Facing student attrition among doctoral students in education: Isolation, peer belonging, and reimagining the LMS

by

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Abstract

Rates of PhD student attrition are alarming. Studies have examined the reasons for this phenomenon and made recommendations, yet attrition remains high. Pursuing an explanatory mixed-methods approach in a Faculty of Education at a Canadian university, this study examined doctoral students' experiences of isolation and belonging, and their peer relationships. The potential of using an existing learning management system (LMS) to reduce isolation among doctoral students was also examined. Data collection occurred in the fall of 2020, with 33 doctoral students participating. This point in time afforded the opportunity to examine the experiences of doctoral students whose studies spanned the period before and during mandated social distancing and remote teaching due to COVID-19. Data collection methods included surveys, interviews, and feedback on a prototype online environment to support connection among doctoral students. As a method of member checking, participants were presented with preliminary study findings in a workshop. Findings confirmed belonging as a need shared by doctoral students. First-year students, international students, and students in the research and writing phases of their programs were most at risk of experiencing isolation as a deterrent to persistence in their programs. Themes developed from the data included:
(a) the struggles of navigating administrative processes, (b) pluralistic ignorance among students related to academic struggles, (c) differences in the levels of support and expectations of supervisors, (d) the need for greater institutional focus on student well-being. While supervisors were identified as the most important contributors to a doctoral student's progress, peers were most important to providing academic, emotional, and social support towards persistence. Recommendations from the study include piloting an LMS environment for doctoral student connection with peers and integrating The Okanagan Charter as a tool to centre student wellbeing in program practices. The author also recommends expanded use of the Doctoral Student Connectedness Scale (DSCS, Terrell et al., 2009) as an evaluation tool to help identify students at risk of attrition from their programs.

Keywords: attrition; sense of belonging; isolation; PhD students; learning management systems (LMS); Third Space; Doctoral Student Connectedness Scale DSCS; COVID-19

Dedication

Thank you to the PhD students who shared their stories. The vulnerability, rawness, and desire to help themselves and other students was more than evident. In order to thrive, PhD students want and need belonging, support, and to know they are a part of a community in the academic setting to which they study, learn, and are researchers. Bringing attention to PhD attrition numbers - is to acknowledge the attrition rates are doctoral student individuals. What are the ways doctoral students express they can be supported to increase retention for their PhD completion? Therefore, I also dedicate this dissertation to all PhD students, with the following sentiments.

To PhD students everywhere: It's a long road – I hope you find your belonging, perseverance, and joy in the journey.

This study sought to highlight common experiences towards awareness and change, specifically in doctoral programs in Faculties of Education. The interviews and student stories made real to me that doctoral students can wonder or think they are the only ones struggling. The participants made claim to belonging and community as a need. And while isolation is necessary for parts of the work, knowing there is community — through a writing group, a club, the library, a supervisor, a friend — can provide encouragement and strength to keep going.

Community and shared stories can dispel beliefs of isolation and feeling like a person is the only one struggling. Someone approachable and available who can answer a question can save a student lots of time fretting or being unsure of where they are and/or how to proceed. Hearing others' interests in research and work can offer community and inspiration to keep going. I hope the results of this research help to provide that support for doctoral students and programs.

I did not realize the PhD would be such a time of personal growth, testing perseverance and will (such arduous and continuous work!), yet, in the end I am grateful for all these challenges. I hope that the research and writing — the development as we grow into our fields — gives you the courage to reach out when you need a listener, when you need help understanding what is needed, and the bonus of a buddy to write with.

When I had times of loneliness, isolation, feeling unsure in my capabilities, I wish I would have advocated for myself and reached out. It often took me extended time to do that, which diminished confidence in myself and my abilities during those periods.

My advice is to advocate for yourself. Check in with your supervisor, ask for a meeting or update them on your progress in an email. Let your supervisor know what you need or that you are stuck. Find the resources available for doctoral students for research, writing, and mental health support, and utilize those. When you are getting to the point of overwhelm (and it can be hard to reach out in that state), have one other person - another student - a committee member- you can let know where you are, and that you need help. I found walking alongside someone else and knowing someone was walking alongside of me- whether another doctoral student - or a doctoral student support - like the library resources - thesis writing groups - helped me to not stop.

Additionally, offering encouragement to others even when I lacked any for myself, reminded me to not give up. And through this practice, I often unexpectedly received encouragement – whether through a fellow student, supervisor, a blog, a meme, or from somewhere else. Through this research process I met other doctoral students and would attend their defense when I could. This turned out to be a gift for me as a student researcher, in getting to know other doctoral students and their research interests, and learning from other students.

A PhD told me, “It always seems impossible until it’s done!” Within those words is ‘I [a]m possible’ . I wrote this on my computer to remind me to keep going. A coaster that said, “Stay calm and finish your dissertation” was also on my desk as a reminder.

Sandra, my doctoral student “buddy”: Thank you for the years of friendship developed through this process, the thousands upon thousands of texts, the shared laughter and successes, the shared tears and compassion, and all the encouragements! All the hours of video – working independently and in community – thank you! We did it buddy. And we have a lifelong friendship as a result . . . besides our new hats!

To my husband Jay, our kids and their families, faculty and students at Simon Fraser and Western Washington University, your belief in me is a gift. To my siblings and parents supporting and cheering me on, it means so much. This was a long process and

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List of Acronyms

ABD	all but dissertation
COVID-19	coronavirus 19
GPA	grade point average
LGBTQ2S	lesbian, gay, bisexual, transgender, questioning, 2 spirit
LMS	learning management system
SFU	Simon Fraser University

Glossary

Academic self-concept "Consists of the beliefs, attitudes, and self-perception students have about their academic competence and performance" (Lent et al., 1997); "Self-concept is a strong predictor of interest in pursuing an academic research career, such as Ph.D." (Ostrove et al., 2011).

Academic social isolation "A feeling of marginalization and anxiety integrating to new learner roles and relationships, and stress concerning the ability to perform in a teaching and learning environment and ability to undertake independent research" (McClure, 2007). Social isolation can appear "As pervasive feelings of loneliness, dissatisfaction, marginalization, and heightened levels of interpersonal distress" (Reynolds & Constantine, 2007).

Disability The American with Disabilities Act of 1990 (ADA) defines a disability as a physical or mental impairment that substantially limits a major life activity such as "communicating and working as well as caring for oneself, performing manual tasks, seeing, hearing, eating, walking, standing, lifting, bending, speaking, breathing" (Chapter 126, Sec. 12102, ADA, 1990). In 2008, the ADA was amended to include learning related activities such as concentrating, reading, and thinking (Americans with Disabilities Act Amendments Act [ADAAA], 2008). A mental illness can be categorized as a disability if it impairs one's ability to cope with the above-mentioned major life activities (Belch, 2011). These definitions show that a disability can be visible or invisible (Evans & Herriott, 2009).

Doctoral students Refers to students who enter through various programs and levels of qualifications of a doctorate degree. There are practitioner and professional doctorate degree programs, e.g., EdD, DPT, DCA, SJD; and there are research-based programs, e.g., the PhD which requires appropriate former degrees yet not necessarily any work experience to be accepted. PhD programs are typically double in length of dissertation and scope of the research project (Neumann, 2005). For the purposes of this study, doctoral students refer to Ph.D. programs in education. Neumann, R. (2005, July). Doctoral differences: Professional doctorates and PhDs compared. *Journal of Higher Education Policy and Management, 27*(2), 173-188. Routledge Taylor & Francis Group.

Educational technology "A systems definition...is characterized as a goal oriented, problem solving approach utilizing tools, techniques, theories, and methods from multiple knowledge domains to: (1) design, develop, and evaluate human and mechanical resources efficiently and effectively in order to facilitate and leverage all aspects of learning, and (2) guide change agency and transformation of educational systems and practices in order to contribute to influencing change in society" (Luppicini, 2005, p. 103).

Exclusion related to identity: "Legitimized forms of exclusion are usually associated with traditional definitions of citizenship. Many critics from both left and right recognize that citizenship is about exclusion (McDowell, 1999) rather than inclusion for any people, despite the common definitions of the term" (Fenster, 2005, p. 224). Bullying and cyberbullying should be considered as part of the definition of exclusion as it is an issue for university students, leading to "mental and physical impacts" (Cassidy et al., 2017, p. 2).

Inclusion Sometimes included with the term safety; inclusion in educational environments and mattering foundational factors for educational success. “Inclusion and safety are distinct but related constructs...important requisites for student learning and development to occur” (Strange & Banning, 2001, 2015, p. 142).

Learning management system (LMS) The history of the LMS comes from the ILS, Integrated Learning System,which offers functionality beyond instructional content such as management and tracking, personalized instruction and integration across the system (Bailey, 1993; Becker, 1993; Brush et al., 1999; Szabo & Flesher, 2002, Watson & Watson, 2007). LMS history started in K-12; “the term is currently used to describe a number of different educational computer applications...it is the framework that handles all aspects of the learning process” (Watson & Watson,2007, p. 28).

Sense of belonging “Refers to students perceived social support on campus, a feeling or sensation of connectedness, the experiences of mattering or of feeling cared about, accepted, respected, valued by, and important to the group (e.g., campus community) or others on campus (e.g., faculty, peers). It’s a cognitive evaluation that typically leads to an affective response or behavior” (Strayhorn, 2012, p. 3).

Social engagement combined with learning is key for students to make meaning of their coursework, build community and connection with faculty and students, which leads to higher engagement academically (Garrison et al, 2000; Lovitts, 2001; Strayhorn, 2012).

Student engagement (Austin, 1984) is defined as “the amount of physical and psychological energy that the student devotes to the “academic experience” (p. 297). These principles are to be considered: (1) “engagement refers to the investment of physical and psychological energy”; (2) “engagement occurs along a continuum”; (3) “engagement has both quantitative and qualitative features”; and (4) “the effectiveness of any educational practice is directly related to the ability of that practice to increase student engagement” (Junco, 2012, p. 163). “In the wider context of higher education, engagement is seen primarily as a quality of the school or college rather than a trait of the individual. The amount of time and effort students put into their studies and other educationally purposeful activities is one of the ‘critical features’ of engagement and used by Indiana University’s National Survey of Student Engagement (NSSE) to measure collegiate quality. NSSE assesses how the institution deploys its resources and organizes the curriculum and other learning opportunities to enable and encourage students to participate in activities that, they argue, show are linked to student learning” (Davis and Morris, 2015, p. 4).

