety of approaches needed (news, email and course team support)	Optional withdrawal with a coded survey developed in Qualtrics	Mixed methods, analytical database available in an Open data Repository (ORDO).

Procedures

This study focuses on a 9-month-module course with twenty-four weekly units and four assessment activities. The course integrates reading materials, online audio-visual materials, a YouTube channel "The student hub live" and radio-style broadcast audio repository. Students have also access to a set of library resources, news and special "quick guides" to provide extra-support for developing activities successfully. Students' interaction with peers and communication with tutors typically occur asynchronously in the online discussion forum and synchronously in online tutorials (in Adobe Connect) and face-to-face tutorials organized in a specific period and locations. In addition, the course provides a channel in social media (Twitter and Facebook) for students' social engagement. This course module presentations are opened 3 weeks prior to the start in order to provide time for students to smoothly engage in their initial activities including a series of fun and friendly online workshops to promote interaction.

Recruitment

Students' recruitment occurred at the middle of the online module. It was supported by the course chair and the module course tutors through an invitation shared in course news page and via central email sent to all students. Recruitment and data generation occurred during 5 weeks (February–March 2020) and was more effective after an email invitation sent to all students.

Instruments

The use of self-report questionnaires is well established as a methodology within research examining epistemological beliefs (Feucht et al., 2017). The self-reflective instrument was underpinned by previous work led by the second author

(Sheehy et al., 2019b) and adapted to the context of online learning and fun.

Box 2 indicates the questionnaire statements:

1. Statements **1–4, 13–17** relate to models of learning (Social Constructivist, and Banking) and are taken from Sheehy and Budiyanto's (2015) development of the Theoretical Orientation Scale (Hardman and Worthington, 2000).
2. Statements **5–7, 8, 10–12** relate to Constructivist and Traditional views of learning, from the OECD international survey (Organisation for Economic Co-operation and Development (OECD), 2010, 2013).
3. Statements **9, 18–21** elicit beliefs about fun and happiness and emerged as stable items from Budiyanto et al.'s (2017) epistemological research.

The adapted questionnaire was implemented in Qualtrics with consent forms, study objectives and a novel embedded code to enable students' withdrawal. This is the first study that provides anonymous withdrawal in Qualtrics. It was then tested in two pre-pilots to check its reliability and the embedded code.

In the first phase of implementation, the self-reflective instrument was used by online students to reflect about the topic "Fun and Learning" through a series of 21 statements using Likert-scale to indicate the level of agreement.

In the second phase, students were invited to complete an optional open-ended question (What is your opinion about fun in online learning?) to provide their reflective views and freely express their feelings on this topic.

BOX 2	Self-reflective instrument about epistemic views related to Online Learning and Fun.		
Theoretical Principles	**Variables**	**Statements**
Socio-constructivism	1. SocialActivities	1. Meaningful learning takes place when individuals are engaged in social activities.
	2. CollaborativeActivities	2. Students learn best through collaborative activities.
	3. SocialProduction	3. Learning can be defined as the social production of knowledge.
	4. TalkProductively	4. Helping students to talk to one another productively is a good way of teaching
Traditional	5. TeachHowtoSolve	5. Effective/good teachers demonstrate the correct way to solve a problem.
	6. TeachingProblemAnswer	6. Teaching should be built around problems with clear, correct answers.
	7. TeachingFacts	7. The teacher's role is to teach facts.
	15. LearnOwnEffort	15. How much students get from their learning depends mostly on their effort
Constructivism	8. TeachInquiry	8. The teacher's role is to facilitate students' own inquiry.
	10. LearnFindSolution	10. Students learn best by finding solutions to problems on their own.
	11. LearnThinkSolve	11. Students should be allowed to think of solutions to practical problems themselves before the teacher shows them how they are solved.
	12. LearnReasoning	12. Thinking and reasoning processes are more important than specific curriculum content.
Banking	13. AbilityNotFixed	13. Students' educational potential is not fixed at birth.
	14. AbilityMayChange	14. Students who begin university with "average" ability do not remain "average" throughout their studies
	16. TeachHomogenous	16. All students should be taught in classes according to their intelligence.
	17. TeachSingleWay	17. I believe there should be a single teaching method applicable to all learning situations.
Fun	18. LearnersHappy	18. To learn effectively students must be happy
	19. LearnWithFun	19. Learning should involve fun
	09. EnjoyLearning	09. To learn effectively, students must enjoy learning
	20. FunHampers	20. Fun activities can get in the way of student learning
	21. EnjoyOnlineLearning	21. I am enjoying studying online
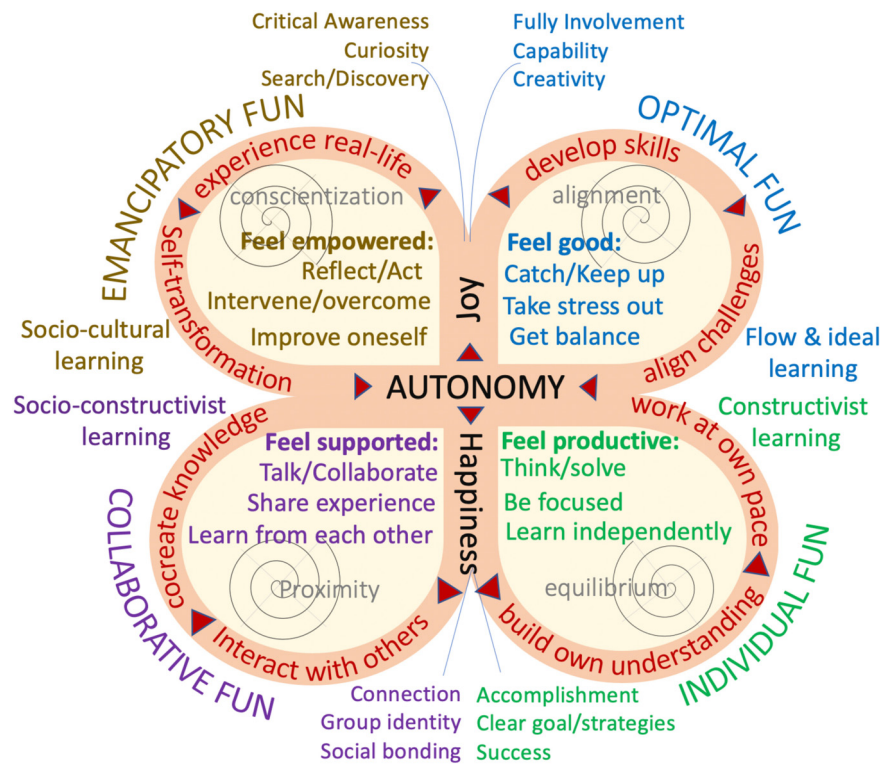
FIGURE 1 | Four levels of Online Learning and Fun (Source: Okada, 2020).

FINDINGS

Preliminary outcomes of this study (**Figure 1**) were presented to all participants through an article published in OpenLearn (Okada, 2020) and also in a journal paper (Okada and Sheehy, 2020: 608). The framework 'Butterfly of fun' including four types of fun in online learning was developed underpinned by Piaget and Inhelder (1969), Vygotsky et al. (1978), Csikszentmihalyi (2020), and Freire (1967, 1984, 1996, 2009) and supported by students' views. **Optimal fun** is the joy of being fully involved in learning, moving toward full capability and creativity. **Individual fun** is the happiness of fulfilling accomplishments, supported by clear goals and strategies. **Collaborative fun** is the happiness of making connections with others, creating social bonding and developing group identity. **Emancipatory fun** is the joy of being curious, able to search and discover whilst being critically aware (Okada and Sheehy, 2020).

Relationships Between Fun and Online Learning Supported by Qualitative Analysis

This study started with a content analysis in NVivo 12 after importing from Qualtrics a csv file with 206 responses about students' views related to fun and learning (qualitative data). The word cloud visualization in Qualtrics (**Figure 2**) about students' views indicated the most frequent words: 148 fun, 123 learning, 50 enjoy/enjoyed/enjoyable/enjoyment, 45 students, 40 distance, 31 tutorials, 29 activity, and 26 time.

The automated thematic analysis map (**Figure 3**) in NVivo 12; represented in Cmap tools provided 89 codes grouped through seven themes: fun, learning, students, tutorials, material, online and activities, which enabled to identify connections between fun and learning presented as following.

NVivo12 sentiment analysis tool (**Figure 4**) indicated a significant amount of neutral and positive comments associated to narratives that included learning and fun. A small percentage of negative and mixed views emerged across all categories apart from course module "material." Three largest clusters emerged focused on fun, learning and activities. Four medium clusters were online, tutorials, fun activities, and students. Two small clusters were material and group.

FIGURE 2 | The word cloud visualization in Qualtrics about Online Learning and Fun.
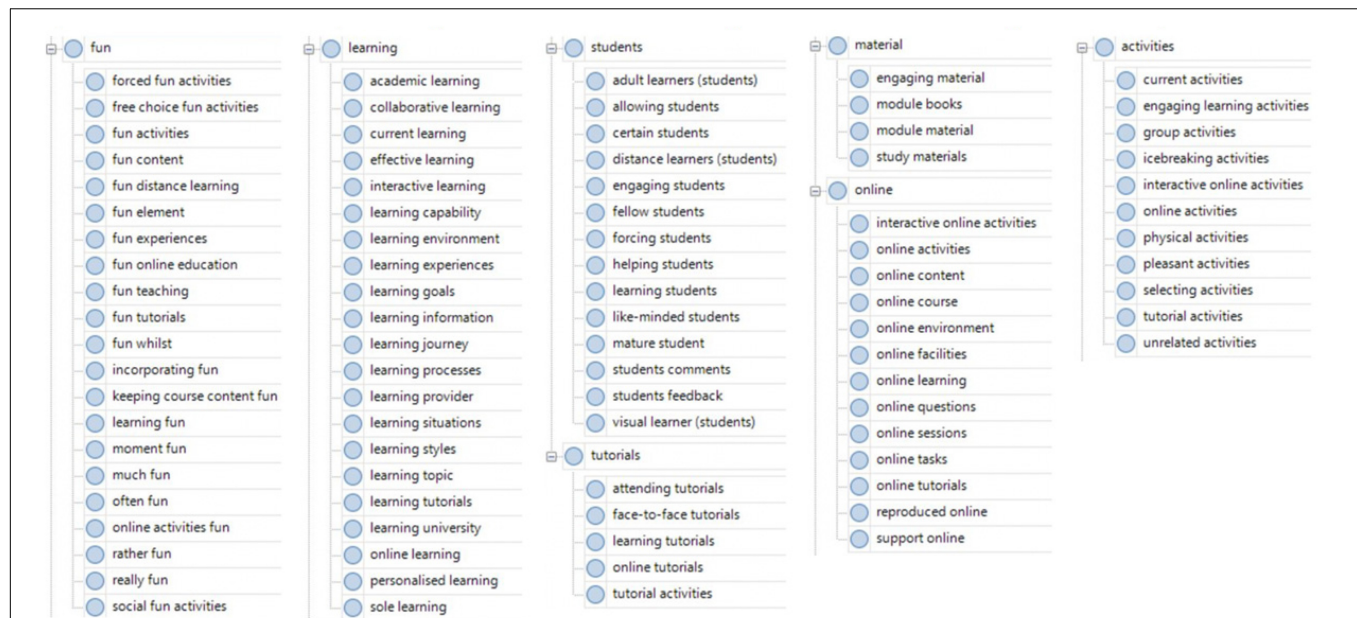
FIGURE 3 | Thematic analysis map about Online Learning and Fun with codes generated by NVivo 12.
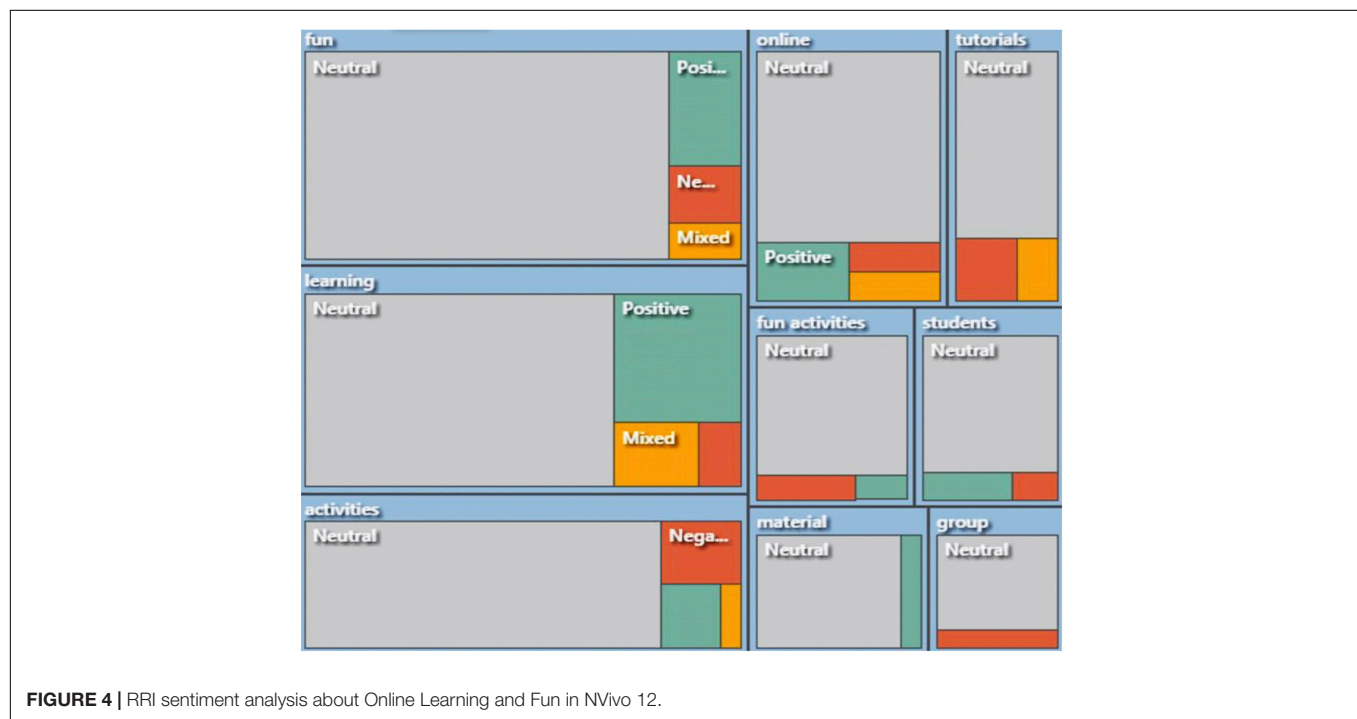
FIGURE 4 | RRI sentiment analysis about Online Learning and Fun in NVivo 12.

NVivo 12 sentiment analysis were used to obtain an overview about students' negative views (**Figure 5**) and positive opinions (**Figure 6**) which were highlighted in red and green by the authors to show the students' responses with a significant narrative.

These visualizations were useful to identify two sets of themes and sub-themes (**Box 3**) related to value and relationships between learning and fun as well review the automated sentiment analysis code manually to check nuances and recode it based on the meaning of narratives.

A total of 206 students' testimonials were coded with these themes and the frequency of codes were represented by percentages (**Box 3**). The first set of themes was used to code the value of fun for students; a total of 43% students indicated positive values about fun in learning, 24% indicated neutral, and 23% mixed. Only 10% indicated negative views about fun in learning. The second set of themes were used to explore the value and relationships about fun and learning. Approximately 18% of students indicated that fun is valuable, 12% fun is important, 13%

FIGURE 5 | Sentiment analysis about students' negative views related to Online Learning and Fun.

FIGURE 6 | Sentiment analysis about students' positive views related to Online Learning and Fun.

fun is useful, 24% fun is needed, 11% fun is difficult, 12% fun depends, and 10% fun is unnecessary.

Relationships Between Fun and Learning Supported by Quantitative Analysis

Quantitative data analysis (**Graph 1**) revealed largely positive views about fun and learning. Most students agreed that fun (as enjoyment) had value in supporting learning. The majority of students agreed with the following statements: 98% To learn effectively, students must enjoy learning; 91% To learn effectively, students must be happy to learn. 88.77% Learning should involve fun. However, a small group of students 16.66% beliefs that Fun activities can get in the way of student learning.

The questionnaire data about 21 statements using Likert scale (1–5) were analyzed through SPSS 24. Cronbach's alpha 0.717 confirmed that the principal components analysis (PCA) was supported (Cohen et al., 2007). The instrument proved to be reliable for both PCAs (Tavakol and Dennick, 2011). The Kaiser-Meyer-Olkin score of 0.756 indicated sample adequacy and the Bartlett's sphericity test (Chi-square = 2329.046 with 210 degree of freedom, Sig. 0.000 < 0.5) confirmed consistency.

Table 2 illustrates factor analysis with principal components, with Varimax rotation and Kaiser Normalization indicated six groups emerged: (1) socio-constructivist perspective, (2)traditional perspective (3) fun and learning perspective, (4)constructivist perspective, (5) banking perspective, and (6) Emancipatory Learning. **Table 1** using the same method

but unrotated solution, indicated three relevant groups: (1) Socio-constructivist learning with traditional teaching and fun; (2) Banking model, transmissive learning and no fun and (4) Constructivist learning and disturbing fun; This approach was selected to examine students' views and beliefs in order to develop recommendations. Therefore, based on the testimonies of the students grouped with PCA unrotated, twenty-one recommendations were listed and grouped according to three groups: apprentices, teaching professionals and the online course team. Three indexes were generated using the variables from the PCA to get an average among each group related to Fun, No Fun and Bad fun:

- C1 Fun = (V19 + V09 + V03 + V18 + V02 + V05 + V04 + V01 + V08)/9;
- C2 No fun = (V17 + V07 + V16 + V06 + -V21)/5;
- C3 Fun bad (hampers learning) = (V10 + V20 + V11)/3.

These indexes (above 3.5 – 5) allowed to group participants' testimonies, select a variety of views and elaborate a representative list of recommendations to enhance students' enjoyment with online learning. NVivo 12 was used to carry out a thematic qualitative analysis with an interpretative approach to extract 21 recommendations supported by inductive mapping (**Tables 3–5**). A consensual review (Hill et al., 1997) through three systematic checks between the recommendations against qualitative data were developed with two experts and a student: individually, in pairs and in group. Five types of feedback enabled reviewers to suggest improvements: 1. **Reduce** (too long, use

BOX 3 | Themes about Online Learning and Fun to analyze qualitative data.

Theme1 Sentiment Analysis	Theme2 V = Value of Fun	Theme3 R = Relationship of fun and online learning	Qualitative data Examples of Students' views about fun and online learning Extracted from 206 participants
Positive **43%**	7. FUN Valuable 18%	7. Fun: helps to feel good	A person's perspective when learning is quite important. To be able to cope and show self-competence will make you feel good. Fun, to have a non-serious outlook helps for some and at different times through their learning experience (Student 291)
		7. Fun: enables to reduce stress pressure	Being able to connect with other students who have chosen the same life path with you, they have lots in common with me and I have found they have more passion than students at brick university. Tutors have passion as well and stress has been relieved as they are more approachable (In my case so far) (Student 615)
		7. Fun: helps to enjoy the experience	Fun in distance learning is key to enjoying the module and keeping people focused and engaged with their studies. (25)
		7. Fun: enjoy, make effort, achieve	People put more effort in if they enjoy or are having fun (Student 84).
		7. Fun: enables to learn best	Having fun interactive learning maintains interest allowing the student to learn effectively and efficiently (Student 579)
	6. FUN Important 12%	6. Fun: engage, participate, learn	I believe that having fun and enjoying your studies improves motivation and helps you to remember what you have learned. However, I feel that not all enjoyment comes from interacting with other students (although that is also very important). I would personally enjoy quizzes, word/diagram games or flash cards that track your progress on remembering definitions. I think things that help set small learning goals enable fun as it helps people to see their progress and hopefully encourage them to want to learn more (Student 480).
		6. Fun: enables to gather and recall Knowledge	I think having fun within learning is essential, as you sometimes don't realize the information your brain has gathered within this time (Student 423)
		6. Fun: supports interest and motivation	Distance learning is what you make of it. The amount of fun had is determinate on the person's own enjoyment and interest of their studies (Student 548).
	5. FUN Useful 13%	5. Fun: supports learning	Like anything if there is not an element of fun you would not do it (Student 356)
		5. Fun: enables to connect with others	I think for me I cannot attend the face: face tutorials I don't get to meet others so when I do talk to others it's always through the online tutorials. I think it's important that there's some light-heartedness and maybe a forum where tutors are not on allowing students to feel more comfortable expressing their ideas and frustrations (Student 211).
Neutral **24%**	4. FUN Needed 24%	4. Fun: is hard when feeling isolated	There is little "fun" in distance learning as you are more often a "lone" learner. I do enjoy face to face learning and wish there was more of it, I learn better that way and it maintains my interest (Student 533).
		4. Fun: is needed in a reading-based course	Learning should be fun, just read and writing from textbooks is not what a call learning, I'm an active learning with dyslexia and find it hard from textbooks (Student 170) Reading and answering online questions isn't enjoyable and isn't helpful for learners who prefer to be practical which will aid their learning. Student (196)

(Continued)

BOX 3 | Continued

Theme1 Sentiment Analysis	Theme2 V = Value of Fun	Theme3 R = Relationship of fun and online learning	Qualitative data Examples of Students' views about fun and online learning Extracted from 206 participants
		4. Fun: elements must be embedded	There needs to be an element of fun in order to maintain motivation (Student 19)
		4. Fun: enables to break the intensity of learning	Those who chose to learn distance learning may still need some form of fun element to break up the intensity of learning (Student 265)
		4. Fun: means managing flexible time	Fun is Great. Teaches independence, time management and flexibility (Student 461)
		4. Fun: requires interactive learning	Meeting other students doing the same course is good, and feels supportive, but not many take up the opportunity (Student 162)
Mixed 23%	3. FUN Difficult 11%	3. Fun is not possible when I struggle	I think being to be able to meet the weekly online tasks and reading takes up so much time, I wouldn't expect any more. Seeing results is fun, but there needs to be concerted effort involved. So it is hard to keep fun at high levels because of periods of stress (Student 288).
		3. Fun needs face-to-face interaction	It' hard to get it across when you are using online facilities and textbooks to do a majority of learning. I'm quite a light-hearted person and am finding it difficult not having that face-to-face humor! (Student 232)
		3. Fun online is limited	You may have to make your own fun but the tutors can help too with in the tutorials (Student 31)
	2. FUN Depends 12%	2. Fun activities require different approaches	Readers like to read the module books, other learners like to watch videos and other people thrive in the tutor forum. Development of resources that suit a wide range of learning styles would make it more fun for adult learners who don't attend classes on a campus (Student 142)
		2. Fun is ambiguous and subjective	I think "fun" is subjective. Some people find the online activities fun, others find reading about a subject that interests them is fun. Some may find engaging with other students at a tutorial to be fun, for others it may be the opposite of fun (Student 59)
		2. Fun must be sensible for productive time	If the fun remains relevant and helps to highlight a point or theory then I believe it would be well received. Students do not want fun activities if they do not add benefit to their current learning, it would be deemed a waste of study time (Student 391).
		2. Fun must not be forced	I find the forced fun activities, ones that start with "now, just for fun let's try X" to be in many cases an annoying distraction (Student 380)
Negative 10%	1. FUN Unnecessary 10%	1. Fun is not needed nor expected	There is no fun in it at all but you don't have to have fun to learn (Student 191)
		1. Fun must not affect Individual productivity	Fun is not an option studying without the cost of the course. Students should be focused (Student 232).

GRAPH 1 | Descriptive analysis about Online Learning and Fun in Qualtrics.

short sentence), 2. **Specify** (very broad, use specific words), **3. Connect** (unrelated, focus more on the data), 4. **Simplify** (complicated, use familiar vocabulary), **5. Clarify** (confusing, revise the meaning). The results of the analysis from mixed methods are presented as follows.

In addition, the graphical comparison between recommendations and full set of qualitative data both auto coded (**Figure 3**) in NVivo 24 (**Graph 2**) ensured diversity with a variety

TABLE 1 | FA Varimax without rotation in SPSS.

Component Matrix[a]

	Component					
	1	2	3	4	5	6
v19LearnWithFun	0.598					
v09EnjoyLearning	0.587					
v03SocialProduction	0.559					
v18LearnersHappy	0.552					0.416
v02CollaborativeActivities	0.549		0.516			
v05TeachHowtoSolve	0.540					
v04TalkProductively	0.536		0.440			
v06TeachProblemAnswer	0.527	0.505				
v01SocialActivities	0.470		0.442			
v08TeachInquiry	0.416					
v17TeachSingleWay		0.610				
v07TeachFacts	0.459	0.557				
v16TeachHomogenous		0.504				
v21EnjoyOnlineLearning		−0.408				
v13AbilityNotfixed						
v10LearnFindSolutions				0.593		
v20FunHampers				0.471		
v11LearnThinkSolve		−0.407		0.470		
v12LearnReasoning						
v14AbilityMayChange					0.539	
v15LearnOwnEffort						

Extraction Method: Principal Component Analysis. NO ROTATE.
a. 6 components extracted. SPSS 27.

TABLE 2 | FA with Varimax rotation in SPSS.

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
v02CollaborativeActivities	0.812					
v04TalkProductively	0.764					
v01SocialActivities	0.717					
v03SocialProduction	0.583					
v06TeachProblemAnswer		0.833				
v07TeachFacts		0.780				
v05TeachHowtoSolve		0.718				
v18LearnersHappy			0.851			
v19LearnWithFun			0.731			
v09EnjoyLearning			0.709			
v10LearnFindSolutions				0.729		
v11LearnThinkSolve				0.695		
v12LearnReasoning				0.625		
v08TeachInquiry				0.520		
v17TeachSingleWay					0.731	
v20FunHampers					0.637	
v16TeachHomogenous					0.588	
v14AbilityMayChange						0.688
v15LearnOwnEffort						0.665
v21EnjoyOnlineLearning						0.504
v13AbilityNotfixed						0.471

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

TABLE 3 | Recommendations about Online Learning and Fun for students supported by mixed methods.

| FINDINGS	Consensual Review			Qualitative Data	Qualitative	Quantitative code		
Recommendation for students	Expert1	Expert2	Student, Expert1 & Expert2	Students' views about learning and fun	Code (Theme3)	C1: Fun!!!!	C2: No fun	C3: Fun bad
R7. Enjoy fun learning activities, feel motivated, focused and engaged in studies aiming at positive results in your learning.	ok	ok	ok	Fun in distance learning is key to enjoying the module and keeping people focused and engaged with their studies. Student-25	7. Fun: helps to enjoy the experience	4.3	1.8	3.3
R6. Be open-minded to experience interactive activities might be helpful to overcome loneliness and isolation.	ok	ok	ok	Having fun interactive learning maintains interest allowing the student to learn. Student-579	6. Fun: supports Interest and motivation	4.2	3.2	3.7
R5. Make your online learning fun and pleasant by identifying the factors that affect your involvement and interest with your studies.	clarify how	clarified, but reduce	clear	Distance learning is what you make of it. The amount of fun had is determinate on the person's own enjoyment and interest of their studies. Student-548	6. Fun: supports Interest and motivation	4.9	3.4	4.0
R4. Identify what in your learning is very difficult (causes anxiety) or very obvious (causes boredom) and discuss alternatives with your peers and teaching staff.	clarify what	clarified but specify	clear	I find that including lots of video and audio resources helps to stop boredom. Student-91	4. Fun: is needed in a reading-based course	4.3	2.0	3.7
R3. Study with autonomy, flexibility and good time management to enjoy your learning with fun and work-life balance.	Specify why	clear	clear	(Fun is) Great. Teaches independence, time management and flexibility. Student-461	4. Fun: means managing flexible time	4.0	2.4	3.7
R2. Communicate with other students on online tutorials who are doing the same course may be fun and supportive.	Specify what	clear	clear	Meeting other students doing the same course is good, and feels supportive, but not many take up the opportunity … Student-162	4. Fun: requires Interactive learning	3.6	1.6	2.0
R1. Apply your learning to your real world by selecting activities that are enjoyable and useful in your life.	ok	ok	ok	Students do not want fun activities if they do not add benefit to their current learning, it would be deemed a waste of study time. Student-391	2. Fun must be sensible for productive time	4.3	2.4	3.0

TABLE 4 | Recommendations about Online Learning and Fun for teaching staff supported by mixed methods.

