Constructing radical community: an ecological model for shifting from an EdD to a We-dD in online doctoral programs

Keith Graham[1] ⓘ · Ambyr Rios[2] ⓘ · Radhika Viruru[2] ⓘ

Abstract

Online learning is often associated with the *alone together paradox* that suggests that online students are constantly connected to one another yet feel more alone due to a lack of real social connection. While research has approached this issue from an environmental perspective, some scholars have recently suggested that aspects of online students' complex ecologies, beyond the online program, may also influence the degree students engage socially. This phenomenological study explores the experiences of 10 students enrolled in an online doctoral program in education. In-depth interviews were conducted to discuss how various ecological systems affect students' ability to socially connect in the online program, revealing students reporting feeling *apart, but together*, rather than alone *together*. This study encourages online doctoral programs and researchers to take an ecological approach, as opposed to an environmental one, in order to construct a more thorough understanding of the online doctoral student experience.

Keywords Doctoral programs · Distance education · Online courses · Interpersonal relationships

Introduction

"It's a lonely business" (participant 4). This is how one participant in the current study chronicled his experience with online learning, a feeling Turkle (2011) might describe as *alone together*. As Turkle notes, the result of the increase of technology in our lives often results in this phenomenon: "We are increasingly connected to each other but oddly more

✉ Ambyr Rios
  ambyrrios@tamu.edu

  Keith Graham
  kmgraham@ntnu.edu.tw

  Radhika Viruru
  viruru@tamu.edu

[1] National Taiwan Normal University, Taipei, Taiwan

[2] Texas A&M University, College Station, TX, USA

alone" (Turkle, 2011, p. 19). For the many higher education students in the US context who were enrolled in at least one online course, accounting for about 30% of all college students total (Allen & Seaman, 2017), the sacrifice of genuine connections with instructors and classmates in face-to-face courses may be a worthy price to pay for the convenience online learning provides.

While loneliness and feelings of isolation remain a major difficulty for doctoral learners in the USA (Ali & Kohun, 2006; Ali et al., 2007) and internationally (Okorocha, 1996) and may manifest differently at various stages of doctoral study (Janta et al., 2014), online doctoral learners face a unique set of challenges and have much higher attrition rates than their on-campus counterparts (Terrell et al., 2012). There have been reports that these more diverse online doctoral learners may experience a heightened sense of isolation, frustration, and separation from their institution because they may not receive targeted or timely support and assistance to successfully overcome educational obstacles during their program (de los Arcos et al., 2009; Yalof & Chametzky, 2016). But as this study shows, if nurtured and supported, vibrant communities of learning can also develop and flourish online.

This study reports on a program in the USA that pushed against the assumed status-quo *alone together* construct. The online doctorate in education (EdD) program featured in this study, which targets teacher leaders who work mostly in the public (state-run) systems in the USA, created what one participant pronounced "was really a We-dD" program (participant 2), or what we term as *apart, but together*. To do this required a shift from viewing online doctoral programs simply as an "environment created by the newer technology" (O'Sullivan, 2000, p. 53), or a substitute for face-to-face environments, and instead embracing an ecological stance toward these online programs that acknowledges instructors and students and other participants as part of a large, "living system" (van Niekerk & Schmidt, 2016, p. 207).

Through our phenomenological case study approach, we sought to answer the following research question: how do the complex ecologies of online students intersect in an online doctoral program? Through exploring this question, we share the voices of students in this online doctoral program as they describe the various spheres that comprise their ecologies and showcase how their ecologies both contribute to being *apart, but together* but also, at times, draw them toward being *alone together*. By highlighting how student ecologies affect online doctoral programs, we hope that online learning can move beyond being simply a "substitute for face-to-face contact" (Turkle, 2011, p. 13) and become a virtual community of learners.

In the following sections, we will consider what it means to be *alone together* in an online doctoral program, describe past research utilizing environmental solutions to this paradox, and discuss moving toward an ecological perspective for understanding social connectedness in online learning. This study contributes to the literature on the online doctoral student experience by offering a unique theoretical perspective about the interactions and intersections among personal and professional social networks constructed and embedded within online programs (Janta et al., 2014). This paper positions as particularly relevant in a COVID-19 era due to the considerable implications of online learning systems on learners and the larger higher education landscape.

Alone Together in online education.

"I think everybody got into a distance learning program because of the convenience and flexibility, but the disenfranchisement that comes with not being able to have face-to-face … we're all human and we want that human element" (participant 3). The online learning literature suggests the existence of the *alone together* paradox: the belief that online students are constantly connected to one another yet feel more alone due to a lack of *real*

connection (Cox, 2018; Turkle, 2011). As Cox (2018) describes, the concept of the "alone together paradox" is facilitated by "radical access to knowledge" provided by the massive breadth of the internet, and is defined as when adults "become accustomed to being constantly connected and together with others, yet feel more alone in these online connections than when face-to-face" (p. 71). While this ontological phenomenon is not unique to online learners, many researchers naturally parlay that to what Turkle (2011) describes, speaking of technology more generally, as the mutual and competing needs of people to be connected and yet separate from each other. Cox (2018) details robust catalogs of online learner experiences of "comfort and discomfort" as a part of this *alone together* paradox; as a juxtaposition, Kuhn (2015) offers a connection to face-to-face educators working to build collaborative practices within the siloed world of content area instructional planning. Kumar and Dawson (2018) characterize online environments as spaces where learners often experience "transactional proximity" despite "geographical dispersion" (p. 53). Other scholars like Blankenship and Gibson (2016) reference the *alone together* construct in their title without mentioning the paradox specifically, as a nod to the vernacular adaptation of the term for general academic purpose. Using the paradox as a theoretical guide, we work to uncover the relational ecologies of our online doctoral students within the radical internet age of learning today.

Social engagement in an online doctoral program

Realizing the potentially negative impact of *alone together*, various scholars have exerted effort toward understanding the effect of social isolation in doctoral programs. As Kumar and Dawson's (2018) analysis of online doctoral programs shows, reducing transactional distances between those who interact in online spaces is key to their success. As they put it, "the more the dialogue, the less the distance and vice versa" (p. 50). As online learning remains poised to continue impacting the landscape of higher education in increasingly unprecedented ways (Allen & Seaman, 2017; Legon & Garrett, 2017), the focus on building community within an online space remains critical to these learners' success (Chang & Smith, 2008; Noel-Levitz, 2011). Specifically, online doctoral learners possess unique circumstances under which they pursue their degree: many work full time as school and district leaders while pursuing their degree part-time. The balancing act between work, home, and school obligations frequently leads to time management tensions and struggles within any or all of these roles (Gardner & Gopaul, 2012). As a result, these learners need various supports and opportunities to manifest a community of learners as they navigate the convergence of their professional, personal, and schooling identities (Ali & Ahmad, 2011; Kember, 2007).

Moreover, Borup et al. (2020) suggest that online learners generally draw from two sets of communities: course communities created through the classes/programs with which they are associated and their own personal communities. However, the interactions between personal and professional communities have not been explored in-depth in the literature (Oviatt et al., 2018). Buck (2016) suggests that persistence and success in online programs are hard to predict given that "the factors that determine persistence or drop-out rates are more complex and variable than just a single or even a few factors, and there is no consensus on all the underlying causes" (p. 139). Blackmon and Major's (2012) meta-synthesis of qualitative research studies on student experiences in online courses found that online students both cited their families as their greatest source of strength as well as the most common impediment to their success. Online students thus come to the table as part of

already existing complex social networks that can be both a help and a hindrance. This study attempts to explore this complex intersection further.