Third Space: Examining and integrating postcolonial sociolinguistic theory of identity and community; this work is attributed to Homi K. Bhabha (2004, p. 55). Third Space Theory explains the uniqueness of each person, actor, or context. Third Space has also been described similarly to Personal Learning Environments as the space between school and work. For this study, Third Space is a space for doctoral students to come together from different backgrounds, programs in the Faculty of Education, and share knowledge, experiences, and formulate relationships and learning through a social construct.

Chapter 1.

Introduction

> I knew that my experience was not unique, that about 50 percent of those who start Ph.D. programs leave without the degree, yet we were isolated from one another.
>
> (Lovitts, 2001, p. x)

As I write this, I am a doctoral student in a PhD program. Throughout my education and work experiences, I looked for ways to configure environments of belonging, particularly with adult learners in higher education. Sense of belonging is important to me. I understand what isolation can do to the learner — from both my personal learning experiences, seven schools within five states (elementary grades first through 9th) I was a new learner in different settings, with different curriculum and standards. I dropped out of college at 19, and re-entered college much later in life. Through my personal experience, observations in a higher education setting, teaching, and others' stories, I have perceived the barrier to achieving higher education goals. Isolation can be destructive, influencing one's mind, one's spirit, one's perception of self, and one's vision of an educational future. In looking at studies on feelings of belonging and higher education, my attention pivoted to doctoral students and attrition rates. Doctoral attrition has remained steady at a dismal 50% average for decades. My attention and academic interest centred on attrition, sense of belonging, academic–social community, and persistence in learning.

1.1. Doctoral Student Attrition Rates: Why Are They So High?

Attrition rate describes the proportion of students who will not complete their degree. The quote from Lovitts (2001) which introduces this dissertation still rings true more than two decades later, across Canada and internationally. There is no definitive answer as to why attrition rates remain high for doctoral students. Several studies on attrition of doctoral students contain recommendations to institutions (Gardner & Mendoza, 2010; Lovitts, 2001; Nettles & Millett, 2006), yet a significant question

remains: Do doctoral programs and institutions believe that attrition is an educational issue that needs to be addressed, or do they resign themselves to attrition as the norm?

Some studies (Bowen & Rudenstine, 1992; Cassuto, 2013; Hockey, 1994; McAlpine & Amundsen, 2011; Sowell et al., 2008; Strayhorn 2012; Sverdlik et al., 2018) show that in the United States and Canada, approximately 40% to 50% of doctoral students will not complete their degree. Attrition in the field of doctoral education, which is the focus of this study, ranges from 50% (Ivankova & Stick, 2003) to as high as 70% (Nettles & Millett, 2006), and these numbers are holding steady (Cassuto, 2013; Sverdlik et al., 2018). The most concerning issue relates to those students who reach the all-but-dissertation (ABD) stage of their programs. Having fulfilled all the course requirements and successfully passed comprehensive exams, why do ABD doctoral students not complete their PhD requirements? This attrition is costly to the institution, as well as professionally and personally to students (Elgar, 2003). Recently published data (Statistics Canada, 2022b) show that in Canadian institutions, doctoral program cohorts are continuing to grow with both domestic and international students; yet at five years the attrition rate is 64%, and the numbers are not yet out for the graduation rate after six years. The most recent statistics at the time of this dissertation (Statistics Canada, 2022b; Sverdlik et al., 2018) confirm attrition rates continue to hover at approximately 50%.

1.1.1. The PhD Experience

Students must make a large commitment of personal and professional sacrifices, time, and resources to reach the final defense and achieve a PhD. In research based on studies by Tinto (1993) and Lovitts (2001), DeClou (2016) examined attrition factors in Canadian graduate programs to deepen investigation of (a) “measures of parent education,” (b) “socio-demographic characteristics,” (c) “academic performance and engagement,” and (d) “social engagement” (p. 175).

This 2016 study was focused on the population of graduate students who had completed a bachelor's degree. DeClou’s recommendations included implementation of social and informational supports for first-generation college students entering graduate programs, for graduate students who are parents or have family responsibilities, and funding supports for graduate students in general (pp. 190–191).

McAlpine and Amundsen (2011) undertook a four-year research program integrating mostly qualitative data from a range of studies, predominantly from the Faculties of Education at McGill University and Simon Fraser University in Canada. This study is important to my research as the authors described "exploring experiences of seeking, belonging to (or feeling excluded from) a community of like-minded individuals, and the range of emotions that such experiences can engender" (p.16). Study participants had obtained their doctorates and were on the journey to becoming scholars in their chosen academic fields. McAlpine and Amundsen took a closer look at what it meant for participants to transition "to the other side of the table" from doctoral students to doctorate thesis supervisors. The researchers examined what preparation participants undertook to be a thesis supervisor, aside from drawing on their own experiences as doctoral graduates. McAlpine and Amundsen wanted to determine the participants' perceptions of the support they received for their transition to graduate thesis supervisors (p. 38).

The study's long-term goal was to "improve doctoral completion rates by rethinking existing policies, practices, and pedagogies based on…research evidence" (p. 203). Their study gave educators and institutions real-life stories of doctoral students and their pre-tenure faculty supervisors. Their findings reinforced a doctoral student's need for a larger community network beyond the supervisor. With a larger network, students felt more integrated into their field. These findings differed from other studies centred on the supervisor as the most important relationship. McAlpine and Amundsen found that students indicating connections to people in academia besides their supervisor contributed to their "feeling like an academic"; therefore, they recommended that programs help students broaden their networks beyond supervisors (p. 3).

Professors from PhD programs might stay in touch with alumni to track their post-PhD employment and career development (McAlpine & Amundsen, 2016). Yet most PhD programs did not typically conduct exit interviews with doctoral students who left before completion (Lovitts, 2001), creating a void of potentially illuminating information. Most doctoral students or candidates departed "silently" (Lovitts, 2001), leaving lingering questions about why they had dropped out. Without formal ways to track PhD student departures and reasons for them, institutions and programs are provided no useful information to address drop out trends.

To address high attrition rates, we must identify causes. Lovitts (2001) excluded the influence of a student's background or personal characteristics on attrition. According to Lovitts, a student's background had no bearing on their persistence to degree completion; rather, the reasons for completion or attrition stemmed from "what happens to them (students) after they arrive" (p. 2). Lovitts stated that the "causes of attrition are deeply embedded in the organizational culture of graduate school and the structure and process of graduate education" (p. 2). Caruth (2015) agrees with Lovitts. As a result of their study, Caruth (2015) encouraged institutions to follow up with doctoral students who did not finish, calling them "lost scholars" and paying particular attention to areas of support— "advisory, supervisory, and department socialization" (p. 210)—to determine their impact on students who had dropped out. Tinto (1993) encouraged continued research into doctoral student experiences that led to attrition, stating that a longitudinal model was not enough to inform programs about the problem, causes, and policy solutions to doctoral student attrition (p. 243). Most studies related to doctoral student "stop out" (when a student takes time away or a leave for a specific reason or circumstance) or drop out (discontinuing their doctoral studies completely), focus on socialization during the first year. These studies further recommend socialization for doctoral students in their first year focused on academic and social connections.

1.1.2. **Socialization of Doctoral Students**

Gardner & Mendoza (2010), using a synthesis of research findings from other studies, recommended that institutions include intentional socialization of doctoral students with faculty and with each other. Other researchers across disciplines and institutions internationally (Lovitts, 2001; McAlpine & Amundsen, 2011; Nettles & Millett, 2006; White & Nonnamaker, 2008) agree that doctoral students need to have opportunities to connect with others and develop a sense of belonging. These other researchers' studies haven't really looked at individual student experiences in a focused study on belonging, isolation, and peers.

In my research, I wanted to gain a clearer understanding of doctoral students' experiences, the relevance and impact of peer-to-peer communities on those experiences, and the potential of peer connection to promote students' success. This understanding, in turn, might help us mitigate barriers to degree completion (Bair et al., 2004; Guentzel & Nesheim, 2006; Strayhorn, 2012).

Some studies have identified situations or student characteristics for which belonging, or socialization, may matter even more. Editors Gardner and Mendoza (2010, pp. 265–267), summarizing researcher chapters in their book (Gardner, 2010; Kasworm & Bowles, 2010; Shinew & Moore, 2010; Weidman, 2010; and Winkle-Wagner et al., 2010), detail particular challenges that some doctoral students can face. For instance, doctoral students who are enrolled part-time or who are managing families may experience more challenges regarding sense of belonging, and may, therefore, need increased peer support. Individuals who are returning as older graduate students may experience increased challenges in the classroom environment. According to Strayhorn (2012, 2019), students who have been historically marginalized within their program or at their institutions (due to gender, race, or other identities) face additional challenges. These examples illustrate the complexities and diversity of doctoral students as well as the context of their lives, including multiple responsibilities and intersecting identities. For some, the students' past experiences with the education system may include systemic patterns of institutional bias and inequity.

1.1.3. Socio-Emotional States and Persistence

Because socio-emotional states affect doctoral students to varying degrees throughout their studies and dissertation completion process (Ali & Kohun, 2007, p. 37), I am expanding on the territory of previous studies which focused on career trajectories, identity development, resilience, persistence, and socialization (Bireda, 2015; Gardner & Mendoza, 2010; McAlpine & Amundsen, 2016; Nettles & Millett, 2006; Strayhorn, 2012). To do so, I focus on the range of student feelings and explore how the presence or absence of doctoral peer relationships impacts doctoral students' sense of belonging and persistence in their programs.

1.1.4. Doctoral Students and Mental Health

One reason doctoral students drop out or stop out is poor mental health. In reporting on two studies examining graduate students and their mental health, Flaherty (2018) noted that mental health was at a crisis level for graduate students "largely due to social isolation, the often-abstract nature of the [graduate] work and feelings of inadequacy" (para.1). These experiences of isolation and loneliness among doctoral students are echoed on PhD student forums and blogs. One doctoral student on a PhD

forum suggested, as an “antidote” to isolation and loneliness, that students “make an effort to get into contact with other graduate students…being in contact with other PhD students will give you someone to talk to, moan to, and will help alleviate these disruptive negative feelings” (INOMICS, 2019, para. 2). On another blog a student wrote: “Some Ph.D. students find the experience of attaining a doctorate crippling, isolating, and institutions are now increasingly aware of the role they must play in addressing these issues” (Else, 2015, para. 8, para. 10).