Findings	Consensual Validation			Qualitative Data	Qualitative	Quantitative code		
Recommendation for teaching staff	Expert1	Expert2	Expert1 Expert2 Student	Students' views about learning and fun	Code (Theme3)	C1:Fun!!!!	C2:No fun	C3: Fun bad
R14. Allow students to discuss any topic (coffee chat), without the presence of teaching staff for them to find common interests and build relationships	Clarify why	clear	clear	I don't get to meet others, maybe a forum where tutors are not on, allowing students to feel more comfortable expressing their ideas and frustrations. Student-211	5. Fun: enables to connect with others	4.4	3.7	3.3
R13. Enhance students' engagement with a variety of fun learning activities that are meaningful in their lives.	Simplify how	Simplified but, Reduce	clear	Learning should be fun, just read and writing from textbooks is not what a call learning. Student-170	4. Fun: is needed in a reading-based course	4.3	2.0	2.7
R12. Teach with a sense of humor (joy) in forums or tutorials, with fun activities as it might enthuse students with the learning topic.	ok	Reduce	clear	I'm quite a light-hearted person and am finding it difficult not having that face-to-face humor! Student-232	3. Fun needs face-to-face interaction	4.9	2.6	3.7
R11. Understand the needs and expectations expressed by students and propose choices.	ok	Specify "needs"	clear	I find the forced fun activities, in many cases an annoying distraction that slows learning down showing an obvious point. Student-380	2. Fun must not be forced	3.4	1.4	4.3
R10. Investigate students' preferences and ways of learning to promote more personalized and fun online education.	Connect what	clear	clear	It doesn't suit all personality types or individual learning styles. I myself, for example, like to just get down to getting the job done. Student-15	2. Fun must be sensible for productive time	4.2	2.0	4.3
R09. Design different types of activities, individual and collective, for students to choose freely.	ok	ok	ok	Distance learning can be very lonely and isolating but sometimes that is good for individual productivity Student-120	1. Fun must not affect Individual productivity	4.3	2.4	3.7
R08. Plan icebreaking activities carefully with clear and transparent purposes as part of learning	ok	ok	ok	I find icebreakers and fun stuff feels like I'm taking part in a social experiment rather than learning Student-11	1. Fun is not needed nor expected	3.1	2.2	3.7

TABLE 5 | Recommendations about Online Learning and Fun for course teams supported by mixed methods.

Findings	Consensual Validation			Qualitative Data	Qualitative	Quantitative code		
Recommendation for course teams	Expert1	Expert2	Expert1 Expert2 Student	Students' views about learning and fun	Code (Theme3)	C1:Fun!!!!	C2:No fun	C3: Fun bad
R21. Link free choice fun activities to small learning goals for students to visualize their progress	ok	ok	ok	I think things that help set small learning goals enable fun as it helps people to see their progress and hopefully encourage them to want to learn more. Student-480	7. Fun: enjoy, make effort and achieve	3.8	3.0	3.3
R20. Offer a selection of material with interactive tasks (audio, video, quizzes, graphics, word diagram, maps, games, flash cards).	ok	ok	ok	People put more effort in if they enjoy or are having fun Student-84	6. Fun: engage, participate and learn	4.8	2.2	3.7
R19. Integrate "real life" activities with content that are useful and practical for meaningful online learning.	Simplify what	Connect why	clear	Reading and answering online questions isn't enjoyable and isn't helpful for learners who prefer to be practical which will aid their learning. Student-196	4. Fun: is needed in a reading-based course	4.4	3.0	4.3
R18. Elaborate a course content that is clear with a balanced mix of reading text, interactive resources and practical projects for students who find reading boring.	ok	ok	ok	The module is boring it's just reading and then answering questions it's very dull and not what I expected Student-175	4. Fun: is needed in a reading-based course	4.2	3.8	2.3
R17. Support online learning experiences that are engaging and meaningful for students to gain skills and knowledge and develop themselves at their own pace.	ok	ok	ok	Gaining skills and knowledge in isolation. Developing yourself without interference. Working at your own pace with module materials. . .Student-41	2. Fun must be sensible for productive time	4.2	3.0	4.3
R16. Create a personalized learning environment with adaptive fun materials to help students with different needs.	Clarify how	Specify why	clear	Development of resources that suit a wide range of learning styles would make it more fun for adult learners. Student-142	2. Fun activities require different approaches	4.2	1.8	3.3
R15. Design a variety of engaging learning activities for individuals and groups to select based on their preferences and abilities.	ok	Reduce	clear	Being able to work on my own as I don't have the time to sit and wait around for other people to be able to do group work. Student-432	1. Fun must not affect Individual productivity	3.1	2.6	3.0
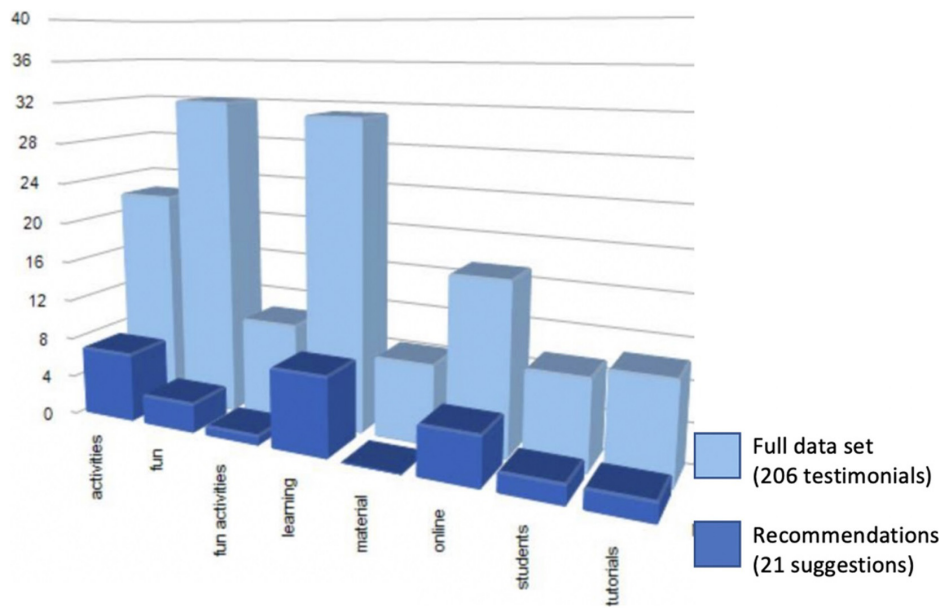
GRAPH 2 | Evidence-based recommendations about Online Learning and Fun supported by consensual review.

of views and consistency with a proportional representation among qualitative themes and quantitative components.

DISCUSSION AND FINAL REMARKS

The value of students' enjoyment with online learning has become fundamental in today's world. The World Bank (2020) and UNESCO (2020) emphasized that more than 160 countries are facing a crisis in education due to the COVID-19 pandemic with loss of learning and in human capital; and over the long term, the economic difficulties will increase inequalities. Various factors will affect educational systems; in particular, low learning outcomes and high dropout rates in secondary school and higher education.

Students' confidence and satisfaction with online learning are highly relevant in a world in which distance education has rapidly become a necessary practice in response to the global the pandemic. This mixed-methods research revealed significant online students' opinions about fun for enjoyable and meaningful learning. Fun is as an important part of the lived experience; however, its meaning is underexplored by literature.

This paper provided a methodology to examine fun in online learning supported by students' epistemic beliefs, underpinned by RRI – Responsible Research and Innovation. A self-reflective instrument with valid and reliable measurement scales with epistemic constructs of online learning and fun helped participants to think about their views about how learning occurs and its relationship with fun. An open database with a three sets of code scheme was generated and shared with all participants during the covid-19 pandemic.

In this study, light is shed on the elements, meaning and relationships about fun and learning considering the students'

"nuanced views" that integrate fun and learning in different ways. Our results provided evidence that a large majority of higher education students (88.77%) value fun because they believe it has a positive social, cognitive and emotional effects on their distance online education. A small group (16.66%) highlighted that fun impairs learning.

This study confirmed that students should experience enjoyable learning so that learning should involve joy. Freire (1996) highlight that the joy of the "serious act" of learning does not refer to the easy joy of being inactive by doing nothing. "Emancipatory fun" (Okada and Sheehy, 2020) underpinned by Freire's pedagogy of autonomy is related to the hope and confidence that students can have fun by acting, reflecting and learning with enjoyment and consciousness. They can search, research and solve problems, identify and overcome obstacles as well transform and innovate their lives with knowledge, skills and resilience to shape a desirable future.

A key contribution of this study is that different epistemological beliefs are associated with different conceptualizations of the relationship between fun and learning (Sheehy et al., 2019a; Okada and Sheehy, 2020). Principal component analysis revealed three groups of students who found (1) fun relevant in socio-constructivist learning (2) no fun in traditional transmissive learning and (3) disturbing fun in constructivist learning. A set of 21 recommendations underpinned by systematic mixed methods and consensual review is provided for Higher Education community including course teams, teaching staff and students to enhance online learning experiences with optimal fun, emancipatory fun, collaborative fun and individual fun. Creating opportunities for students to voice and reflect on their own views and values is fundamental to develop more effective online course designs aligned with their needs.

Congruent with the positive effects of optimal experience in some online environments' studies (e.g., Esteban-Millat et al., 2014; Sánchez-Franco et al., 2014), this study confirmed that fun creates an opportunity and expectation for students to experience positive feelings in learning such as good mood, enthusiasm, interest, satisfaction and enjoyment that are all relevant for "optimal" learning.

Researchers who see fun as having a close relationship with learning have proposed different types of fun. Lazzaro (2009) highlighted "easy fun" in activities such as games and role play that stimulate curiosity and exploration. Papert (2002) identified "hard fun" within goal-centered and challenging experiences, where the difficulty of the task is part of the fun. Tews et al. (2015:17) examined fun in two contexts, fun in learning activities developed by students and fun in teaching delivery by the staff. The former was characterized as "hands-on" exercises and activities that promoted social engagement between students. The latter concerned instructor-focused teaching that included the use of humor, creative examples, and storytelling. Their findings indicated that fun delivery, and not fun activities, was positively associated with students' motivation, interest and engagement.

Notably, their findings indicated fun delivery, but not fun activities, was positively related to student' motivation, interest and engagement. Prior examining activities and delivery, our study highlights the importance of investigating students' epistemic views. There is therefore the opportunity for novel research to examine factors and effects of fun and student learning experience including epistemic-guided learning design.

Our study highlights the importance of investigating students' epistemic beliefs and its connections with the essence of their views. There is therefore the opportunity for novel research to examine factors and effects of fun and within student learning experience including the influence of epistemic-guided learning and teaching design.

A series of studies with Indonesian teachers (Sheehy et al., 2019a) suggested that their beliefs about how learning occurs are influenced by their views about happiness and, by implication, fun in relation to learning. These teachers often commented on the relationship between happiness and learning, and many saw happiness as an essential feature of good classroom teaching. However, they described a relationship between happiness and learning that was different in nature to that found in Western educational research. There is a tendency for Western educators to see happiness as "a tool for facilitating effective education" (Fox et al., 2013, p1), and as something that is promoted alongside educational excellence. In contrast, many Indonesian teachers see learning not as separate from happiness but as part of it (Budiyanto et al., 2017; Budiyanto and Sheehy, 2019).

Other research has implied that this belief in separation arises when people see teaching as a simple transfer of "untransformed knowledge" from expert to student, in a traditional model of learning (OECD, 2009) also known as the "banking model of education" Freire (2000). This separation may be reflected in the balancing act between happiness with fun and academic achievement described in the CEE report mentioned above. In contrast, those who believe that learning is a social constructivist process are more likely to see happiness with fun as important to the process of learning. The situation remains that we have an incomplete understanding of fun in the domain of learning (Tews et al., 2017) and it remains to be clarified by empirical research (Iten and Petko, 2016); in particular under the lens of epistemological beliefs (Sheehy et al., 2019a) and practical experiences.

Our study also complemented a previous research about fun on traditional university' campus whose students highlighted that fun in learning must integrate stimulating pedagogy; lecturer engagement; a safe learning space; shared experience; and a low-stress environment (Whitton and Langan, 2018). Some key effects of fun, for example, pleasant communication and creation of a relaxed state to reduce stress (Bisson and Luckner, 1996) are important factors to support learners during the isolation. Fun as an inner joy of wellbeing and engagement is an important component to propitiate learning with the creation of new patterns that are interesting, surprising and meaningful (Schmidhuber, 2010) to involve students with formal education during uncertain time of post-pandemic.

As indicated by the research-authors and collaborators, further studies are important based on the RRI approach to construct new questions and also explore the issues indicated by preliminary studies (Okada and Sheehy, 2020). New issues must be also examined on the effects of fun on online learning, also considering age, gender, socio-cultural aspects, accessibility, digital skills, and geographical differences. Developing further recommendations at broader institutional, national and international levels about effective and engaging online learning is also important to empower individuals and society to face, innovate and reconstruct a sustainable and enjoyable world.

DATA AVAILABILITY STATEMENT

The open database can be accessed, downloaded and reused: Okada and Sheehy (2020) OLAF PROJECT data set. Open Research Data Online. The Open University. https://doi.org/10.21954/ou.rd.12670949 (November 2020). The Open Questionnaire can be accessed from the supplementary material Qualtrics Survey OLAF project.pdf.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by The Open University, HREC – Human Research and Ethics Committee. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

AO wrote the first draft of the abstract and prepared the manuscript. KS provided the instrument and feedback about the final version. AO was responsible for the survey

implementation in Qualtrics, data generation, instrument's tests, data analysis through mixed methods, and validation supported by collaborators with consensual review. Additionally, AO created the figures, graphs, and tables. Both authors contributed to manuscript revision, read, and approved the submitted version.

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The COVID-19 Diaries: Identity, Teaching, and Learning at a Crossroads

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Despite the fact that American education has at its core strived to provide pathways of opportunity to remedy socio-economic inequalities, as educational institutions transitioned into online virtual classrooms due to the COVID-19 pandemic these inequalities have come into sharper focus for us. During the process of engaging in a larger self-study, we became more aware of the stark socio-economic disparities of our students in a virtual space, specifically amongst students of color, and how these disparities affected learning outcomes and their identity. Juxta positioning the situated in-between spaces of in-class and virtual environments our identities as educators were fluid and intersectional, negotiated in response to student interactions thereby enabling changes in our Dialogical Selves. The sample for this study consisted of 2 faculty members and 40 students. Data sources included reflexive journals, recorded class sessions, students' questionnaires, and artifacts such as student feedback collected through "exit tickets" as well as recorded meetings. Some findings include (1) students' identities were negotiated differently in face to face classrooms vs. virtual classrooms, (2) fluidity in intersectional identity due to intersections of I-positions in the dialogical self, and (3) acknowledging and accepting the presence of COVID-19 created a sense of community in the virtual classroom (4) incorporating self-care and caring pedagogical practices provided an empowering space for students and educators.

Keywords: identity, equity, technology, COVID-19, dialogical self theory (DST)

INTRODUCTION

From its inception, American education has at its core strived to provide pathways of opportunity to remedy socio-economic inequalities. This is evidenced by Horace Mann who stated "Education, then, beyond all other devices of human origin, is the great equalizer of the conditions of men—the balance-wheel of the social machinery" (Mann, 1865, p. 669). Holding on to this ideal, students of various socioeconomic, sexual orientation, religious, immigrant, and racial/ethnic backgrounds have access to a quality empowering education and equal opportunity to excel in school and life-an emphasis on social mobility, a cornerstone of American democracy. However, many scholars today contend that we are far from Mann's "equalizing" goal. A snapshot of the educational landscape showcases the inequalities existing amongst its student population. These disparities stem from everyday racism, classism, and bias in all its forms–it is prevalent in the structures of education and contributes toward hegemonic ideologies. Further, neoliberal policies tend to marginalize those who are socio-economically disenfranchised by favoring others with the means to choose optimal

educational settings. Since education is an inherently socio-cultural process, the insidious nature of such disparities affects students' identities in the situated environment of the classroom thereby enabling changes in their Self.

The COVID-19 pandemic seems to have exacerbated such inequalities and has impacted students of color disproportionately. While such inequalities do find a way of filtering into the classroom, in an online space they tend to be magnified, thereby hindering learning outcomes and problematizing their academic identities. Additionally, our identities as educators shift as we negotiate our positionalities in response to student interactions. Thus, educator and student identities are constantly negotiated, each affecting the other contextually and spatially thereby necessitating changes within individual selves. The shifting nature of individual positionality in the individual Self is in "dialogue" with the other selves in the society of mind and extending into the environment. The shifting nature of identity and self of students and teachers negotiated within the shared situated space of the virtual classroom has enormous implications for student learning and best teaching practices in different regions of the United States of America as well as other countries currently in a similar situation.

BACKGROUND

Schooling during the COVID-19 pandemic has had disparate effects for students across the socio-economic ladder. UNESCO reported that the pandemic has caused educational disruption and school closures for over 1.2 billion students (Giannini and Brandolino, 2020). Academic institutions moved to online virtual instruction mid-March with most higher education students required to vacate their dorms on campus. While most K-12 and university closures were initially announced as temporary with extended spring breaks, they were later modified to fully online indefinitely on advice from governmental agencies. The education community was forced into an unplanned online learning experiment. Institutions began using various digital and video conferencing tools to help students connect and stay on track to complete the semester. However, this created challenges especially for students from low-income families. Many students did not have a place to return to, reliable internet access, or a support system to help them through this crisis. School closures due to the concerns of the spread of the pandemic turned a spotlight on equity as a marginalizing factor, especially how they contribute to educational disadvantages and students' disfranchisement.

We premised our research on the assumption that our virtual classrooms would mirror our face to face classrooms and be uniquely amenable to promoting equitable learning environments. We soon realized that this was not the case. While educational technology and e-learning are not new resources, the crisis-driven approach to replicate the dynamic nature of the face-to-face classroom in a virtual classroom was fraught with difficulties. Socioeconomic inequities due to poverty issues of access to reliable technology, ethnicity basic needs, and other background factors seemed to impact our students of

color disproportionately in the virtual environment. Although everyone's lives were upended due to COVID-19, we observed our students of color struggling to navigate the transition from face to face classrooms to online virtual classrooms. Most did so in silence, their renegotiated identities marginalized and masked. Their lived realities negatively affected their engagement in the virtual classroom.

It is a generally held mainstream perspective that education has the potential to elevate opportunities and empower those who are disadvantaged due to socioeconomic status. Contrary to this view, neoliberal education is commodified and helps students dominated by individualism to be consumers of an educational product the purpose of which is intended to better their economic condition (Slaughter and Rhoades, 2004). Since it allows for the privatization of public domains and a privileging of a free market, it enables those with financial means to procure a better educational product including school choice (Ravitch, 2016). These policies are detrimental to the success of "poor, black, Hispanic, and non-native English speakers are least likely to have such access, and they are most likely to attend segregated low-quality schools" (Brathwaite, 2017, p. 1). Researchers agree that structural inequalities in access and opportunity prevent minorities and students from low-income families to achieve their educational goals (Delpit, 1995; Darling-Hammond, 2000; Giroux, 2004). Further, the lack of access to digital equipment can disproportionately impact students who come from low-income families. In a recent Observer article, Finn (2020) reported that "Forty-four percent of New Yorkers living in poverty do not have access to the internet... [and] when looked at through the lens of race, the statistics highlight a deeper inequality: 30 percent of black and Hispanic New Yorkers lack access, while 20 percent of white and 22 percent of Asian residents go without reliable internet at home" (May 12, 2020, paragraph 8). The "digital divide" exacerbated existing educational inequalities due to school closures and social distancing measures (Sen and Tucker, 2020). While socioeconomic disparities seemed to contribute significantly to students' access or lack thereof to technology, racial-ethnic factors played a role in exacerbating these differences (Jones and Abes, 2013), reinforcing societal normative ideologies and linguistic tropes. Further, since identity processes are inextricably linked to individuals' relations and comparisons with the other, the educational environment provides a space for evaluating individual understandings of identity. This "in-between" space according to Bhabha (2001) serves as a locus of negotiation and "provides the terrain for elaborating strategies of selfhood—singular or communal—that initiate new signs of identity, and innovative sites of collaboration, and contestation, in the act of defining the idea of society itself" (p. 136). Here their lived experiences and situatedness in the virtual classroom becomes central in self-definition.

The disconnect that we observed in our virtual classrooms due to COVID-19 pushed us to evaluate our taken for granted assumptions of student identity and how that impacts their learning. Further, the differences in online student identity and classroom student identity forced us to acknowledge the complicated nature of privilege amongst our students and our

own as educators, as power relations within the classroom became more obvious. We fully acknowledge that while our virtual classroom revealed profound disparities in our students' access to support and opportunities, it also made us question the effectiveness of our pedagogical practices whether it was "caring" enough. In this research, we focused on the ways in which the virtual environment exacerbated student inequalities, amplified their differences, and reshaped their identities, specifically how did the inequalities affect the identities and self of students of color. We critically analyzed the nature of our pedagogical practices in the virtual classroom and how it impacted student learning. Further, we evaluated how our identities as educators were negotiated due to student interactions in the virtual classroom and the implications of these interactions on our sense of Self.

Intersectional Identities

As such the identity labels tend to emerge through interpersonal and social interactions in broader social contexts and systems of power and inequality thereby necessitating the recognition of identity categories one ascribes to (Weber, 1998; Torres, 2003; Anderson and Collins, 2007). These identity labels are never neutral but rather negotiated, it affects ways of thinking, influences perceptions of self and others, motivates and predicts behavior, and learning outcomes. Some aspects of identities tend to remain central, and others are created and recreated, constantly shifting, and negotiated based on the situatedness and responsivity of individual actions (Abes and Kasch, 2007). While each theoretical perspective (psychology, CRT, ecology, post-structuralism) uniquely locates identity within its disciplinary lens, they share some commonalities notably the influence of social context and social groups on the individual. Some others (LATCRIT, feminist intersectionality) focus on the multifaceted intersectional dimensions of identity (e.g., race, ethnicity, gender, sexual orientation). As Hall (1996) states, "identity is a narrative of the self; it's the story we tell about the self in order to know who we are" (p. 6). These perspectives assert that an individual's identity is neither grounded nor a given, rather it is fluid and situated, intersecting with lived experiences contextually and spatially (Evans et al., 2010; Jones and Abes, 2013).

As an analytic lens, the intersectional perspective of identity seems most appropriate when evaluaing student identity as various aspects of their identities exist simultaneously in any given context. Intersectionality accounts for fluidity in identity by considering the socio-cultural advantages and disadvantages of individuals specifically when they occupy simultaneous dimensions of oppression and privilege in contextual settings (Risman, 2004; McCall, 2005; Grant and Zwier, 2012). In this regard, Dill and Zambrana (2009) list four observations characterizing intersectionality:

(1) Placing the lived experiences and struggles of people of color and other marginalized groups as a starting point for the development of theory; (2) Exploring the complexities not only of individual identities but also group identity, recognizing that variations within groups are often ignored and essentialized; (3) Unveiling the ways interconnected domains of power organize

and structure inequality and oppression; and (4) Promoting social justice and social change by linking research and practice to create a holistic approach to the eradication of disparities and to changing social and higher education institutions (p. 5).

Our students are from very diverse backgrounds. Some have resources, opportunities, and support outside of school, while others were left to take care of themselves, their basic needs and necessities during the COVID-19 pandemic. Their racial-ethnic backgrounds tended to exacerbate socioeconomic inequities. These factors influenced their identity and sense of self. Their lives, differences, and disparities came into sharp focus when we transitioned into online virtual classrooms. With everyone's lives upended, many of our students of color were at an enormous disadvantage. As they struggled to navigate this transition, their vulnerabilities were amplified.

Dialogical Self

Since educator identities are negotiated and constructed through intersecting relationships and social interactions in academia, it requires an approach that can make sense of the fluidity and conflictive tensions in identity formation. In emphasizing the shift in educational space to a virtual environment due to COVID 19, we pay attention to its effect on our pedagogical practices and our professional and personal narratives of self and identity.

The dialogical approach offers a valuable way of conceptualizing teacher identity by framing identities as the dialogue that takes place between the I-positions, the "voiced positions" of the Self (Hermans, 2001). The Dialogical Self Theory (DST) emphasizes the complexity and multifacetedness of the self. Since the Individual self emerges through social interactions, it is reflective, dialogical, and context-driven. Proposed by Hermans (2001, 2012, 2014) the theory asserts that individuals navigate several I-positions within the self as a society in the mind at any given time. From this lens, the individual self is seen as emerging through social, historical, and societal processes between the Self- I "internal" (individual's mind) and Self-other "external" (dialogue with others within the mind), an interconnection between the self and society of mind, a process of positioning and counter positioning (Hermans and Hermans-Konopka, 2010). These "I-positions" as an "internalized positional designation" (Stryker, 1980 p. 60) takes on a "unique voice" that is relational and dialogical, positioned, and counter positioned responding to multiple social narratives temporally and spatially. From this lens, identity is the outcome, "it is the expectation held by each I-position" representing a particular aspect of identity, due to "sociocultural positioning" (i.e., situatedness), and a point of temporary attachment (Hall, 1996). From this lens an educator's identity is constantly negotiated "through intra- and interpersonal processes" (Kaplan and Garner, 2018, p. 2,036), "It is a product of attempts to interrelate I-positions in ways that can lead to a sense of self that is more or less coherent, and which can be sustained in the everyday work that takes place in classrooms" (Henry, 2019, p. 266).

Thus, the dialogical self and intersectional identity evolve out of social interactions as individuals actively participate in

its construction, deconstruction, and negotiation. While our identities were negotiated due to student interactions in the virtual space, our location of privilege as educators both allowed and hindered how we might "know" our students.

MATERIALS AND METHODS

This research began as an Institutional Review Board (IRB) approved self-study that focused on identity intersections and negotiations between teachers and students and the examination of our pedagogical practices. Self-study research was selected for its ability to highlight our becomings, the tensions, dilemmas, to assist in our understandings of ourselves, our teaching practices, and how they affect our students, their identities, and learning (Hamilton, 1998; Berry, 2004; LaBoskey, 2004; Loughran, 2004). As an inquiry guided research, self-study highlights the reflective, active, and transformative nature of teaching and learning. Critical friendship played a central role in our self-study research. The present research study grew out of our evolving critical friendship. Costa and Kallick (1993), define a critical friend as:

> A trusted person who asks provocative questions, provides data to be examined through another lens, and offers critique of a person's work as a friend. A critical friend takes the time to fully understand the context or the work presented and the outcomes that the person or group is working toward" (p. 50).

Being a critical friend to each other helped us explore our practices as teacher educators, with a lens focused toward intentionally broadening how we understand ourselves and our students. We aimed to provide alternative perspectives and feedback to one another without judgment (Kember et al., 1997) utilizing the self-study method to sustain ourselves as faculty and scholars in a space of vulnerability and openness (Hamilton et al., 2016). We share the belief that our identities are socially constructed, and multiplicitous, and benefit from regular, rigorous problematizing in dialogue with a critical friend to effective make sense of the identified roles associated with our positions in our institutions, our experiences, and professional identities as this study evolved (Murphy et al., 2011; Pinnegar and Murphy, 2011; Davey, 2013). From our initial conversations together, we established norms for engagement to honor what we recognized as necessary for this work: honesty, trust, and vulnerability with oneself and each other. Such intimate scholarship (Hamilton, 1998; Hamilton and Pinnegar, 2014) requires a fluidity of process that takes into account time, attention, and dialogue that is both supportive and probing.

Since the spatial/temporal nature of dialogical self and identity framed this research, we sought to delineate students' intersectional identities and its influence on their view of self, specifically how they perceive themselves through individual self and others' lenses and its implications for teaching and learning. As Hall (1990) suggests, "identities are the names we give to the different ways we are positioned by and position ourselves within" (p. 223). Thus, our position as educators is from the standpoint of being "with" our students. The "with" is in "relation to" our students. It is a tensioned space of negotiation and becoming. During the process of engaging in this larger self-study, we became aware of the stark disparities of our students in a virtual space and how these disparities affected their learning.