Vekkaila et al. (2014) found that social belonging was a key source of engagement in face-to-face doctoral work in the behavioral sciences, and other scholars have found similar trends in online doctoral programs (Terrell et al., 2009). It is for this reason that recent research specifically examining online doctoral programs has highlighted aspects of program structures geared toward facilitating instructor-student and student–student engagement (Breitenbach, 2019; Fuller et al., 2014). Breitenbach (2019) described how a cohorted online doctoral program incorporated dialogue and collaboration into courses. This effort yielded higher student and instructor engagement that potentially could result in higher program completion. Similarly, Fuller et al. (2014), reporting from a student perspective, describe aspects of the University of Florida online program that created various online opportunities for students and instructors to interact; however, the students noted the continued challenge of "developing learners' social presence" (Fuller et al., 2014, p. 77).

The studies reviewed above on creating social connections within an online program share a common trait: they focus on changes in the program environment as a solution. While studies have shown some increases in social engagement resulting from changes in the program environment, challenges still remain in creating the social presence and engagement that students desire (Fuller et al., 2014). The focus on the learning environment has provided a partial solution to *alone together*, but there is a need to build upon this environmental approach so as to make greater strides toward *apart, but together*. One possible way forward is to move toward an ecological view, which may allow for a better understanding of the factors contributing to online social engagement.

Toward an ecological view of online doctoral programs

Ross et al. (2013) suggest that analyses of the quality of online learning programs must include consideration not only of the relationship between people but also the complex relationship between the learner, instructor, and the technological and structural environment in which these beings interact. The interactions between beings and the educational platform have been documented to be codependent and relational in nature (Bødker & Klokmose, 2012; Vasiliou et al., 2017; Verster, 2009). Vasiliou et al. (2014) describe this environmental interaction with learning organisms in terms of ecology. The terminology of environment is frequently utilized when describing online spaces, but adding the nomenclature of ecology infuses the necessary interactions between living beings within the online space. Biological ecology is coined specifically as the "ever-evolving relationship and interaction between organisms and their environment" (Verster, 2009, p. 89); moreover, Vasiliou et al. (2014) promoted ecology as a multitude of unique devices and people working together in a unified system. Similarly, as Barnett (2020) saliently comments, while academia as a whole remains deeply committed to core values of "reason, inquiry, understanding, and learning," it has only limitedly engaged with the multiple and sometimes "impaired" ecologies of "knowledge, learning, social institutions, persons, the economy, culture, and the natural environment" that surround it (p. 269). The adoption of an ecological approach, according to Barnett, goes further than just recognizing the multiple worlds within which both individuals and institutions reside: it also recognizes that those worlds may be fragile and in need of support and implies an acceptance of an ethical responsibility to work toward repairing those worlds.

The ecological model inspiring the theoretical lens of this work comes from Bronfenbrenner's (1977, 1979) seminal ecological systems theory. Bronfenbrenner proposed that human development occurs within "an ecological environment … conceived as a set of nested structures, each inside the other" (Bronfenbrenner, 2005, p. 5). With the student at the center, this ecological system expands outward to various systems. The microsystem comprises individual environments where the learner is present, and these various microsystems interact within the next tier—the mesosystem. One level above these is the exosystem, where the learner-present microsystems interact with systems where the learner is not present yet is indirectly affected. The macrosystem encircles these various systems and represents attitudes and cultures, and the chronosystem broadly undergirds all of these systems by adding the dimension of time to the model. By looking beyond the examination of online doctoral programs as a singular environment, or system, in online education and expanding it using Bronfenbrenner's framework, we may begin to observe that the online learning experience, and its subsequent effectiveness in terms of social connectedness, could be influenced by a multitude of dynamic systems, both physical and digital, that extend far beyond the elements of the program.

The focus on interactions in an ecological setting provides increased emphasis on the need for community within such a space where technologies and people coexist—thus enabling online learning goals to be focused on the generation rather than transmission of knowledge (Bødker & Klokmose, 2012; Vasiliou et al., 2017). Whereas Guattari (2005) has suggested that there are three kinds of ecologies—relating to human beings, the natural world, and institutions that are socially constructed—Barnett (2020) goes further to say that universities as a whole are part of at least eight ecologies—namely those of "knowledge, learning, social institutions, persons, the political sphere, culture, the economy, and the natural environment" (p. 272)—and that world-class institutions both recognize and build upon these entanglements in the best interests of their students. This study thus attempts to explore what those entanglements look like in one online doctoral program.

Methods

The data from this study were gathered over the course of two years from participants who were enrolled in an online EdD program at a large public university in the southwestern United States. The Carnegie Project on the Education Doctorate (Carnegie Project on the Education Doctorate 2021) defined the EdD as "prepare[ing] educators for the application of appropriate and specific practices, the generation of new knowledge, and for the stewardship of the profession" (para. 5). CPED currently has 117 universities that are part of this coalition, all committed to making the EdD a degree that serves the unique needs of professional doctoral students.

The researchers all occupied positions at the university relating to the EdD program in the study. The first author was (at the time) a graduate assistant assigned to the program due to his expertise in online education and qualitative research. As he had only recently begun working with the program, many of the student participants were not acquainted with him. Given that he occupied a somewhat neutral space in the program, he conducted most of the interviews. The second author was the graduate advisor for the program. Given that she was often the first point of contact for most of the students in the program as well as the one to whom they came to first with their difficulties, she was more intimately acquainted with their multiple lifeworlds than the other researchers. Recognizing this as

one of her subjectivities (Peshkin, 1988), she drew from this expertise in the interviews she conducted. Finally, the third author serves as the faculty coordinator for the program; her background in early childhood education was the original impetus for exploring an ecological framework in relation to this study.

The study employed qualitative methods given the researchers' commitment to constructivist over objectivist ways of knowing (Bhattacharya, 2017), within which orientation researchers "aim to work within the context of human experiences and the ways in which meaning is made out of those experiences" (p. 6). In keeping with this framework, the researchers committed to well-established guidelines (Bhattacharya, 2017; Lincoln & Guba, 1985; Patton, 2015) for conducting rigorous qualitative research including but not limited to collecting and interpreting data from multiple sources (in this case, interviews supplemented by discussions around completed ecology diagrams) and open discussions among the researchers regarding how their own values and assumptions impacted the study. As described below, the researchers held targeted discussions at critical junctures in the study and drew from both theoretical and methodological literature to design the study. The ecological model was chosen given the lack of an equivalently comprehensive model in the literature on online learning. The ecology diagrams were added to the study given that recent research suggests that adding visual methods to qualitative studies can enhance their power (Glaw et al., 2017).

All students who enrolled in the online EdD program in curriculum and instruction were offered the opportunity to participate in the study. Out of the approximately 90 students enrolled in the program, 34 completed an open-ended survey created by the researchers that focused on student experiences in the program and that invited them to share details about the lifeworlds that they inhabited that intersected with their lives as online students.

Based on these responses, the researchers then created an online diagram, adapted from Bronfenbrenner's ecological model of child development (1977, 1979), placing the online learner rather than the child (as Bronfenbrenner does in his original model) at the center of the ecology and inviting students to populate the rest. Bronfenbrenner's ecological model, as described above, although originally developed to understand how children grow and develop, has been widely adapted to understand other processes such as how families of research methods influence one another (Onwuegbuzie et al., 2013), community partnerships (Leonard, 2011), immigrant experiences (Paat, 2013), and mathematical modeling (Edelen et al., 2020) to name but a few. In particular, the framework emphasizes how individuals comprise much more than themselves and represent an amalgamation of how individual dispositions interact with many layers of social and cultural phenomena and structures. As such, the model seemed particularly relevant to the lives of our online learners, who were much more than just online students and who often brought some of their social and cultural worlds to the program with them.