What does institutional awareness look like? Student services for academic, mental health, and financial support are present to varying degrees on campus. For doctoral students, is it enough, given the attrition rates? Awareness of mental health for graduate students (and impacts of mental health on attrition) appears to be something important to pay attention to. Could universities be doing more for doctoral students in the area of mental health? Tracking attrition rates is meaningless unless institutions and doctoral programs include the answers as to WHY attrition rates are so high. Graduate student mental health should be a factor that is taken seriously. Alongside determining what supports meet doctoral students' needs, doctoral programs may want to consider implementing evaluative methods to track student progress and well-being as a strategy to offset attrition. The consequences for doctoral students of degree non-completion may extend far beyond not attaining the PhD:

> This “failure” [to complete] can be devastating. Indeed, non-completers describe the experience of deciding to leave as “gut-wrenching”, and they feel “really shaken up”, “horrible”, “shell-shocked”, “disappointed”, and “depressed” by it. Some leave feeling suicidal, some attempt it, and some appear to succeed. (Lovitts, 2001, p. 6)

Doctoral students’ own stories may provide insight into mental health barriers and experiences that may be a factor in doctoral student attrition.

1.1.5. **Doctoral Students and Peer Relationships**

Some studies (Gardner & Mendoza, 2010; Lovitts, 2001; Nettles & Millett, 2006) have addressed the supervisory relationship and suggest that one of the most important factors in doctoral degree completion is the successful relationship with a faculty advisor/mentor, who often is the faculty supervisor/committee chair. Other studies (McAlpine and Amundsen, 2011) talk about the importance of expanding student

networks with others, as academic professionals. The broader a doctoral student's network is, the more the student can perceive themselves as an academic.

Supervisors may have multiple students at one time. I am curious whether being introduced to other doctoral students, or working together with other doctoral students who have the same supervisor, would make a difference to belonging. In reflecting on McAlpine and Amundsen's (2011) recommendation of broadening doctoral student relationships, would supervisors who extend their supervision to connect doctoral students to one another give students the opportunity to learn together and support one another?

Few studies have examined the role of peer relationships on the doctoral experience or how doctoral students connect to each other, even though doctoral students have suggested that a sense of belonging is important to them (Strayhorn, 2012). While understanding that single-cause explanations rarely resolve complex problems, I wondered whether a lack of peer relationships could contribute to attrition, while encouraging peer relationships could offset attrition. Examining individual perceptions and stories can provide more information about doctoral student socialization, how it occurs, and its relevance to doctoral students' persistence to completion.

While experiences of isolation and belonging, and the importance of doctoral peer relationships are two of the driving forces…a third is the question of how doctoral students connect to each other. This study also explored the possibility of using an educational technology, the learning management system (LMS), Canvas as a space for community, a Third Space.

1.1.6. **The Third Space**

Third Space was originally defined by Bhabha (1994) as a space of liberation, where systems of oppression and acculturation could be deconstructed, in order to reconstruct through a leveled hierarchy. Bhabha's focus was specifically marginalized populations. Students could create something new in that Third Space across identities, creating solidarity and common ground.

Third Space has also been described as the space in-between personal life and work. In this study, Third Space is described as the space in-between academic and personal life: A space where academic and social are connected within the community of doctoral students, to build connections to one another while at the same time engaging in academic activities.

1.2. The Learning Management System (LMS)

The idea of using educational technology to address isolation and increase feelings of belonging has piqued my interest since I was studying for my master's degree. Learning management systems (LMSs) such as Canvas, and utilizing Canvas outside of an academic course has been of particular interest. The LMS traditionally has been used as an online space for courses, whether in-person or online. The instructor decides the content and resources for the course –e.g., syllabi, individual modules that break the course content into topical sections enhanced by extra readings, videos, assignments, and quizzes. The LMS is opened at the beginning of the term for academic reasons then closed at the end of the academic term. Students, depending on the access given by the instructor, can locate what they need to support their course. These systems provide certain safeguards for the students and the institution, as the technology must be licensed and is available only to invited users within the institution for that LMS. Additionally, the LMS is a shield of protection from outside influences, e.g., advertising, privacy intrusions, people outside the institution, and other content which comes unsolicited on social media sites, websites, and other public digital platforms. LMSs curtail concerns related to privacy or misuse of one's personal information.

LMSs are thought to be widely underutilized at post-secondary institutions (Ali & Wood-Harper, 2020; Princeton, 2018; Washington 2019). They could be used for more than courses, as a place of reprieve from the onslaught of outside media, for focus, information gathering, interaction with others, social connections, and networking, all from one digital platform. In 2015 I created a Canvas student orientation platform while in my master's program. The Canvas student orientation site provided an asynchronous platform for student employees, in multiple departments, to gain basic information, prior to their in-person student employee orientation. With institutional review board approval (human subjects review/ethics) I conducted a study to evaluate the student employee experiences of those university students who had been a part of the Canvas

asynchronous orientation. Through interviews and focus groups, students shared their experiences and knowledge gained through the Canvas student orientation site. The surprise finding that influenced my future research interests was that students reported feeling connected to the larger department and in some cases the university, and saw themselves belonging (Van Wingerden, 2021). This orientation site is still in use today. This experience fueled my exploration of Canvas as a Third Space for connection for doctoral students.

I am interested to know if doctoral students can perceive an LMS as a possibility for community outside of a course. The LMS does not contain ads and is more private than social media. Could the LMS, through design and student facilitation, become a place of decentralized power, where students can interact freely by choice, exist as place between courses and personal life, centred on academic scholarship with self-directed ways to connect with doctoral students in their own program and across programs within the Faculty of Education? With their more complex lives, would a doctoral student LMS site provide avenues of connection to peers for students to persist and lessen attrition?

This study seeks to illuminate student experiences that might result in attrition. My own experiences in student affairs, personally in my own education journey, and as an educator who works with undergraduate students in a college of education, have shown me the difference between isolation and belonging in terms of student self-efficacy, knowledge development, and resilience. Is attrition an automatic phenomenon that predictably occurs at the doctoral level, as statistics seem to show, or are there ways to discover an antidote or deterrents to attrition within the doctoral student stories?

1.2.1. Theoretical Frameworks and Doctoral Student Retention

Belonging has been established as a human need. To examine peer belonging in the context of academic and social environments of doctoral students, I draw on theories of graduate student development (Gardner & Mendoza, 2010; Tinto, 1993), isolation (Graham & Massyn, 2019) and attribution theory related to doctoral student departure (Berelson, 1960; Jones and Nisbett, 1971).

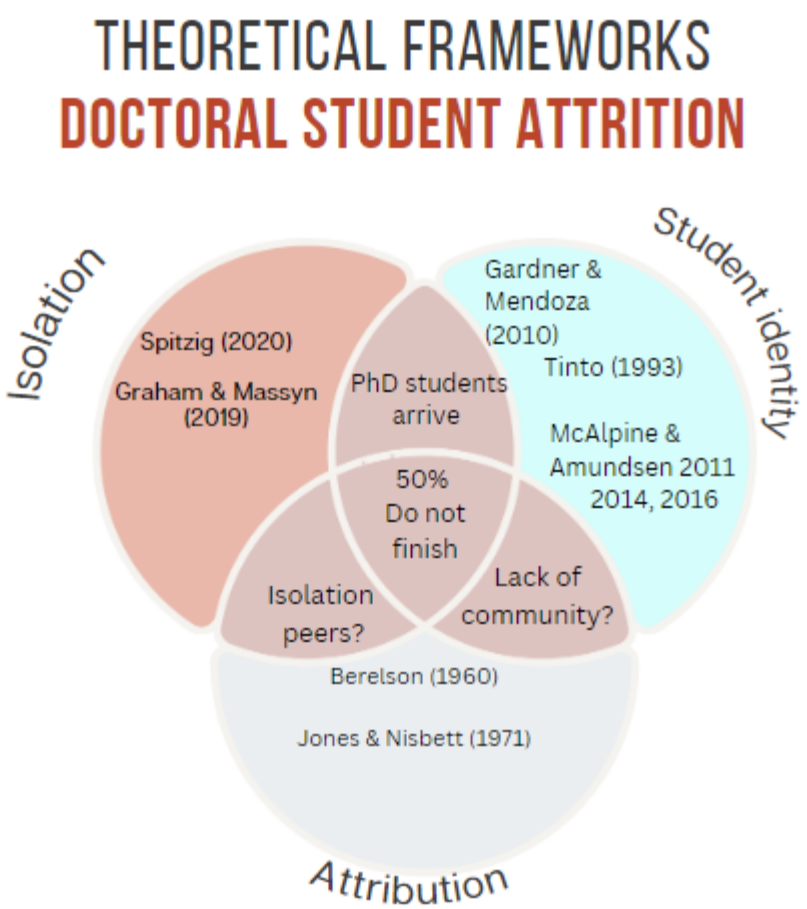

Figure 1.1 Theoretical Frameworks Doctoral Student Attrition

In the context of educational technology design and doctoral students, I look at theoretical frames of Third Space (Bhabha, 1994, 2004; Gutierrez, 2008; Poot & Austin, 2011; Potter & McDougall, 2017; Rye, 2014; Schuck et al., 2015), communities of practice (Lave & Wenger, 1991), and the social presence of communities in online environments (Garrison et al., 2000).