Participants

The sample for this study consisted of 2 faculty members and 40 students. We are teacher educators at a small catholic liberal arts institution in the mid-Atlantic, USA, who infuse intersectionality and social justice topics in classroom discourse attending to our students' experiences as first-generation college students from immigrant and underrepresented backgrounds. Charity is a faculty member and associate dean in the School of Education. Self-study affords her the opportunity to explore and refine her pedagogical approaches and to engage in productive and meaningful critical friendships. She has taught teacher education students in her course Educational Assessment Development and Evaluation Models, as well as undeclared first year students in University 101: Dream, Dare, Do for the last two years. Likewise, Lavina is a faculty member in the School of Arts and Sciences, teaching a host of philosophy courses and coordinating the undergraduate honors program. When teaching ethics, and dialoguing about contemporary moral and social justice issues, Lavina regularly notices paradigm shifts in student thinking. This led Lavina to self-study to evaluate her role in such shifts and to explore the self-study approach during her 2 years as a full-time faculty member.

Students vary in demographic backgrounds, age, race, and ethnicity. Sixty five percent of the students in this study were female and 34 percent were male; 33 identified as first-generation college students, while 51 percent as second-generation and two students were foreign. Seventy four percent were between 18 and 20 years old; 18 percent were between the ages of 21–24; four students were working adults between the ages of 26–48. Twenty three percent of the students who participated in this study identified as white, 12 percent identified as black; 18 percent identified as Hispanic; and 46 percent of the students declined to identify. We ensured that all students were given a thorough explanation of their informed consent form, with the option to forgo participation and we provided assurances that all students' identities would be kept anonymous.

Data Collection

First, we reviewed our recorded virtual classes maintaining reflective notes of the exchanges revealing the intricate nature of students' racial-ethnic identity and how it contributed toward their academic identity. Next, we wrote individual narratives via google drive exploring the nuanced nature of teaching in-person vs. teaching virtually. This introspective evaluation enabled us to critically evaluate our identities and roles as teacher educators. Additionally, we reviewed each other's narratives and served as each other's critical friend (Schuck and Russell, 2005). We engaged in a process of collaborative inquiry where we provided one another with ongoing feedback (Placier et al., 2005) by seeking clarification, asking probing questions, and exploring both similarities and differences between our experiences. We used introspective reflexivity and peer debriefing to add credibility to our self-study. The goal of critical reflection and

introspective reflexivity was to engage in a hopeful activity that focused on obstacles to student equity and how these obstacles affected their identity and ours in the virtual classroom.

Data sources from Fall 2019 and Spring 2020 included reflexive journals, recorded class sessions students' questionnaires, and artifacts such as student feedback collected through "exit tickets" in both the first year course *University 101: Dream, Dare, Do* and the second year philosophy course *PHIL 250: Making Moral Decisions*, as well as recorded meetings. In our weekly meetings, we discussed emergent themes through the lens of how the disparities disenfranchised our students. Over a shortened semester, we engaged in online regular meetings to debrief and analyze all sources of data.

RESULTS

The salient features of this study revealed that there is a dynamic nature to the multifaceted identities for both teachers and students that emerged differently in the virtual classroom space. Initial findings from student questionnaires administered to our classes during the Fall of 2019 and Spring 2020 semesters before the shift to online virtual instruction revealed two broad categories of identity factors: (1) intersectional identity; and (2) a more personal understanding of self. The shift to virtual instruction exacerbated student inequalities and amplified their differences. Our students of color struggled with identity factors and how it affected their learning, which had implications for their sense of self.

Multifaceted Identities in Face to Face Classrooms

The identity factors of immigration, ethnicity, social class, and first-generation status intersected with one another in complex ways and heavily influenced students' perceptions as evidenced in their statements. For example, their perspectives ranged from "Being Hispanic, we are known to have "hands-on" jobs, or do "dirty work" but that is not the life I want for myself or my future family. I want to be able to support my parents retiring early" to "My grandparents didn't come to any college, they went straight to working in factories after coming from Puerto Rico to provide for my mom/aunts/uncles." Self-expectations of students of color often emerged as mirroring the American ideal of working hard to be successful. Their I-positions took on the unique voice of resilience. Students articulated hopes of achieving more than their ancestors and parents; they expressed a collective sense of internalizing responsibilities to make family members proud.

While some identity factors intersected in empowering ways, others lent themselves to marginalizing effects. For example, "I have always done well in school, so I put a lot of pressure on myself to do well and not disappoint my family. They have high expectations for me too. I am Nigerian." In this response we see a high degree of awareness of the student's immigrant status and the expectation of that status, to be "better than." Here the self of the student is located by their perception of parental expectations.

This is marginalizing the student's identity. Her Self- I position as a Nigerian intersects with the Self-other position of parental expectations. This is marginalizing the student's identity due to the need to conform to familial expectations. Hermans (2001) view who asserts, "The self is not only 'here' but also 'there,' and, owing to the power of imagination, the person can act as if he or she were the other and the other were him- or herself" (p. 250).

The second category that emerged was students' understanding of self-co-mingled with academic identities. Some students reflected, "I would identify as a student who is trying to build a good life for myself in the most efficient way possible" and "Academic influence is the fact that I always do work on time and only want the best grades as possible, this makes me a perfectionist." These quotes show students' keen awareness of their academic and personal identities. These are internal I-positions taken by the student "I am a good student," "I am a perfectionist." The I-position also holds a future expectation of "wanting a good life." From the lens of DST, these internal I-positions can take on the present and future expectations, they may be in agreement or conflict with each other based on context and situatedness. The I-positions (internal and external) in the self of the individual's mind extend into the environment taking on unique roles i.e., identities.

Negotiated Identities: A Virtual Disconnect

In face to face classrooms, students' identities were associated with characterizations of themselves as "Very academically driven, constantly studying & doing work ahead of time" and "Organized, studious." When instruction shifted to virtual, we observed the disconnect with the students' articulated identities. External factors and the situated nature of identity often influenced students' representations of self. During an observation, Lavina noticed a student who had previously presented herself very differently in Charity's class.

> In Sara's introduction, she mentions that she is outgoing...I didn't see it all. Maybe because I have had Sara as my student for 2 semesters. She was very reserved in my classes. In my 2nd class, she slowly opened up. So, I see a disconnect. Was this her public voice? My instinct tells me it is. The question is why did she decide to use her public voice" (Lavina, Course Observation 1).

Charity experienced Sara as outgoing during face to face instruction, but when the course shifted, Sara retreated literally into the virtual background. We discussed the reasons for the inconsistency in the presentation of the self and could not determine the source. While other students' perceptions of Sara at the start of the semester, as evidenced by the feedback exit slips, revealed "I love how outgoing, fun and enthusiastic you are" and "Your bubbly personality will be great in the classroom #outgoing," this did not continue online. This was the first indication that suggested to us that representations and evaluations of the individual self, differed, based on the modality of classroom instruction. It became evident that students' identities, and sense of self in the virtual classroom seemed either negotiated or marginalized.

To confirm our initial findings, at the end of the semester we asked students how they defined their online vs. face to face classroom identities. Students were clear that they did not feel as comfortable to participate as openly in the online virtual classroom space. "[Face to face] classroom[s] makes teaching more fun and interactive as you can see other people face to face and read reactions. The online classroom is interactive but not as fun as classroom learning. Online classrooms require more focus to understand what's been said" and "I feel less motivated to do work and instead rather find other things to do." Students withdrew more often and were more reserved online. As one student explained "For my online identity, I became more straight forward and technical in my approach to class. In my classroom identity, I wish I could have showcased a little more personality, but I felt less sure online even though I knew everyone from the first half of the semester."

Examining Our Pedagogical Practices

We had similar expectations of being a critical friend to each other. We mirrored a shared vision of examining our pedagogical practices to benefit and empower our students. Toward this goal, we questioned shifts in student identity as it negatively impacted participation and student learning outcomes. Students shared the same classroom community, face to face in the 1st half and virtually during the second half of the semester. Reasons for shifts in students' identities prompted us to critically examine our pedagogical practices in the online virtual classroom. For example, Charity reflected:

> As boundaries between school and home began to blur, exploring the shifts in our intersectional identities were also a source of comfort. My responsibility quickly became making strategic adjustments to a range of assessments and activities and I tried to remember that it would take students time to transition (Charity Journal, 5–20).

Further, we tailored assignments to the online virtual environment and gleaned that students needed more explicit direction online. We surmised that this could have been a reason why they pulled back; students who struggled to adhere to deadlines were more focused on the details of the course rather than deeper understandings and meanings. White students were more apt to report that "The online change felt like things carried out the same as they would physically." By contrast, we were struck by the feedback and disengagement from our students of color. The disparity was stark. We focused on uncovering what was causing students of color to withdraw from interacting in the virtual classroom; was it a result of equity-access, privilege, or both? Focusing on this disconnect, Lavina observed,

> A classroom tends to equalize students. You don't know their "background" unless it is visible (race) or personally shared. I was struck with the home situation of my students. One student was feeding her less than a year-old sibling bottled milk. Another, a young mother of 2 mentioned she wasn't getting enough sleep due to homeschooling her kids. In the background of another student, I saw 4 kids and a grandmother all in one room. These were in stark contrast with other students who had a quiet place,

their room, and animals around. It saddened me to see that the students who had issues were my students of color... Seeing was very problematic for me. And here I was thinking about staging and presenting myself in the virtual classroom, these students had more pressing issues to consider. They call education the great equalizer… I am not so sure. Education can become an amazing equalizer only if individual equity is considered (Journal, 5–20).

As observed, a lack of access to educational space and family responsibilities caused students of color to disengage. While they retained their identity as a student, the I-position of voice was marginalized. At times, the Self-I position seemed masked and shut down. The dialogue between the various I-positions in the self of the individual lent itself to a marginalized identity caused by intersections between ethnicity and socioeconomic status SES. Further due to being located by the students in the virtual environment, Lavina's I-position (Self-other) about student identity was conflicted. Students' situatedness and lived experiences caused changes in Lavina's situatedness. This in-between space that both Lavina and the students occupied was one of marginalization and disenfranchisement.

As educators, we acknowledged that there can be no equality without due consideration to issues of access and equity. The disparities in our student population were reinforced in our online virtual classrooms. It became clear that our students' sense of self and identity was intertwined with their lived realities and inseparable. We lamented the role of structural and systemic inequities present in our students' lives. The ideals proposed by Horace Mann seemed like a distant dream in the age of COVID-19. It forced us to reevaluate the meaning of "equal education for all." Issues of technology access were one of the starkest differences. Twenty years ago, Charity had a stock of loose-leaf paper and pencils that she exhausted each year to help alleviate equity issues. By contrast, today's virtual classrooms demand Wi-Fi hotspots and Chromebooks to close these learning access gaps. Charity explored options to provide students with loaned laptops rather than relying on their phones. However, when a student quietly explained she needed to sit outside the closed public town library to utilize internet access after running out of her phone plan minutes, it became clear that learning virtually at home for an extended time was presenting challenges that would not be easily resolved.

We were forced to reflect on the effectiveness of our pedagogical practices, and how we could attempt to overcome some of the inequities faced by our students. We acknowledge the lived realities and hardships faced by our students due to socio-economic inequalities. In recognizing the limitations of our privilege as educators, we began to think about ethical implications about shared understandings, communally agreed-upon principles of engagement, codes of involvement that guide actions, and set rules of participation that ensure safety and well-being, productivity, positive learning, and development in virtual classrooms. For example, we reflected upon the ramifications of recorded discourse between participants, student responsibility in maintaining the safety of online presence, and the problems of creating and maintaining a safe space in a

virtual classroom. Lowenstein (2008) conceptualization of ethics emerged that emphasized maximizing good and minimizing harm and suggested that ethics are an attempt to think critically about human conduct, determining what is right and wrong, what is good and bad.

Teaching is often characterized as a humanistic profession that requires kindness, care, compassion, empathy, an understanding of others, and an ability to build connections with a variety of people. While we cannot alleviate the socioeconomic inequities, we focused on modifying our pedagogical practices by humanizing ourselves and establishing care and care-based practices as the focus, regardless of the learning format. We focused on strengthening student relationships by providing opportunities for dialogue and communication, consideration for student unique circumstances, alleviating student anxiety, and fostering a sense of community in the classroom. For example, Charity began to meet with a few students' multiple times per week to review in greater depth class session material that was harder for some students to process in a virtual setting. By meeting at different times of day in small groups connectivity issues also tended to improve. Although adding small group sessions was time-consuming, students asked more questions, sought feedback, and slowly student performance and participation improved. Even with the inclusion of caring practices, Charity noticed that students of color were less likely to accept course review invitations, and encouraging emails sent often went unanswered.

Acknowledging and Accepting the COVID-19 Presence

After the shift from face to face instruction to online virtual instruction it was impossible to avoid COVID-19 as an ever-present element, it filtered into our classrooms disrupting teaching and learning. As the study progressed, there were moments of clarity when we recognized the value of acknowledging COVID-19 openly and addressing it with our students. This was a critical way in which we care-based practices. Charity shared:

> There came a point when I gave up trying to have a "regular" class. Instead, we began to start each class session with a brief discussion of personal updates about any family members who were immediately affected, as well as the statewide updates and how these might play out. We began to create a space during class to unpack these challenges (Journal, 4–20).

Charity was situated by her students, her Self-I position as a caring educator conflicted with the Self-other position, her views of her students. The dialogue between the two I-positions in her mind was negotiated thereby creating a space and allowing for potentially empowering learning outcomes for all students. Applying appropriate inclusivity and humanizing perspectives, Charity expertly converted the in-between space into a learning community that helped foster participation of the students in the virtual environment.

As Charity and her students settled comfortably into virtual learning, a hacking incident in the virtual classroom seemed to shatter the growing sense of community. Charity noticed two unwanted guests join after 20 min of a class session and despite multiple attempts to block their joining, these two individuals burst into the class yelling and messing with the class verbally. Charity canceled the call after a second attempt and afterward moved to use the zoom waiting room feature from then onwards. When debriefing with students about the negative profile pictures used by the hackers depicting racist images, many students first reported that they did not know what was going on, that they were "surprised." For some students, like Charity, this was their first experience being "zoom bombed" and they expressed feelings of "disappointment" explaining that "you would think people would change in college" not realizing these hackers were most likely from outside the university. Another student explained that this was the second time for her, and found it "pretty obnoxious, disruptive, and didn't understand the reason for it." As an educator, Charity made a space to discuss this incident in the next class session, acknowledging that if the class was together in person such an intrusion would never be permitted nor have occurred. The nature of virtual learning however had revealed a vulnerability she had not anticipated, one that in her mind she should have been able to prevent. Her sense of self as an educator meant protecting her students from individuals who showed horrific images yelling hate-filled racist statements toward others. While Charity took steps to prevent such attacks in the future, the event reinforced her sense that there was a need to discuss with students it's impact. Like Charity, there was a student who struggled to get the images out of her head, while other students felt "there are just sick people out there." As an educator Charity wanted to ensure she could minimize the negative effects of the intrusion and struggled ethically with the prospect that perhaps a student in the course potentially could have shared the session access information, even inviting these unwanted crashers. Her Self-I position as a caring educator led her to acknowledge and accept that this incident was a direct result of the COVID-19 circumstances; her students expressed agreement that this is one of the unfortunate realities of the virtual classroom since COVID-19. Charity couldn't help but question if students of color perhaps held back more in the virtual environment as a result of feelings of lack of safety in the learning environment? She made sure to remind students that the university was instituting the virtual waiting room for all classes, and that an investigation of such incidents was indeed taking place; such security breaches were taken very seriously and would hopefully be prevented in the future.

Toward the final weeks of the semester, we observed 3-fold effects of incorporating effective teaching practices. First, we used COVID-19 as a teachable moment, as the above instance illustrates. As a class, Lavina and Charity established routines to help incorporate aspects of identities outside of school and to discuss how we were coping. On some occasions, Charity asked students to select something they wanted to share from home since boundaries between school and home were increasingly blurring. Students enjoyed showcasing pets. Bringing a joke to class was encouraged, and on "April Fool's Day" students wearing silly glasses and hats lightened the mood. Second, we adjusted

course content, assignments, and provided practical assistance for students who were teaching full time. For example, a full-time kindergarten teacher was leading his fellow teachers in his school with technical assistance, virtual learning resources, and guidance, so the class joined in by selecting a children's story and using Flip grid to record a read-aloud for him and his students. Charity saw no reason to exclude this from course assignments and asked students to post feedback for one another as part of a class assignment. And third, exploring virtual instruction meant taking time to explore apps, integrate activities into our assignments, and discuss the benefits and challenges of using varied modalities with K-12 students. We leveraged student assignments to explore and use technology apps in real-time to benefit virtual instruction (e.g., iMovie, Kahoot, Flip grid, and TicToc).

Lavina and Charity both saw the benefits of creating a community of learners through care-based practices. It reflected in better student learning outcomes. However, Lavina's experiences and narrative of online virtual instruction was one of disillusionment. She was very often forced to acknowledge the realities of the virtual classroom stemming from a lack of collaboration and engagement from her students of color.

> While the university expects students to sit in a quiet place, dress appropriately, etc., how is it even possible when they don't have space…? This is so frustrating. How can rules be enforced here. Yes, I too would like some sense of decorum, but I cannot ignore their situatedness. They don't have to tell me; I can see it. I wonder if students don't put the video on because they are embarrassed by what others might see. Maybe they feel unsafe and cannot share themselves. Maybe they are afraid of the mask falling away. If I consider myself as a caring teacher, I must consider this (Journal 4–20).

Lavina bristled at the rigidity of the structures at large and insisted on relaxing the expectations to acknowledge and account for students' lived experiences. This lack of equity amongst the student population became more pronounced when relating to their lack of access to technology. For Lavina, it became more evident as the semester progressed. The current reality of "remote learning" highlighted the digital divide, the socio-economic divide, and the racial divide as she struggled to engage her disengaged students. Her Self-I and Self-other positions were positioned, and counter positioned by the situatedness of her students. She noticed,

> I know at least two students have not signed on, maybe because they have no access to laptops (they are African American too). How do I help them if they have no way to access the internet? I heard someone in a meeting mention about having students log in through their cell phones. Now, if I remember correctly one student does not even have a cellphone! (Journal 4–20).

This made Lavina despair about the nature of inequity and how it tended to disenfranchise students of color. While she considered herself to be a caring teacher, she questioned the nature of the virtual environment. It made her question her privilege as an instructor:

> The more time I spend in the virtual classroom, the more disillusioned I become as I face the lack of equity and equality. How must the student feel in showing their world to the rest? At times like this, I am keenly aware of my privilege. Now the question remains…how do I use my privilege appropriately to empower them? How do I negate the problems of their world? How do I try to use a virtual classroom to equalize them in some way? And the most important question of all… is this even remotely possible? How do I make my classroom a safe space again? (Journal 4–20).

In questioning privilege, Lavina's internal position of "I am an educator" is conflicted, in dialogue, and counter positioned with the external positions i.e., views held (the educator) of students especially those lacking equity. Her Self- I position is conflicted and despairing in the in-between spatial temporality of the virtual classroom, as it is constantly questioned, negotiated, and forced to acknowledge the situatedness of her students in the virtual environment. The resolution of the I-position can take place when the circumstances of students or when the students "locate" the educator differently. While the identity as an educator remains the same, the voice of the I-position is marginalized.

DISCUSSION

Two educators, two distinct narratives. One hope-filled another of disillusionment and despair. While some findings may not be unique, it did reinforce for us what we have known in the abstract, that students of color often lack the resources for an empowering education and that neoliberal systems favor those with economic means. We do not wish to deny or minimize the huge differences in opportunities that exist amongst students. When students were on campus, it lessened to a certain extent their differences in equity and access to technology, a virtual environment on the other hand exacerbated and amplified those differences.

The Embodiment of Care

As researchers and practitioners, we found ourselves examining the embodied nature of care and how it manifests in online virtual environments since care is situated at the center of most, if not all, of our moral, ethical, or professional responsibilities as educators. Some have taken a critical stance and emphasized the need for society to equalize the private and public ways in which care is divided into labor and the implications of gender (Held, 1990; Ruddick, 1998; Kittay, 1999). As our private and academic worlds collided, we had to adjust our understandings of identity and care. Noddings (2012) explained, "In an encounter or sequence of encounters that can be appropriately called caring, one party acts as a carer and the other as cared-for. Over time in equal relations, the parties regularly exchange positions. Adult caring relations exhibit this mutuality" (p. 771–772).

We recognized that both independent and interrelated moments of meaning-making unfold in face to face and virtual classrooms, albeit differently. These have potential implications for curriculum redesign and equitable education. We observed and experienced first-hand the importance of being more explicit in online virtual classroom environments. Care practices

also unfolded communally. Through care-based pedagogical practices, teachers could make a positive difference for students, through daily practice whether face to face or in online virtual classrooms. We question what care-based practices look like in virtual classroom environments? It translates into increasing students' motivation and commitment to improving their sense of confidence for a subject, willingness to try challenging tasks, and engagement in aspects of learning they don't like. Care was the vehicle for relationship development and maintenance in many ways, and relationships formed a context for learning in the classroom community, simply moved to an online virtual environment.

Intersectional Identities and Dialogical Selves

The implications of individual and collective intersectional identities and the complicated nature of privilege and power relations became more obvious in the virtual classroom. Additionally, our selves were in constant dialogue due to "... internal and external positions meet(ing) in processes of negotiation, cooperation, opposition, conflict, agreement and disagreement" (Hermans, 2001, p. 253). We problematized what counts as knowledge and our role as faculty, as "producers of knowledge" (Giroux, 2016). We looked at this through the lens of care, showing empathy and compassion for our students, yet how to care for students became complicated by the limitations of equity. Sadly, we did not arrive at a point during online virtual instruction to address or unpack the culture of commodification in education. Quietly we reflected upon on the possible effects of recording our classes and the negative impact this potentially had on student participation. Ethically, we recognized that students often raise morally charged questions and share very personal and emotionally charged experiences that we as educators promise to ensure their anonymity and our impartiality. As educators, we asked ourselves how to best preserve this stance in the classroom when the virtual class session is recorded and can be replayed and kept for future evaluation? At the start of each semester and the beginning of each class we provided and review with our students the rules of engagement, a set of guidelines to ensure confidentiality and that all classroom community members understood the need for trust and compassion; this specific aspect of setting up classroom community was a delicate balance to strike amidst the reality of video-recorded sessions. Further, we often felt unable to apply the practices of care for our students consistently enough to make a significant difference. For example, in future classes, Charity plans to review the steps to follow in the event of any unwanted intrusions, simply to make students aware that while unlikely, this reality can be minimized and avoided. Furthermore, both Charity and Lavina will plan for more time, engagement, and trust to explore these topics together in the future. Rice et al. (2019) words reminded us of the charge:

> every dimension of a research project is an opportunity to work toward social justice. Intersectionality deals with the complexity and messiness of lives, relationships, structures, and societies, so data collection and analysis methods must be responsive to contexts and serve liberatory objectives. Thus, in our view, the

animating consideration for critical researchers in undertaking intersectional research is one of continuously and unequivocally interrogating at every stage of the process, "Am I doing justice?" (p. 420).

Although we acknowledge that we looked at issues of students' equity from the lens of justice (What is just and what is right), our intersectional identities as educators led us to engage in the relational work of teaching that affected key aspects of our pedagogical instruction such as the implementation of care-based practices, planning curriculum and implementing lessons that address equity, and assessing student work with due consideration to their unique life circumstances. Given the nature of the relational work associated with teaching and learning between teachers and students, ethics and pedagogy are naturally intertwined (Campbell, 2008). As we tried to take into account the needs of our students from diverse backgrounds, we had to ultimately see past our self-interests and emphasize theirs.

Moving to a virtual classroom due to COVID-19, amplified, and complicated the meanings and understandings of Self and our identities as professors and researchers. This was in part due to the construction, reconstruction, and negotiation of our Selves as were located and situated by our students in multiple ways. A recurring trend emerged in which it was observed that in face to face classrooms the ability to humanize oneself facilitated a sense of camaraderie and equality between teacher-student; thus, reducing the power dynamics and structural constraints in the classroom. This was much more challenging to enact in every online session in the virtual classroom. In the temporal space of the virtual classroom, we were all learners situated and uniquely positioned by our experiences, yet our students of color were less receptive and less comfortable in sharing of themselves. Early reflections revealed an attempt to "honor how people learn first and foremost" (Charity, Journal 3–20). However, by the end, everyone was tired, tapped out, challenged, and the key takeaway rested on the reality that virtual learning was exhausting. Ultimately, Charity reflected that:

> This experience has increased my respect for how much goes into the instructional design to use technology more seamlessly, and how important it is to tailor everything to my students' needs. As a community of learners, we regularly reflected on what worked and what needed to be changed. This focus on taking the time to apply what we have learned, and continually working to improve ourselves (Journal, 6–20).

As for Lavina, she shared,

> I empathize with my students, coming from a minority background myself, I understand what my students feel. I sense their powerlessness especially when I know that I am not so different from them. But I believe that marginalizing experiences have the potential to be a powerful tool for empowerment and change. And so, I will continue trying to engage and understand (Journal 6–20).

As the internal positions of the dialogical self become relevant (I am a person of empathy) due to the connections it has with

the external positions of student perceptions (located by student powerlessness), we need to explicitly account for dialogue that is focused on care to better engage our students in the virtual environment. In empathizing with our students about their unique circumstances, we became more aware of our Selves and how it impacted our identities and our students' ways of being.

Implications for the Teaching Profession

Caring for students is critical work, and the toll it takes on teachers is ever increasing during uncertain times. As policy mandates send teachers back into schools across the United States to engage with students in a variety of classroom settings and scenarios, including hybrid and hy-flex models of face to face and virtual learning environments, the last 6 months demonstrates the determination and commitment of teachers to creatively address learning issues and the emotional needs of students. Supporting students is an integral responsibility of educators as is the role of collaboration and dialogue with other faculty becoming even more essential in virtual spaces. The relational and humanizing elements highlighted in this study were necessary on many levels, including pedagogically. The ethic of care can be seen exhibited between educators and students, students with one another, and amongst educators to promote self-care. The COVID-19 pandemic sheds a spotlight on many limitations within the educational structures regarding both the ethic of care for students as well as self-care practices for educators. For example, educators who might have prior found the physical separation between school and home helpful for setting boundaries, increasingly struggled more during COVID-19 with the blurring of teaching responsibilities and family duties at home. Working remotely requires more self-regulation amongst teachers and educators to stop, turn off the computer, walk away from emails and texts from students, families, and colleagues. Ed Week reported how teachers spend their time has changed dramatically, with an 87 percent increase of time spent troubleshooting technology problems and a 71 percent decrease in student instruction and engagement, 69 percent less time presenting new material, 61 percent less time engaged in enrichment with students, and 40 percent less time spent doing review (Herold, 2020). Truancy figures were much higher in high-poverty districts, higher amongst older students than younger students, and yet truancy rates are lower across the board for schools in which there is at least one device for every student. Similarly, most districts are faced with the challenges of reopening with little or no financial assistance from the government to order and provide proper personal protective equipment (PPE), cleaning, professional development for virtual teaching, or staffing models that support proper distancing between teachers and students. Reopening contingency plans at many levels fail to properly fund health protection measures for teachers and students, fund devices for students in need, or plan and account for the need for guidance and support to implement virtual learning long-term should the need extend beyond a soft opening for schools at the start of the academic year. Further, the ethic of care and self-care are integral to sustain effective learning communities and yet both are being grossly ignored in the United States, sparking lawsuits between teachers' unions and governors. Most educational institutions over-rely on teachers' sense of care for their students to make up the difference for a lack of proper resources necessary to provide safe and effective education during the pandemic.