All the students who participated in the survey were thus invited to complete an adaptation of Bronfenbrenner's ecological diagram (see Fig. 1 for example). As Guest et al. (2012) have commented, using relatively unstructured instruments in exploratory research can enhance the dependability of the study, as they allow teams of researchers to gather and interpret multiple perspectives generated from participants without pigeonholing responses into predetermined categories. The blank diagram consisted of a small circle with the words online learner within it and then five expanding concentric circles around them; each circle was labeled using Bronfenbrenner's levels, namely the microsystem (explained as the immediate environment of the individual), the mesosystem (ways in which microsystems interacted with one another), the exosystem (ways in which the individual interacted with environments they could not control), the macrosystem (interactions
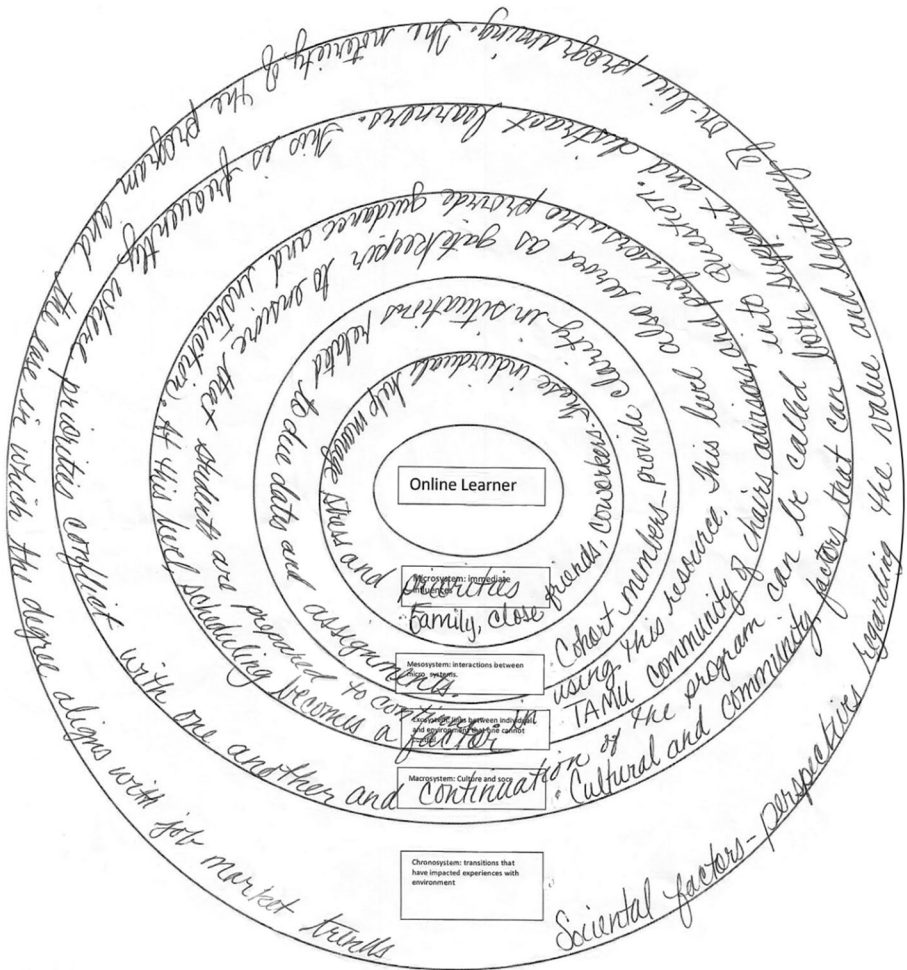
Fig. 1 Bronfenbrenner's ecological diagram

between the individual and culture and society), and finally the chronosystem (the impact of time on interactions with the environment). Ten students completed the diagrams. Based on the responses to the diagrams, the researchers then conducted open-ended interviews with 10 students (some of whom had completed the diagrams and some who had not) enrolled in various stages of the program.

The demographic information that the 10 participants provided revealed that the participants inhabited a variety of professional spaces, specializing in diverse areas of study ranging from technology, mathematics, social studies, and inclusion issues in education. Moreover, participants held significant roles of impact in education, including teacher, school administrator, district leader, regional executive director, and higher education director. Descriptions of demographic information about the participants, including participant roles and areas of focus for their final record-of-study topic, can be found in Table 1.

Two of the interviews were conducted with two participants at one time, at the wish of the participants. Interviews were conducted either in person or through the use of

Table 1 Participant demographics table

Participant	Education position	Record of study area of focus	Gender	Race/ethnicity	Age	Program year
Participant #1	Computer science teacher	Gamification to Boost Engagement of African American Students	Female	Black	45–49	3
Participant #2	School principal	Effective Principal Preparation for Closing Racial Achievement Gap	Female	Black	40–44	3
Participant #3	District educational technology specialist	Teacher Technology Proficiency	Male	White	35–39	3
Participant #4	School principal	Addressing Disparities between ELL and non-ELLs	Male	Hispanic/Latino	30–34	3
Participant #5	Deputy executive director regional service center	Effects of State Accountability on Social Studies Education	Female	White	55–59	3
Participant #6	District math instructional coach	System Support for Dual Enrollment High School Teachers	Female	White	50–54	3
Participant #7	History teacher	Social Justice and Equity in Social Studies Education	Female	White	35–39	2
Participant #8	District director of technology	Technology Integration Principal Leadership	Female	White	50–54	4
Participant #9	University director of diversity and inclusion	Black Male Special Education Teachers	Male	Black	45–49	4
Participant #10	Assistant principal	Administrators as Curriculum Leaders	Female	Hispanic/ Latino	40–44	2

video-conferencing software by two of the three researchers. Since the third author served as the doctoral adviser to many students in the program, she did not conduct any of the interviews. Each interview lasted for approximately one to one and a half hours. At the end of each interview, a member check was conducted to ensure that their perspectives had been captured adequately. All interviews were recorded and then transcribed through the use of transcription software. The researchers then reviewed each transcript and corrected any errors.

The open-ended responses from the surveys as well as the interview data were analyzed by all three researchers using qualitative coding procedures based on the processes described by Miles et al. (2020). In line with this process, data coding was done over two cycles. During the first cycle, the interview and survey data were equally divided among the three lead researchers with the provision that researchers did not at first code interviews that they had conducted themselves. During this first cycle of coding, each researcher independently coded the data they had been assigned. During this phase of coding, the researchers did not have access to each other's codes. However, prior to the first round of coding, the researchers all did a preliminary reading of the data assigned to them and agreed that they would use concept coding, as it seemed to best capture the perspectives represented in the data. Miles et al. (2020) have described concept coding as a form of coding in which researchers "assign meso- or macro levels of meaning to data or to data analytic work in progress" (p. 66). Concept coding is considered particularly appropriate when the data is rich with phrases or words that symbolically represent meanings at a broader level. The data for this study was richly imbued with language loaded with deeper meanings, such as when students described an EdD as more of a "We-dD" or when they enthusiastically used language only used on campus to describe themselves, even though they had rarely ever set foot on the campus itself. Once the first cycle of coding was complete, the researchers met to discuss the codes that they had generated. Although there were large areas of agreement, some differences that existed were reconciled and a new set of codes agreed upon. To enhance the dependability of the data, each researcher then used the agreed-upon codes to code one interview that they had not coded before to ensure that the new system of coding adequately represented the data that existed. This iterative revision of the codes was considered key to improving the dependability of the data (Guest et al., 2012; Lincoln & Guba, 1985). Further following Miles et al.'s (2020) protocol, a second round of data coding was then done by the researchers together to group the codes into themes. These themes were not only generated based on the concepts that emerged from the data but also from the ecological frameworks that undergirded the study (and that were represented in the instruments used to collect the data). These themes are presented in the sections below. Meetings between the researchers also served another important function in that they served as a form of peer debriefing; since each of the researchers approached the data from a unique vantage point (graduate assistant assigned to the program, graduate advisor, and program director), the meetings became critical discussions that kept the researchers honest.