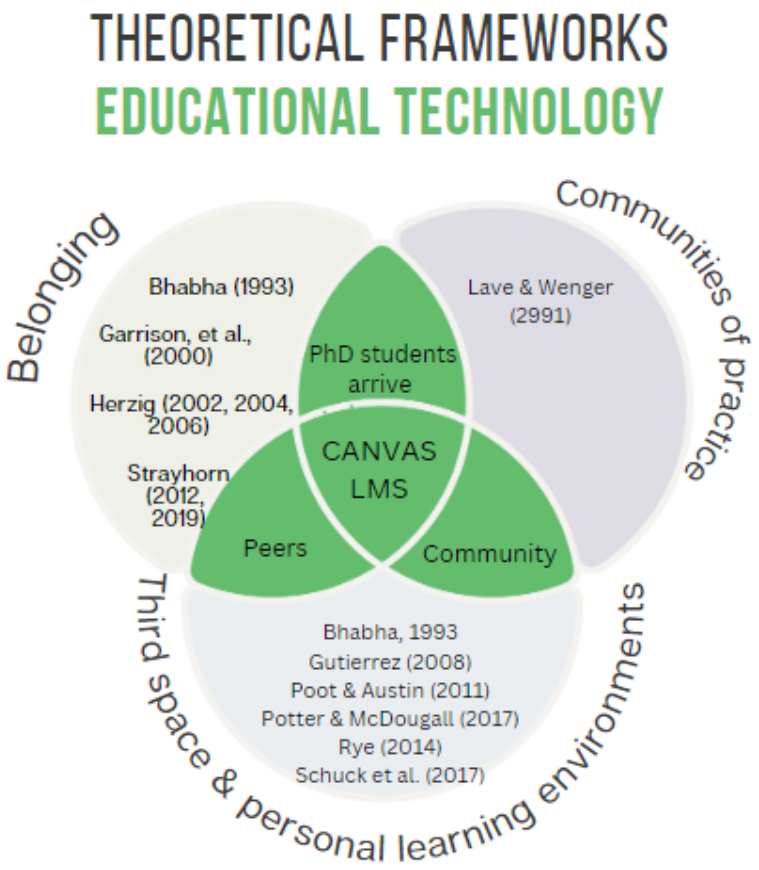

Figure 1.2 Theoretical Frameworks that might have a relationship with Educational Technology and Belonging through design and utilization

Figure 1.2 is a speculative idea of how theories might interface with belonging when the LMS is designed with social learning in mind. Garrison et al. (2000) designed the Community of Inquiry Model (CoI) directly related to student online learning, which shows the entanglements of cognitive presence, teaching presence, and social presence as necessary to the educational experience. Lave and Wagner (1991) have written about communities with common goals and visions, that engage in tasks over time, establishing themselves and new membership through peripheral situated learning. Personal learning environments, the space between work and school, the theories in Figure 5.1 and belonging (Herzig, 2002, 2004, 2006; Strayhorn, 2012, 2019, and Bhabha's 1993 Third Space theory) may guide the design and use of an LMS as a Third Space.

Students use digital devices and forms of communication in all aspects of their lives (Kwok-Wing, 2011; Laurillard, 2008; Van Wingerden et al., 2016). Social media is perhaps unbeatable in creating connections between people and possibly contributing to a feeling of belonging. However, in an academic environment, where doctoral students are engaged in scholarly activities and original research the lack of privacy of social media can be risky for academic discussions about new research topics and sharing writing. Additionally, it is a distraction to academics. For these reasons social media may not be the best contender for creating communities of benefit to doctoral students. I believe a platform that is limited to the doctoral student academic community, which combines academic activities and information, with the opportunity to engage with other doctoral students in scholarly discussions, sharing of experiences, encouragement in their academic endeavors may be a more valuable virtual space for doctoral students.

There is less literature on the LMS itself and online environments as they relate to belonging. Studies have been done integrating other technologies with an LMS to promote student belonging, e.g., integrating Discord and Teams with the LMS to foster connection and belonging (Kahu et al., 2022); the LMS as a platform for pre-service practicum teachers (2008); and another study on the LMS and the effect of engagement and sense of belonging in a hybrid course (Ustun et al., 2021). There is a gap of literature connecting the LMS itself, outside of a course or cohort, as a stand-alone resource towards building community and sense of belonging among students.

During the COVID-19 pandemic learning technologies such as video conferencing and collaborative cloud platforms became more important in creating social community and connection. Zoom became a mainstream video conferencing platform as a result of COVID-19. Therefore, it is important to explore how doctoral students might experience inclusion and belonging through the design and development of community spaces within LMSs. I am interested in how Canvas, when used as a social–academic technological space, mediates student interactions with resources, materials, and one another. Finally, I explore possibilities to extend the use of Canvas, and LMSs generally, as a peer-to-peer interaction tool—a virtual, inclusive, and comfortable hub for social–academic connection.

1.3. COVID-19 and Its Implications for This Study

Writing my thesis during this period has emphasized the need to realize the capacity of institutions to move teaching, communication, dissertation defenses, and other activities online versus in-person. This research integrates considerations of COVID-19 in the following ways: (a) participant sampling and selection occurred 100% online (e.g., email, digital poster, etc.); (b) individual interviews were moved from face-to-face to videoconference (Zoom), and the Preliminary Findings Workshop presentation was moved from a face-to-face focus group setting to an online (Zoom) setting; (c) the pandemic's impact on doctoral students' experiences was examined through specific questions for the participants throughout the study, including pre-pandemic and onset-pandemic questions; (d) the prospective importance of LMS as a connector and Third Space was now considered to be potentially more important for a pandemic and post-pandemic world for doctoral students, as perhaps place and space to gather, to learn, to engage, and has the ability to provide a context of academic socialization outside of a course. The virtual world has been expanded since the onset of COVID-19, with social distancing, online teaching, and online activities now requisite.

1.4. Research Questions

This study examines the following research questions:

1.4.1. Research Question 1

What are the experiences of isolation and belonging for PhD students in the Faculty of Education before and during COVID-19?

1.4.2. Research Question 2

How did doctoral students stay in touch before COVID-19 and during COVID-19?

1.4.3. Research Question 3

How can a learning management system (LMS), such as Canvas, support a sense of belonging for PhD students?

1.5. Organization of the Dissertation

The structure of the dissertation includes a literature review in Chapter 2, the study methodology in Chapter 3, and the findings in Chapter 4 and Chapter 5. The discussion is provided in Chapter 6, and a conclusion of the study in Chapter 7 includes a summary of findings connected theoretical frameworks, limitations, and possibilities for future research.

Chapter 2.

Literature Review

> Much more work needs to be done on the immediate and long-term emotional sequelae of attrition. Indeed, the extent to which suicide attempts and completions among graduate students appear to far exceed national averages indicates that a mental health crisis exists inside the hallowed halls of academe. It is a clarion call to action.
>
> (Lovitts, 2001, 276)

2.1. Introduction: A brief history of the PhD

From the Latin, the term “philosophiae doctor” or Doctor of Philosophy (PhD) is translated to mean “love of wisdom” and “to teach.” The PhD became known as the degree that allowed those who obtained it to teach in higher education in the field of their interest. In North America, PhD programs generally follow three steps to completion: (1) coursework for one to three years; (2) a qualifying or comprehensive exam; and (3) original research produced and presented through a written dissertation and a public defense of the research (Elgar, 2003; McAlpine & Amundsen, 2016).

The original doctoral degree was awarded at the University of Paris in 1150, and Germany was the first country to adopt a Doctor of Philosophy degree known as a PhD (Noble, 1994; Partington, 1995). The United States modeled its PhD after Germany’s, with Yale University awarding its first PhD in 1860 (Rosenberg,1961). Since then, PhD programs have continued to grow internationally. In Canada, 98 universities have PhD programs (Yocket, 2023, para 12). A doctorate is the most advanced degree that one can attain, and it is considered the most elevated, visible academic achievement (Barnett, 2021).

2.1.1. The Context for the Study

The historical context shows that the basic elements of attaining a PhD to a great extent remain unchanged, as do attrition rates. Further, Lovitt’s (2001) study highlighted the impact of the PhD degree process on mental health and attrition. The COVID-19 pandemic brought to public attention both isolation and mental health. The purpose of

this literature review is to examine what has been studied and understood in relation to PhD student attrition, particularly regarding their experiences of isolation and/or belonging, the impact of COVID-19, and the potential of learning management systems (LMSs) as a Third Space, an equalized, connecting, social academic space. Specifically, the review will highlight the following areas of research: (a) attrition; (b) isolation; (c) belonging; (d) socialization; (e) COVID-19; (f) learning management systems; and (g) relevant theoretical frameworks.

Literature Review Sources

The literature review included two university library databases, one Canadian and one in the United States; several print books; and Google Scholar. Other sources came directly from doctoral course materials and other works recommended by my committee. Journals searched included *Educational Technology Research and Development; Journal of the Learning Sciences; Journal of Educational Computing Research; Journal of Research on Technology in Education; Interactive Learning Environments; Learning, Media and Technology;* and *Cognition and Instruction*, and journals related to doctoral education and teaching, among others. Search terms included, but were not limited to, “attrition,” “belonging/sense of belonging,” “isolation,” “community of inquiry and learning management systems,” “teaching presence,” “cognitive presence,” “social presence,” “learning management systems (LMS),” “course management systems (CMS),” “learning management system and Third Space,” “technology and Third Space,” “doctoral students and Third Space,” “mental health and doctoral students,” “graduate student mental health and isolation.” As I moved through the literature, “course management systems” were eliminated, “COVID-19” and “doctoral students” added; Third Space included personal learning environments; and new literature was integrated into the findings and conclusion of the dissertation. Other sources came as I followed citations from relevant books and articles.

Government and University Higher Education Policies

Policies in higher education are established “as vehicles to develop social and economic growth and international competitiveness” (McAlpine & Amundsen, 2011, p. 4). McAlpine and Amundsen gave the example of the Canadian government putting forth a stated objective for Canada to “rank among the top five countries for research and development by the year 2010”; the government expected “higher rates of research

productivity …doctoral student completion, and the demonstration that research has an impact internationally" (p. 4). As a result, universities increased enrolment in both master's and doctoral programs, even though Canada (and the United States) had more doctoral degree holders than available academic jobs (McAlpine & Amundsen, 2011). Although McAlpine and Amundsen found that this policy resulted in higher enrolments and higher graduation rates, the impact on attrition rates is unclear. They cited no data on how many of the enrollees graduated. Overall, universities do not do a good job of keeping statistics on students who enroll, but do not complete their degrees (Elgar, 2003; Gardner & Mendoza, 2010; John & Denicolo, 2013; Lovitts, 2001; Nettles & Millett, 2006).