Just as during the shutdown, there will continue to be a wide spectrum of resources available for virtual instruction depending on teachers' contexts. Some districts, teachers, and students engaged utilizing state of the art technology, while other districts were faced with sending home photocopied packets of work to students, and some districts shut down altogether. Little has changed for educators: Teachers are ultimately responsible for being responsive to another individual's needs, not simply in the context of a solitary individual at a time, such as in the case of psychologists or counselors. By contrast, teachers are typically providing direct care for 20 or more individuals daily for upwards of 10 months in a given year. Like other helping professionals, the toll taken for providing individualized care can be daunting and taxing for the care provider. This suggests that given the realities of teaching being a caring profession, perhaps more time needs to be devoted to pre-service and practicing teacher's development of self-compassion as a practice and avoiding burnout, and advocacy skills to secure the resources and support necessary to make teaching virtually a successful enterprise. Mor Barak et al. (2001) found that burnout is often related to the level of inexperience and is also associated with workers who tend toward perfectionism or generally high standards and ethics for the care of clients, in teachers' cases, toward students. In higher education, the vast majority of teachers serve in adjunct positions and/or lack union representation; receiving pedagogical guidance varies across institutions, and professional development related to juggling how to best juggle completing priorities such as research, publishing, grant writing, curriculum development, and g the consuming nature of teaching students.

In the teaching profession, educators at all levels are often most isolated from one another, and school cultures often fail to provide counseling services to help cope with the daily stressors associated with working in a caring profession. Teaching in online and virtual classrooms are no exception. Teaching "at home" further blurs the lines between professional and personal responsibilities. As Neff and Germer (2013) explained, in caring professions, compassion must be applied as a healthy attitude toward oneself and a strong sense of one's strengths and limitations. Neff and Germer (2013) posited that self-compassion is comprised by (a) a mindfulness or being open and present to one's suffering, (b) self-kindness, and (c) a recognition of the common experience of suffering inherent in the human experience applies to oneself first and foremost. Helping teachers to navigate the boundaries between personal and professional care would help alleviate the often-gray area of when to stop, hold back, even simply to practice better self-care to serve as a more effective caregiver.

Little is legislated for teacher's self-care. Union advocacy in this area is restricted historically to hours worked and the number of students allowed in a classroom with one teacher, and this is further delineated only in public schools. Only recently are practices such as meditation, yoga, and physical exercise encouraged or mandated, and primarily for the betterment of

students. The advantages of prioritization of such practices in schools for teachers are numerous.

CONCLUSION

Indeed, there is growing social awareness of inequities and lack of opportunities created by educational disadvantage for students of color. We acknowledge to be transformative is to have a sense of how we come to "be," how interactions shape each other's identity. Our identities and positionalities as educators shifted as we found ourselves being constantly located by the students in the virtual environment sometimes in marginalizing ways. Our Selves and intersectional identities as educators interacted within ourselves (in the society of the mind) and with the other (our students) extending into the environment causing us to question our pedagogical practices and how best to empower our students.

There are many lessons to be learned in the messiness of adapting through the COVID-19 crisis. We further acknowledge that while our virtual classroom revealed profound disparities in our students' access to support and opportunities, it also made us question the effectiveness of our pedagogical practices and pushed us to reconsider what caring pedagogy looks like, sounds like, and how care may be experienced differently in a virtual classroom. We asked ourselves in what ways could we be more responsive to the needs of our students of color and make pedagogical adjustments to help these students be as involved and active as in face to face classrooms. We also noticed the need to rethink strategies to close the learning gap on many levels that extend beyond the classroom. Educational institutions and telecommunication companies can help work together with educators and administrators to eliminate the underlying issue of students' lack of digital access. No doubt that

budgets are being slashed and economic uncertainty reigns in our current context, but funding initiatives are necessary to ensure all students have the technological tools to access learning. When will the United States of America as a nation and a society be willing and ready to take a hard look at the policies and funding issues associated with making education and equity priorities for current and future generations of students? Similarly, other countries too have had their education systems compromised by COVID-19. It is likely that educators from around the world worry about these same issues raised since it has enormous implications for student learning and best teaching practices. While the answers are not easy, as educators, we assert that the educational community should not wait until the next crisis to respond to inequities and issues of disenfranchisement. We are at a crossroads and it is time to reflect together and then to act.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Felician University Institutional Review Board. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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Impact of COVID-19 on Educational Services in Canadian Children With Attention-Deficit/Hyperactivity Disorder

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The COVID-19 pandemic led to school closures and a rapid transition to online classes. However, little is known about the impact of online learning in Canadian children with Attention-Deficit/Hyperactivity Disorder (ADHD). An online survey created on Qualtrics was distributed to families across Canada. Data collection was conducted over a total of five weeks in May and June 2020. We reviewed 587 surveys (4% margin of error using a 95% confidence interval) completed by caregivers/parents of children with ADHD (mean child age 10.14 years, $SD = 3.06$). Survey questions focused on hours of schoolwork completed and whether the learning needs of children with ADHD were met during school closures. Results indicated 90% of children with ADHD received web-based learning during the pandemic. Parents (41%) reported < 5 h of schoolwork per week, and 35% indicated between 5 to 10 h. Of the parents who said their child with ADHD had a modified curriculum (68%), 40% reported receiving educational materials that met their learning expectations during online classes. Parents (59%) reported that their child found it "very challenging" adjusting to online classes. The results indicated that children with ADHD faced significant challenges in adapting to online learning during the pandemic. Binary logistic regression indicated significant associations between depression severity, difficulties with starting and managing tasks and challenges adjusting to online learning. Long-term consequences of these challenges will need to be determined to ensure children with ADHD are able to meet their academic expectations.

Keywords: ADHD 1, COVID-19 2, educational services 3, children 4, pandemic 5

INTRODUCTION

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder with prevalence rates between 5% and 9% in Canadian school-aged children (Brault and Lacourse, 2012; Polanczyk et al., 2014). According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V), symptoms of ADHD include age-inappropriate levels of inattention or hyperactivity and impulsivity (American Psychiatric Association, 2013). Typically, children with ADHD encounter challenges with their academic functioning, peer relationships, and emotional regulation (Biederman et al., 2004; Wolraich et al., 2019). These challenges make it necessary for children with ADHD to receive psychosocial and behavioral interventions (Canadian

Attention Deficit Hyperactive Disorder Research Association, 2018; Wolraich et al., 2019). Furthermore, children with ADHD are often prescribed medications to manage their symptoms (Cortese et al., 2018). Consequently, these multimodal interventions require follow up from psychologists, pediatricians, family doctors or other healthcare professionals on a frequent basis.

On March 11, 2020, the World Health Organization (WHO) declared coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2), a pandemic (World Health Organization, 2019). Currently, there are no known vaccinations available to protect against COVID-19. As a result, based on different public health agency recommendations, the federal, provincial and municipal governments across Canada declared preventative measures to stop the spread of COVID-19. These preventative measures included the closing of schools, community centers, reduced access to medical and therapeutic personnel and other physical distancing measures.

The rapid closure of schools meant that teachers and other educators had to quickly transition to online classes without any developed guidelines for planning and delivering the online curriculum. There are also many possible adverse consequences associated with school closures, such as interruptions in learning, social isolation, parents unable to engage in homeschooling and lack of childcare for working families (UNESCO, 2020). Esposito and Principi (2020) further stated that online learning through technology could be hard to implement. Therefore, without proper online learning guidelines, children with special and different needs may be more vulnerable to the challenges associated with online learning, thereby exacerbating existing disparities (Schiariti, 2020).

Many schools often serve as a first-line treatment resource for mental health challenges in Canadian children (Liebenberg et al., 2015). School boards offer services such as access to school psychologists, social workers, speech and language pathologists, physical and occupational therapists. Furthermore, children with ADHD specifically depend on different school-based psychosocial and instructional interventions for their academic success (Lovett and Nelson, 2020). Given the rapid closure of schools and a quick transition to online classes, it is essential to understand how these changes affected children with ADHD. While the full impact of COVID-19 will likely take some time to understand, the potential negative consequences of school closures on children with ADHD need to be studied (Esposito and Principi, 2020).

There is currently limited available research specifically investigating the impact of COVID-19 on parents and their children with ADHD as it pertains to school closures. A recent survey of 538 parents of French children with ADHD was conducted during the first 20–30 days of lockdown (Bobo et al., 2020). The parents reported that their children struggled to complete their school-related tasks, and their teachers could not provide accommodations to meet the children's needs. Another study from China, although not specifically addressing school-related concerns, found that parents of children with ADHD reported increased symptoms in their children (Zhang et al., 2020). Lastly, a study conducted on adolescents in the United States reported that remote learning was challenging specifically for adolescents with ADHD compared to those without (Becker et al., 2020), and parents whose child with ADHD had an individualized educational plan found it harder to support their child at home.

On April 17, 2020, the European ADHD guidelines group published a practice guideline on how to manage ADHD symptoms in the pediatric population during the pandemic (Cortese et al., 2020). The guidelines did not, however, provide specific information on how to deliver educational services during the pandemic. Furthermore, to the best of our knowledge, there is no existing resource in North America on how to adjust or modify educational services to meet the needs of children with ADHD during a pandemic or an epidemic. Given the unprecedented and novel situation, it is essential to gather information regarding the impact of COVID-19 on learning and educational services provided to Canadian students with ADHD.

The current research study has three aims: 1) to describe the changes in learning and educational services taking place during the pandemic, 2) to describe how the transition to online learning went for students with ADHD, and 3) to investigate the relationship between socio-demographic characteristics, mental health symptoms and challenges adjusting to an online curriculum. Due to the unprecedented and novel situation and no prior published paper on transition to online learning in children with ADHD at the time of study design and data collection (April 2020), the current study did not have any specific hypotheses.

MATERIALS AND METHODS

Study Design and Participants. An online survey was created using Qualtrics to gather information from parents about the educational impact due to the COVID-19 pandemic restrictions on children with ADHD. The survey was distributed to families across Canada through research websites, social media (Twitter and Facebook), and direct email contact. The survey was active from May 11, 2020, to June 15, 2020, for a total of five weeks. Minimum survey response of 384 participants was required to represent the Canadian pediatric ADHD population of 430,000 children, based on a prevalence estimate of 7.2% of six million children (Statistics Canada, 2016; sample size calculator used a 95% confidence interval, 5% margin of error). Upon completion of the survey, participants were included in a draw for one of fifty CAN$20 gift card.

Inclusion Criteria
Any caregivers of children between the ages of 5 and 18 years who were diagnosed with ADHD and currently living in Canada were eligible to participate in the study. While the current study did not confirm the ADHD diagnosis and relied on parent reports, as part of the survey questions, parents were asked to report what year and what type of healthcare professional (family physician, pediatrician or psychologist) made the diagnosis.

Measures

The survey was part of a larger study understanding the impact of COVID-19 in children with ADHD. The questionnaire included 113 questions related to demographic information, education, lifestyle, and mental health challenges during the pandemic. The average time to complete the survey was approximately 30 min.

Socio-Demographic and Medical Information

Participants provided demographic information, including postal code, household income range, and the number of people in the home. Parents reported their child's comorbid diagnoses and diagnosis of a learning disorder. Lastly, parents answered questions related to their child's current medication use and involvement in behavioral therapy.

Impact of COVID-19 on Learning and Educational Services

Questions related to changes in educational services were asked through items created by study authors. Parents were asked questions related to online classes, including programs used for online classes, hours of online instruction, challenges with different executive function (EF) skills and whether the student's learning needs were met through the online programs.

Educational Challenges During the COVID-19 Pandemic

Parents were asked how challenging it had been for their child to adjust to online learning. This question used a Likert scale ranging from 1 "not challenging at all" to 4 "extremely challenging."

Mental Health Questions

Parents answered questions about their child's mental health symptoms using the Patient Health Questionnaire-9 (PHQ-9), Generalized Anxiety Disorder-7 (GAD-7) and the Swanson, Nolan, and Pelham, Fourth Edition (SNAP-IV).

PHQ-9 (Kroenke et al., 2001). Parents were asked to rate whether their child experienced depressive symptoms over the previous two weeks using a 4-point Likert scale ranging from 0 "not at all" to 3 "nearly every day." Total scores ranged from 0 to 27, with higher scores indicating higher distress. In a large general population sample, the scale was valid and reliable compared to longer symptom inventories assessing anxiety and depression.

GAD-7 (Spitzer et al., 2006). Parents completed the GAD-7 questionnaire to rate symptoms of anxiety in their child with ADHD (Spitzer et al., 2006). The GAD-7 uses a 4-point Likert scale ranging from 0 "not at all" to 3 "nearly every day." Total scores ranged from 0 to 21, with higher scores indicating higher distress.

SNAP-IV (Bussing et al., 2008). Parents answered the SNAP-IV to rate their child's current ADHD symptoms.

TABLE 1 | Sample characteristics.

Characteristic	%	Valid n	Mean	SD
Age		587	10.14	3.06
5-8	34.9	202	6.99	1.03
9-12	43.6	256	10.36	1.08
13-18	21.9	129	14.65	1.58
Gender				
Woman/girl	28.3	166		
Man/boy	70.2	412		
Other	1.5	9		
Total annual household income				
Under $25,000	5.3	31		
$25,000-$49,000	9.2	54		
$50,000-$74,000	15.2	89		
$75,000-$99,0000	15	88		
$100,000-$124,999	18.1	106		
$120,000-149,999	10.2	60		
Over $150,000	27.1	159		
Currently taking medications				
Yes	74.2	587		
Currently taking part in behavioral therapy				
Yes	33.6	587		

Note: Household incomes are in Canadian dollars.

The SNAP-IV 26-item scale is an abbreviated version of the Swanson, Nolan, and Pelham (SNAP) Questionnaire (Swanson et al., 1992). The SNAP-IV uses a 4-point Likert scale ranging from 0 "not at all" to 3 "very much." The questionnaire provides three sub-scores based on total inattention, hyperactivity/impulsivity, and opposition/defiance. The cut-off score for inattention is 1.78, hyperactivity/impulsivity is 1.44, and opposition/defiance is 1.88.

Data Analysis. Survey data was first manually inspected to check for accuracy. From the 663 responses, 587 had answered greater than 90% of the survey questions and were deemed complete. The remaining 76 were removed due to incomplete responses. The survey had an approximate response rate of 64.6% based on the number of total individuals who started the survey. All data were analyzed using SPSS version 25. Descriptive statistics (percentages, mean and standard deviations) were computed for demographics and main study variables. Bivariate correlations using Spearman's correlations were used to determine relationships between socio-demographic characteristics, mental health symptoms and challenges adjusting to online classes. Multivariate binomial logistic regression was then conducted on socio-demographic characteristics and mental health factors that were significantly affecting adjustment to online classes for children with ADHD.

RESULTS

Participant Demographics. The demographic information is presented in **Table 1**. A total of 587 surveys were reviewed from parents of children with ADHD. The mean age of the children was 10.14, SD = 3.06 (mean age male = 10.21 years,

TABLE 2 | Mental health and executive function skills scores.

Characteristic	%	Valid n	Mean	SD
Overall PHQ-9		575	9.50	5.38
No or minimal concerns (total score 0–4)	18.1	104	2.57	1.24
Mild (total score of 5–9)	36.7	211	7.06	1.40
Moderate (total score 10–14)	27.8	160	11.64	1.40
Severe (total score >15)	17.4	100	18.43	2.86
Overall GAD-7		573	7.50	5.45
No or minimal concerns (total score 0–4)	34.9	200	2.13	1.39
Mild (total score of 5–9)	35.6	204	6.93	1.39
Moderate (total score 10–14)	15.4	88	11.73	1.39
Severe (total score >15)	14.1	81	17.64	2.06
SNAP-IV inattention subscale		570	2.09	0.59
Met Parent form cut-off score (parent cut-off score 1.78)	69.6	397	2.40	0.36
Did not meet parent form cut-off score	30.4	173	1.38	0.34
SNAP-IV hyperactive/Impulsive subscale		570	1.76	0.76
Met Parent form cut-off score (parent cut-off score 1.44)	66.8	381	2.20	0.48
Did not meet parent form cut-off score	33.2	189	0.89	0.35
SNAP-IV opposition/Defiant subscale		570	1.56	0.83
Met Parent form cut-off score (parent cut-off score is 1.88)	38.7	220	2.43	0.39
Did not meet parent form cut-off score	61.3	349	1.01	0.48

Note: Patient Health Questionnaire-9 (PHQ-9), Generalized Anxiety Disorder-7 (GAD-7) and the Swanson, Nolan, and Pelham, Fourth Edition (SNAP-IV).

TABLE 3 | Changes in educational curricula and services during COVID-19 pandemic.

Characteristic	%	Valid n
Who was the primary person supporting child's learning at home?		587
Parent/Caregiver	89.5	519
Grandparent	0.5	3
Sibling	0.7	4
Teacher	4.8	28
Other	4.5	26
On average, how many hours a week is your child doing schoolwork?		
<5 h	41.4	240
5–10 h	36.2	210
11–15 h	12.8	74
16–20 h	6	35
>20 h	3.6	21
Have you and your family tried to follow a routine?		580
Yes	94.1	546
No	5.9	34
Is your child receiving web-based learning from school/teacher?		580
Yes	90	522
No	10	58
Does your child have an individualized learning plan?		580
Yes	69.7	404
No	30.3	176
Is your child receiving educational materials that are meeting their specific learning needs?		580
Yes	40.5	235
No	59.5	345
How are you maintaining a routine for your child?		
Routine set up by parents	42.2	243
Teacher provided schedules	3.5	20
Child manages their own routine	4.7	27
Co-creating routines with child and parent	40.8	235
Other	8.9	51
What has made online classes challenging?		
Difficult to stay focused	81	575
No good quiet space for learning	17	575
Distractions (parents and siblings)	58.8	575
Material is not engaging enough	41.6	575
Having to share laptops/computers with others	18.1	575
Internet bandwidth	12	575

female = 9.87 years). In regard to gender, 70.2% of the children were male, 28.3% female, and 1.5% other (categories included transgender female, transgender male, non-binary, and prefer not to answer). Consistent with the Canadian demographic, ethnicity reported in the current study showed 80.7% were Caucasian, 5.3% First Nation or Metis, 2% Asian, 1.2% Black or African American, 1.5% Hispanic, and 9.2% were in the Other category, which included mixed profile (Aboriginal people accounted for 4.9% of the total population in the 2016 Census, and 77.7% reported not being a visible minority; Statistics Canada, 2016). Parents (55.4%) reported household incomes greater than $100,000, 30.2% between $50,000 and $99,000, and 5.3% less than $25,000. According to Statistics Canada 2018 information, median family income for two-parent families with one to ≥ 3 children was $105,490 to $113,060 (Statistics Canada, 2018). Survey responses were obtained from all provinces and territories except the Northwest Territories and Nunavut, with the majority of responses from Alberta (40.9%) and Ontario (31.3%). Based on the 2016 and 2018 Stats Canada Data and Government of Canada demographic information (Statistics Canada, 2016, 2018), we considered this survey to be an adequate representation sample of the current Canadian population.

At the time of survey completion, 34% of children were currently involved in behavioral therapy, (e.g. social skills training, cognitive-behavioural therapy), and 74% of children were taking medication to manage their symptoms. In terms of a learning disorder diagnosis, 41% of parents reported their child having a comorbid diagnosis of learning disorder, with 6.3% of parents reporting a diagnosis of reading disorder, 19.3% reporting a diagnosis of writing disorder, 5% reporting a math disorder and 24.4% reporting multiple disorders. Parents (58%) also mentioned their child having other comorbid diagnoses, with 38% reporting anxiety, 9.6% reporting Autism Spectrum Disorder, 6.5% reporting a diagnosis of depression, 6.2% reporting a diagnosis of Tourette syndrome or Tic disorders, and 6.1% reporting a diagnosis of Oppositional Defiant Disorder.

Impact of COVID-19 on Learning and Education Services. **Table 3** presents changes in learning and educational services following COVID-19 pandemic restrictions.

At the time of survey completion, all schools were closed, and no one reported attending in-person classes. To continue their academic learning, schools rapidly transitioned to online learning. Parents reported that 90% of children were receiving web-based instruction from their school/teachers during the school closures. Google Classroom was the predominant tool used to support online teaching (66%), followed by Microsoft Office tools (14%) and Zoom (4%). In terms of hours of schoolwork completed, parents reported that 78% of children with ADHD were completing 10 h or less of schoolwork per week (41% < 5 h, 36% 5–10 h) during the COVID-19 pandemic. Of the children with ADHD having an individualized learning curriculum (commonly known as an individualized education plan, IEP) (69.7%), only 40.5% of parents reported that their child was receiving educational materials that met their child's specific learning needs.

Prevalence of Educational Related Challenges due to COVID-19

Parents (60%) communicated that it had been very or extremely challenging to adjust to online classes. Some of the reasons that were discussed included difficulties staying focused (80%), distractions (58%), material not engaging enough (41%), having to share laptops/computers with siblings/family members (18%), no good quiet space for learning (17%), and difficulties with internet bandwidth (12%). Furthermore, 94% of survey respondents tried to follow a routine during the COVID-19 pandemic. Of them, 60.5% stated that it was very or extremely challenging to adjust to this new routine with their child. Lastly, parents reported executive function challenges when completing online learning (see **Figure 1**). There were no significant age or gender differences identified in terms of difficulty or issues adjusting to online classes.

Mental Health Questions
PHQ-9
The Cronbach alpha score for the PHQ-9 for our sample was 0.79, indicating good internal consistency. Based on parent report for the PHQ-9, 36.5% (214/585) of children met the criteria for mild depressive severity, 27.8% (163/585) moderate depressive severity, and 17.7% (104/585) severe depressive symptom severity (moderately severe and severe categories were combined) (See **Table 2**).

GAD-7
The Cronbach alpha score for the GAD-7 was 0.89, suggesting good internal consistency. On the GAD-7, 34.8% (204/573) of children met the criteria for mild anxiety-like symptoms, 15.0% (88/573) moderate anxiety-like symptoms, and 13.8% (81/573) severe anxiety-like symptoms (See **Table 2**).

SNAP-IV
Based on the cut-off scores for the SNAP-IV, parents reported that 73.6% of their children with ADHD were currently exhibiting clinically significant Inattentive symptoms, 66.8% were showing clinically significant Hyperactive/Impulsive symptoms, and 38.7% were exhibiting clinically significant oppositional defiant behavior (ODD). The Cronbach alpha score of 0.94 suggests good internal consistency (See **Table 2**).

Correlates of Educational Challenges During the COVID-19 Pandemic
Results from Spearman's correlations are presented in **Table 4**. In terms of socio-demographic information, age, gender, number of people in the household, total household income, currently taking medication, presently involved in therapy and receiving psychoeducational support did not significantly correlate with facing challenges with online courses. Inattentive and ODD symptom reports on the SNAP-IV, total depression scores on the PHQ-9, total anxiety symptom scores on the GAD-7, and challenges with different EF skills were correlated to facing difficulties adjusting to online courses.

TABLE 4 | Correlates of Educational Changes due to COVID-19 pandemic.

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Found it challenging to adjust to online classes		0.07	0.02	0.03	−0.01	0.14[aa]	0.06	0.08[a]	0.18[aa]	0.12[aa]	0.16[aa]	0.08[a]	0.22[aa]	0.20[aa]	0.11[aa]	0.10[a]	0.20[aa]	0.09[a]	0.06	−0.02	0.03
2	Age		–	0.06	0.06	−0.03	−0.05	−0.40[aa]	−0.12[aa]	0.03	−0.12[aa]	0.19[aa]	−0.08	0.21[aa]	0.24[aa]	−0.10[a]	0.08	0.12[aa]	−0.18[aa]	0.05	0.03	0.00
3	Gender			–	−0.02	0.00	0.05	0.06	0.07	0.01	−0.04	0.05	0.04	0.02	−0.07	0.00	−0.06	0.01	0.01	−0.08	0.11[aa]	−0.05
4	Household income				–	0.13[aa]	−0.06	−0.10[a]	−0.17[aa]	−0.17[aa]	−0.17[aa]	0.00	0.02	0.05	−0.01	−0.11[aa]	−0.04	−0.02	−0.12[aa]	0.04	0.02	0.00
5	Number of people in the household					–	−0.07	−0.02	0.09[a]	−0.05	−0.03	−0.06	0.00	−0.05	−0.03	−0.05	−0.05	−0.03	−0.01	−0.09[a]	0.04	−0.04
6	SNAP-IV_Inattention						–	0.53[aa]	0.45[aa]	0.43[aa]	0.38[aa]	0.26[aa]	0.21[aa]	0.28[aa]	0.24[aa]	0.23[aa]	0.27[aa]	0.24[aa]	0.20[aa]	0.08	−0.04	−0.02
7	SNAP-IV_Hyperactive/impulsive							–	0.55[aa]	0.32[aa]	0.48[aa]	0.04	0.28[aa]	0.02	0.01	0.19[aa]	0.04	0.05	0.32[aa]	0.06	−0.06	−0.01
8	SNAP-IV_ODD								–	0.48[aa]	0.52[aa]	0.09[a]	0.25[aa]	0.10[a]	0.08	0.23[aa]	0.04	0.08	0.39[aa]	0.07	0.01	0.01
9	PHQ9_Total									–	0.65[aa]	0.19[aa]	0.19[aa]	0.20[aa]	0.19[aa]	0.27[aa]	0.18[aa]	0.14[aa]	0.25[aa]	0.11[aa]	0.03	−0.03
10	GAD7_Total										–	0.12[aa]	0.24[aa]	0.07	0.08	0.26[aa]	0.14[aa]	0.05	0.36[aa]	0.14[aa]	−0.03	0.01
11	Staying organized											–	0.17[aa]	0.44[aa]	0.41[aa]	0.29[aa]	0.24[aa]	0.31[aa]	0.16[aa]	0.01	−0.05	0.00
12	Ability to inhibit responses												–	0.23[aa]	0.18[aa]	0.32[aa]	0.16[aa]	0.19[aa]	0.39[aa]	0.10[a]	−0.03	0.00
13	Monitoring tasks													–	0.47[aa]	0.27[aa]	0.29[aa]	0.38[aa]	0.12[aa]	0.04	0.01	0.03
14	Managing time														–	0.27[aa]	0.25[aa]	0.36[aa]	0.07	0.09[a]	0.00	0.01
15	Transitioning from one task to another															–	0.23[aa]	0.30[aa]	0.32[aa]	0.05	−0.06	0.01
16	Working memory																–	0.21[aa]	0.18[aa]	0.05	0.05	0.01
17	Starting tasks																	–	0.16[aa]	0.03	0.03	−0.04
18	Controlling emotions																		–	0.06	0.01	0.00
19	Currently taking part in therapy																			–	0.10[a]	0.05
20	Currently taking medications																				–	0.03
21	Accessing psychoeducational support																					–

[a]*Indicates p < 0.05 and* [aa] *indicates p < 0.01. sample n ranged between 573 and 587 (parents could skip questions). Note: Patient Health Questionnaire-9 (PHQ-9), Generalized Anxiety Disorder-7 (GAD-7), Swanson, Nolan, and Pelham, Fourth Edition (SNAP-IV), Oppositional Defiant Disorder (ODD).*
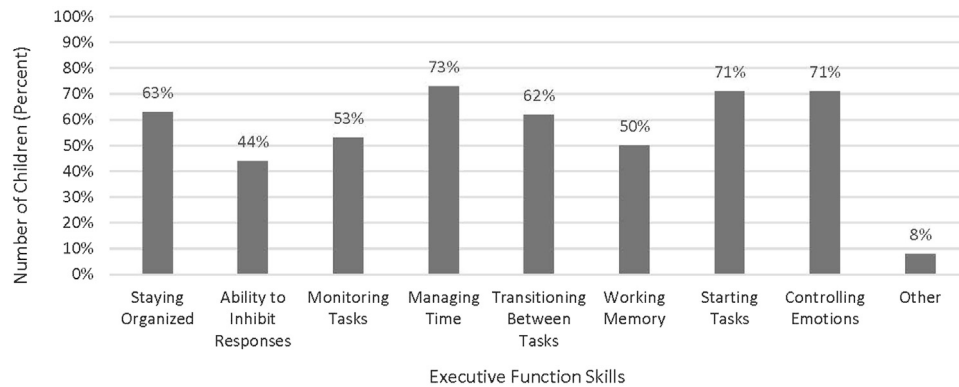
FIGURE 1 | Number of children experiencing difficulty staying organized, inhibiting responses, monitoring tasks, managing time, transitioning between tasks, holding mental information (working memory), starting tasks, and/or controlling emotions during COVID-19 pandemic (caregiver report, n = 580, 70% male, average age = 10.14 years, SD = 3.06).