Findings and discussion

Based on our premise that *alone together* can become *apart, but together* when taking into account not only the online learning environment but the full ecologies of students, the following section is divided into two parts. We begin by reporting on the phenomenological

reflections of students on elements within the online doctoral program, or the online doctoral environment. These elements are sometimes embedded within the university-sanctioned online doctoral structure while at other times extend to student-initiated external, but connected, environmental spheres. We then pivot to external spheres that are not necessarily directly connected to the online environment but no less influence whether students experience online learning as *alone together* or *apart, but together*.

Elements within an online doctoral environment

Several elements within the online doctoral environment contribute toward creating an atmosphere of *apart, but together*. Some of these elements are foundational within the online program structure that create initial interest and engagement. Others relate to the within-cohort and between-cohort relationships that stem from the program structure, leading students toward creating connection spaces outside of the university-sanctioned spaces. As will be seen below, in some cases, these elements are program-driven while in other cases, they are created and driven by the students themselves.

Program structure

Often the foundation for the building of relationships in an online environment is program engagement resulting from the online program structure. The participants in the study shared various motivations for wanting to fully engage in the program from the program's ranking to its degree focus and rigor and even the university's tradition and culture. Participant 7, a history teacher, reported choosing this program based on rankings and the focus of the degree:

> I first looked at, what was it, the US News and School Report to look at different EdD programs … my local options were only in educational leadership, and I wanted to do something that was more, in my mind, more focused on the art and practice of instruction and curriculum leadership … And from my understanding, [current university] is just a better university than [local university option].

Others, such as participant 2, a school principal, shared pride in being part of a highly rated program: "In terms of education, when you read…[current university] is top in the state; I mean kicking butt and taking names." Along with being a top-rated program comes a rigorous course load, which must be embraced to be successful: "Because as far as the EdD program goes, this one is probably one of the more time-consuming ones in the state" (participant 5). At the doctoral level, students want to feel like their program is pushing them to grow, "I've heard from probably a thousand people since I started this, 'Oh, you paid the money for a doctorate. You're going to get it.' No, you won't!" (participant 2).

Program pride as an element of the program environment seemed to influence stronger social engagement for the students. In some cases, this pride was derived from the reputation or culture of the university, which may be connected to Bronfenbrenner's (1977, 1979) macrosystem encompassing social and cultural values. For others, pride was a result of the rigor of the program, or a function of the program microsystem. Various participants expressed concern that a stereotype exists regarding online doctoral programs as a degree that is bought rather than earned. It was important for the students that they felt they were attending a program at a reputable university and that they were rigorously working to achieve their doctorate, not having one handed to them. Similar to Breitenbach's (2019)

finding that some online classes inspired more engagement than others, the rigor and culture of this program may have influenced the degree students engaged.

Another way the program structure sets its students up for success is by arranging periodic face-to-face meetings. Though this doctoral program is fully online, the program provides opportunities for face-to-face engagement before, during, and after the degree. Before students begin the program, they are invited to campus for a face-to-face orientation. Participant 5, a regional deputy executive director, shared her thoughts on this aspect: "I do think it made a difference … you got to know each other that day or two." Participant 10, an assistant principal, further talked about the importance of inviting current and former students to these orientations to provide advice and encouragement: "When we did the orientation … you know, how you guys brought in different people from different cohorts and they would give us, you know, just some pointers and tips, that was also very helpful." Moreover, participant 9, a director of diversity and inclusion, expressed his desire to continue to give back to the program through mentorship even after graduation:

> I will keep imparting my wisdom on the cohorts … to keep the family mentality going, that we really are in this thing together. We're all one big family despite what cohort you're in … you're still connected in this program, and we can still network. And you never know, you know, you call one of us, and we might help you with a job or maybe … your personal life or so on and so forth.

Whether it is through orientation or other opportunities such as study abroad or retreats, incorporating face-to-face opportunities in the program structure may provide the stimulus for cultivating *apart, but together* online.

Face-to-face orientations at the beginning of the program emerged as an important event for encouraging future interaction in the online environment. The students in this study, similar to students in Fuller et al. (2014), reported that orientation was a positive factor contributing toward their desire for and success in connecting with classmates. In addition to orientation, opportunities for on-campus retreats and study abroad trips provided further opportunities to bring students closer, both those in the same cohort and those from other cohorts. The students in this study both appreciated these opportunities for interaction and requested more opportunities to engage further within and between cohorts. These findings suggest that, for this program, face-to-face events may have been a powerful stimulant for greater online engagement.

Cohort

"If [what you are looking for] is just to kind of be off by yourself isolated, you're not going to get everything out of the program that you could get out of it" (participant 8). The online doctoral program in this study is built on a cohort structure where students progress through coursework as a group. However, the structure of a cohort does not in and of itself ensure that an *apart, but together* mentality will develop; buy-in from the cohort members is critical. "The fact that I know that I'm going to work with these same however many people we have…I do put in a lot of effort into building relationships with those people… because I know that over the course of three years, you know, you get what you put in as far as relationships with the other people" (participant 10).

When cohort members do buy in, the cohort structure can help students take on and overcome the challenge of a rigorous doctoral program. Participant 9, a director of diversity and inclusion, shares his feelings on the impact of the cohort system:

> It helps cut down on feeling alone. And then for those of us who really struggle with impostor syndrome and things like that, and those of us of color who've been through bad, all kinds of experiences in our life. That wasn't always positive to feel invisible...so to have this family mentality where we're looking out for each other, take care of each other, cohorts checking on each other and come together … that helps us cut down on the alienation and the isolation and the loneliness as well as the feeling invisible.

As noted by participant 9, the cohort system can be particularly impactful for students who have been marginalized in the past as well as for students who feel like "impostors" in the program.

While buy-in is one prerequisite for effective relationship building in a cohort, the participants in this study also touched on another critical element—positivity. Participant 8, a district director of technology, spoke on this point:

> I don't know if it was just something that we all felt from the start of the program as far as not having those feelings of negativity because it wasn't like any of us went, "Oh my gosh, so and so is being so negative." That has never, and I can honestly say that has never entered into our conversations. They've, they've been uplifting. And even when, because there have been some struggles, even when there were struggles, it was like, okay, what can we do to help? How can we help you move forward? There's just not been, there's just, there hadn't been any negativity, and I think that's part of the, you know not to be Pollyanna, but I think that's been part of what I loved about this program is the group of people in my cohort have been such supporters because they're going through the same thing. (Participant 8)

It seems from participant 8's comments that had the cohort been a place of negativity, the impact of the cohort system and the program, particularly on relationship building, may have been weakened. It is perhaps for this reason that participant 10 believes cohorts should live by the following rule: "Make sure that you don't turn your cohorts groups into, you know, a venting, bitching session and always keep it positive…because you know, you can either bring each other up or bring each other down." When students engage and stay positive, even in the face of adversity, the cohort provides a comfort that "you're not doing it alone, and you just have to gut it out and do it [together]" (participant 6).

As found in Breitenbach (2019), the utilization of a cohort model showed to be a strong influence on student engagement. However, this study showed that engagement not just within cohorts but also between cohorts, as discussed in our program's structure, encouraged feelings of *apart, but together*. Connecting to Bronfenbrenner's (1977, 1979) model, we can see how various cohorts, or microsystems, connect and interact together in what Bronfenbrenner would term the mesosystem. Providing opportunities for new cohorts to interact and learn from previous cohorts and alumni, the mesosystem of various cohorts seemed to give students a greater sense of community and, subsequently, a stronger desire to engage.