Inquiries into the PhD Experience

Researchers have been motivated to conduct research into doctoral students' experiences for a variety of reasons: (a) they were recently PhD students themselves (Lovitts, 2001; Nettles & Millett, 2006); (b) they teach, supervise, and/or advise doctoral students (Golde, 2005; Herzig, 2002, 2004, 2006; McAlpine & Amundsen, 2011, 2016; Strayhorn, 2012); and/or (c) they are government researchers looking to understand an issue of concern for higher education generally (Canadian Association for Graduate Studies, 2001; Council of Graduate Schools, 2008, 2019; Gardner & Mendoza 2010; Golde, 2005; Herzig, 2002, 2004, 2006; Lovitts, 2001; Nettles & Millett 2006; Strayhorn, 2012, 2019). Collectively, these investigations have contributed to our understanding of doctoral students' barriers and experiences, raised awareness of doctoral student attrition, and offered recommendations for institutions with PhD programs.

Several studies have examined the role of factors such as the length of time it takes to complete a doctoral degree, the limited availability of funding, potential loss of income, stress on personal relationships, and unfulfilled expectations among doctoral students (Canadian Association for Graduate Studies, 2001; Leijen, Lepp, & Remmik, 2016; Nettles & Millett, 2006).

McAlpine and Amundsen (2011) studied the role of the doctoral supervisor and how this role is experienced by students in relation to other academic demands and in the context of building an academic career (p. 7). Their findings include the importance of doctoral students building networks with each other and with faculty. The same researchers also conducted a ten-year study examining the career trajectory of doctoral

students (2016). They followed 48 participants in their longitudinal study and showed that the doctoral journey and outcome may be different for each student; there is a diversity of pathways. Their work highlights how students develop and change over time related to their career goals and their socio-emotional states during the process towards their goals. Their research also addresses the doctoral student environment, as well as students' feeling of inadequacy and competition in relation to their peers and academic progress.

2.2. Attrition

In this study, PhD attrition is defined as the departure from a PhD program before successful completion. In other words, it focuses on non-completers (students who did not finish the degree and or dissertation process) which includes those who dropped out during the program/coursework or those who finished the program/coursework, but not the dissertation, also known as "all but dissertation" or "ABD" (Young, VanWye, Schafer, Robertson, & Poore, 2019). This section looks at doctoral attrition literature from the past two decades.

2.2.1. Early Views of Attrition

Tinto, in the second edition of his book *Leaving college: Rethinking the causes and cures of student attrition* (1993) provides a helpful baseline in the literature for understanding college student departure. As he describes in his book, students come to universities with various background attributes, (e.g., demographics, skills, competencies, educational experiences, and goals or commitments). These background attributes combine with the academic and social experiences that students have in college to mediate in various ways their academic and social integration. This leads to their collegiate goals, intentions, and institutional and external commitments, which then result in their persistence or decision to depart. Researchers have used Tinto's model (1975) as a foundation for their studies on graduate students that look at characteristics of progress, supervisory relationships, and stages of the PhD (Girves & Wemmerus, 1998; Golde, 2000; Nettles & Millett, 2006).

I build on this earlier research into doctoral students' experiences in the PhD in relation to isolation and sense of belonging. Lovitts (2001) examined attrition and its

emotional and psychological fallout for students. She applied emotional and stress theories to the experiences of students she referred to as “non-completers” (p. 193). I was more interested to study the emotional state of doctoral students while in their program related to isolation and belonging after reading Lovitts’ findings, which showed the long-term detrimental anguish and depression students reported feeling after not finishing their PhDs. Lovitts argues that the investment students made in their programs was related to the emotions they would feel when not completing. Gardner and Mendoza (2010) have studied socialization and doctoral students; while Nettles and Millett (2006) focused on active successful doctoral students within their second year and took into account funding, differences amongst doctoral students, and progress to degree (p. xvi). Their study did not specifically examine doctoral students’ experiences of isolation and belonging. They pointed to peer relationships as an area to explore to determine whether peers factored into student experiences.

Golde (2000) focused on the relationship of the supervisor and the doctoral student. Often faculty members and deans associate attrition with a single factor, such as lack of money, talent, or commitment (Golde, 2000). However, there is seldom one cause. The doctoral student attrition decision is impacted by the full complexity of students’ lives. The success of the student is a shared responsibility that includes the student and the department; this suggests the need for “modifications in both theory and practice” to support completion. Case studies of doctoral students showed that “pivotal in each story, and confirming previous research findings, was the importance of a supportive advising relationship in helping students make progress toward their degree” (p. 219). For doctoral students, advisor connection is essential if they are to integrate into the academic community (p. 221).

Golde’s (2000) findings suggest a needed refinement in Tinto’s (1993) theoretical formulation to describe doctoral student attrition. Tinto suggests that students can fail due to lack of integration into their department. However, attrition may have many aggravating causes; therefore, well-integrated students may also experience an event that is as disruptive to their experiences as lack of integration into their department (Golde, 2000). Tinto (1993) talks about the importance of advisors in the final dissertation stage. Yet Golde (2000) found that faculty advisors were important all along the way:

> [Advisors] clearly played a role for many students from the outset of the program. Furthermore, relationships with advisors need to take centre stage in formulation of academic integration for doctoral students. Students expect and appreciate a committed, caring advisor (p. 221).

Though some may say that some attrition is expected and may even be desirable to maintain the rigour in doctoral programs (H. Okahana, personal communication, August 17, 2019), most researchers claim that universities should aim to reduce these levels of attrition (Gardner, 2009; Gardner & Mendoza, 2010; Lovitts, 2001; Nettles & Millett, 2006; Virtanen et al., 2017). The consensus among researchers is that attrition in doctoral programs is a problem that has not been effectively addressed by post-secondary institutions (Cassuto, 2013; Gardner & Mendoza, 2010; Lovitts, 2001; Nettles & Millett, 2006; Virtanen et al., 2017).

Okahana, author and head researcher of the Ph.D. Completion Project (2009), an international study involving three countries (United States, Canada, and the United Kingdom), suggested that "attrition is good, ask any faculty, when it has been done as a thoughtful decision" (personal communication, August 17, 2019). Okahana and his research team have examined the source(s) for the 50% attrition rate, which is cited repeatedly in the literature. His team is not sure the 50% figure is still accurate or up to date, since it is mentioned so widely while citing older studies (H. Okahana, personal communication, August 17, 2019). Institutions may not fully track attrition in doctoral programs, leading to ambiguity in reported attrition and retention rates. Key researchers (Elgar, 2003; Gardner & Mendoza, 2010; Lovitts, 2001; Nettles & Millett, 2006) support Okahana's observations on attrition statistics and their currency and accuracy.

Attrition and Social Supports

When it comes to the question of what kinds of social support might help lessen attrition, recommendations from Elgar's (2003) study included thesis support groups and social support for students (pp. 22–23). A gap in the Elgar study is a lack of information on the socialization of doctoral students related to either faculty or peers. The recommendation of "social support for students" (p. 23) confirms there is a need for institutions to know more about students' social support needs and the programming that might meet those needs.

Lovitts (2001) heard from non-completers that being more integrated socially and academically would have made a difference, including more guidance from supervisor/advisor(s), more information about graduate school and expectations, and something more than just a cursory orientation.

2.2.2. Attrition and Attribution Theory

Elgar (2003) ascribes attrition to something lacking in students' aptitude, skills, or persistence to complete. Okahana (2009) and Lovitts (2001), on the other hand, assert that doctoral students have the capabilities to complete their PhD; the problem lies with graduate studies programs that do not serve the needs of these students. Students are situated within the context of doctoral programs, making it necessary to examine the programs themselves rather than over-attributing attrition to students or their personal situations (Ross, 1977; Lovitts, 2001).

Lovitts' (2001) study found that when students were successful, institutions took the credit; yet when students failed to complete, faculty tended to place the responsibility on the students. Students often blamed themselves when they did not complete their programs (Lovitts, 2001), thus reinforcing the view taken by faculty. "The issue of assigning responsibility for students' departure from doctoral studies has never been addressed directly," according to Lovitts (p. 27). From Berelson's findings in 1960, up to and including Lovitts' work, "graduate deans, graduate faculty, and recent Ph.D. recipients place the burden of responsibility more on the departing students than the institution" (Lovitts, 2001, p. 22). Lovitts further found that the competitive nature of doctoral programs leaves students feeling isolated and judged by their peers if they share their struggles, which adds to their stress level and exacerbates mental health issues.

Gardner (2008) argued that attrition of doctoral students should be examined more closely, since deeper insights into the cause(s) of attrition rates would be helpful to institutions. Gardner notes that the doctoral journey includes social elements (courses, faculty, faculty supervisors/committees, student peers) as well as academic dimensions. Strong social networks can provide support to academic work, particularly during the more isolated dissertation stage, when much of the work (reading, writing, research) occurs outside of the classroom and university campus (Gardner & Mendoza, 2010;

Lovitts, 2001; Nettles & Millett, 2006; Strayhorn, 2012, 2019). The idea of social and academic integration has been supported in studies (Gardner & Mendoza, 2010; Lovitts, 2001; McAlpine & Amundsen, 2014; Nettles & Millet, 2006). Encouraging peer relationships that combine social and academic aspects at the beginning of the doctoral student experience, perhaps by having students do academic work together, could be important in building support networks. As well, with intentional infrastructure and programming, peer relationships could be formed and sustained during the dissertation process, when students mainly work alone, potentially reducing attrition.

2.2.3. **Faculty-Student Relationships**

Examining high rates of attrition among PhD students points to the need to examine the overall student experience for factors that may impact persistence and successful completion. Thanks to studies of the doctoral experience, there is an understanding that the experience is nuanced, multi-layered, and complex (Gardner & Mendoza, 2010; Lovitts, 2001; McAlpine and Amundsen, 2011, 2016; Nettles & Millett, 2006). These studies document the critical importance of faculty-to-student relationships, which according to various researchers (Gardner & Mendoza, 2010; Lovitts, 2001; Nettles & Millett, 2006) are the most important factor in doctoral degree completion.

McAlpine & Amundsen (2011) also suggest that doctoral students would benefit from the development of larger support networks, in addition to what is provided by supervisors. They suggest that graduate programs should consider how larger support networks than currently exist, could be implemented more consistently for more students. Encouraging and supporting doctoral students to create networks in and beyond their programs, including developing guiding relationships with academic faculty other than just their supervisors, is recognized by students and faculty alike as a method to advance doctoral student agency and success (Jazvac-Martek et al., 2011).