Block-wise logistic regression indicated total depression score on the PHQ-9 (OR = 1.08, 95% CI [1.00, 1.17], p = 0.047), challenges with monitoring tasks (EF skill monitoring task; OR = 2.39, 95% CI [1.18, 4.83], p = 0.016) and challenges with starting tasks (EF skill starting task; OR = 1.83, 95% CI [1.01, 3.31], p = 0.045) significantly affected the odds of facing difficulties adjusting to online courses (**Table 5**).

DISCUSSION

The purpose of this study was to understand changes in learning and educational services provided to Canadian children with ADHD during the COVID-19 pandemic. To our knowledge, this is the first study to document changes in learning and educational services provided to Canadian children with ADHD. Findings from the study suggested that all children with ADHD switched

to online learning following school closures. The results showed that 90% of children were receiving web-based instruction. This meant that a small percentage of students did not complete online learning since the beginning of the pandemic. However, the reasons for not completing remote learning are unknown.

Similar to the findings of Becker et al. (2020), students with ADHD were engaging in reduced hours of online instruction. On average, in Canada, a child typically receives about 5.5 h of direct instruction from teachers per day. Our data revealed that 41% of students spent less than 5 h per week on their schoolwork, and about 36% spent between 5 to 10 h during the COVID-19 pandemic. This is a significant reduction in instructional hours. With school closures, the impact of these reduced instructional hours on children with ADHD will require follow-up. Future research needs to address whether the reduced instructional time leads to an increase in academic disparity among a group of students that usually need extra

TABLE 5 | Stepwise logistic regression model predicting challenges with online classes for children with ADHD.

Variables	B	SE.	Wald	df	p	Odds ratio (OR)	95% CI.	
							Lower	Upper
SNAP-IV_Inattention	0.191	0.270	0.500	1	0.479	1.211	0.713	2.057
SNAP-IV_ODD	-0.110	0.217	0.257	1	0.612	0.896	0.586	1.370
GAD7_Total	-0.006	0.038	0.026	1	0.872	0.994	0.923	1.071
PHQ9_Total	0.079	0.040	3.952	1	0.047[a]	1.083	1.001	1.171
Staying organized	0.182	0.310	0.346	1	0.556	1.200	0.654	2.204
Ability to inhibit responses	-0.103	0.321	0.103	1	0.748	0.902	0.481	1.693
Monitoring tasks	0.870	0.360	5.847	1	0.016[a]	2.387	1.179	4.831
Managing time	0.458	0.317	2.090	1	0.148	1.581	0.850	2.942
Transitioning from one task to another	-0.059	0.312	0.036	1	0.849	0.942	0.511	1.737
Working memory	-0.061	0.300	0.042	1	0.839	0.941	0.522	1.694
Starting tasks	0.606	0.302	4.022	1	0.045[a]	1.833	1.014	3.314
Controlling emotions	0.424	0.334	1.613	1	0.204	1.528	0.794	2.939
Constant	-0.147	0.462	0.102	1	0.750	0.863		

[a]Indicates p < 0.05. Note: Patient Health Questionnaire-9 (PHQ-9), Generalized Anxiety Disorder-7 (GAD-7), Swanson, Nolan, and Pelham, Fourth Edition (SNAP-IV), Oppositional Defiant Disorder (ODD), Confidence Interval (CI).

support. These findings will help teachers and educators provide targeted interventions and educational support to reduce the gap in learning.

Of the students with ADHD receiving online learning, significant challenges in adjusting to online classes were reported by parents. Specifically, online learning became more challenging for individuals who were exhibiting depressive symptoms and had struggles with starting and managing tasks. Our findings revealed that the majority of online learning for children was dependent on parents. While parents tried to follow a routine during the pandemic, over 60% of them reported finding it difficult to sustain a routine. Additionally, some parents reported that their child with ADHD did not have a quiet space to study at home, was distracted by others, or had to share devices with siblings, and thus were not able to engage in their online learning properly. As Canadian schools begin to reopen, it is imperative to address some of these inequities and support parents as much as possible to prevent further academic disparities.

In terms of learning, a significant portion of the survey respondents mentioned that their child was not receiving learning materials that were based on their child's modified curriculum or individualized education plan (IEP). Given that 41% of the children with ADHD from the current sample had a learning disorder, it is important for teachers and educators to monitor and provide learning materials that are relevant for their students. This will help with engagement and improve the overall learning experience.

Interestingly, parents of children with ADHD reported significant challenges in implementing EF skills during the COVID-19 pandemic. While EF challenges are common in individuals with ADHD (Willcutt et al., 2005), the present study was not specifically investigating changes in EF skills during the pandemic. However, parents and teachers are encouraged to teach and apply strategies, (e.g. using a daily planner, creating checklists, setting time limits) that children with ADHD can use to manage their EF challenges (Gaskins and Pressley, 2007; Kaufman, 2010).

It is also essential to mention that parents of children with ADHD reported significant mental health challenges in their children during the COVID-19 pandemic, especially related to depressive and anxiety symptoms. While the purpose of this study was not to investigate mental health challenges, it is important to monitor these symptoms closely overtime to ensure appropriate interventions are provided for these children. There are severe long-term consequences of untreated depressive and anxiety symptoms, specifically in the pediatric population (Rapaport et al., 2005). Additionally, consistent with the current study, studies with other neurodevelopmental disorders have reported challenges during the COVID-19 pandemic, including individuals with intellectual disability (Courtenay, 2020) and Autism Spectrum Disorder (Colizzi et al., 2020). Although there is some consensus around the impact of COVID-19 on mental health and educational services, it is difficult to understand the exact significance of this pandemic on a vulnerable population. Future studies are required to answer whether the COVID-19 impacted vulnerable populations differently compared to the general population.

Limitations and Future Studies

This study provides valuable information about the impact of the COVID-19 pandemic on children with ADHD. However, these results need to be considered in light of some limitations. The survey data is cross-sectional and thus unable to make inferences about long-term impacts of changes in learning and educational services due to school closures. Another limitation of the survey sample is the reliance on parent reports for the diagnosis of ADHD in their children. As indicated by the SNAP-IV symptoms, a proportion of the children with ADHD did not meet the symptom cut off. However, it is important to note that these below threshold ratings could be due to a number of factors, including receipt of medication or behavioral treatment. Numerous factors impact online learning for children with ADHD, and the current study did not capture all these relevant factors. Lastly, while the survey sample was considered representative of the Canadian population, it is possible that we received responses from highly motivated parents, high socioeconomic status families representing a disproportionate fraction of the population, potentially with needs and struggles.

Future studies are certainly needed to continue to understand the challenges faced by children with ADHD during the COVID-19 pandemic. The current study did not specifically investigate the impact of children's motivation, engagement and commitment to learning on successful online learning experiences; therefore, forthcoming studies are needed to address these concerns. It would allow educators to intervene and address some of the challenges with online learning. It would also be important to understand the challenges of online learning from the perspectives of students and teachers who are engaged in online teaching of students with ADHD. Future studies should address potential variables that could help mitigate challenges related to online learning. Finally, as we monitor the reopening of schools and adjustments implemented by school boards, it is important to specifically understand how the lack of face to face instruction these past few months have impacted learning in children with ADHD.

CONCLUSION

Overall, this study provides valuable information about the educational challenges faced by children with ADHD. Given the present study's findings, it is vital to provide behavioral intervention and treatment to children with ADHD to address their depression and EF skill-related challenges. In addition, it may be useful to tackle emotional concerns simultaneously using a transdiagnostic approach to interventions.

With the strong possibility of a second wave of COVID-19 and additional school closures, it is important and necessary for educators and mental health professionals to be aware of targeted strategies that could help ease the transition to online classes for children with ADHD. As a recent article stated, "we should anticipate that the secondary stressors from the

COVID-19 pandemic will escalate the number of children with developmental, behavioral, psychological, and maltreatment concerns both during and in the aftermath of this crisis" (Fung and Ricci, 2020).

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusion of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Conjoint Health Research Ethics Board (CHREB: REB20-0672), University of Calgary. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

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Higher Education Teaching Practices Experience in Mexico, During the Emergency Remote Teaching Implementation due to COVID-19

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Higher education teaching practices experience in Mexico changed from face-to-face teaching to the emergency remote teaching derived from the health contingency by COVID-19. The change from face-to-face to an online modality in the Mexican education system represented a great challenge for teachers of all educational levels. In Mexico, the federal government declared on Tuesday March 24, 2020, Phase 2 of the plan to address the country's Covid 19 pandemic. Governments in at least ten states decided to suspend their activities and services as of March 17, including the education system. On April 13, the Mexican education system began activities in the online modality exclusively; however, derived from the country's technical adequacy and digital connectivity conditions, a large proportion of the educational campuses, academic programs, and the teaching staff were not prepared for this situation. This cross-sectional study was carried out to analyze the faculty members experiences about the change from face-to-face to an online modality in the health emergency context due to the COVID-19 outbreak. We designed a study to gather information on practice in the new online learning scenario. For this purpose, we collected data on the previous experience in the conduct of online courses, the technological tools used, the barriers faced while driving online courses, the current conditions of use of educational and technological tools, the vision for the future, and some indicators of physical and mental health.In a sample of 341 faculty members, those working in public institutions were on less favorable terms than their peers attached to private universities. In contrast, lecturers recorded better conditions for dealing with modality change than full-time teachers. Likewise, lecturers more often mentioned having their infrastructure to teach courses from their homes than full-time teachers, which indeed responds to less access to the universities facilities in which they teach. Another important aspect to highlight is the increased proportion of teachers in public institutions and lecturers who have other jobs, so their workload can be more intense than those of their peers.

Keywords: emergency remote teaching, higher education teaching, teaching practice's experience, COVID-19, Mexico

INTRODUCTION

As in so many other countries, the change from face-to-face to distance-driven courses in Mexico represented a significant challenge for teachers of all educational levels. Most governments worldwide have closed education institutions as an attempt to contain the dispersion of COVID-19. The temporary closure affects approximately 23.4 million higher education students and 1.4 million teachers in Latin America and the Caribbean; this represents about more than 98% of the region's population of students and higher education teachers (UNESCO, 2020a).

In Mexico, on October 2020, all schools are still closed by the health status declaration issued on March 14, 2020. Since then, 36 million students of all educational levels follow the process of distance learning (Fernández et al., 2020). The 2019–2020 school year has enrolled 4,931,200 undergraduate and graduate students; of these, 869,556 were already online students (Asociación Nacional de Universidades e Instituciones de Educación Superior – ANUIES, 2020). In Mexico, school cycles begin in August and end in June of the following calendar year. In this way, the health emergency was included in the second half of the 2019–2020 cycle.

In this article, we adopt the emergency remote teaching definition provided by Hodges et al. (2020), as a temporary switch from face-to-face teaching to an alternate instructional delivery mode derived of extraordinary events, which implies the use of remote teaching tools for education instead of teaching delivered in a classroom, and that will return to the face-to-face format once the emergency has been controlled. It is important to highlight that emergency remote teaching model implies a fast-track development, and is based in a temporary instructional support system as a result of a crisis, without pre-planned resources or infrastructure, as is required in online learning programs (Whittle et al., 2020). On the other hand, a fully online university course typically requires six to nine months to plan, prepare, and develop a course to be successfully taught (Hodges et al., 2020). In addition, emergency remote teaching implies the use of synchronous communication tools to develop a teaching session, as a replacement of classrooms sessions; online courses are usually developed in an asynchronous fashion.

The change from face-to-face to the emergency remote teaching in the Mexican education system, like that of so many other countries, represented a great challenge for teachers of all educational levels. In Mexico, in the 2018–2019 school year, 4,705,400 undergraduate and graduate students had been attended by 414,408 teachers in 5,535 schools (SEP, 2019).

In the Universities in Mexico, 71% of teachers have a lecturer category. Lecturers have as their primary employment an occupation related to a specific discipline, this promoting teaching by linking real practice and higher education. On the other hand, lecturers may be not integrated into the academic programs. They also had limited benefit from continuous training even if they teach 40 h of classes per week, in various faculties or programs of the same institution or several institutions (OECD, 2019).

Before the health emergency, virtual education was present in most of the largest higher education institutions, public or private, either as an extension of the physical classroom or as a virtual campus. However, this has depended on the capacities of the institutions themselves (UNESCO, 2020a).

In Mexico, remote education began with the need to promote literacy in rural populations, depending on the communication tools available in those times. In 1941 the Primary Radio School for Adults was created; in 1947 the Federal Institute of Training for the Magisterium was created; in 1968 the Center for Basic Adult education and tele-secondary was created; in 1971 the Center for the Study of Advanced Means and Procedures of Education was formed (Navarrete-Cazales and Manzanilla-Granados, 2017). These models have had a favorable impact as a training alternative for social groups that cannot be adapted to the traditional school education model (Moreno and Cardenas, 2012). These models consist of the transmission of content; by following a model of expository pedagogy with evaluations to give information on learning and accredit the degrees. The instructor has a transmission role. The student has to listen or read and follow guidelines, respond to exercises, and be evaluated. There was no synchronization in communication, and this communication is a one-way road.

The pioneers of distance university education in Mexico were the Universidad Nacional Autonoma de Mexico -UNAM- and the Instituto Politecnico Nacional -IPN-. In 1972, the UNAM created the Open University System, which is currently known as the Coordination of Open University, Educational Innovation, and Distance Education-CUAIEED- (UNAM, 2020), and IPN created the Open Teaching System in 1974 (Navarrete-Cazales and Manzanilla-Granados, 2017). In the past 25 years, university education online offerings has increased in public and private schools. In 1997 the Instituto Tecnológico y de Estudio Superiores de Monterrey -ITESM-founded the Virtual University (Moreno, 2015); the Universidad Virtual del Estado de Guanajuato started operations in 2007 (UVEG, 2020); and the Open and Remote Universidad de Mexico was created by presidential decree in 2012 (UnADM, 2020). Since 2009 it has operated as a program of the Ministry of Public Education (UNAM, 2020). Currently, virtual education is considered a means to improve university students' skills and learning (Duran, 2015).

The change from face-to-face to the emergency remote teaching took place in a Mexican education system characterized by the lack of teachers trained to incorporate information technologies into the daily pedagogical experience, insufficient technological capacity to meet the simultaneous demand of millions of users, and unequal access to the availability and use of information technologies in Mexican households (Fernández et al., 2020).

In Mexico, 44.3% of the country's households have a computer, and 56.4% have internet through a fixed or mobile connection. The service shows slow information transfer (50.1%) and constant interruptions (38.6%). In particular, 39.1% of students in the country lack this service (Instituto Nacional de Estadística y Geografía- INEGI, 2019). On the other hand, the availability of technology seems insufficient for the number of people who usually live on average households, which were 3.7 people in 2015 (Instituto Nacional de Estadística y Geografía- INEGI, 2015).

The confinement derived from the health contingency by COVID-19 brings significant challenges for teachers of all educational levels. It requires great adaptations and the development of new skills to comply with the curriculum.

Moreover, insufficient technological endowment or trained personnel has also added the need to create or modify processes and the lack of adequate personnel to develop such processes and adaptation technologies. However, with no more time to prepare these conditions, teachers have been forced to work with creative and innovative solutions, over the march, adapting, and easing the content and designs of learning courses in different training areas. The intensive use of these platforms and tools in traditional courses always depends on the initiative of teachers (UNESCO, 2020a)

Gradually, teacher's strategies to adapt to remote education derived from the health contingency have been published and are no longer just the anecdotes in social media. To date, UNAM published a study of Educational Challenges during the COVID-19 pandemic. As a result, they find that the main problems faced by teachers are related to logistics (43.3%), technology (39.7%), pedagogical challenges (35.2%), and socio-emotional status (14.9%) (Sánchez et al., 2020). Another study to identify teachers, students, and their families' educational experiences in basic education, during COVID-19 confinement was conducted at the National level by the National Commission for the Continuous Improvement of Education. The results were pending as of this publication (Comisión Nacional para la Mejora Continua de la Educación -MEJOREDU, 2020).

MATERIALS AND METHODS

This is a cross-sectional, exploratory, non-experimental, and descriptive study through an online questionnaire. The research question for this study is to understand the challenges faced by higher education instructors and students as a result of the implementation of the emergency remote teaching model in the context of COVID-19 outbreak, considering that there could be significative differences between public and private higher education institutions. In the instructor's case, this study expected a significative difference regarding challenges faced between instructors accordingly to the type of contract they have with their employer (full-time professor and lecturer).

Sample

The sampling was carried out by the snowball technique to higher education teachers of Mexican public and private institutions. The decision of using snowball sampling for this study was based on the lack of access to a list of faculty members from diverse higher education institutions, which is a requirement for random sampling (Etikan et al., 2015). In addition to the lockdown restrictions imposed by health authorities to avoid mobility as a measure to slow COVID-19 spread, the possibility of getting access to instructors from several higher education institutions across the nation was another incentive to choosing this sampling method. This study aimed to capture information from an array of instructors working in different institutions with a variety of ways to respond to the emergency remote teaching. The criterion of inclusion was to be a university teacher and have taught at least one course between January and July 2020. It was when the national indication was given to change the face-to-face model to

distance learning. The target population includes undergraduate, master, doctoral, and specialization professors.

Data Collection Instrument

We integrated a team of full-time professors and lecturers from public and private universities in Mexico to design the study and the data collection instruments. The questionnaires were elaborated based on researcher's team experiences gained after the emergency remote teaching implementation, as well as on some validated questionnaires (Sánchez et al., 2020). In addition, we adapted the Teachers Stress Scale (ED6) to measure stress in higher education instructors (Gutiérrez-Santander et al., 2005). Two separate questionnaires were developed to collect data for each population (students and instructors), with the purpose to contrast perspectives from both groups about the same phenomena; questions for students were adapted to their circumstances and academic activities but maintaining the comparability with instructors' questions, as possible. Students questionnaire and results will be discussed in an upcoming article, as the current document is centered in the instructors' experience, exclusively. The instructors' questionnaire objective was to explore graduate and undergraduate teachers' experiences related to the change from face-to-face model to a remote modality implemented to ensure the healthy distance strategy derived from the health emergency from the COVID-19 outbreak. To reach that goal, the instrument has eleven sections, as follows:

Overview

We collected participants' demographic characteristics such as age and gender, marital status, housing condition and cohabitation, household composition, minors, seniors, and special needs persons' care. We also obtained information about the city and state of residence.

Affiliation Institution

This section included questions about the institution in which they teach, the name, level of studies, the number of different courses, the knowledge areas of these courses, the number of students enrolled, and the academic program's name. If they work in more than one institution, they must choose the one with the highest education level or where they have the most groups or students.

Teaching Experience

We asked about the teacher's educational characteristics as a degree and field of knowledge, the time of experience in teaching, and their exclusivity to teaching practice.

Other Jobs

We requested information about other jobs, the kind of work, and the conditions under which that work is carried out during the contingency by COVID-19.

Teaching Practice Before Change from Face-To-Face to the Emergency Remote Teaching

This section's aim was to inquire about previous infrastructure conditions for offering online courses, pedagogical skills

associated with the use of communication technologies and technological tools, technological adequacy expressed by the provision of electronic equipment, adequacy of internet connectivity, and the logistical adequacy related to the spaces and the quality of the spaces to impart their courses.

Teaching Practice After Changed from Face-To-Face to the Emergency Remote Teaching

This group of questions collects information regarding the current characteristics of remote teaching, current technological conditions, adequacy of current connectivity, current logistical adequacy, barriers in teaching practice associated with switching to online mode exclusively, and the economic impact of working from home.

Physical and Mental Health Conditions

This section aims to identify COVID-19 risk factors, and symptoms and signs of anxiety, depression, motivation and satisfaction.

Interpersonal Relationships

These questions inquire about interpersonal relationships with family, and students originated from the work and associated with the change from face-to-face to emergency remote teaching.

Troubleshooting

We ask about institutional support for solving troubleshooting and solving technological issues.

Identification of Problems in Students

This section includes identifying students' technological qualifications, connectivity adequacy, current logistical adequacy, lack of knowledge and use of specialized tools, poor time management, financial problems at home, mental health problems, and domestic violence.

Future Perspectives

The last section asks about the willingness to continue in distance mode teaching and the desire to get trained in various digital forms for teaching practice areas.

Data Collection

Data collection was done using an online Google Forms questionnaire; this tool allowed us to monitor the questionnaire response in real-time. Data collection was done during the period from June 20 to November 6, 2020. We sent an invitation to participate in the study to a database contact associated with the Binational Border Health Network and other colleagues. The invitation included a brief description of the study, its objectives, and its scope. Participants were also asked to share the questionnaire link among their colleagues to dispersing the invitation by a snowball.

Participants agreeing to join the study gave their informed consent to provide the study's information and consented to such data for statistical analysis purposes. Names, email addresses or other ways to identify the respondents were not asked.

TABLE 1 | Sociodemographic characteristics of participants.

Variable	
n =	301
Sex	
Female	53.3%
Male	47.8%
Age groups	
25–39	27.6%
40–49	35.8%
50 and more	36.6%
Marital situation	
Single, widow, separated, divorced	31.5%
Married, in a consensual union	68.5%

Data Analysis Strategy

Data were exported and analyzed using SPSS version 25.0 (IBM Corporation). Descriptive statistics were presented as counts and percentages to summarize the collected data.

As a data analysis strategy, we stratified the teachers in relation to the institution type in which they are working, public or private, and their designation in the institution, full-time teachers, or lecturers. We chose these variables since we assume that the level of infrastructure in private institutions favors the use of information technology in teaching practice. Similarly, we consider that the access of full-time professors to the infrastructure of universities is greater than that of professors per subject.

RESULTS

We received a total of 358 responses from them, we excluded 57 responses due to eligibility criteria for a total sample of 301 complete responses. We had an 84% response rate. Of these, 82% of participants live in seven states of the Mexican Republic, out of 23 states represented in the study. The states with the largest participation were Baja California (26.4%), Quintana Roo (20.1%), Tamaulipas (11.3%), Nuevo León (10.2%), Zacatecas (5.3%), Coahuila (4.9%), and Mexico City (3.9%). Academics from more than 110 universities in the country participated; they teach in 62 undergraduate academic programs, 17 master's programs, three specialty programs, and seven doctoral programs. About the discipline of teachers training, the greatest participation was of professionals in the areas of Medicine and Human Pathology (25.4%), Economic and Administrative Sciences (19.0%), Pedagogy and Educational Sciences (15.1%), Life Sciences (10.3%), Psychology (8.6%), and Sociology (6.0%). The remaining 15.6% declared a wide variety of disciplines.

Demographic Characteristics of Participants

Of the 301 participants, 53.3% were females; the participant's age ranged from 25 to 69 years (mean ± SD = 45.92 ± 9.78 years). About 27.6% of the participants were aged 25–39 years, 35.8% were aged 40–49 years, and 36.6% were aged 50 years and older. The larger proportion of the participants (68.5%) reported being married or in a consensual union (**Table 1**).

TABLE 2 | Job profile of participants.

Type of work institution	(%)
Public	68.5
Private	31.5
Level	
Undergraduate	84.9
Graduated	15.1
Position	
Professor or professor-researcher (full time)	50.9
Lecturer	49.1
Number of courses	
1	12.9
2	24.1
3	32.3
4	14.7
5	8.6
6 and more	7.3
Number of groups	
1	9.9
2	27.2
3	24.6
4	15.9
5	11.2
6 and more	11.2
Number of students	
Up to 30	20.3
31–59	27.6
60–119	31.0
120 and more	21.1
Weekly hours dedicated to teaching	
Less than 20	65.5
Between 20 and 40	31.5
More than 40	3.0
Years of experience as a teacher	
Less than 10 years	31.5
10–19 years	35.8
20 years and more	32.8
Other job(s)	
Yes	53.0
No	47.0
Working from home in other job(s)	
Yes	47.2
No	35.8
Some yes, some no	17.1

Job Profile of Participants

Regarding their job profile, 68.5% of the participants worked for a public higher education institution, while a private higher education institution employed 31.5% of the participants; a vast majority of the participants (84.9%) reported teaching at the undergraduate level. About 50.9% reported having a full-time title about their job's position, and 49.1% have a lecturer contract. More than two-thirds (69.3%) of the respondents declared responsible for up to three different courses, and the other 30.7% are in charge of four or more classes. About the number of groups, 61.7% of the respondents declared to be in charge of a maximum number of three groups. And 37.3% of them are teaching for four groups and more. The number of students these education professionals handle is high; 20.3% of the respondents have up to 30 students, and 21.1% have 120 students or more. For many of the respondents, teaching is not their only job; actually, 53% reported having another job (**Table 2**).

Institutions Digital Conditions, and Teachers' Skills Before the Emergency Remote Teaching Model Implementation

From this point, we present the data analysis in two categorizing variables: the type of institution, public and private; and professors' appointment, Professor or professor-researcher, and lecturers. From now on, we are referring to the Professor or professor-researcher category as full time teachers.

About knowledge of infrastructure, professors from private universities declared better conditions, with virtual campuses (84.9%) and online courses offer (75.3%), but in a smaller proportion, the virtual classes were part of the subject (32.9%). On the other hand, lecturers registered a better position for the three categories that were asked: virtual campus endowment (83.3%), online course offerings (70.2%), and online section as part of the courses (38.6%). However, we should note that the three characteristics correspond to the conditions of the institutions properly.

Concerning previous skills, private universities professors declared better states about being familiar with the use of educational platforms (90.4%), with the conduct of online courses (67.1%), with the remotely evaluation of students (69.9%), and having experience offering online courses (56.2%). But public universities teachers were in better condition about taking online training courses (77.4%) and being familiar with remote education teaching tools (80.5%). Regarding the type of appointment analysis, lecturers showed a higher level of familiarity with the use of educational platforms (87.7%) than full-time teachers, the use of distance learning teaching tools (79.8%), the conduct of online courses (67.5%), the remotely evaluation of students (66.7%) and having conducted online courses (50.0%) and were only excelled by the full time professors concerning having received online training courses (79.7%). It is essential to note lecturers cannot commonly participate in universitie's academic activities, and activities are planned based on full-time teachers' needs (**Table 3**).
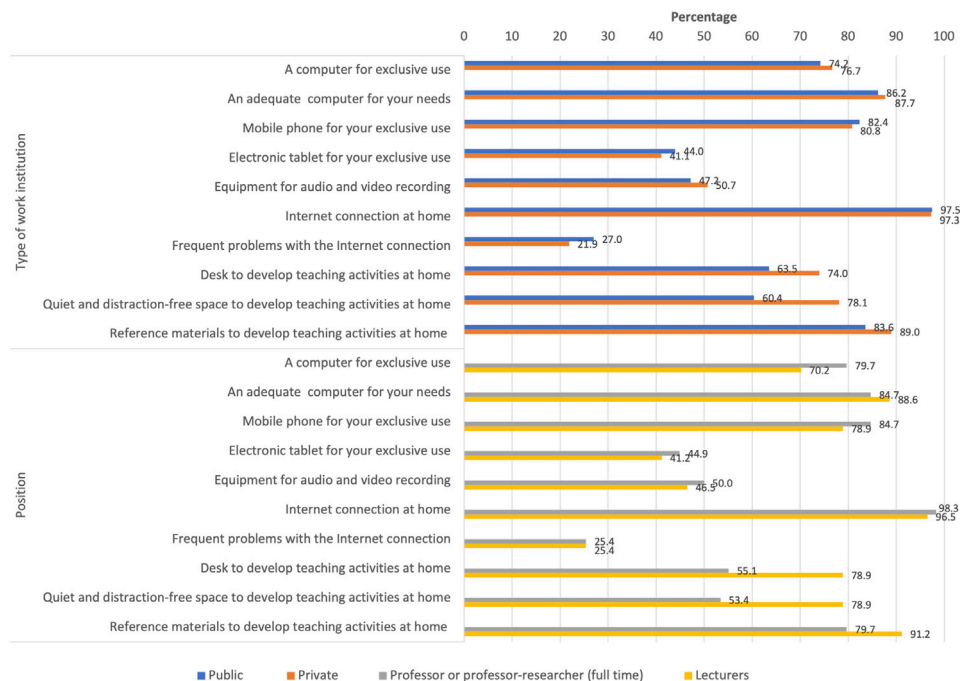
Use of Technological Tools to Support the Teaching Practice, Previous to the Emergency Remote Teaching Model Change

Concerning the use of technologies, professors from private universities declared greater use of the included tools. This difference was greater by up to 20 percentage points using academic work platforms and video tools, between 12 and 13 points for synchronous work and storage tools. The one that showed the least difference (6 percentage points) was the communication tool. By the type of position at work, the differences between lectures and full-time professors were small. It would seem that the use of tools is more associated with the type of university than the kind of appointment, because it shows less difference in use by teachers according to the type of appointment (**Figure 1**).