Connection spaces

When one considers brick-and-mortar campuses, there are many spaces where students connect, both inside and outside of the classroom; however, this is not necessarily the case in online programs. In order to create opportunities to be *apart, but together*, participants in this online doctoral program took it upon themselves to socially engage in various

connection spaces. These spaces included university-sanctioned spaces such as eCampus, a learning management system (LMS), as well as other social networking platforms. Participant 7, a history teacher, equated these spaces to the brick-and-mortar experience in the following way: "The analogy I would make is that the eCampus is like the teacher's classroom where you have your more student behavior … and then the Facebook and text messaging is like the hallway or the campus."

Some participants commented that the university-sanctioned LMS is not necessarily sufficient for facilitating *apart, but together*. In response to this, some instructors brought in additional technology for communication, such as FlipGrid. Participant 7 specifically noted the benefits of FlipGrid:

> I think that human connection can be really motivating, and it's hard to replace that with an email or with an online discussion. So I think the FlipGrid was the closest to doing something like that … I really liked hearing people's voices and seeing their faces and I thought it was really endearing, the people that would write what they wanted to say, and then you could see them reading it as they would record it."

Simply by "seeing their faces," even asynchronously, seems to have allowed for participants to feel closer bonds to their fellow classmates.

Though social connections were created within the online courses, the participants in this online doctoral program desired to connect beyond the university- and instructor-sanctioned spaces. Participant 8 explains the creation of such a space on Facebook:

> When we were at our orientation, someone mentioned setting up a [Facebook] group. So I was the one who set it up and, basically, that was a space for us to just check in with each other periodically … It was mostly just to say, "Hey, I'm here, I'm here. Do you need something? How's it going? Let me hear from you" … And the nice thing about it is it's whenever they're online. It's not anything intrusive or in their face, but it's just, "Hey, we're here."

Participant 3, a technology specialist, described this Facebook space as "our lifeline." He further explained that the Facebook group "is where we post life happenings. Today I had a rough day at work. This happened. I know y'all, I understand. I'm trying to do this. What do y'all think?" The participants use the Facebook group as a place to share ideas, collaborate, and provide support.

From this larger Facebook group created for the entire cohort, smaller groups formed in other spaces depending on the needs of the group. As participant 7 notes, "You've got the big group with Facebook, and then we kind of have the instant message group and then the text group." Participants noted that these smaller groups developed for a variety of reasons from class projects to topic interests to just deeper personal connections developed during the program. Regardless of the connection space, be it university-sanctioned or student-driven, participant 9 points out the necessary ingredient for success: "We commit, we commit. We commit to reaching out to each other."

Fuller et al. (2014) noted the important role that LMS messaging functions and social networks played in increasing social engagement online. However, at least in the case of the LMS, the students in this study seemed to believe the LMS was inadequate and welcomed the use of other applications for interaction, such as FlipGrid, which allow asynchronous communication with video. Simply being able to see the face and hear the emotion of their classmates gave a sense of togetherness even while apart. The students in this study also emphasized the importance of student-sanctioned online spaces, those outside of the immediate online doctoral environment, where students could both discuss issues,

encourage each other, and share about their online doctoral progress or their personal lives. Thus, encouraging cohorts to create their own spaces for communication may have increased comradery and enhanced the engagement in this program's university-sanctioned spaces.

Identity and impact

One final factor within a program that inspires engagement and connection is when the program acknowledges a student's identity and creates an impact on their lives as professionals and scholars. Participant 9 spoke on how the program facilitated the discovery of a new identity:

> I'm more of a social justice advocate and warrior than I thought I was. I knew I was always passionate about it, but I didn't know I was this passionate about it until I got to doing the research on it...my research interests help me to find who I really am and who I'm wanting to become and who I'm becoming...and how I want to mold others to become whoever they're supposed to be.

It is particularly on this last point, "I want to mold others to become whoever they're supposed to be," where the finding and acknowledgment of identity can inspire social engagement and the desire to develop an *apart, but together* relationship. When students allow themselves to engage with others in this manner, it can have an effect on the broadening of one's worldview:

> I've grown up in pretty much a white privilege type life and getting to experience where others have come from and their culture and their struggles have definitely broadened my worldview. And I think that's part of what this program has done as far as online learning and getting to experience the different people. (Participant 8)

As participant 6, a math instructional coach, puts it, when students of various identities are empowered to share in an online environment, the impact is "not just getting to know people, but…learning all these different perspectives."

Greater engagement in this program may have been achieved both through authentic opportunities to interact, those beyond the typical "reply to two classmates' discussion posts," and also by connecting to the identities of students. Incorporating student identities was found to be particularly important for the students in this program, who desired to engage in curriculum and social interactions that connected and enhanced their current and future selves.

Influential factors in an extended ecology

"I have other things I need to be doing that affect the EdD, and the EdD affects those things" (participant 5). The quality of connections students can make in an online doctoral program is often tied to factors that extend beyond the online platform, the cohort, and the program environment. As the quote above suggests, there is a reciprocal relationship between the various spheres that make up an online doctoral student's ecology and their experiences in the EdD program. However, the relationship is not static; it changes over time as one computer science teacher's reflection points out: "My life was governed by my EdD … now my life governs my program" (participant 1). In this section, we turn to how

students' families, work, and other external forces either enhance or detract from their doctoral progress.

Family

"Family's number one but not when you're doing your doctorate" (participant 4). Many students who engage in online doctoral programs are girlfriends, boyfriends, wives, husbands, mothers, fathers, and/or grandparents. These roles take priority in their lives, but engagement in an online program has forced them to make sacrifices, either in their family life or their EdD life. As several participants have shared, the sacrifice can take an emotional toll.

> Family life has almost a negative effect on my experience in the program. And I don't really like framing it that way, but I don't really see a better way to say it. I cannot do everything that I have to do without making a sacrifice somewhere. And even though in my mental space family is absolutely number one, and I'm doing this for my family … it has really fallen hard on my family to try to do this (Participant 3).

For participant 3, there appears to be some guilt about having to sacrifice family life, but at the same time, the participant tries to frame this sacrifice as one that will eventually benefit the family. A similar sentiment of guilt is shared by participant 10 who recounted, "I definitely have like mom guilt because every spare second I'm on my computer. And they know that, and they've kind of given up. So it's so sad, but you know, it happens." While there is a sense of remorse in these words, both participants 3 and 10 have reasoned that this is the price for engagement in an online doctoral program.

However, the sacrifice is not always the family—sometimes engagement in the online doctoral program must be sacrificed. Participant 10, an assistant principal, who above reported feeling "mom guilt," also noted that, at times, the family will take the priority: "My kids, if they say, and this is just in general, 'Hey, I need you to run me,' they're all in sports or whatever, 'I need you to run me to my practice or to this game.' I'll completely stop what I'm doing and just go do it." Family responsibilities sometimes must take priority, which may mean certain opportunities for social engagement in the doctoral program may be foregone.

While such responsibilities, such as taking children to sports practice, may result in a temporary break in social engagement, other family issues may have a larger impact. A few participants disclosed the effect divorce has on their participation in the program. Participant 2, a school principal, who remained engaged in the program despite a recent divorce, lamented, "So now the emotional toil, the emotional toil is heavy. So I'm toiling more at night than I would've been … I have a finite amount of bandwidth." Others facing similar hardships have been reported to gravitate away from the online group as participant 9 shared: "I know a couple of people [in the cohort going] through divorces and they kind of have … their difficulties right now. So we try to be there, support them, but they kinda like going their own direction."