2.2.4. **Doctoral Student Attrition in Canada, the United States, and the United Kingdom**

All PhD-granting Canadian universities participated in the PhD Completion Project, an international, seven-year study focused on various aspects of the PhD granting process, including attrition and completion (Okahana, 2009). Comparison

groups were formed at some universities in the United States and the United Kingdom. The study found that most students who enter doctoral programs have the academic ability to complete the degree, and it listed a variety of reasons for attrition, including lack of funding, length of time to completion, impact of faculty supervisors, and job opportunities or career changes.

Institutions generally fail to collect data on doctoral attrition at their institutions, including the reasons students leave, from students who leave after the first year of their doctoral programs (approximately 10 to 15%), or from those who leave at the "all but dissertation" (ABD) stage (Bowen & Rudenstine, 1992, as cited in Nettles & Millett, 2006; Cassuto, 2013; Lovitts, 2001). Therefore, it is not clear whether some students complete their degrees elsewhere or do not complete them at all (Gardner & Mendoza, 2010; Lovitts, 2001). The lack of research on the first-year doctoral student experience is a compelling contrast to the mass of studies on the first-year undergraduate experience (Callary et al., 2012; Gardner & Gopaul, 2012; Golde, 1998; Lovitts, 2001; Smolarek, 2019).

There are still lingering questions as to why so many students leave their programs, since academic ability is not considered a factor for most non-completers (Lovitts, 2001; Okahana, 2009). McAlpine & Amundsen (2011) state that "societal, institutional, and disciplinary contexts were more central than student ability in determining which students leave and which remain" (p. 203). This leaves the field wide open to explore what influential factors, reasons, and contexts influence students who do not complete their doctoral studies.

Who is Responsible When Doctoral Students Do Not Succeed?

One legacy of Lovitts' work was to raise the question of who is responsible for doctoral student attrition (Lovitts, 1996, 2001; Lovitts & Nelson, 2000). Lovitts and Nelson (2002) leaned into the idea that the cultures of higher education may contribute more to doctoral students dropping out than individual student characteristics; "the real problem," they wrote, "is with the graduate programs rather than with the character of their students" (p. 49). Given that attrition rates have remained high, Lovitts and Nelson's inquiry into student perceptions of their own failure versus institutional failure, and supervisors' perceptions of student failures, is worth exploring.

There are differences in perception as to the causes of attrition from PhD programs (Gardner, 2009), and whether and how blame can be apportioned. Additional studies have located the causes within institutions, including their institutional culture, faculty, and student community—all important contextual influences that impact success (Beck, 2016; Gardner & Mendoza, 2010, Rigler et al., 2017; Strayhorn, 2012, 2019). Other studies have examined "identity trajectory," examining individual students' stories to understand more fully the choices, experiences, and outcomes for students throughout their PhD programs and in the workforce afterward (McAlpine & Amundsen, 2016). These studies suggest that more focused examination is needed of doctoral students themselves and factors that contribute to not completing their thesis.

Most doctoral students who do not complete their degrees leave their programs silently (Lovitts, 2001), and other students, faculty, institutions, and society are left to speculate on their reasons for leaving. Golde's (2000) case study illustrates this silent departure, emphasizing that it is a choice on the part of the student not to share why they leave their PhD programs. Self-blame is one reason for silence noted by Gardner and Mendoza (2010) and Lovitts (2001). Another is apprehension about retribution or getting on the wrong side of faculty or an institution (Golde, 2000). Some students believe that leaving on bad terms could harm their career as they try to get hired in their field, or pursue work on research teams within the same faculty.

Golde's study (2000) involved interviews with students. One doctoral student shared a letter with an ombudsperson that described that he left due to perceived unfair treatment from a faculty member. The student told Golde that he never sent the letter, in part because the faculty supervisor was "still in my field and could influence my career" (p. 207). When faculty and institutions have power that can be exercised beyond the purview of their doctoral programs, it is not surprising that students are not naming their reasons for leaving. This then hampers accurate tracking of the reasons for attrition. The power that institutions and departments (including faculty) hold, and students' awareness of this, is an identified theme in other studies (Ames et al., 2018; Lovitts, 2001; Pyhalto et al., 2012; Rigler et al., 2017; Sverdlik et al., 2018).

2.2.5. **Barriers to Completion**

> Provincial PhD graduation rates are strikingly low compared with the graduation rates of Canada's peer countries. Overall, Canada ranks second-to-last place among the peer countries. (Conference Board of Canada, "How Canada Performs: Ph.D. Graduates," 2014, para. 3)

Elgar (2003) addressed the lack of studies related to administrators' discontent with attrition rates for PhD programs. A survey questionnaire was used in their study to determine: whether graduate deans were aware of completion rates and times-to-completion for their institution's PhD program; administrator views on completion rates and time-to-completion; initiatives the universities had put in place to help PhD students finish their programs in a timely manner; and "suggestions for other changes...to improve productivity outcomes in PhD programs" (p. 13).

Elgar's study participants were senior administrators (deans, vice-chancellors, or vice-presidents) of graduate-degree-granting universities in Canada, the United States, and the United Kingdom. The United States and the United Kingdom were considered comparison samples to Canada. The researcher's assumption was that "most deans would be able to provide data on (or at least an estimate of) completion rates and times-to-completion" (pp. 13–14). Actual participants included all 48 Canadian universities with PhD programs and 120 randomly selected universities in the United States and United Kingdom with graduate programs. The U.S. sample was drawn from the Council for Graduate Schools, and the U.K. sample was drawn from the U.K. Council for Graduate Education. Regarding true attrition statistics, the findings were clear that institutions have neither current nor accurate numbers on doctoral students' attrition from enrollment to degree completion, nor do they have numbers on students with a permanent status of ABD. This conclusion is supported by similar findings in other studies (Gardner & Mendoza, 2010; Lovitts, 2001; Nettles & Millett, 2006).

In Elgar's study (2003), two focus groups convened to address the challenges in PhD retention and completion. The focus groups were made up of ten graduate students, three post-doctoral research fellows, and two faculty members from Dalhousie University in Halifax. The survey was then constructed and sent to the much wider sample described above.

The study data showed that only one-third of graduate deans had concrete knowledge of their student completion rates and length of time to completion (less than institutional reporting claimed). Time-to-completion rates were higher in those universities with smaller programs and fewer PhD students, while larger universities that had more student funding had better completion rates.

Elgar found “a prevalent lack of knowledge and some sense of complacency regarding completion rates in PhD programs.” Further, increased public funding was valued over changing PhD requirements to “accommodate funding realities or to improve completion trends.” Some of the graduate deans did report being proactive in taking steps to help their students complete their degree via “thesis-writing workshops and thesis support groups” (Elgar, 2003, pp. 20, 23).

The survey reached a wide population, and the mix of stakeholders who participated in the focus groups added a deeper level of credibility and helped identify what made completing a PhD difficult and what could be done to address the challenges. The mixture of qualitative and quantitative data is another strength of the study. However, the author also noted the limited number of respondents and the disparity between the number of responders who claimed to have statistics on completion rates and time-to-complete, and the number who provided those statistics. The results further indicate a need for universities to collect data on non-completers and to make changes to better support students.

Lovitts’ *Leaving the Ivory Tower: The Causes of and Consequences of Departure from Doctoral Study* (2001) is an extensive, multi-pronged study. The methodology included collecting six areas of data from seven resources: (a) survey to PhD completers; (b) survey to PhD non-completers; (c) interviews with a sample of non-completers; (d) interviews with the directors of graduate studies; (e) interviews with a sample of [supervisors/advisors/professors] from faculties producing high- or low- PhD completion rates. The high- or low- PhD numbers of productive faculties is a reference to the number of PhD completers. More specifically, some schools have fewer spots for PhD students than others; (f) retention rates of faculty; and (g) observations made during site visits to each university. Included in the study were 1 rural public research university, 1 urban university, and 9 departments. Lovitts’ sample size was 816 students from the public and private research universities and included one-hour long telephone interviews

with non completers (n=30), thirty-minute semi-structured interviews with directors of graduate studies, thirty-minute interviews with faculty (n=33), and observations (pp. 14-15).

Lovitts found many barriers for students in PhD programs, including their first-year experience of the doctoral program. Students indicated a lack of information about their program; an absence of community; challenges in the student's relationship with an advisor/supervisor; and the student's disappointment with the learning experience as barriers which led to dropping out or leaving the program. Lovitts also explored the topic of assignment of agency and responsibility for those who fail to finish their PhD and found that students often blamed themselves; supervisors and the institution also often assigned responsibility for failure to the student. In a study by Logan et al. (2021) on depression among doctoral students in the life sciences, the researchers looked at two factors, research and teaching. For the factor research, findings emulate Lovitts (2001) in that doctoral students struggled with depression during research phases, when they felt they were not able to do the research or asked a question they thought was not smart, all resulting in lowered self-efficacy. This lowered self-efficacy was due to the student not being sure about their capabilities, and perceiving their own lack of progress as a consequence of their own perceived limitations.

In a more recent study (Castello et al., 2017), the researchers' studied Spanish universities with doctoral programs. They wanted to discover the reasons why doctoral students dropped out. Their findings are similar to Lovitts' (2001), and include students feeling/being isolated or not feeling integrated and socialized into programmes, among other factors. The study is relevant as they focused on doctoral students who were in the social sciences. The methodology was quantitative and they encouraged future qualitative studies.

In Wollast et al. (2018), researchers focused on non-U.S. countries to study barriers to the completion of doctoral degrees. Their population was doctoral students (all disciplines) in the largest two French speaking universities (p. 152). They found risk factors of dropout in the first two years due to lack of funding; other factors such as gender and whether a student was single or married also impacted retention. They focused on factors of completion, and with a sample size of N=1509 were able to take into account relationships between the predictors they identified, as well as identify

students who were most at risk. This was a large quantitative study that did not focus on doctoral students' peer relationships as a factor nor a predictor. They recommend a mixed methods study in future research to incorporate qualitative data for increased understanding of predictors of success and dropout of doctoral students.