TABLE 3 | Digital conditions of institutions and skills of teachers before the emergency remote teaching model by type of work institution and appointment.

	Type of work institution		Position	
	Public (%)	Private (%)	Professor or professor-researcher (full time) (%)	Lecturers (%)
Infrastructure				
The University had a virtual campus	71.7	84.9	68.6	83.3
The University offered online courses	65.4	75.3	66.9	70.2
Online courses were part of the subjects	39.6	32.9	36.4	38.6
Abilities				
Had taken online training courses	77.4	69.9	79.7	70.2
Familiarity with using educational platforms	85.5	90.4	86.4	87.7
Familiarity with the use of distance education teaching tools	80.5	75.3	78.0	79.8
Familiarity with conducting online courses	62.3	67.1	60.2	67.5
Familiarity with the assessment of distance learners	56.6	69.9	55.1	66.7
Had ever conducted online courses	42.1	56.2	43.2	50.0
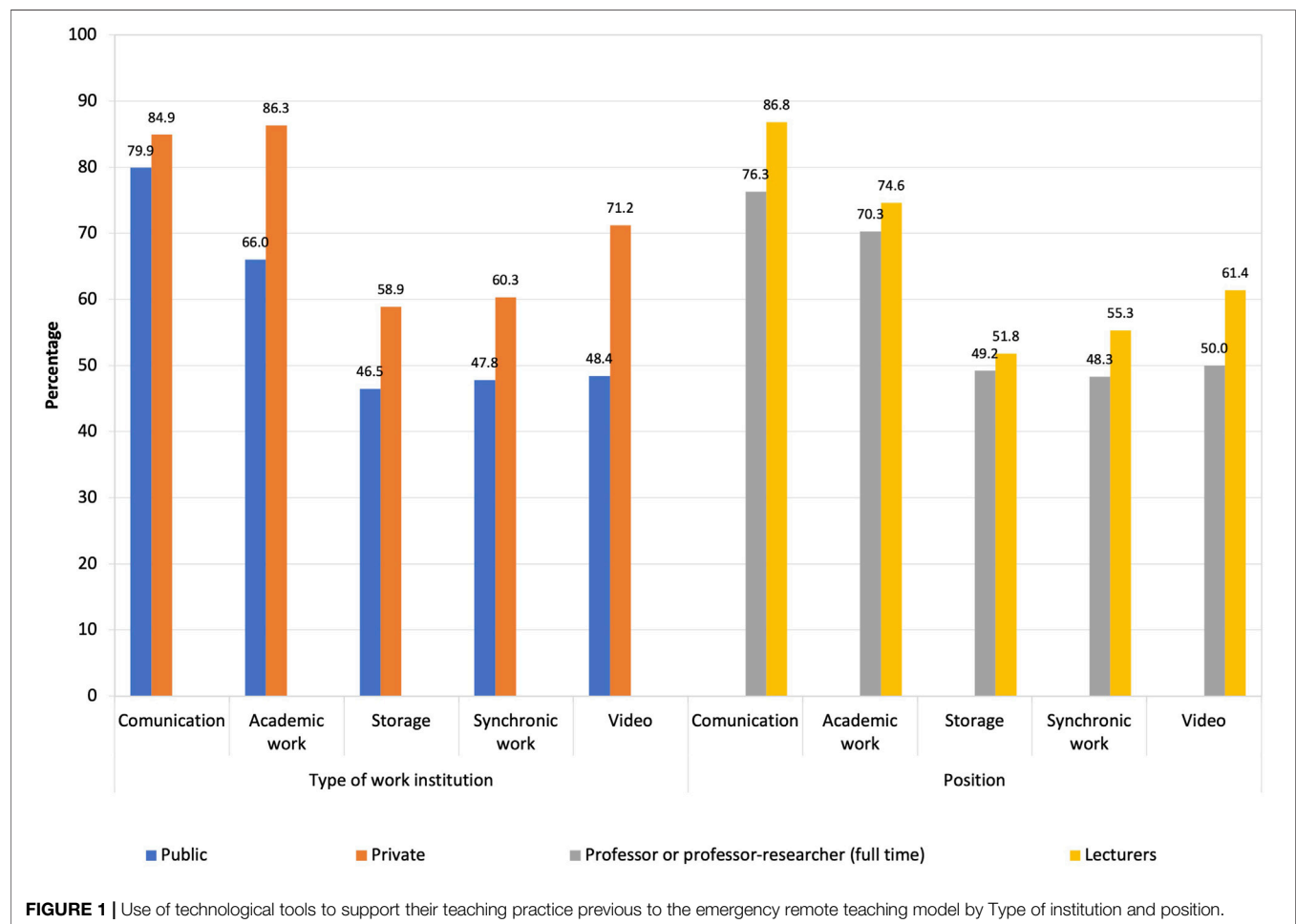
FIGURE 1 | Use of technological tools to support their teaching practice previous to the emergency remote teaching model by Type of institution and position.

FIGURE 2 | Technological, connectivity, and logistical conditions for the teaching practice previous to the emergency remote teaching model, by type of work institution and position.

Technological, Connectivity and Logistical Conditions, Previous to the Emergency Remote Teaching Model Change

We collected information for five indicators of technological conditions, two of internet connectivity, and three related to logistical adaptations for teaching practice. Of the ten indicators identified in seven of them, private universities professors had better conditions than those from public universities. However, the differences between the two types of professors are small and range from 1.5 to 3.5 percentage points.

We observe the most significant variations in infrastructure adaptations. Examples of these included having a desk to develop its teaching activities (with a difference of 10.5 percentage points) and having a quiet and distraction-free space to develop teaching activities at home (that presented the greatest variation, a 17.7 percentage points difference).

The three categories in which professors at public universities had better conditions are having a mobile phone and an electronic tablet for exclusive use and having internet connection at home. In the other hand, full-time teachers show better technological adaptations than lecturers.

In contrast, lecturers presented better conditions concerning logistical endowments presenting more than a 20-percentage points difference for the desk to develop activities as a teacher and a quiet and distraction-free space for teaching activities from home in relation to full-time

teachers. A result to highlight is that one quarter of both types of professor declared internet connection problems (**Figure 2**).

Use of Digital Technology Tools During Current Academic Work

Concerning the use of technological tools to support their teaching practice, teachers from private institutions showed better conditions than professors at public universities in the five categories of tools defined for this study: communication (93.2%); academic work (91.8%); storage (56.2%); synchronic work (91.8%); video (82.2%). In the case of distinction by type of contract, lecturers presented better conditions of use in four categories of tools: communication (93%), academic work (84.2%), video (76.3%), storage (52.6%), but in the case of synchronic work, full-time teachers had a better condition (90.7%) (**Figure 3**).

The biggest variations between the use of tools before the emergency and currently is in synchronous work tools and are presented by full-time teachers. They have an increase of 42 percentage points. The second place was in public universities teachers, with a rise of 34 percentage points, followed by teachers from private institutions with 31 percentage points, and in the case of lecturers, the increase was 24.5 percentage points. The slighter variations were in the case of storage tools.

Differences in tool use are less marked when analyzing by position type. The biggest difference in using synchronous
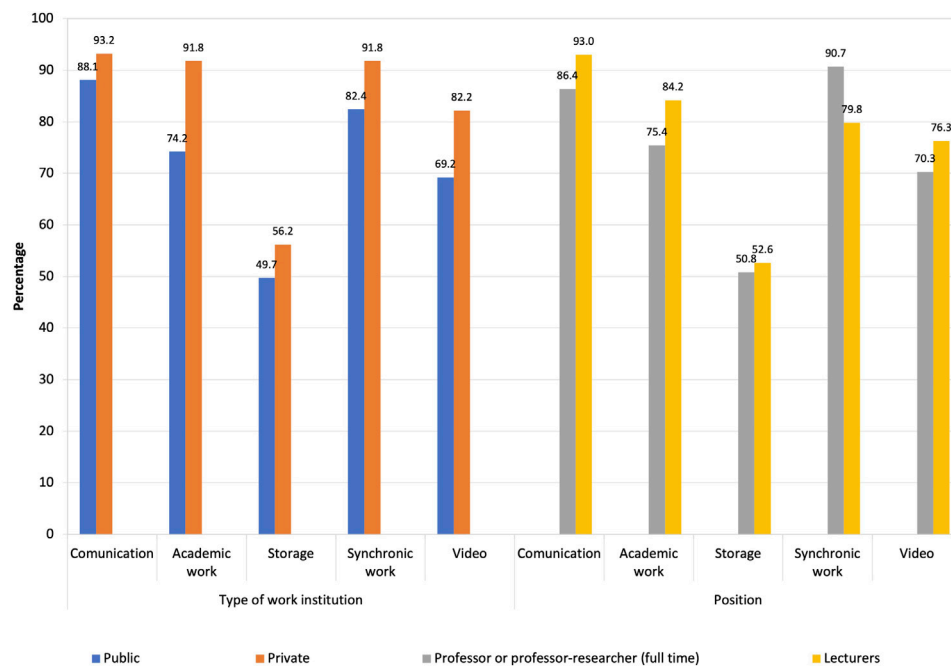
FIGURE 3 | Use of technological tools as a current support for their teaching practice by type of work institution and position.

work tools are between full time professors and lecturers. The type of tools with the lowest level of difference is communication tools, which may be related to the availability and popularity of such tools. The category of tools that has the greatest difference between teachers by type of institution is academic work tools. We need to remember that this tools should be provided by the institution. However, it stands out that less than half of professors at public universities use that type of tools (**Figures 1**, **3**).

Technological Conditions for the Current Teaching Practice

Concerning the technological conditions for their current teaching practice, public university professors declared that they were in better conditions than private universities professors. Public university professors presented the highest proportion of computer equipment for exclusive use (73.6%), electronic tablet for exclusive use (43.4%), and equipment for audio and video recording (27.7%), exclusive mobile phone (83.6%) and problems with an internet connection (24.79%) show a better level for private universities professors.

Concerning the technology conditions for their current teaching practice, full-time professors report better conditions in exclusive use computers (80.5%), mobile phones (83.9%), and electronic tablet (50%). In contrast, lecturers recorded greater access to audio and video recording equipment (27.2%) and had less frequent internet connection problems (21.9%).

Regarding the technical conditions for their current teaching practice by type of institution, variations range are from less than one percentage point to less than five percentage points. When we analyze by contract type, the variations are greater, having a variation of 11.2 percentage points in the frequency of internet connection problems at home and 16.5 percentage points for availability of computer for exclusive use (**Figure 4**).

About the technological characteristics declared before the pandemic, there is a greater variation for the four categories of teachers in the provision of audio and video recording equipment. In all four cases, this is a decrease ranging from 19.3 to 26 percentage points for professors; this indicator's behavior contrasts with the increased use of videos and tools for synchronous work declared by university teachers. We believe this may be because although more audio and video tools are used to have synchronous sessions, they are considered part of communication platforms even when audio and video are being streamed and were previously used to record the session (**Figures 2**, **4**).
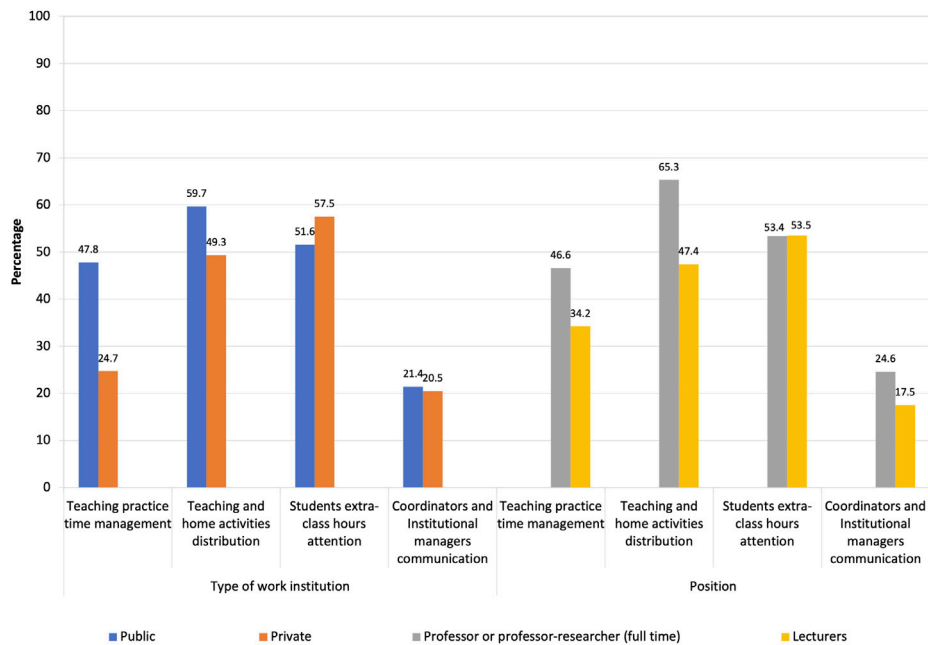
Current Logistical Problems in Teaching Practice

The full-time professors and public universities professors declared the greatest proportion of problems concerning current logistical issues. The main difficulty is the distribution of time between teaching and household activities; in this case, participants reported having this
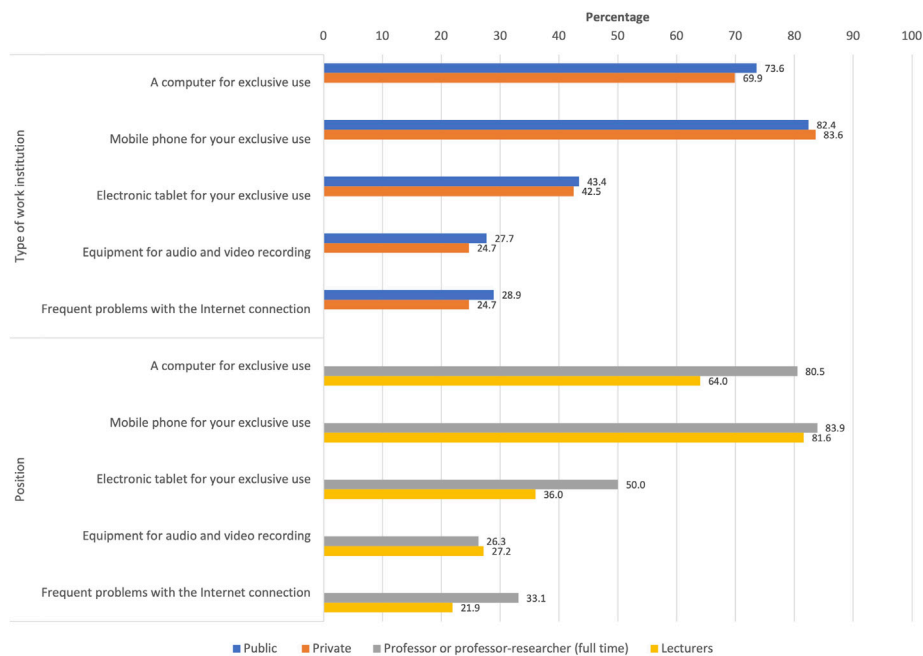
FIGURE 4 | Technological adaptations, connectivity in the current teaching practice of teachers by type of work institution and position.

FIGURE 5 | Current logistical problems in the teaching practice by type of work institution and position.

problem at 65.3% and 59.7%, respectively. The second most common problem for the four categories of teachers was the extra hours of attention to students, with more than 50% in all of them, reaching almost 6 out of 10 for teachers in private

universities. The third problem with the greatest presence is the teaching practice time management and was reported by 47.8% of professors from public universities and 46.6% by full time professors. For the four categories of teachers, the least
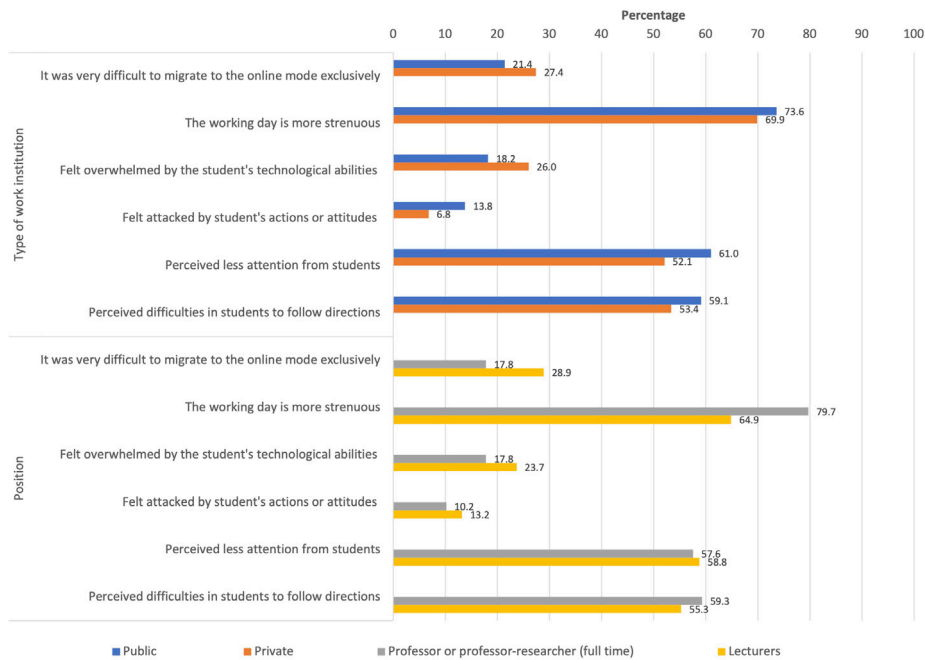
FIGURE 6 | Barriers in the teaching practice by type of work institution and position.

Barriers in Teaching Practice

The four categories of teachers consider in a large proportion that working hours are more strenuous than before the online modality, full time professors 79.7%, Public 73.6%, Private 69.9% and lecturers 64.9%. The following most relevant problems are associated with having received less attention from students in 52.1% and 61% of cases in all teacher's categories, between 53.4% and 59.3% of teachers reported having seen greater difficulties in students in following the directions (**Figure 6**).

The Economic Impact of Teaching Work From the Teachers'

In general, we observe minimal variations between expenditure increases for six of the eight indicators for each pair of professors' categories analyzed. Between full time professors and lecturers, the biggest difference in spending was data expenditure for the cell phone and electricity service. Overall the largest increase in payments declared by the four categories of teachers was the Electricity Service. The second expense declared in a more significant proportion by three categories of teachers was the house's internet service; the third expenditure declared in greater

problem stated was institutional communication with coordinators or managers. Combining these situations may have exposed teachers to a process of physical and emotional breakdown, which could be reflected in their teaching performance (**Figure 5**).

proportion by three categories of teachers was the spending on data for the cellphone (**Figure 7**).

DISCUSSION

The emergence of COVID-19 represents, to date, one of the most significant health crises in the recent history of humanity; at signs of its rapid spread, national governments around the world began to take steps that sought to contain the rate of dispersal of the disease (UNESCO, 2020b; UNESCO, 2020c). Among the activities that underwent a drastic change in their usual way of developing was education at all levels, moving from an in-person modality to an emergency remote teaching modality (Hodges el al., 2020; Mahdy, 2020; Pragholapati, 2020; Sahu, 2020). Both educational institutions and teachers had very little time to implement the changes necessary to not interrupt the academic cycle (Hodges et al., 2020; UNESCO, 2020b). In Mexico, this change took place a little more smoothly, as it coincided with the Easter holiday period so that the transition could be carried out in a somewhat less hasty way. However, university teachers (like the rest of the teachers at the other educational levels) were not fully prepared to cope with this change. This premise was one of those that gave rise to this study.

Participants in this study are 285 undergraduate, master, or doctoral higher education teachers from public or private institutions in Mexico who taught between January and July 2020. This study is one of the first to be carried out in this
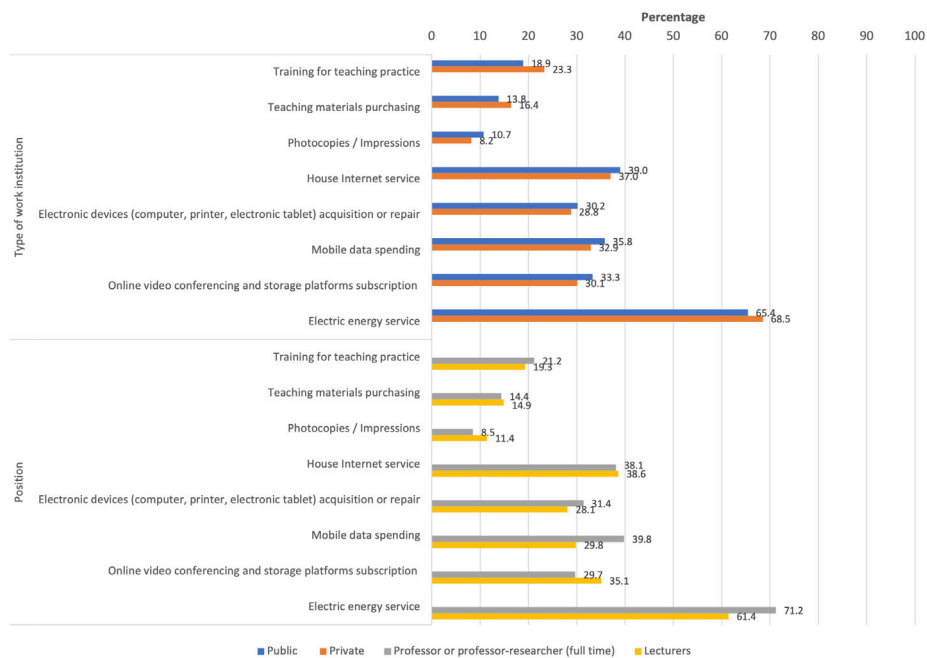
FIGURE 7 | The economic impact of teaching from home by type of work institution and position.

regard in the country; we only reference the one presented by UNAM. (Sanchez et al., 2020). The emergence of COVID-19 and its initially unsuspected consequences have had impacts that go beyond the field of public health. The rapidity with which the outbreak spread and the little information about its potential led governments to make strong decisions to try to keep this disease under control. More than eight months into the confinement, little is known about the consequences it has had and will have in the future. In particular, there are many concerns about how student's academic readiness will be affected, and what other impacts will be in the immediate future. For this reason, this document seeks to contribute information on how teachers faced the transition to emergency remote teaching, as a diagnosis of their ability to respond to challenges of this magnitude. The data presented seek to provide inputs for decision-making that contribute to the search for solutions to emerging problems in the field of university education.

The intention was to have a sample that would represent the structure of the national teaching plant and have a presence of 59% of public university teachers and 41% of private university teachers (Asociación Nacional de Universidades e Instituciones de Educación Superior - ANUIES, 2020); however, we had greater participation of professors from public universities (69%). On the other hand, we tried to have a participation of 70% of lecturers because it was the proportion identified at the national level (OCED, 2019), but we had very balanced participation between the two categories of teachers. Nearly a third of teachers had four or more courses, 38% had four or more

groups, and 52% served 60 or more students. More than fifty percent declare to have another job, which is associated with being a lecturer.

In this study, the data captured show that professors from private universities and lecturers, in contrast to their peers, declared a more significant proportion use of technological tools to support teaching practice since before the health emergency (Sanchez et al., 2020). This result seems consistent with the fact that private universities offer a considerable number of courses online, so teachers are more likely to be familiar with these academic work tools. Similarly, there was an increase in the proportion of teachers who used technological tools due to the shift to remote education; mainly, teachers showed more significant use of communication tools. This latest fact clarifies that teachers faced the need to identify new ways to communicate with their students through digital message applications. Despite this availability of digital channels to maintain contact, university teachers indicated that they felt further away from their students, which coincides with the results of a comparative study between teachers and university students in Mexico and Argentina, in which the authors also highlight the existence of better tools for communication as well as an unfavorable impact on teacher-student relationships (Gómez et al., 2020).

In contrast, the data captured in our study suggest that a sector of university teachers had to deal with the shift to the remote teaching model in unfavorable issues of technological and workspace adequacy, which must undoubtedly have represented an additional challenge in adapting to the

change in modality. That is, while teachers might be familiar with some technologies that facilitated their work during confinement, they often did not have the right equipment and space in their homes to develop their teaching activities. A similar conclusion was presented in the comparative study with Argentina, where Mexican teachers declared a greater lack of equipment for their teaching work (Gómez et al., 2020).

Another issue that is considered important to highlight has to do with the barriers that teachers perceived during the process of teaching their courses from confinement, considering that their working hours have become more strenuous, that they did not have the tools to optimally manage their time, that they did not find a balance between the time dedicated to teaching and home activities, which is in accordance with the concept of double shift or double presence (Franco et al., 2020), and the identification of schedules to serve students outside the classroom environment, a condition associated with the fact that students paid less attention during class and that they demonstrated greater difficulties in following the teacher's instructions for carrying out activities, point to an environment of high levels of stress, which could have led the teachers to burnout. These results are consistent with what was found in other studies, related to stress in workers during confinement due to the abovementioned health emergency (Giniger, 2020; Victoria and Curo, 2020).

We want to highlight the lecturers' case; even though they could have faced more challenges because of their contractual relationship with their higher education employers, the results of this study point out a better response from this group to the emergency remote teaching model. It is important to mention that lecturers could be less involved in university dynamics and have reduced access to the facilities. Based on this premise, lecturers have to cover the requirements for teaching (for example, having a work area in their homes, access to technology and materials) on their own, which allowed them to be better prepared to face the emergency remote teaching conditions. These considerations are supported by the data shown in this article. On the other hand, universities in Mexico should take advantage of the lessons learned from this contingency, through the improvement or the implementation of learning management systems, including instructor training, to be prepared to respond in a more effective way to future emerging conditions.

We acknowledge that this study is missing the institutional perspective regarding the emergency remote teaching model. The study design did not include a review of programs, plans, or any documentation elaborated by the higher education institutions to define guidelines to implement the change of instructional model. This information should be included in future research about this topic to have a better understanding of institutional conditions regarding emergency remote teaching planning, as a framework to be cognizant of how instructor's and student's experiences could be defined by the institutional response.

CONCLUSION

We find that the university-level professors captured in this study had the tools to move their course from a face-to-face modality to emergency remote teaching. Buy they were not homogeneous if we analyzed by type of higher education institution and the type of contract in their workplace. In general, teachers from private institutions presented better conditions for transitioning to the new model without further setbacks. Based on the data obtained, teachers who did not have the equipment or adequate equipment were identified to cope with remote work transition. Similarly, the answers indicate a lack of teachers' familiarity with various digital tools to facilitate their remote teaching experience. In both cases, it is suggested that universities should implement strategies that enable access to equipment and tools among all their teachers, without making them responsible for covering their cost.

Similarly, since the current situation is unclear about an end date, teachers must receive training to improve their performance under the emergency remote teaching modality and recommendations related to time management and stress management, among other tools to meet the demands of the emerging model.

However, it highlights lecturers, since they reported in more significant proportion to be better prepared for the transition in various areas. Lecturers traditionally do not have adequate workspaces in their universities, so they have had to adapt space in their home to develop their activities outside the classroom, such as preparing classes, reviewing tasks, among others.

It is important to note that in all cases, teachers said they had seen an increase in their expenses related to increased use of electricity and the internet in their homes; this highlights the importance of considering an additional payment as a form of compensation for these higher expenses. Likewise, an important proportion of the teachers stated that their working days became more strenuous, which seems to be linked to the fact that, when working from home, teachers had to face the activities of the home (the so-called double day). The COVID-19 outbreak has undoubtedly represented an enormous challenge in all sectors of country's life. In the particular case of teachers, the conditions under which they are doing their work should be assessed to identify potential impacts on university-level teachers' mental health, which may affect their ability to develop their teaching activities.

There is no doubt that more detailed analyses should be done, and for a more extended time on this subject since this is a new topic, as we are still at a stage where we only see the immediate consequences of the change. We must pay attention to the potential implications in the medium and long term. In some areas of Mexico, emergency remote teaching model will be in place at least during the first semester of 2021.