Family issues, such as those above, may have an effect on the ability or willingness to be *apart, but together*. However, the participants also reported on ways that families can help support a stronger engagement in the online doctoral program. Sometimes, this comes in the form of a partner taking on extra responsibilities: "I'm blessed to have a husband who was very much supportive and picked up on the housework and you know, the meals and

the laundry, all of those things" (participant 8). Other times, it means setting strict schedules with the family:

> Then my husband, we have to sit down and talk about my weekly schedule and not in a controlling way … I'm working on adding to our shared calendar, like homework time, or talking to him about like what major assignments are coming up that I'm just going to have to work really hard on and ignore him. (Participant 7)

While there is evidence that family may draw students toward *alone together*, the participants have also shown strategies to help maintain being *apart, but together*.

Given that many doctoral students enter online programs with various family responsibilities, learning to balance the microsystem of family duties with the microsystem of program demands within the mesosystem is critical for enhancing the ability to engage online. The participants in this study exhibit various strategies to strike this balance, including predetermined schedules and a temporary uneven distribution of responsibilities with a partner. When students need greater emotional support in the event of family troubles, such as divorce, providing resources so that students can receive the necessary help outside of the program may be helpful. Many universities offer student services of this nature, though online students may not be aware of the existence of such services and how they can engage with them.

Work

For online doctoral students employed in schools or other educational organizations, work can serve as an environment that enhances learning experiences in the online doctoral program or be an isolated sphere contributing to the feeling of *alone together*. Many of the participants work in environments where supervisors allow for time for studies and, subsequently, greater engagement in the program:

> I'm very blessed because I had a wonderful supervisor at work who...would know that I had a deadline coming up or something that I needed to work on. And so he would say, 'All right, go in your office and close your door and this is what I expect you to be working on.' (Participant 8)

Other supervisors go beyond simply giving time to work and engage the participants in conversations about how doctoral work can be applied to the school: "I'm encouraged by my boss … 'How can you make that work here? How can, you know, take what you know, this idea that you were writing about?'" (participant 3). Such face-to-face conversations with a supervisor may help the learner connect more with their studies while at the same time provide an outlet for collaboration. Conversations such as these sometimes also extend to colleagues who are enrolled in other online doctoral programs, creating an additional online learning community: "I actually have three people on my team who are pursuing their doctorate degrees currently…so it's kind of brought about this collaborative aspect of those of us on our team" (participant 8). Whether with a supervisor or with colleagues, such conversations create a new meaning to *apart, but together*, where the interlocutors are not necessarily involved in the same doctoral program, but together they are creating new meaning and social engagement.

Unfortunately, not all participants work in environments that facilitate integration with the online doctoral sphere. For some participants, particularly those who are principals,

their role as educational leaders allows for little time for considering the program during their workday:

> I think as one of the worst things, I was not going to, I wasn't going to pass some of the opportunity for a principalship, but this was not the right time for me to assume a principalship for the first year. It just wasn't. If I was still in the comfort of my previous position, I probably would have had chapters one, two, three done at the minimum. (Participant 2)

Other participants, such as participant 10, do not believe it is appropriate for the spheres of work and the online program to coincide: "I never ever, ever work on school at work … I think for me it's a moral thing not to." Whether it be the demands of a position or one's personal convictions, work may not always enhance the online program and could contribute to the feeling of *alone together* by creating two separate spheres that are not allowed to interact.

The mesosystem connection, or lack thereof between the microsystems of the online doctorate and work, has emerged as an important dimension for these students. While some students reported having supportive supervisors and colleagues that provided opportunities to engage in conversations about the program and explore ways to merge learning with the professional environment, others described a distinct separation. Connections between the online doctoral program and work may have reduced the feelings of *alone together* for some of these students by providing real-life opportunities to discuss and implement material learned. The experiences of the students show the possibilities of connecting the online program with work by engaging supervisors in conversations on class material or forming scholarly communities with other colleagues. Such engagement outside of the program may have led to stronger engagement within the program for those fortunate enough to make such connections between the doctorate and their work.

Other forces

Beyond family and work, an online doctoral student's ecosystem consists of various additional external forces, some they are aware of and others that they are not, that may impact the feasibility of cultivating *apart, but together*. These forces may be political, cultural, or societal in nature, and they often differ based on the individual student's circumstances. While the discussion of these forces is beyond what a single article can cover, there is one external force worth specifically addressing—financial forces.

The influence of finances begins for a student when choosing a program and carries on throughout, often dictating what experiences a student can engage in. Participant 2 described his decision process for one university, "[Other university] immediately priced out because it's 40 K a year. Like, no, I can't do that for four years." Similarly, participant 7 noted, "even though [current university] is out-of-state tuition, it is still cheaper than in-state tuition in [state of residence]." Participant 1 described that unlike many PhD programs, "[The] EdD…ours are unfunded … so all of that plays a part because every day I think about this $70,000 in student loans that I have."

The pressure of tuition costs also presents barriers to engagement in many activities embedded in the program structure discussed above. Commenting on the upcoming study abroad, participant 7 expressed, "The Italy itinerary looks incredible. But summer tuition, the challenge for that for me is that … in summer the installments are like four times, so much more expensive … my tuition is close to $8,000 in the summer." She further hoped

"that there was a little bit of a decreased tuition for out-of-state [tuition] with the online program" so that she could engage in these opportunities to strengthen social and professional relationships with her classmates. For many in this group, the choice to pursue *apart, but together* or *alone together* often comes down to the financial price tag.

The forces which comprise the exosystem, or indirect environment influences, in a student's ecology are broad and in need of further exploration and development in future research. One salient part of the exosystem affecting student engagement in this program was financial obligations. Whether it be the cost of tuition, the price of travel for face-to-face activities, or existing debt from student loans or other financial obligations, finances affect the willingness and/or ability to engage. Recommendations of outside resources for students struggling with finances, such as university financial services, may have proven helpful for some students. Additionally, greater consideration of finances when planning program events, particularly optional events, may also have helped lead toward greater engagement in face-to-face events and, subsequently, in the online environment.

Conclusion

Taking a phenomenological approach, this study examined factors contributing to the *alone together* paradox, or feelings of isolation, in an online EdD program. We took an ecological approach, inspired by Bronfenbrenner (1977, 1979), for examining this phenomenon as a way to build upon previous research that focused on elements within a program environment that affect student social connection. We believe the theoretical basis of the paper holds strong even more so amidst the COVID-19 era and the recurring effects of a pandemic, as we must consider all systems related to online students' perspectives. COVID-19 itself is very much an exosystem that through the mesosystem is having an effect on all microsystem elements. Furthermroe, COVID-19 is also activating the chronosystem, therefore triggering new shifts within the entire ecology of learning and online learning communities specifically.

The voices of the online doctoral students in this study echo similar sentiments to students in past studies reporting that feelings of social isolation do not have to be the price of learning online, contrasting with Cox's (2018) assertion that students are apt to feel more alone online and that programs can take various measures to bring students toward a feeling of *apart, but together*. However, the data also suggested that factors outside of the online doctoral environment, particularly elements encompassing the student's greater ecology, may support or detract from the opportunity to engage socially with others online, thus corroborating what Turkle (2011) suggests as the desire to be connected online but the need to be physically separate.

Where this study has expanded beyond previous literature is in the acknowledgment of factors outside the program environment that enhance or detract from social engagement. Connections to Bronfenbrenner's (1977, 1979) work, mainly the micro- and macrosystems, have begun to emerge in the data concerning program elements reported above. However, the power of the full ecological model shows utility in highlighting factors such as family, work, and other external forces, which have emerged as influential elements affecting the degree students may engage online. While many programs have looked for solutions to feelings of *alone together* within the microsystem mainly, an exploration of the various ecological systems, such as the mesosystem and exosystem, may provide more options for enhancing student engagement. Furthermore, when

we consider the responsibilities that come with adopting an ecological framework, namely the value commitment to not just recognizing but enhancing the ecologies that one is part of, program responsibilities are transformed. If as Barnett (2020) states, an academic institution that commits to an ecological framework is "minded, therefore, to orchestrate its activities so as to play its part in repairing and/or enhancing the ecosystems in which it is entangled" (p. 279), traditional notions of what programs play in supporting online students are re-imagined. The multiple inhabited worlds that students bring with them to the program become not just entities to be acknowledged but connections to be strengthened.