2.2.6. **Isolation and Loneliness**

Studies show that a lack of involvement and connection with faculty and student peers is a hindrance to student success, and that this occurs for students from different backgrounds and identities (Ali & Kohun, 2006; Golde 2005; Hackman & Walker 1990). This isolation directly correlates with students' likelihood of dropping out of their doctoral programs (Ali & Kohun, 2006; Golde, 2000; Lovitts, 2001; Olgren, 2004; Rockinsaw-Szapkiw, 2012; Rockinsaw-Szapkiw et al., 2014).

According to Lovitts (2001), isolation leads to pluralistic ignorance. Pluralistic ignorance refers to the situation where a doctoral student in isolation may believe that they are the only one who is struggling, even as others around them also struggle. Lovitts notes that those who feel isolated generally do not reach out due to the perceived competitive environment. Significantly, non-completers indicated that they thought "other graduate students understood the formal requirements and the informal expectations far better than they did" (p. 77). Faculty, student support services, and other doctoral students may not be aware of a student's struggle with feelings of incompetence. This deepens the isolation, as supports are not there because the student's struggle is invisible.

Generally speaking, "non-completers are less likely than completers to receive research and teaching assistantships and are more likely to not have received any support at all" (Lovitts, 2001, p. 6). Doctoral students with research and teaching assistantships (RAs and TAs) are more embedded in their departments socially and professionally, often having private offices or shared offices right in the department. In addition, Lovitts' overall findings showed that those who did not complete interacted less frequently with their peers during the early stages of their graduate education and were less satisfied with those peer relationships than those who completed their degrees. On the other hand, Lovitts also found that "some attrition results from too much integration and regulation" (p. 43): for example, doctoral students who were overly focused on

academic tasks but failed to complete them, or who were overly adapting to department social systems, but failed to establish connections and bonds with the community (p. 43). In interviews with students who completed their degree and those who did not complete their degree, Lovitts found that “integration into the student subculture” (p. 77) is important to understanding the informal expectations of a department. One respondent stated that they “never felt especially welcomed…lacked information about the program…believed she was on the outside looking in on the ‘in-crowd’” (p. 77). Interview data suggest that when doctoral students are “struggling” and observe other graduate students as “thriving,” “they come to believe they are the only ones” who do not understand (p. 79). This reinforced the survey findings regarding pluralistic ignorance. Lovitts suggests that integrating students into the “student subculture” could be an antidote for isolation and the pluralistic ignorance that can surface for doctoral students.

Cantor (2020) summarizes the various factors behind doctoral student loneliness: 1) There is less attention on the transition from undergraduate to doctoral studies, than from high school to undergraduate; 2) The doctoral student may be situated with few other doctoral students in a program; 3) In programs such as arts and humanities, research is conducted alone, unlike the case in, for example, research labs, where research is generally conducted together with other people; 4) International doctoral students are away from their usual support systems; 5) The length of a program during which the student is reliant on the one relationship with a supervisor can be an issue, especially depending on the nature of that relationship; 6) Issues may arise from other stressful relationships within competitive research contexts; 7) Doing the PhD creates a separation from family and non-academic friends; 8) Family and friends do not understand the doctoral student’s new life and context; 9) Issues arising from the rigour and life demands of completing a PhD; 10) Issues arising from the isolation and open-ended nature of doctoral research, with the attendant “not-knowing” and uncertainty; 11) Issues arising from the challenge of the personal journey, which is often a test of character, including life sacrifices; and 12) Given the competitive research culture, doctoral students often blame themselves when they think they fall short, which actually may be inaccurate (imposter syndrome). Imposter syndrome is when a person has a mindset that they are not capable, they are an “imposter” (fraud); which is an internal condition causing anxiety when externally, they are successful and capable.

These findings illustrate that part of isolation is the misinformation students believe about themselves and others. The isolation which perpetuates the misinformation proves to be a barrier to doctoral student self-efficacy and success.

2.2.7. Coping with Isolation and Loneliness

How do doctoral students address their own loneliness and isolation? In one study, researchers (Janta et al., 2014) used forums on a website to collect data, with the participants' understanding that their participation was not anonymous. The researchers tracked how the students used the online forums, finding that students were using the website's various forums, to share ideas and advice, and to seek support from others who might be experiencing loneliness or having similar issues to their own.

The researchers identified different types of loneliness. "Loneliness itself was expressed in a number of ways, varying from general feelings of boredom to more alarming signs of depression," with "most of the issues relating to anxiety and loneliness" occurring in the beginning of the doctoral process (compare Ingleton and Cadman, 2002, as cited in Janta et al., 2014, p. 6). The initial months in the students' programs were the loneliest for them. Peers wanted relationships with other peers and identified isolation as a factor. The largest number of threads in the online forums were initiated to gain support, both emotional and practical. The doctoral students wanted to connect with other doctoral students, yet often were unsuccessful in making connections. The researchers noted the dilemma of loneliness in doctoral students and their desires to connect with peers for advice, academic socialization, and support. Their recommendation was for students to be more proactive in seeking each other out.

Pivoting to research on belonging assists in understanding how to counter isolation and the impacts of these phenomena on a student's educational experience.

2.3. Belonging

Students' sense of belonging and the factors that contribute to it has also been the subject of research. Strayhorn (2012) writes that in "higher education, sense of belonging refers to students' perceived social support on campus, a feeling or sensation of connectedness, the experience of mattering or feeling cared about, accepted,

respected, valued by, and important to the group (e.g., campus community), or others on campus (e.g., faculty, peers)" (p. 3). Research posits a sense of belonging as key to academic success (Herzig, 2002, 2004, 2006; Strayhorn, 2012, 2019).

Studies in higher education have linked a sense of belonging to critical positive results for students with respect to academic self-concept, self-efficacy, intrinsic motivation, and academic persistence (Freeman et al., 2007; Hausmann et al., 2009; Ostrove et al., 2011; Strayhorn, 2012). Sense of belonging is powerful, as it favourably affects student perceptions of themself, interactions with other students and their academic coursework, and academic achievements (Osterman, 2000; Reilly & Fitzpatrick, 2009). Though the preponderance of studies involves undergraduate students, a sense of belonging has been found to impact retention and persistence (Freeman et al., 2007; Hausmann et al., 2009; Strayhorn, 2019).

Obtaining a PhD is a high-stakes, rigorous process, with several program complexities. Students who commit to a PhD program may not be aware of the impact of the amount and type of work involved, the possible isolation from peers, family, and friends, especially while they are focused during the research and writing phase, and the large time commitment (Janta et al., 2014; Rigler et al., 2017). To prepare and retain PhD students, institutions should look at what environmental, contextual, and programmatic factors can be put in place to support and encourage academic integration, which often has a by-product of social integration. Lovitts (2001) identifies some of these, such as seminars for first-year students at which faculty discuss their research; ongoing fora that discuss issues and research related to effective advising and mentoring; and formal and informal opportunities for faculty and students to interact. Lovitts goes on to place the onus on the university to design ways to see the student through to completion:

> However, because the university and the department admitted the student into the doctoral program and that admission carried with it an implicit agreement to bestow a degree on the student if the student made satisfactory progress, the university and the department have an obligation to do whatever is necessary to see the student through to completion. In other words, the burden should be on the university and the department, not on the student (p. 272)

Cassuto (2013) agrees with Lovitts that the environment is an important factor, with most of the responsibility resting with the faculty and departments, not the student.

Cassuto sees students in three categories: (a) those who cannot finish; (b) those who choose not to finish; (c) and those who finish. He does not agree that attrition is good or expected in doctoral programs. Both Cassuto and Lovitts agree that programming and integration of students into the department is important in the first year. Lovitts (2001) recommends two years of deliberate integration measures that would result in improved retention for doctoral students.

2.3.1. Sense of Belonging, Equity, and Inclusion

Sense of belonging is lowest when students feel that they are in the minority, marginalized, and unwelcome (Herzig, 2002, 2004, 2006; Hurtado & Carter, 1997; O'Meara et al., 2017; Strayhorn, 2012, 2019). Microaggressions affect marginalized populations disproportionately; women have been found to be more susceptible than men to the negative impact of microaggressions, leading to feelings of isolation and alienation (O'Meara et al., 2017). Microaggressions are defined as "the everyday slights, indignities, put downs and insults that people of color, women, LGBTQ2S (Lesbian, Gay, Bisexual, Transgender, Two-Spirited) populations or those who are marginalized experience in their day-to-day interactions with people" (Sue & Spanierman, 2020, p. 7). Marginalized populations continue to face oppressive systems and must navigate pressures around acculturation in academic environments.

Invisible disabilities, such as mental health issues, can be misidentified or judged, thereby contributing to marginalizing and isolating students (Vaccaro et al., 2015). Sense of belonging was shown to help students with invisible disabilities become connected, decrease their isolation, and increase their empowerment (Vaccaro et al., 2015). Fostering graduate students' sense of belonging could be a tool for improving pathways to the professoriate for groups that are typically underrepresented in academia, such as people with disabilities, women, and people from racial or ethnic minorities (Ong et al., 2011; Vue, 2021).

Boulay's (2022) autoethnography documents their challenges with mental illness and its impact on their journey toward a PhD. Boulay cites Siebers (2010, p. 3) when describing disability as "not an individual deficiency...but as the product of social injustice, one that requires not the cure or elimination of the defective person but significant changes in the social and built environment." Boulay goes on to state that:

> the social model understands disability to be an external and socially imposed concept that shapes the ways each person will experience the world around them in different ways. Therefore, a person is not disabled because they require the use of a mobility device, but rather it is the structural environment that makes many spaces disabling. (p. 85)

Disabilities, both visible and invisible, become problematic when individuals are "othered" in environments that hold to normative standards that do not fit each individual and their situation. This can include being marginalized, made invisible or excluded, or experiencing other forms of oppression. Faculty, staff, and the student community can learn and work together to produce better classroom and study settings for doctoral students with disabilities. Better programming for doctoral students can foster social integration of diverse students, as noted by Tienda (2013):

> I consider how institutions of higher education value diversity by asking whether its pedagogic benefits are being realized. I engage this question by focusing on inclusion, which I define as organizational strategies and practices that promote meaningful social and academic interactions among persons and groups who differ in their experiences, their views, and their traits. (p. 467)

2.3.2. Sense of Belonging and Communities

Building a community in higher education can positively impact a sense of belonging and mattering (White & Nonnamaker, 2008). I focus on two kinds of communities: learning communities (Andrade, 2007; Yang et al., 2007) and communities of practice (O'Donnell & Tobbell, 2007; Lave & Wenger, 1991; Zimiat, 2007).