Further research on this topic should consider the impact of the pandemic on socioeconomic conditions of instructors, evaluation of how the emergency remote teaching model has influenced their teaching methods, and how they are dealing with the challenges they faced, one year later. Also, a wider geographical representativity and a bigger sample could allow us to analyze the differences between regions or states. In

addition, qualitative data could be collected to gain a better understanding of how the instructors experienced the change of teaching model, and their perceptions and expectations for the future.

DATA AVAILABILITY STATEMENT

The raw data that supports the conclusions of this article will not be available until the authors conclude the analysis they are currently working on for upcoming publications.

ETHICS STATEMENT

This project received approval by the ethics committee established 554 by the Mexico Section of the US-Mexico Border Health Commission. A de-identified database was part of the data analysis; the analysis of the data did not include any personal information or any other way to identify the participants.

AUTHOR CONTRIBUTIONS

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Dilemmas, Challenges and Strategies of Physical Education Teachers-Researchers to Combat Covid-19 (SARS-CoV-2) in Brazil

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This paper addresses the challenges presented by the coronavirus pandemic in Brazil, questioning the strategies and the dilemmas shown by teacher-researchers in Physical Education in tackling Covid-19 (SARS-CoV2). The Covid-19 pandemic has had significant social impacts, such as the sudden interruption of basic education activities in Brazil, due to the need for social isolation. Brazilian basic education comprehends schooling from early childhood education (similarly to kindergarten and preschool in other countries) and elementary school (1st–9th grades) to high school (10th–12th grades). Measures taken as precautions have demanded an overhaul of the teaching systems, pedagogical structures, and strategies for interaction, almost all of these being involved in a teaching process that is mediated by digital technologies. Therefore, one asks just how Physical Education teachers and their respective teaching networks get organized when faced with social isolation, with regard to work strategies for ways to relate to knowledge. The main objective of this article is analysing the pedagogical experiences of teacher-researchers–teachers from state-owned schools and university researchers–in four Brazilian states, namely Ceará, Pará, Rio Grande do Norte and São Paulo, in order to discuss the implications upon Physical Education in schools, as a way to tackle the pandemic through social isolation. This is an exploratory and descriptive study that makes use of narratives. It also includes a project for intervention. The design of this analysis is inspired by the methodological structures of pedagogical cases, which includes narrative accounts, the shared analysis of these accounts by different teachers and researchers, and the synthesis of the analyses in the form of a balance of experiences. There are three dimensions that are integrated into the relationship to knowledge–identitary, social and epistemic dimensions–, that are essential for the Physical Education teachers who narrate the situations they have experienced. Here we consider that the educational process must not be reduced to a mere transmission of information through technological resources and digital platforms. One must also accept and acknowledge that complex teaching situations are inserted in the relationships to knowledge. As such, they must not be regarded as generic and fragmented. The purpose of the intervention project is to collaborate with the practices of Physical Education teachers seeking to prevent, identify,

and report on cases of Covid-19 among students and their family members. Social isolation has been the most efficient protective measure to reduce the impact of the spread of the virus, but it comes up against problems to be addressed in Brazil, such as subnotification of cases. In this regard, the project makes a significant contribution toward the fight against the SARS-CoV-2 pandemic. In a certain way, it connects public health actions and the development of communication aids, as well as applications for building of awareness of prevention of health risks, assistance to the most vulnerable and/or isolated people, prevention of the psychological impacts of the health crisis, and the tackling of violence against children during the confinement. Many are, and many shall be, the impacts of Covid-19 upon Brazil and upon the world as a whole. Apart from health and the economy, the pandemic we now face shall have an influence on our system of values and, hence, on our choices and our way of life. This link also becomes explicit when Paulo Freire views education as a political act, with the main intention of stimulating the potential of understanding reality, or in other words "reading the world", a condition to take part in the organisation of this world. It would not be possible to take social action without taking sides, without making choices; and these choices are firmly anchored to a socially constructed system of values. According to Paulo Freire, this human action should be conscientious. The main role of the educational process should be that of constructing this awareness. Therefore, thinking over the values that guide us is of paramount importance. In current reality, faced with a health problem that interferes with our way of life and in the adoption of a given system of values, education should play a key role for the creation of opportunities to think over values and their reformulations.

INTRODUCTION

Many are, and many will be, the impacts of Covid-19 in Brazil and in the world as a whole. Going well beyond health and economy issues, the fact is that the pandemic we now face shall have an influence on our system of values and, as a result, on our choices and way of life. The impact of social and economic conditions on the construction of the system of values of a certain society has been investigated by Inglehart (1971), Inglehart (1981), Inglehart (2008). According to this author, social organization is a key factor within the construction of a hierarchy of values. In studies carried out in different European countries, Inglehart (2008) noticed that there is a difference between the values taken up by new generations, more concerned with issues like autonomy, freedom of expression, and post-materialist values, while the former generations had, among their core values, physical and economic security, or materialistic values. Inglehart (2008) believes that the economic and political changes in these countries has been a key factor in establishing the difference between these two generations. He also believes that the system of values is formed with greater stability in the passage from adolescence to adulthood, and that, in this phase, the situation of the country will have significant effects for the adoption of materialist of post-materialist values. Agreeing with the author, Pereira et al. (2005) state that the source of the values taken up by the individual people is within the current ideological identity.

The school is one of the social institutions responsible for the dissemination of the values of a society, bringing about the interaction between different agents (Menin, 2002; Thornberg, 2008). To think about the educational process and its impact on the setting up of the system of social values, we feel it is essential to seek support from the pedagogical concept defended by Freire (1996). The link between education and values is strongly evident in Freire (1996), and appears, for example, when the author argues that education is a political act, with the ultimate aim of instilling in the student an understanding of the reality in which he or she is inserted, thereby allowing the "reading of the world". This reading is essential so that the student can see himself or herself as someone who also "writes the world", takes a stand and makes choices; these choices are anchored to a socially constructed system of values. According to Freire (1996), this human action must be conscientious. It is up to the school, and to the educational process, to make this awareness building happen. Therefore, thought about the values that guide us is in fact essential. In current reality, faced with a health problem that interferes with our lifestyle and with the adoption of a certain system of values, the school must have a key role in the creation of opportunities for thought with regard to the values and their reformulations.

The Covid-19 Pandemic and Education in Brazil

About a century ago, we perceived the first arguments about a revolution in education, triggered by the use of technologies in scholastic spaces. Enthusiasts of cinema and radio, television and computers, among others, started to defend a technological

revolution that did not materialize within the school unit. At moments of radicalization, we even noticed positions that announced the demise of the scholastic institution or even the emergence of a "society without schools" (Buckingham, 2010, p. 38).

Verily wise remarks about such waves were drawn up by educational historian Cuban (1986), Cuban (2001) and taken up again by Buckingham (2010) to reconsider the place of the school within this "game of disputes" between tradition, upheld in the scholastic institution, and the social and cultural calls made by a society mediated by technology. This latter author defends the non-disappearance of the school as an institution, but first stresses the need to bring the concepts of teaching, communication and culture into alignment, going well beyond the absorption of technological terms and devices.

In Brazil, the intersection between communication and education has already been the result of a variety of legal provisions and projects, even if these may have presented themselves in a fragmented manner. This confirms that the progressive growth of technological media and the inroads it has made into the scholastic environment have not had significant effects upon the institutionalized pedagogical practices. Among the many reasons that have played a part in this fact, it is worth mentioning that this issue has been insufficiently addressed as part of initial teacher education (Fantin and Rivoltella, 2012). Looking specifically at the initial and ongoing education of Physical Education teachers, this aspect is also noted, according to statements made by the teachers themselves, who mentioned feeble involvement with the issues of technology and media (Souza Júnior, 2018).

The confirmation of this fact does not allow Physical Education teachers, among others, to feel confident to debate and to use digital technology in their lessons. In general, they cast doubt on whether technology would fit in with their very own philosophies for the teaching-learning process; whether they are actually prepared to invest time and practice to use it; or even how they would use it to enhance the way in which the teachers teach and the students learn (Burne et al., 2018).

In these days marked by the fight against the pandemic of SARS-CoV-2 (also known as Covid-19/corona virus disease 2019), the procedures known as "social isolation" and "social distancing" have been the most effective protective measures to reduce the impact of the spread and contagiousness of this virus (European Centre for Disease Prevention and Control, 2020). It has been used in many countries, including Brazil, where these measures have been in place since March this year.

Among the social impacts that this pandemic has brought, the sudden stoppage of activities in Brazilian basic education–especially the lessons–caused by the need to implement social isolation has demanded a complete overhaul of the teaching systems, the pedagogical structures and interaction strategies, nearly all of these being involved in a teaching process that is strongly mediated by digital technologies. However, the issue is much wider than this, as there are structural inequalities within society, which means that millions of Brazilians have only a precarious access to technologies.

Many school networks around the country have decided to stop in-person activities, preferring to use remote activities or distance learning, with the approval of the Brazilian Ministry for Education. However, the strategies, the actions and the working conditions vary enormously and, in this regard, we see reorganization of teaching activities in many subjects, including Physical Education. The teachers now feel coerced into making use of technology as a condition to press on with their remote teaching activities. Under normal conditions, as confirmed in one of the state-owned networks we have looked into (Torres et al., 2016), many teachers do not even use a computer in their classes; even those who do refrain from using the computer very often throughout the scholastic year.

There are conjectures stating that in the post-pandemic period there shall be greater interest in distance learning, on the part of the students, as learning through digital screens would be more motivating and more efficient. Indeed, according to Betti (2020), scholastic education is largely out of touch with globalization, social media, explosion of time and space, and so on; however, in the current situation, amid the pandemic, we already see the budding of feelings of "hiraeth with regard to the school" and a refusal to take part in remote educational activities. In addition, it is an urgent demand that the state-run school provide the teachers with conditions that encourage a critical and transformative teaching style, with the support of technology. This requirement, in turn, leads to a need for formative opportunities so that the teachers may deal with the growing demands of schooling, demands that were not met during the Physical Education Teacher Education (PETE) degree course (Oliveira and Pesce, 2020).

To establish special programmes for teacher education, it is essential that the teachers be heard and that they understand what challenges they have faced to carry out their roles as teachers in the current scenario. Because of this, the purpose of this paper is to look into the pedagogical experiences of teachers in the state school networks of the Brazilian states of Rio Grande do Norte, Ceará, São Paulo and Pará, with a view to questioning the effects upon Physical Education in schools, considering the fight against the pandemic resorting to the strategy of social isolation. On analysing these educational experiences, we seek to get to know the viewpoints and perceptions of these teachers, with regard to these experiences.

METHODS

This is an exploratory study, descriptive in nature, which makes use of the narrative accounts made by three teachers at state-owned schools in the states of Rio Grande do Norte and Ceará. The design of this analysis is inspired by the methodological structure of pedagogical cases (Armour, 2014), consisting of: 1) narrative statements, in the first person, as stated by teachers who report on the use of digital technology in their lessons, highlighting the opportunities and the challenges of the experience; 2) analysis of narratives by different researchers immersed in the same context yet with different theoretical approaches; and 3) a synthesis of the analyses, as carried out

by a researcher in the PETE field, different from the first two, who makes a general presentation of the experiences and analyses. Regarding the narrative statements (stage 1), the teachers are all coauthors of this study and agreed to collaborate in its conception and analytical development. Ethically, we have discussed the idiosyncratic implications of conducting this study in collaboration and identifying ourselves as coauthors. During the analysis (stages 2 and 3), we have confronted our descriptions twice to avoid bias. Firstly, two researchers acquainted with the teacher's background analysed the report to describe its embedded framework. Then, secondly, another researcher–not acquainted with such background–provided feedback on the descriptions.

In this article, we work with reports submitted by five Higher Education researchers and three full-time Basic Education teachers of the municipal and state school networks of the cities of Belém (one case from the state of Pará), Fortaleza (one case from the state of Ceará), Natal (two cases from the state of Rio Grande do Norte) and Vinhedo (one case from the state of São Paulo). We have supported our descriptions with the collaborative perception of being teachers-researchers who, in the specificities of their research issues–relationship to knowledge, teacher education practices through collaboration between university and school teachers, and digital technology–seek to make a joint analysis of the pedagogical implications of the reports. We believe that the sharing of the reports, different perspectives of analysis and synthesis, as well as resumptions for further thought, strengthen the formation of collaboration networks (Borges and Sanches-Neto, 2014; Venâncio et al., 2017) for the area with qualitative reverberations, to have no hierarchy of knowledge between teacher(s) and researcher(s). So, let us move on to the reports! We organized five accounts to describe the different contexts.

ACCOUNTS

Although the number of teachers who participated in this study might be understood as a limitation, the diversity of realities faced by them during their daily work provides complex qualitative insights. They all work in public schools, located in capital cities from three different Brazilian states, and their working conditions vary from state to state, and even from the location of each school in the same city. In the following accounts, the participating teachers–as coauthors of this study–explain their work conditions and describe some aspects of the school community where they work, such as the social and economical backgrounds of the school community related to the human development index (HDI). We explain briefly the context and idiosyncrasies of each teacher, but kept the personal sense of the writing (1st person) to preserve the original meaning of the narratives.

Account 1–Many Paths, Several (in) experiences: The Cases in Ceará

This account was originally penned by an experienced teacher who has been working for twelve years in the municipal school

network of Fortaleza and for six years in the state-run school system of Ceará. He currently works in four schools, in these systems, and has recently completed a professional Master's degree in Physical Education (PROEF program), reflecting upon and investigating his pedagogical practices. The state of Ceará has an overall HDI of 0.682 and its capital city–Fortaleza–has HDI of 0.754. In terms of well-being, quality of life and human development, a HDI value above 0.800 would be classified as very high, between 0.700 and 0.799 high, 0.550–0.699 as medium and below 0.550 as low.

According to the teacher, after the first notified case of Covid-19 in Fortaleza (Silva and Muniz, 2020), the municipal and state governments decided to suspend in-person school lessons in their respective school networks (both state-run and private) and also used actions related to distance learning (known locally as EAD), in compliance with the terms of State Decree No. 33,519 of 19 March 2020, in item III of Article 3, that states that: "In-person scholastic activities, in all schools and Universities of the Government-run networks, in the state of Ceará, are hereby mandatorily suspended for a period of fifteen (15) days as from 19 March, with the option of starting this suspension on 18 March". In another State Degree, No. 33,523, of 23 March 2020, the suspension of class activities was extended to 1 May 2020. In the municipality of Fortaleza, Decree No. 14,611 of 17 March 2020, determines the suspension of in-person educational activities in all schools of the municipality-owned school network, on a mandatory basis, from 20 March to 31 March of this year.

In this context, the teacher(s) must prepare home-based scholastic activities to be handed in, with the adoption of some forms of Digital Technologies for Communication and Information (DTCIs), including WhatsApp, e-mail from the school coordinator, Facebook, Instagram, Online Student, Google Classroom, and Google Drive), also taking into account the reality experienced by each school, for such use. In the light of such conditions, I would like to present my thoughts about this moment: 1) Difficulty in complying with the pedagogical guidelines of four different schools; 2) Align thoughts and execution of pedagogical practices with the use of DTCIs within the school itself; 3) Heterogeneity in the use of DTCIs as a didactic and pedagogical tool; 4) Difficulty in drawing up and creating situations for experimentation of bodily practices, as a theme unit of the curricular subject of Physical Education, and the use of DTCIs.

Here I must stress that this division into four points is not a result of any hierarchy or sequence, but merely seeks to make comprehension easier for the reader. The items here listed are interconnected, and these relationships can be stressed or not during the discussions. The first topic opens a discussion about my difficulty to comply with pedagogical guidelines in these days of pandemic. Every week, the educational networks (state and municipal) change the information about how to proceed with home-based activities. By way of example, I could mention that, in the first week of suspension of in-person lessons, the Education Department of the State of Ceará advised us to use WhatsApp groups with the student(s) and send documents to the e-mail addresses of the school board; in the second week, we were to send

the activities through Google Drive. In the midst of the turbulence of information, we should also mention that each school uses the DTCIs that are most convenient or most accessible. This means that I see myself having to use different technologies, as I teach in four different educational contexts.

With regard to alignment of thoughts and execution of the pedagogical practice within the school itself, I have also observed, in what has been said at virtual and written meetings of the WhatsApp group, that the teachers have different opinions about the moment we are now going through: some agree with the use of DTCIs while others oppose this. I also see that there are some disagreements regarding which DTCIs should be used, such as Google Drive and/or the WhatsApp group, among others. In most cases, this is because the teacher(s) are more familiar with one type of technology than another. This means resistance to adopt a new resource within the set of DTCIs, also because they do not feel comfortable with "the new", and neither have any training possibilities been offered to the teachers, students or school management, at these times of emergency.

I have noticed that most of the teachers are very worried and hesitant, as they see this as a moment never before experienced in the history of humanity, and that has significantly affected the lives of those working in basic education, their teaching practices, and also the "new" relations that they need to establish with themselves, as human beings, faced with a world pandemic, among the content to be taught and with the students. The heterogeneity in the use of DTCIs as a didactic and pedagogical tool is a point that UI consider crucial at these times of pandemic, as I perceive that within the school unit, we have teachers of different ages, who see the world in a different light and have differing views of the human being, different teaching qualifications, different beliefs, different degrees of (de)motivation, dreams and expectations.

In the schools where I work, I see differences between different professionals regarding the use of DTCIs. As an example, I mention that I know a teacher who has great difficulty in sending e-mails, while there is another teacher, in the very same institution, who can easily create applications and handle different technological resources. This phenomenon is not only among teachers, but also in groups of students. I teach at night, where I have students who are 60 years old and have never used a computer in their lives.

In view of this, how can we reduce the distance between peers, between teachers with and without experience, about the use of DTCIs? What can we do to facilitate the teaching and learning processes with the use of DTCIs in emergency situations? What technological resource would be most appropriate for the students at Brazilian state-run schools? What is the role of DTCIs during these times of social isolation? These are just some of the questions bubbling in my mind!

To close, I would like to highlight the difficulty in preparing experimentations involving content (games and play activities, gymnastics, dancing, sports, contact sports and adventure pursuits) for Physical Education lessons and the use of DTCIs. Physical Education is a compulsory component of the curriculum, that should address the issues of "knowing about something" (concepts and knowledge) and of "knowing how to

do it" (experimentation), of bodily practices. At this moment, I have noticed that, in the Facebook groups on Physical Education there has been a rise in the number of posts asking for suggestions of activities about the aspect of 'knowing how to do it'. On the other hand, I do not see the same occurrence of questions about "knowing about something". However, after all, shouldn't we link theory and practice? Why do we have difficulty in linking Physical Education mediated by DTCIs? Could it be that some content within Physical Education are "easier" or "more difficult" to be put as a theme in these pandemic days? These are just the concerns of a teacher seeking to think, act, and think again, in benefit of the quality and social function of state education, even in difficult periods as the one we now face.

Account 2–Educational Actions in Belém do Pará During These Pandemic Times

This account was originally written by an experienced teacher who has been working for the municipal and state basic education network of the Brazilian state of Pará. He specialized in Special Education, with an emphasis on Inclusion. He has been working as a teacher in a specialized state-run unit, in three municipal schools, and at the Municipal Department of Education (Semec), where he has helped with the recording of video lessons. The state of Pará has an overall HDI of 0.646 and its capital city–Belém–has HDI of 0.746.

For the teacher, we have been advised about the suspension of lessons and have been invited to participate in the delivery of staple food baskets (welfare supplies) in some of the schools. In other schools, we have prepared questionnaires for the students to fill in together with some colleagues, for the Semec video lesson project; here we were divided into cycles, being free to list subjects to be addressed in the lessons. Here I would like to stress that, even though I must acknowledge the efforts that the colleagues at Semec have made to produce content, there has been a lack of specific training for carrying out the activities on video, together with poor publicity of the lessons.

At Semec, the recordings were made with the help of a studio specially hired for the production of the material, which was complemented with homemade videos for showing on free-to-air (FTA) TV and later on YouTube. We used mobile telephones, computers, and social networks, for the publicity of the lessons. Even though the lessons have been praised, I must confess that I received many reports from students who were unable to watch the content due to the lack of a signal on channel 47 (private) in their homes, and for financial constraints blocking them from having a high-quality Internet service to watch the lessons on YouTube. At the City Hall, the video lessons, that were to continue through to the first weeks of July, were terminated earlier to prepone the holidays, which meant that this Project could not even secure the minimum number of lessons for this curriculum component.

Of course we miss the contact with students and colleagues; the moments of sadness on the death of colleagues during the pandemic and, most significantly, we felt the stress generated by the spate of controversies about the lessons being resumed without any assurance of security, which got worse with the

publication of a technical note on 26 May by the State Education Council, establishing a schedule for the return of in-person lessons, penciled in for the first fortnight of July, for the state-owned sector, and the second fortnight, for the private school network.

We felt that our opinion has no relevance, meaning that we are left at the mercy of the progress of data regarding infections, without us having any real assurance that the City Hall or the State Government will ensure minimum conditions of health and hygiene, or even clear and well-structured plans for the resumption of in-person lessons. I work in two different schools, and ever since I arrived, every day we have faced the problem of lack of water. There are also classrooms where the air conditioning does not work, meaning that we are forced to work in the heat or even have a rota of classrooms together with other colleagues.

What we see is the exclusion of students who do not have access to good quality Internet and, more significantly, the feeling of "doing for doing's sake" as there is no training, qualifications or even any standardized guidance to lead these processes.

And, on reading the Council note, some queries come to mind: Why do state-run schools have to restart before private schools? Could this be to see if our students and colleagues have been infected by Covid-19–or possibly to make sure that the students who pay shall be safer?

Account 3–Outlook for the Pandemic Within the Reality of São Paulo

This account was originally the work of a lady teacher who has, for the past nine years, been working in the Government school network of a municipality of the interior of São Paulo State. She has worked as a teacher in a municipal school, and also worked in the Municipal Department of Education, working in the qualification of teachers for the network. The state of São Paulo has an overall HDI of 0.783 and its capital city has HDI of 0.805. However, the teacher works in the network of Vinhedo (HDI of 0.817), which is characterized by offering good working conditions and proper equipment in the schools. Although the municipality has a very high HDI, there is an impoverished population with students who cannot access the internet.

In the teacher's perspective, to talk about my school experience in the pandemic, one must go back in time a bit, as the new coronavirus arrived in my town well before the in-person scholastic activities were suspended. The town where I teach is close to Viracopos Airport with its many international flights. In addition, the municipality has many upmarket closed condominiums, and has a population of about 72,550 inhabitants, meaning that the city is quite small.

The first ever case of the novel coronavirus in Brazil was reported on 26 February and was a case imported from Italy (Brazil, 2020a), involving someone who spent the weekend in one of the luxury condominiums in their city. With this notification, the municipality, and particularly the school where I teach, started some protocols with regard to the pandemic. This was well before measures were taken by the State, and well before knowing that the virus would become a reason to close teaching

institutions. There, my lessons already had to adapt in some ways, as we had already included protocols for hygiene before and after the lessons, with washing of hands and use of sanitizing gel, bought by the management of my school.

At that moment, we started to see the dead on television every day, together with the distancing situation experienced in other countries, while we unfortunately witnessed an utter lack of preparation with regard to the restrictive measures here in our country. However, during this period, many reports and questions asked by the children within the school's daily activities helped, to a certain degree, to make people get alarmed about what was yet to come.

On 13 March, a Friday, I went to school to give my morning lessons, and started to feel feverish, with smarting eyes and a sore throat. I stayed at the school in the afternoon and then, at the end of the day, when I returned home, I had a high fever that continued over the weekend and even on Monday, when I felt really weak.

Then, on 19 March, the City Hall informed the parents that there would be pedagogical proposals during this period of distancing, which we still thought would not last long. Then there was a discussion about the term contact says, and the need to offer 200 days of tuition time or 800 h.

On 24 March, there arose a collection of activities as created by the media center of the Department, without even listening to the teachers about how the structuring of the processes would occur with regard to the children and their families during this new situation. In fact, the creation first happened on an internal process, between the technical team of the Department and the management teams of the schools, and an invitation was sent to anyone with an interest in suggesting activities.

However, in parallel to the network process, my school unit organized and structured contact with families by setting up WhatsApp groups, initially concerned with families who, we knew, could already be facing financial difficulties. However, this contact through messaging apps was organized and managed by the school's management team, and the teachers were not granted access. We could only create or send materials that could be passed on within these groups, without any direct contact with the children or with their families.

Within this process, I decided to construct some proposals that could be experienced by the children in their own homes, and which could, to a certain extent, continue with the projects that we had been constructing before the world stopped, at least our world did. I came up with three proposed suggestions, for the class groups I teach, based on a theme of games and play activities that we had been studying prior to the pandemic. All the proposals had the same organization style: first the theme and our previous study were put into context; then some kind of construction for the children was proposed; at this moment it was necessary to construct or otherwise prepare, based on elements of their daily activities, one possibility being interaction within an e-nvironment which the children could use as yet another option for games and play activities within their homes, or even on their mobile telephones, while attempting to detach most children from the shooting-based games that they always said they spent hours on, so arriving at the proposal of a final product that could

be a base for new types of interaction between the children and their families.

At this first moment, I sent the proposals through the WhatsApp account of the coordination of the school, who would pass the message on to the family groups of each scholastic year group; however, I never got any feedback about what the children thought about this or if they interacted with the proposals, which could have been through lack of feedback on the part of the families or the non-return by the school.

After this initial moment within the repertoire offered to the children through the messaging app, as a work proposal of mine, the Education Department, through a normative instruction, asked us to come up with activities to make up the routine activities of each year, where the teachers of all schools would send the Department a routine schedule divided into days of the week, with their respective content. Thus, the teachers of Physical Education were asked to include their activities in a "space" within this routine, a space they called "recreation". I readily opposed this and started another proposal, opposite to this, for construction in partnership with the polyvalent teachers of my unit, in a non-fragmented movement. Soon came another normative activity, by which "specialist" teachers would no longer work on the schools' routine. They had to rally round with their colleagues from other schools, by class year, and then only send "activities" for the corresponding years. At this moment, I ended up taking responsibility for the fourth year, and planned proposals for the whole network, together with a Physical Education teacher from another unit; however, once again opposing the guidance, I continued working in partnership with the teachers of my own unit.

This movement continued for 2 weeks, and then we received notification of holidays. We stayed on holiday for 20 days and then we returned with a new style of organization. The collection, which formerly had proposals based on years, was now organized by school, meaning that each school would organize its own proposals based on some established guidelines, including: that the specialist teacher would produce activities contextually removed from the routine as proposed by the teachers, that would also be placed in a separate location from the school routines, generalizing the proposals for years, based on the whole network. I opposed this organization once again and embarked upon construction with my colleagues from the unit. We constructed proposals and interdisciplinary routines that for some weeks started from the themes of body culture, such as: discussion about the types of gymnastics; eating habits and physical activities, carried out in the third year; games and play activities as portrayed in works of art, in the second year; and African play activities, in the fourth year. However, I still need to send the "activity" to be part of the Physical Education collection on the City Hall website, as I was the only specialist teacher in the whole network who wanted to construct proposals articulated with school routines, by year.

In this regard, my main difficulties are related to moments of direct contact with the children, and interaction and constant dialogue with work colleagues, to establish a routine that could be interesting for the children and, at the same time, not fragmented and not a mere mishmash of activities. Together with these

difficulties, a strong feeling of anguish still lingers, for being part of a movement which is the exact opposite of what the network established and what my Physical Education peers were doing. I registered my justification at the general management of the segment, which enabled me to establish my routines with the school, as I feel this is more respectful, provided that, in parallel, I could maintain my "activities" with the group of Physical Education teachers. Therefore, I have done my utmost to meet these demands, but I still feel anguish because of the lack of communication with the children, and unfortunately understanding that with this process of social distancing one still plans to reproduce a school logic that was already not working in person and that shall surely not have any success with distancing.

I believe that, as I see it, public funds are being incorrectly used, as the municipality is able to provide the children and their families with access to technology, but the investment of the Education Department still remains at the level of printing routines, thereby reproducing a traditional standard of teaching, already obsolete, which for some time now does not address the needs of the children and does not guarantee learning, let alone the interlocution of our daily activities, which, even though many people don't want this, has indeed changed, meaning that we have to change as well!