The voices of the students in this study show that there are various avenues within a student's ecology for cultivating *apart, but together* in an online doctoral program. Environmental approaches from previous research that mainly focused on program microsystems have been further substantiated in this study, while factors from the meso-, exo-, and macrosystems that encompass the greater student ecology have emerged as additional avenues for enhancing engagement with others in the program. For programs looking to improve social engagement between students, it is recommended that administrators and instructors examine the full ecology of their students as these may differ from those of the participants in this study. Interventions addressing both internal and external forces may provide more effective solutions than those that consider the environment alone.

Taking an ecological approach to understand student experiences in this online doctoral program has allowed us to expand beyond environmental approaches for increasing student social engagement and consider solutions encompassing students' full ecologies. However, as is the nature of phenomenological inquiries, the experiences and feelings reported in this study may reflect only those of the participants studied and cannot necessarily be generalized to other students or programs. Our study was restricted to a small group of student participants in a specific online doctoral program at a single university, and as such, findings should be held in the context of this study. Additional data collection across different programs and institutions could seek to crystallize these findings further. Because the ecological model has not previously been applied to online learning, continuing to follow the threads of the ecological model to analyze different research questions in our program might make these findings more salient and robust. At the same time, the voices of the students allow for the conceptualization of an ecological framework for exploring the *alone together paradox*. This same limitation that the study can only claim to speak to the experiences of students in one EdD program in the USA may also limit how its findings can be applied in other disciplines and in other national and cultural contexts given that doctoral programs vary vastly. However, we do believe that the adoption of an ecological framework offers certain unique possibilities. In light of Barnett's (2020) contention that committing to an ecological stance is a value commitment to recognizing, affirming, supporting, and perhaps even repairing communities that academic programs are part of, we believe that it gives academic leaders across the world and across disciplines a starting point from which to begin asking questions as to how they can ethically sustain the communities they are part of. Barnett offers the following questions for universities everywhere to consider:

> Might it wish to develop new pedagogical approaches to enhance its students' state of wellbeing and thereby contribute to their personal ecosystems? Might it work more actively in the local community and play its part in developing the ecosystem of social institutions in the region (and perhaps advance social justice or

the public sphere)? Might it look seriously at its use of the resources of the natural environment and so help to minimise eco-degradation there? Might it consider ways in which it can draw some of its research groups together across the disciplines and help to generate new epistemic energies and a more vibrant knowledge ecosystem? (p. 279).

As Barnett has said, given that many universities have been overrun by ideologies of "cognitive capitalism" and "institutional entrepreneurship," these conversations are particularly important to have.

Building upon this work, future research could collect ethnographic or case study data of online doctoral students' experiences or continue to collect data specifically at targeted time periods over the course of their doctoral program to better understand how the ecology might manifest differently. Similarly, future research might see where impacts of the COVID-19 pandemic could fit within the ecology and its impact on online doctoral programs and student experiences. Research will need to examine the implications of the chronosystem shift and the subsequent changes to other systems as a result of the pandemic. Our rudimentary observations have been that there is less of a connection already between our most recent cohort of online doctoral students as a result of the COVID-19 pandemic, but interviewing and comparing responses from experienced versus new cohorts might be of interest due to the cancellation of various events (e.g., on-campus orientation, optional/subsidized university study abroad opportunities, cross-cohort community hangout visits). Future research might specifically explore the complexities and implications of the greater geographic, cultural, ethnic, and racial diversity present in our program as compared to our university's overall population or consider the ways external pressures such as the tracking of metrics like time-to-graduation perform as agents of consideration within this ecological frame.

We believe that the experiences of the students provide an invitation for researchers and program administrators to look beyond environmental solutions to feelings of loneliness in online learning and recognize and embrace solutions that account for the full ecology of students. While every student's ecology is unique and exploring all possible ecological dimensions is beyond what any single study could accomplish, this study opens an avenue for future inquiries into ecological aspects that influence online student social engagement. We believe at a college or program policy level; there are many implications that might nurture a community of learners, including a focus on intrusive advising, offering just-in-time advising resources and touchpoints, writing retreats, and scholarships to alleviate financial stress from the students. Moreover, we encourage online and face-to-face options for program-related events, affording students options and flexibility to participate in a community of learners through a format that meets their needs and schedule. Taking an ecological perspective provides many new opportunities for online programs to improve engagement between students online, moving away from *alone together* and achieving *apart, but together* in online learning.

Declarations

Conflict of interest The authors declare no competing interests.

References

Ali, A., & Ahmad, I. (2011). Key factors for determining students' satisfaction in distance learning courses: A study of Allama Iqbal Open University. *Contemporary Educational Technology, 2*(2), 118–134. https://doi.org/10.30935/cedtech/6047

Ali, A., & Kohun, F. (2006). Dealing with isolation feelings in IS doctoral programs. *International Journal of Doctoral Studies*, *1*(1), 21–33. 10.28945/58

Ali, A., Kohun, F., & Levy, Y. (2007). Dealing with social isolation to minimize doctoral attrition-A four stage framework. *International Journal of Doctoral Studies*, *2*(1), 33–49. 10.28945/56.

Allen, I. E., & Seaman, J. (2017). *Digital learning compass: Distance education enrollment report 2017.* Babson Survey Research Group. https://onlinelearningsurvey.com/reports/digtiallearningcompassenrollment2017.pdf

Barnett, R. (2020). Realizing the world class university: An ecological approach. In S. Rider, M. A. Peters, M. Hyvonen, & T. Besley (Eds.), *World Class Universities: A contested concept* (pp. 269–285). Springer.

Bhattacharya, K. (2017). *Fundamentals of qualitative research: A practical guide*. Routledge.

Blackmon, S. J., & Major, C. (2012). Student experiences in online courses: A qualitative research synthesis. *Quarterly Review of Distance Education, 13*(2), 77–85.

Blankenship, J. C., & Gibson, R. (2016). Learning alone, together: Closed-cohort structure in an online journalism and mass communication graduate program. *Journalism & Mass Communication Educator, 71*(4), 425–439. https://doi.org/10.1177/1077695815622113

Bødker, S., & Klokmose, C. N. (2012). Dynamics in artifact ecologies. In T. Pederson, L. Malmborg, G. Jaccuci, & K. Hornbaek (Eds.), *Proceedings of the 7th Nordic conference on human-computer interaction: Making sense through design* (pp. 448–457). Association for Computing Machinery. https://doi.org/10.1145/2399016.2399085

Borup, J., Graham, C. R., West, R. E., Archambault, L., & Spring, K. J. (2020). Academic communities of engagement: An expansive lens for examining support structures in blended and online learning. *Education Technology Research Development, 68*, 807–832. https://doi.org/10.1007/s11423-020-09744-x

Breitenbach, E. (2019). Evaluating a model to increase doctorate program completion rates: A focus on social connectedness and structure. *International Journal of Doctoral Studies, 14*(1), 217–236. https://doi.org/10.28945/4239

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32*(7), 513–531. https://doi.org/10.1037/0003-066X.32.7.513

Bronfenbrenner, U. (1979). *The ecology of human development*. Harvard University Press.

Bronfenbrenner, U. (2005). Ecological models of human development. In M. Gauvain & M. Cole (Eds.), *Readings on the development of children* (4th ed., pp. 3–8). Worth Publishers.

Buck, S. (2016). In their own voices: Study habits of distance education students. *Journal of Library & Information Services in Distance Learning, 10*(3–4), 137–173. https://doi.org/10.1080/1533290X.2016.1206781

Carnegie Project on the Education Doctorate. (2021). The CPED framework. https://www.cpedinitiative.org/the-framew

Chang, S. H., & Smith, R. A. (2008). Effectiveness of personal interaction in a learner-centered paradigm distance education class based on student satisfaction. *Journal of Research on Technology in Education, 40*(4), 407–426. https://doi.org/10.1080/15391523.2008.10782514

Cox, A. (2018). The online alone together paradox as a context for incidental and informal learning. *New Directions for Adult and Continuing Education, 159*, 71–89. https://doi.org/10.1002/ace.20288

de los Arcos, B., Coleman, J., & Hampel, R. (2009). Learners' anxiety in audiographic conferences: A discursive psychology approach to emotion talk. *ReCALL, 21*(1), 3–17. https://doi.org/10.1017/S0958344009000111

Edelen, D., Bush, S. B., Simpson, H., Cook, K. L., & Abassian, A. (2020). Moving toward shared realities through empathy in mathematical modeling: An ecological systems theory approach. *School Science and Mathematics, 120*(3), 144–152. https://doi.org/10.1111/ssm.12395

Fuller, J., Risner, M., Lowder, L., Hart, M., & Bachenheimer, B. (2014). Graduates' reflections on an online doctorate in educational technology. *TechTrends: Linking Research & Practice to Improve Learning, 58*(4), 73–80. https://doi.org/10.1007/s11528-014-0771-4

Gardner, S. K., & Gopaul, B. (2012). The part-time doctoral student experience. *International Journal of Doctoral Studies*, *7*, 63–78. https://doi.org/10.28945/1561

Glaw, X., Inder, K., Kable, A., & Hazelton, M. (2017). Visual methodologies in qualitative research: Auto photography and photo elicitation applied to mental health research. *International Journal of Qualitative Methods, 16*, 1–8. https://doi.org/10.1177/1609406917748215

Guattari, F. (2005). *The three ecologies*. Bloomsbury.

Guest, G., MacQueen, K. M., & Namey, E. E. (2012). *Applied thematic analysis*. SAGE.

Janta, H., Lugosi, P., & Brown, L. (2014). Coping with loneliness: A netnographic study of doctoral students. *Journal of Further and Higher Education, 38*(4), 553–571. https://doi.org/10.1080/0309877X.2012.726972

Kember, D. (2007). Reconsidering open and distance learning in the developing world: Meeting students' learning needs. *Routledge*. https://doi.org/10.4324/9780203966549

Kuhn, D. (2015). Thinking together and alone. *Educational Researcher, 44*(1), 46–53. https://doi.org/10.3102/0013189x15569530

Kumar, S., & Dawson, K. (2018). *An online doctorate for researching professionals: program design, implementation and evaluation*. AU Press.

Legon, R., & Garrett, R. (2017). *The changing landscape of online education (CHLOE)*. Quality Matters and Eduventures. https://www.qualitymatters.org/sites/default/files/research-docs-pdfs/CHLOE-First-Survey-Report.pdf

Leonard, J. (2011). Using Bronfenbrenner's ecological theory to understand community partnerships: A historical case study of one urban high school. *Urban Education, 46*(5), 987–1010. https://doi.org/10.1177/0042085911400337

Lincoln, Y. S., & Guba, E. (1985). *Naturalistic inquiry*. SAGE.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2020). *Qualitative data analysis: A methods sourcebook* (4th ed.). SAGE.

Noel-Levitz. (2011). *National online learners priorities report*. https://www.noellevitz.com/upload/Papers_and_Research/2011/PSOL_report/202011.pdf

Okorocha, E. (1996). The international student experience. *Journal of Graduate Education, 2*, 80–84.

Onwuegbuzie, A. J., Collins, K. M., & Frels, R. K. (2013). Foreword: Using Bronfenbrenner's ecological systems theory to frame quantitative, qualitative, and mixed research. *International Journal of Multiple Research Approaches, 7*(1), 2–8. https://doi.org/10.5172/mra.2013.7.1.2

O'Sullivan, P. B. (2000). Communication technologies in an educational environment: Lessons from a historical perspective. In R. Cole (Ed.), *Issues in web-based pedagogy: A critical primer* (pp. 49–64). Greenwood Press.

Oviatt, D. R., Graham, C. R., Davies, R. S., & Borup, J. (2018). Online student use of a proximate community of engagement in an independent study program. *Online Learning, 22*(1), 223–251. https://eric.ed.gov/?id=EJ1179651

Paat, Y. F. (2013). Working with immigrant children and their families: An application of Bronfenbrenner's ecological systems theory. *Journal of Human Behavior in the Social Environment, 23*(8), 954–966. https://doi.org/10.1080/10911359.2013.800007

Patton, M. Q. (2015). *Qualitative research and evaluation methods* (4th ed.). SAGE.

Peshkin, A. (1988). In search of subjectivity—One's own. *Educational Researcher, 17*(7), 17–21. https://doi.org/10.3102/0013189X017007017

Ross, J., Gallagher, M. S., & Macleod, H. (2013). Making distance visible: Assembling nearness in an online distance learning programme. *International Review of Research in Open and Distance Learning, 14*(4), 51–67. https://doi.org/10.19173/irrodl.v14i4.1545

Terrell, S. R., Snyder, M. M., & Dringus, L. P. (2009). The development, validation, and application of the Doctoral Student Connectedness Scale. *The Internet and Higher Education, 12*(2), 112–116. https://doi.org/10.1016/j.iheduc.2009.06.004

Terrell, S. R., Snyder, M. M., Dringus, L. P., & Maddrey, E. (2012). A grounded theory of connectivity and persistence in a limited residency doctoral program. *Qualitative Report*, *17*(31), 1–14. https://doi.org/10.46743/2160-3715/2012.1747

Turkle, S. (2011). Alone together: Why we expect more from technology and less from each other. *Basic Books*. https://doi.org/10.5613/rzs.41.3.7

van Niekerk, M. P., & Schmidt, L. (2016). The ecology of distance learning: Bridging the gap between university and student. *South African Journal of Higher Education, 30*(5), 196–214. https://doi.org/10.20853/30-5-663

Vasiliou, C., Ioannou, A., Stylianous-Georgious, A., & Zaphiris, P. (2017). A glance into social and evolutionary aspects of an artifact ecology for collaborative learning through the lens of distributed cognition. *International Journal of Human-Computer Interaction, 33*(8), 642–654. https://doi.org/10.1080/10447318.2016.1277638

Vasiliou, C., Ioannou, A., & Zaphiris, P. (2014). Understanding collaborative learning activities in an information ecology: A distributed cognition account. *Computers in Human Behavior, 4*, 544–553. https://doi.org/10.1016/j.chb.2014.09.057

Vekkaila, J., Pyhältö, K., & Lonka, K. (2014). Engaging and disengaging doctoral experiences in the behavioural sciences. *International Journal for Researcher Development, 5*(1), 33–55. https://doi.org/10.1108/IJRD-09-2013-0015

Verster, M. (2009). Creating an online learning ecology in support of mathematical literacy teachers. *International Journal of Education Development Using Information Communication Technology, 5*(5), 85–100. http://ijedict.dec.uwi.edu/viewarticle.php?id=863

Yalof, B., & Chametzky, B. (2016). Mentoring online doctoral students through a community of practice model. *The Online Journal of Distance Education and e-Learning*, *4*(2), 39–46. https://www.tojdel.net/journals/tojdel/articles/v04i02/v04i02-05.pdf

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