Account 4–Actions, Paths and Possibilities in the Municipality of Natal

This account was originally prepared by an experienced teacher, who has been working in the municipal school network in Natal for 16 years, and who is currently a pedagogical advisor at the Municipal Education Department (SME). She completed her Professional Master's Degree in Physical Education in 2012, developing an intervention project at Physical Education lessons at one of the schools, where she worked for 11 years. The state of Rio Grande do Norte has an overall HDI of 0.684 and its capital city–Natal–has HDI of 0.763.

According to the teacher, after Decree No. 11,920 of 17 March 2020 (Brazil, 2020d), which established the situation of emergency in the municipality of Natal, the City Hall–among other measures taken to establish social isolation in the city–publishes, as effective action for all school units, the suspension of lessons for a period of 15 days, which can be extended for a similar period or any other period as may prove to be necessary.

This extension is confirmed with the publication of a new decree, Decree No. 11,931 on 1 April 2020 (Brazil, 2020e), setting a new time frame for suspension of lessons, which would remain in effect until 30 April 2020, a period also subject to review at any moment, whether for preponement or extension of the period. During the first 15 days of suspension of lessons, the Education Department of the Municipality of Natal (SME), under the guidance of the Assistant Secretary for Pedagogical Management, started to discuss, with their advisor teachers, the possibilities of the Early Childhood Department and the Primary Education Department continuing with their educational actions.

These thoughts resulted in the establishment of a portal with the ultimate aim of facilitating approximation between teachers

and students in these days of social distancing, to think of the educational process based on this new reality.

The proposal as sent and debated with the advisors–in which I include myself, as a member of the Physical Education component–is that of showing possibilities and suggestions of activities that, initially, could somehow maintain the relationship between student(s), school, and teacher(s). A relationship that, in the current situation, seeks to establish not the development of learning or specific content, but affective ties and support through play and interactive activities, so that we can stay together in a fun and pleasant way during this period. We quite understand that thinking of, and reflecting upon, actions of this ilk is far from easy considering the host of realities present within the schools of our municipality, the difficulty of access to digital media, and, most importantly, to those arising from the social and economic changes experienced by all families through this period of isolation (teachers, students, coordinators, etc.) with restrictions on ways of access, sustenance, and subsistence, especially the limitations on food intake as a result of lack of regular school meals.

It was also necessary to think about the teacher(s) who had sought other methods of time management, tasks, and new dynamics for personal and professional life. It also became necessary to keep a sensitive eye on the range of contexts in which the teachers of the whole country found themselves immersed, those seeking to reinvent themselves through online lessons, video lessons, and interactions on digital platforms, among others. Many were caught napping, without any kind of support or treatment, or even the necessary qualifications to be active in these virtual platforms, and seek, often in a forced manner, to establish a new significance for their didactic and pedagogical actions.

It was therefore up to the municipality of Natal to consider such realities and to try to find a way that would not make the current reality even worse. The establishment of a digital platform starts with an action which initially brings the socialization of links selected by the team of advisors for the different curriculum components, and here we shall focus on those related to scholastic Physical Education, so that the teacher may access these links and then, based on the situation of the teacher's school, choose those that they feel are appropriate for the student(s).

The activities of the platform are not for evaluation purposes, and similarly are not mandatory, and based on this principle the platform only allows access by teachers in the state education network through registration, providing information such as enrollment number, teaching unit, and e-mail address for registration. It is not mandatory for the teachers to share these links with their students. These are suggestions of complementary activities so that there may be closer approximation with the students during this period. Each teacher has the liberty of choosing whether some of them are shared or forwarded, considering that not all students within the network have access to digital media, or even a mobile telephone that could connect the student to the activities through the links. However, we well know that many teachers and schools already work in their units with groups established through digital platforms, be it WhatsApp, Facebook or Instagram, and that not only allow the circulation of information and other guidance to students and parents/guardians, as also are spaces used by some teachers for the teaching of content and learning to the students,

throughout the scholastic year. Thinking about re-establishing this bond between students and schools, there is the presentation of activities that are easy to understand and that can be easily accessed through a mobile telephone.

Physical Education teachers have access to links that are made available through the thematic units as present, both in the Brazilian National Curriculum (BNCC) (Brazil Ministry of Education, 2018) and in the Curriculum References of the Municipality for Primary Education (Natal, 2020), divided by year of schooling, such as: online games, short videos, comic strips, short texts, creation of games and toys, among others that allow interaction with the core themes of Physical Education and that can be carried out without significant resources at home. Many teachers, even though activities are suspended within the municipality, have already registered and are now accessing the links of the platform.

Faced with realities that are so close, and nearly always so distant between schools, with regard to interaction by social media or networks, some teachers have found difficulties in accessing the students, initially. The teacher's colleagues report that they are not able to make the links get to them in those schools that do not have WhatsApp groups or Facebook pages, but which, even so, have got in touch with the management of the schools to try to find ways to make these arrive. Other teachers have managed to achieve this sending, using these very platforms. What we perceive here is the attempt, made by a significant part of the teachers, to establish some link with the students, by sending videos, models of games for construction, possibilities of play activities to be carried out at home, but without getting any concrete return from this reach. We understand that others are somewhat distant from this process, when they understand that this is the moment to suspend activities. However, we stress the importance of the initiative, that could bear significant fruit for the teachers in the network, and which could, in the future, be pedagogical partners to feed and enrich the platform.

Together with these actions, the Physical Education teachers are encouraged, through social networks on ongoing qualification in Physical Education, to publish short videos with play activities or other activities that they could do at home, together with their siblings or family members, and some proposals to this effect have already been created and publicized by these, in the social networks of the groups of specific qualifications in Physical Education (@focoefnatalrn).

Many are the possibilities suggested by the education networks in order to overcome the problems that arise from the changes of conjecture caused by this pandemic, but it is necessary that these all seek to reflect respect for the human conditions of the subjects of the process, as also their possibilities, limitations, anxieties, and adaptation to a new reality, so as to reduce the effects of this period of social isolation, with important effects upon the educational field.

Account 5–Physical Education in Schools in the State of Rio Grande do Norte, in These Pandemic Times

This account was originally given by an experienced teacher who has worked for 6 years in the state basic school network in the

Brazilian state of Rio Grande do Norte. The teacher has a Master's degree in Physical Education and has 3 years of experience working with PETE programmes in private and government-run institutions.

For the teacher, in the state of Rio Grande do Norte (RN), the suspension of in-person lessons, in both private and government-run schools, occurred with the enactment of Decree No. 29,524 of 17 March 2020 (Brazil, 2020b), suspending the lessons for fifteen days, and then with the passing of Decree No. 29,583 of 2 April 2020 (Brazil, 2020c), extending the suspension of lessons until 23 April 2020, both these decrees being published in the Official Government Gazette of the State of Rio Grande do Norte (DOE), which further adds to the anguish shown by students, parents and guardians, teachers, school directors, and other agents within the educational process.

The deconstruction of a scholastic year, possible shortcomings of the learning process, the lack of interpersonal coexistence, among other factors, have led to the appearance of many measures in an attempt to reduce the effects of such factors. These include the challenges of the use of digital technologies.

In the current situation marked by social isolation, the use of the distance learning system (recorded video lessons and asynchronous tutoring) and remote lesson systems (lessons in real time, requiring synchronous access) appear as possibilities within this period, as they create opportunities for the continuation of teaching and learning processes, based on the materials prepared by the teacher, and also on a schedule and calendar that have been adapted to the current pandemic. However, it is necessary to think about the possible pedagogical consequences of these models in the school system, especially in territory marked by economic, social and cultural differences. This means that the first point to be discussed is that of access and opportunities.

If we consider the state-owned school network, the author of this statement being part thereof as a teacher, then the low usage, or even non-usage, of the suggested platform by teachers is based on some premises, namely: non-mandatory use of these techniques when giving lessons; absence of technical knowledge of the digital tool as proposed by the Integrated System for Education Management (SIGeduc); or even through the feeling of injustice toward students that, as a rule, do not have the technological knowledge for due following of the activities.

We see a powerful reinforcement of the social and economic inequality within the state, as many of the students will not have access to the proposed model, as also the possibility of a delayed scholastic year or even an inflated make-up of classes during the rest of the year. We can also mention the learning that has not been made through human coexistence, and most importantly the bodily movements in Physical Education lessons. It is through body movements, in lessons with themes based on much content based on body practices, such as sports, dance, gymnastics and the like, that the students acquire and show what they have learnt, their feelings and emotions, also acquiring self-confidence and self-esteem; improve in aspects such as responsibility and respect for self and others; and also increase motor performance, among others, having a direct influence on the student's daily life. I can perceive that such dimensions are hindered in the absence of teaching activities in the state-owned school network.

On the other hand, on leaving the state-run and entering the private school network, in which my daughter is inserted as a student of Year 2 of early childhood education (which covers Year 1 to Year 5), we observe the fact that some students, especially those in early childhood education and starting upper primary school (Year 6 to Year 9), who are watching remote lessons at home, need a tutor, normally the father or the mother, or the guardian, to offer assistance for this process, whether in the art of using a computer and/or the lesson platform, or in the organization of the study materials for the different materials, and so on.

However, this remote teaching, together with this new function carried out by school tutoring, has brought many discussions on the part of parents/guardians because, while some of them commemorate the fact that they can play a more active role in their children's school lives and also praise the efforts that the schools have made, to offer lessons in all subjects, and also the specialized schools (sports, dance, etc.), in an attempt to reduce the educational harm brought by the pandemic, others show dissatisfaction, caused by many factors, such as undue charging of school fees (students not using the school premises, as contractually agreed), passing through the belief that it is the responsibility of the school, and not of the parents, to teach the content, and finally the impossibility of their children receiving such support due the remote work that is simultaneous to that of the lessons.

Regarding the lessons of Physical Education and those at the specialized schools, both are using more individualized strategies, always giving advance notice about the materials they could use and the activities they shall be carrying out. During the lesson, the teacher explains and shows what the students shall do, and then asks the students to also carry out or do these tasks. As examples, we could mention the construction of a toy in the Physical Education lessons, and socialization based on a technical dance gesture within the Modern Dance (MD) school as mentioned below.

As I see it, the return of on-site lessons remains somewhat uncertain. Faced with this scenario of doubts, it seems necessary to reconsider the reorganization of the school, together with the school community (classload, course content, scholastic year, etc.) during the similarly uncertain duration of the pandemic. Education, in its element of digital technology, should be more closely looked at, but should still be regarded as something complementary, as access thereto is still somewhat unequal.

Here I would like to mention a positive point within my account. The added value that the educators are given in the discourse of parents and guardians who, on carrying out this role of tutors, feel some essential needs and anguishes that this professional person passes in his or her pedagogical acts, understanding that it is by no means easy to be a teacher, and resizing their importance and social relevance.

COMMENTS

Following, we comment the teachers' accounts from three different perspectives, regarding their relationships to

knowledge, collaborative practices, use of technology, and a Freirean approach. We have considered the reasons for various inequalities described, such as a biased attitude of the administration, questioning the teachers' competency to teach, lack of agency and socio-political communication. The **Figure 1** displays a chart showing the facts that mobilize or demobilize teachers for the use of technology.

Pedagogical Thoughts Considering Relationships to Knowledge

Venâncio and Sanches-Neto, (2019) highlight the complexity of the actions of each teacher when he or she recognizes that each student is full of idiosyncrasies, as a reflexive being, and (self) critical about his or her movements, thoughts, and relationships. This means that the obstacle that is traditionally enforced in concrete teaching situations is the practice of movements in an alienating manner, with regard to the subject of the movement. In previous accounts, we see that the three teachers of Physical Education are faced with a world situation where uncertainties abound, generated by a lethal virus, and tacklings based on their own relationships to knowledge and those of their students.

When a subject recognizes himself or herself as a being with relationships, both with self and with the other, this means that he or she is able to anticipate, identify and arrange for situations so that their own actions can have a bearing on certain contexts, always in the presence of other people. In this regard, when the six teachers are aware of the realities, conditions, and possibilities of the teaching networks in which they work–whether with regard to infrastructure, to the capacity of each teacher to prepare his or her own methods and pedagogical reasons and intellectual resources (the knowledge domain), know how to use equipment and the technological resources (knowledge as an object), and rally round to learn in relationships with others (the relational device) and the activity to be carried out (Charlot, 2000; Venâncio, 2019) – one then identifies that it does not suffice to use Google (Charlot, 2005) so that everything may be solved, just like a touch of magic.

There are three dimensions that intermingle in their relationship to knowledge: the identity, social and epistemic dimensions (Charlot, 2000). In the identity dimension, the relationship to knowledge shows the history of each person, his or her expectations, concepts of the human being; in the case of narrative accounts, this dimension is perceived when one of the teachers admits that there are work colleagues who do not value the use of technologies and are not discriminated by the others, while there are others who prefer other ways of triggering the educational process within the school unit, maintaining their self-image. In the social dimension, the subject does not only have a relationship with himself or herself, recognising the presence of the other person. This dimension of knowledge expresses a relational perspective when one of the narrators mentions that there are teachers who master technological resources, and those who do not. In this case, every one, within a social and relational perspective when faced with their own knowledge and that of their students, and aware of the social, economic and family situations, makes himself or herself available to collaborate and to

try to use new (technological) forms and means. Last but not least, we have the epistemic dimension with regard to knowledge, in which one acknowledges the conception of knowledge, and teaching practices, as processes for the very construction of knowledge, as the real expression of the knowledge as learnt, in the case of the aspects present in the three accounts, in some cases passed from non-possession to possession. In other words, some cases of knowing how to access, use, share, teach and learn about forms of knowledge, whose existence has been deposited in objects, places, and people.

The three dimensions with forms of knowledge are essential for these Physical Education teachers, who presented accounts about the situations experienced, and back up the acceptance that the educational process cannot be limited to the transmission of information through technological resources, digital platforms and the like. It is therefore necessary that human beings, in relation to their own knowledge and that of others, create and generate complex situations, and that they may not be recognized as relationships of knowledge when they are generic and fragmented. Venâncio (2019) highlights the fact that there are connections with complex and polysemic forms of knowledge, and that each subject may enjoy the time that is pedagogically necessary in order to learn based on Physical Education.

With the pandemic, the relationships to knowledge and human conditions for tackling it through new types of social coexistence (at the school, or in a virtual learning environment, and at home) bring about changes and lay bare the neglect by the Government, also showing the lack of ongoing formative policies for teachers, lack of investment in schools' infrastructure, and the lack of conditions for family members to accompany the work that is carried out by teachers within the schools.

Comments Based on Collaborative Practices for Teacher Education

The dynamics of the contemporary world change people's way of being and, according to Charlot (2005), there are some phenomena that stand out. Social practices, like education, incorporate other forms of knowledge, and social attachments are changing to the extent that teachers and students are given little value as political or ethical subjects. There is a world dimension in interdependence with globalization, which means a new stage of domination or oppression (Charlot, 2005; Charlot, 2013).

Due to the accumulation of contradictions that lead to many different types of ruptures, there is a new type of schooling which tends to replace the old one. These seems to be the case with the situations reported by the three teachers, with regard to the implications of the pandemic context. However, we do not know which model shall be followed by teachers in the future, and we do not even know the meanings of teaching and qualification. The concept of teaching implies shared knowledge, and the idea of qualification involves promoting competences in a subject. This means that teacher qualification would be an act of working on knowledge within pedagogical practices, situating them in relation to the complex possibilities of the act of teaching. In the opinion of Charlot (2005), teacher qualification means giving them competences to

manage situations of tension, and also prepare mediations between practices and forms of knowledge.

We understand that, in spite of the individual conduct as set by decrees in each teaching network and of the spread of Covid-19 in Brazilian territory, as also of educational policies, it is necessary that the teachers plan their actions as a group. In the case of account 1, there is an excerpt about teachers that: "[...] do not feel comfortable with "the new", and these teachers, students and school administration staff have not even received possibilities of qualification, at these times of emergency." There are technocratic prospects for school education that move the teachers away from any decision-making process (McLaren, 1997). As a result, it makes perfect sense for there to be resistance, even in emergency situations, and for the teachers to collectively refuse to be treated like good staff that merely obey orders.

In the following excerpt of account 2, the concept of lack of specific training for the remote activities as proposed to the teachers through the decrees is hereby reinforced:

"It is also necessary to take a sensitive look that extends over to the different contexts in which teachers from the whole country are immersed, those who seek to reinvent themselves through online classes, video classes, and interaction on digital platforms, among others. Many were caught by surprise, without any kind of support or training, or even the necessary qualifications to enter these virtual platforms, and now seek, often in an enforced manner, to establish a new significance for their actions, both pedagogical and didactic."

The qualification of the teachers for tackling adversity within the context of the pandemic does not do without political intervention because, even in the current context, there are many curricular approaches available for the teachers, who are politically and culturally empty. In these proposals, the students are taught to fragment their thoughts to isolate them from the pace of daily life (McLaren, 1997). The concern shown in the excerpt of account 3 refers to this sense of qualification, as the teacher thinks about the "reinforcement of social and educational inequality in the state, as many of the students shall not have access to the model as proposed". This means that, in the (self) formative logic, the most efficient way of teachers taking on the complex and diffuse demands of the Covid-19 pandemic is through collective and collaborative mobilisation, for the group of their actions.

Momentaneous Comments Based on Technology Within Teaching Action: Organicity or Urgency?

On observing the general panorama of challenges that the social isolation process has brought to education, from the standpoint of teachers who toast us with their accounts, and consider the pedagogical considerations that have followed on from them, it is necessary to have a more concentrated understanding of the ways in which the Physical Education teacher has been made to reorganize his or her postures with regard to the use of technology.

A mapping shows that, ever since the 1990s, the international literature focused on education discusses the role of barriers within the implementation of Technologies in teaching practice (Ertmer, 1999), considering the mentioned extrinsic barriers, or barriers of the first class (resources either absent or inadequately supplied to the teacher, such as: time; training; support; premises, etc.) and the extrinsic barriers of second class (beliefs and teaching attitudes with regard to use of technology, such as: teacher-student relationship; trust in the selection and use of technological devices, and their implications for teaching methods; selection of content; evaluation procedures, etc.)

Different from the author here quoted, who invested in the identification of barriers, the fact is that contemporary researchers into Physical Education (Burne, 2017; Souza Júnior, 2018) prefer to discuss the factors that affect the adoption of technologies by teachers. There, we can perceive elements that mobilize or demobilize teachers for their use, and which we apply to the accounts mentioned above.

It seems that, on systemizing demands as shown in the reports, the strategies presented by different realities lead to the appearance of personal, structural and pedagogical dilemmas among the teachers. Most of the factors that mobilize and demobilize the teachers come close to the considerations about relationships between teachers and students, on the one hand, and forms of knowledge–be they of the identity dimension–where it is acknowledged that every teacher and every student builds his or her own path, with experiences mediated by social conditioning factors and which should be respected in their singularity -, of the social dimension, where one considers issues related to access and competence in the use of technology, apart from the social and economic contexts inherent to them–or the epistemic dimension–where there is announcement of competences regarding usage, sharing, and understanding of devices, and the implications this has on the art of teaching and learning. To us, it seems that, observing the reports and thoughts summarized in the chart above, many of the mobilizing factors are centered on the social and epistemic dimensions of the relationship to knowledge, especially with regard to the recognition of social conditions and experiences that announce knowledge to be shared between the teachers.

With regard to the demobilizing factors, we highlight the feelings of incapacity; the perception of absence of qualification for the use of technologies; instability and fear regarding the use of the devices–all linked to gaps in teacher education, which appear in more significant form in these days of social isolation. However, in an opposite direction of what demobilizes, there is the power of sharing ideas between the teachers, something that, in the (self) formative perspective, helps toward collective and collaborative growth of the teaching networks.

The experiences reported raise the issue that the transposition carried out at the urgency of the pandemic, and which has not been reflected that much in the transposition of the remote model, has generated a set of motivating and demotivating factors among the teachers. The most important pedagogical implication is in examples of the acritical use of technological

resources, merely as a strategy for the transmission of content, without relating them in any way to the historic moment we are now living through (with regard to technology and to the pandemic itself). However, there is also the preparation of an unplanned collaborative chain in which teachers proposing to challenge themselves can create strategies for filling in the gaps that currently exist in qualification, in educational policies, and in investments within the process of school education in Brazil.

Pedagogical Comments on the Freirean Perspective

The reports made by the teachers present a portrait of the challenges that they face. They show difficulties that are common to everyone in the world, who need to keep social distancing, change their daily routines, and tackle fear and uncertainty, being faced with SARS-CoV2. If all the stress caused by the pandemic were not enough, they also see themselves facing the need to recreate the pedagogical process itself, in an attempt not to fully interrupt the process of the children's schooling. We consider, as one strength of this study, the teachers' perspectives about their teaching work from different states and regions of the country. The teachers provided critical insights of situations that can illustrate the cultural, economical, and social variety of teaching in Brazilian contexts. Our description of their working conditions also can provide insights into the common problems faced and solutions proposed by the teachers in these different teaching backgrounds.

Many teachers highlight the lack of autonomy for this recreation, as the administrative staff do not encourage dialogue, instead determining what the teaching actions should be. Each network has proposed the use of different resources. Digital platforms and television channels have been created to make communication between teachers and students possible, for sending a wide range of pedagogical materials, including course booklets and video lessons. However, the proposed strategies come up against the immense inequality that both teachers and students have to face, with regard to access and mastery of TDICs. It is essential to point out that students suffer more because of the perverse inequality than has an impact on the country and which has been made prominent with the pandemic. In Account 4 the teacher highlights just how worried she is with being unable to be close to the students and to monitor how they have received and use the materials that she produced.

This reality makes it well nigh impossible to implement an education based on dialogue, as proposed by Paulo Freire. Almost . . . Dialogue does not occur in a synchronous fashion, and many times only the teacher is responsible for giving a message. We know that many students do not receive the message and, when the message is indeed received, they do not always understand the message or have the opportunity to reply to it. Without direct contact with the teachers, some may take up a kind of "banking" Physical Education, where the teacher decides what activities the student shall carry out (whether motor activities or not), without the student being able to understand what he or she does and why. Sometimes, not even this kind of education gets effectively implemented. All the limitations enforced upon the school team

may leave the teacher in a paralysed state, without envisaging any possibility of action.

This is the moment when the Pedagogy of Hope, as defended by Paulo Freire (1997), makes perfect sense. Brazilian education is right now going through a "limit situation", meaning a situation for which we do not have an immediate solution (Freire, 1970). Perceiving this situation is the first step to tackle it, by creating "untested feasibility", a notion that had been presented by the author as a proposed solution to face a limit situation.

In this regard, Freire (1997, p. 51) says:

> What we cannot do, as imaginative and curious beings, is stop learning or stop seeking, researching why things are as they are. We cannot exist without asking ourselves about tomorrow, about what shall come in the future: in favor of what, and against what; for whom and against whom it shall come; without asking us about how we can make the "untested feasibility" real, demanding that we fight for it.

Based on this concept as raised by the author, there is a need to construct this "untested feasibility". In Account 5, the teacher proposes something that could get somewhat close to the Freirean view, highlighting that, in the light of the moment now experienced, it is important to assign less importance to the content and learning of knowledge, suggesting that Physical Education should prioritize the maintenance of the affective bond between teachers and students. This bond is something really fundamental and it is necessary to find ways of constructing this bond. It is indeed necessary to define the priority of school education at this moment, and this, a bond with the students, could be prioritized, as other goals cannot be achieved if this dialogue is not established.

Some of the teachers highlight difficulty in dealing with the different content of Physical Education, but none of them comments on whether the pandemic and its impact has been present as a theme within their lessons. If we consider, like Freire (1996), that education allows critical understanding and action upon the world, analysing, together with the students, just how everyone's lives have changed in current times, and the impact of these transformations in all dimensions, also in that of self-movement, is essential. In addition, if teachers and students manage to establish dialogue, then it is possible to stimulate their involvement in the construction of practices that could be carried out even in situations of social isolation and could be more significant to the students. Even though this discussion cannot be made right now, it would be important if this dialogue could occur as soon as the lessons are restarted.

CONCLUSION

Based on the findings from our analysis of the accounts, there are the following conclusions:

- All the teachers presented a systematic portrait of the challenges they faced during pandemic, meaning that they have agency and accountability about their own teaching work. The teachers showed common difficulties, such as social

REPORTS	FACTORS	DEMOBILIZERS	MOBILIZERS
Account 1	External, or first class	✓ Lack of a platform to unify the actions of the network. ✓ Frequent changes in strategy for interaction with the students.	-
	Internal, or second class	✓ Fear of use and implications in the relationship between administration, teacher, and student. ✓ Lack of experience of some teachers and students, in the use of technological devices. ✓ Incipience of the relationship of technological mediation, and experience in bodily practices.	✓ Existence of experience in technological devices, in some teachers and some students.
Account 2	External, or first class	✓ Lack of training or qualification for remote action. ✓ Difficulty for the students to gain access to technologies. ✓ Lack of time to organize a pedagogical flow with changes in strategies and schedule.	✓ Support from the Education Department, with structure to produce audio-visual materials used in remote teaching.
	Internal, or second class	-	✓ Experience in production of content, shown by some teachers.
Account 3	External, or first class	✓ Lack of dialogue of the Education Department with the teacher, to make digital artefacts available.	✓ Availability of didactic artefacts for use in remote teaching, thanks to the Education Department.
	Internal, or second class	✓ Frequent changes in the strategy of interaction with the students.	✓ Existence of experience shown by some teachers and students, regarding the use of technological devices. ✓ Collaboration between teachers, within proposals for activities in remote teaching, through digital platforms.
Account 4	External, or first class	✓ Difficulty in gaining access to technologies. ✓ Lack of training or qualification for acting within the digital platforms. ✓ Access exclusive to teachers from the network.	✓ A platform unifies all actions taken by the teaching network.
	Internal, or second class	✓ Difficulty for some teachers to have contact with students through the digital platforms. ✓ Teachers distant from the process of technological mediation.	✓ Existence of experience with digital platforms, for some students and teachers. ✓ Collaboration between teachers, in digital platforms.
Account 5	External, or first class	-	✓ Presence of a platform, albeit with pedagogical gaps.
	Internal, or second class	✓ A feeling of incapacity, regarding the use of the network's platform. ✓ A feeling of injustice in the different methods of access by the students. ✓ Lack of confidence in the development of relational dimensions within the experience of bodily practices through technological mediation.	✓ Perception of the possibility of technological mediation and experience of bodily practices. ✓ A feeling of added professional value by the parents, through remote monitoring and tutorial action.

FIGURE 1 | Chart showing the facts that mobilize or demobilize teachers for the use of technology. Source: Prepared by the authors, based on the model of Souza Júnior (2018).

distancing, change of their daily teaching routine, and coping with being afraid of the uncertainty regarding Covid-19;

- The teachers were overstressed to recreate the pedagogical creations itself to keep their students' learning pace within the process of schooling. Many teachers highlighted the lack of autonomy for this recreation as the administrative staff do not encourage dialogue to foster teacher collaboration;

- The instructions are imposed from the authority; however, such instructions disregard that different networks show different resources. Digital platforms and television channels were created to make communication between teachers and students possible and for sending wide range of pedagogical materials, such as course booklets and video lessons;

- The proposed strategies came up against the immense inequality that both teachers and students have to face in Brazilian public schooling. The teachers were under stressed conditions as they were unable to be closer to their students and to monitor the use of materials that themselves and other teachers have produced;

- The teachers concluded that there is a lack of activities in Physical Education classes by this method hence this kind of education is not effectively implemented. In this sense, all the limitations enforced on the school team may leave the teachers in a paralysed stage without envisaging any possibility of action;

- The teachers felt that the whole basic education system is going through a "limit situation", having no immediate solution

except to follow the theory of *Pedagogy of Hope* (Freire, 1997). But it is difficult to advance–in the sense of the *Pedagogy of Authonomy* (Freire, 1996)–because the majority of the teachers were not qualified for using DTCIs in their teaching.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

AUTHOR CONTRIBUTIONS

AJFS, CCS, RGT, ESF, and WLC jointly developed the capture of narratives with Physical Education teachers in different states of the Brazil and contributed to the writing of the text. ACA, LV, and LSN played a fundamental role in the analysis of data under the lens of different theoretical references. All authors contributed to the article and approved the submitted version.

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