Van Wingerden et al. (2017) describe how Lave and Wenger's (1991) communities of practice theory informed a group of graduate students who continued to collaborate on academic scholarship over time. They formed a community of practice, resulting in apprenticeship, shared power, sustainability, and belonging for members. McLoughlin and Kane (2006) used technology to build community and a sense of belonging among students, using an online chatroom in a classroom environment. Research on how graduate student communities are formed and supported shows promise in suggesting changes that can be made, and programs that can be implemented to increase doctoral students' sense of belonging.

2.3.3. **Sense of Belonging, Graduate Study, and Doctoral Programs**

Despite its importance, there is a dearth of research on sense of belonging among graduate students (O'Meara et al., 2017, Strayhorn, 2012), in particular: PhD students related to peer connections, the relationship between lack of sense of belonging and attrition, and the first-year doctoral experience, as well as the all-but-dissertation experience. While some studies have focused on attrition as it relates to motivation of PhD students, there is a gap in research related to attrition and the impact of peers and belonging on attrition specifically for PhD graduate students. The experiences of undergraduates, and even master's students, can vary markedly from those of doctoral students (Strayhorn, 2012).

The phenomenon of a sense of belonging has been measured in different ways, and previous studies do not necessarily shed light on what students at the doctoral level need (Lovitts, 2001; Gardner, 2009; Strayhorn, 2012, 2019). Doctoral students have defined reasons and expectations for earning a PhD, reasons for attending their specific programs, and needs to be affiliated with their programs and fields (Gardner & Barker, 2015; McAlpine & Amundsen, 2016). Doctoral students are typically not as concerned with the institution as they are with their programs and fields (O'Meara et al., 2017). Strayhorn (2012) among others have studied graduate student experiences, with some attention on doctoral student experiences.

Experiencing a sense of belonging directly improves graduate student retention, completion rates, and success (Lovitts, 2001; O'Meara et al., 2017; Strayhorn, 2012). Graduate students who experience a greater sense of belonging also have a greater interest in pursuing research and faculty careers in higher education (Ostrove at al., 2011). In a study of doctoral nursing students, who have clinical rotations and internships where they interact with others in the field, it was found that the students were engaged in an additional, small group interactive and interpersonal activity group. This added to their socialization as students, thereby building a stronger community (Reilly & Fitzpatrick, 2009). They reported feeling valued, like they "fit," and the added socialization was seen as imperative for student success (Reilly & Fitzpatrick, 2009).

A study of 360 graduate students across 15 institutions showed that students who felt a higher sense of belonging with their department, peers, and faculty members

had higher GPAs (Strayhorn, 2012). According to Strayhorn, this was mostly true for doctoral students, as a sense of belonging was found to matter most to students seeking the highest level of education. In another study, a “more open and encouraging program environment” was one of three factors named as necessary to offset attrition rates in higher education PhD programs (Cassuto, 2013, para 8). Related research suggests that whether students remain in a graduate program or leave, has to do with the culture and environment of the program (Lovitts, 2001), which implies a sense of belonging. Administrators, professors, deans, and students are all part of the educational environment (Cassuto, 2013). Contexts are important and contribute to or detract from students’ sense of belonging.

2.4. Socialization

2.4.1. Socialization and Sense of Belonging

Graduate school socialization is defined as the process of learning the knowledge, skills, behaviours, norms, and values of a graduate program and discipline or field and becoming part of an academic community (Boyle & Boice, 1998, as cited in Strayhorn, 2012; Weidman et al., 2001). Research focused on doctoral student socialization has described the faculty-student relationship as the key relationship in doctoral student success to degree completion (Gardner & Mendoza, 2010; Lovitts, 2001; Nettles & Millett, 2006).

Lack of overall support in graduate school has a negative impact on students’ sense of belonging, thereby impeding their experiences and success in graduate school (Carlone & Johnson, 2007; Fox, 2001; Litzler, Lange & Brainard, 2005; Patton, 2009; Welde & Laursen, 2008). As already mentioned, the culture and environments of academic departments and programs affect the sense of belonging for graduate students (O’Meara et al., 2017). O’Meara et al.’s study found that feeling a sense of belonging is most impacted by the quality of faculty-student relationships. This is consistent with other studies that reported these professional relationships with faculty matter the most to graduate students (Gardner & Mendoza, 2010; Golde, 2000; Nettles & Millett, 2006; Weidman et al., 2001). Students consistently maintained that relationships with faculty mattered the most to them, despite the stress, discomfort, and impact of microaggressions and/or the positive impact of micro-affirmations (O’Meara et

al., 2017). However, O'Meara's study did not examine the effect of student-to-student socialization on isolation and belonging for doctoral students.

Identity development that occurs in students in doctoral programs has been described as involving two processes: their epistemological development (Shinew & Moore, 2010), relating to developing one's scholarly viewpoint about theories of knowledge; and their social identity development (McEwen, 2005, as cited in Gardner & Mendoza, 2010). Both processes can affect feelings of competence, incompetence, and a sense of fit, or sense of belonging, with the community.

Belonging has been studied fairly extensively with undergraduate student populations, and to a lesser extent with graduate and doctoral students (Strayhorn, 2012, 2019). Strayhorn's studies on sense of belonging have been quantitative, qualitative, and mixed, and have focused mostly on low-income and historically excluded populations.

Terrell et al. (2009), inspired by Lovitts' (2001) work, focused on student attrition from doctoral online (distance programs) and doctoral "limited residency" programs. They developed the Doctoral Student Connectedness Scale (DSCS), which is a validated instrument that measured how connected doctoral students felt to their faculty and their peers, through a series of Likert scaled questions. The DSCS has been used by Terrell et al. and by other researchers. Terrell et al. used it to measure doctoral students in the dissertation (research and writing) phase of their program. This scale would be useful to measure doctoral students' connectedness in two major phases of their programs: the pre-research and dissertation phases. Centring belonging as a well-being goal for the academic culture would help to offset isolation exacerbated by oppressive systems and hegemony.

Findings in a study conducted by Jones-White et al. (2022) indicate that a greater sense of belonging for doctoral students reduced the odds of anxiety and depression. Ideas of marginality and mattering as "key influences on student development" (Schlossberg, 1984, as cited in Gardner & Mendoza, 2010, p. 210) have been studied for some time (Cole et al., 2020; Ditzel, 2019; Schlossberg, 1984, 1989; Vue, 2021; White & Nonnamaker, 2008). Questions of socialization, attrition, and why students stay or go have been examined in three large studies (Gardner & Mendoza, 2010; Lovitts,

2001; Nettles & Millett, 2006). The findings of these studies reinforce the ideas that doctoral students need a sense of belonging; connections between doctoral students and their faculty and peers help lower depression and anxiety; and online doctoral students who are connected to their faculty and peers, persist better, and may do well with a community of practice, among other recommendations. However, even with these studies, their recommendations, and their emphasis that sense of belonging is an examined and studied need, there is still a gap between high attrition and retention. This points to the need for more studies at universities that dig into doctoral student experiences to determine what are the tipping points of isolation and what are the tipping points for belonging.

Gardner and Mendoza (2010) reviewed work specifically on doctoral program socialization. They report on twelve studies from various researchers, pinpointing the evolving process of socialization that occurs for a doctoral student, with strategies and recommendations for institutions, faculty, and students. One of their recommendations is for students to create an "intellectual community" with other students through relationship building, "which will enhance their academic work" (p. 257). For belonging, further work and research is needed on peer and faculty relationships as they relate to "mentoring and advising" (Nettles & Millett, 2006, p. 103). In an expansion of previous work, and addressing current issues for doctoral programs, Lovitts (2001) indicates that student success celebrations, with "portrait boards" and pictures of current and first-year doctoral students, facilitates both socialization and students' sense of belonging (p. 273).

Golde (2000) outlined the differences between doctoral students and other graduate and undergraduate students. They argue that "doctoral education serves to socialize students into a profession; and simultaneously, students are socialized into, assume, and then leave the role of graduate student itself" (p. 200). Consequently, doctoral student socialization, cultivating a sense of belonging, distinguishes itself from what other graduate students and undergraduate students may need.

2.4.2. **Social Integration into Departments and Faculty Relationships**

Research documents the importance of faculty-student relationships in providing modes of academic socialization that lead to degree completion for doctoral students

(Gardner & Mendoza, 2010; Herzig, 2004; Lovitts, 2001; Nettles & Millett, 2006). Faculty members are powerful role models, and although an older study, Girves and Wemmerus (1988) have argued that faculty members are the “primary socializing agent in the department " (p. 185). More studies are needed on the role of peer socialization for belonging and retention. Perhaps socialization that includes faculty members and peers working together might promote community across and within faculties.

Academic integration is imperative for student success in doctoral programs, and the absence of academic integration contributes more to doctoral attrition than the lack of social integration (Golde, 2000; Tinto, 1993). The absence of social integration can impact the experience of the doctoral student but, according to Golde (2000), does not lead to doctoral attrition. Students hesitated to share their decision to leave a program with their peers because they saw their peers as “similarly powerless” (p. 222). In their struggles, they experienced “confusion, fears, which increased their isolation from their peers”; sometimes students “distanced themselves because the idea of a student’s dropping out was perceived as ‘threatening’ and ‘too dark’” (p. 222). Integration is important for doctoral students, supervisors, and programs at a much wider level than just the local community to meet the new demands and revitalize the PhD for research in social and global issues (Bengsten, 2021).

Given that faculty relationships are central to socialization into an academic program/department and profession, and that socialization is key to belonging and retention, it is unlikely that relationships with faculty and socialization will diminish in importance for academic success (Lovitts, 2001; Strayhorn, 2012). Parsing the impact of peer socialization, both socially and academically, for doctoral students’ sense of belonging and success, remains a fertile area for exploration (Cassuto, 2013; Gardner & Mendoza, 2010; Janta et al., 2014; Lovitts, 2001; Nettles & Millett, 2006; Virtanen et al., 2017).

2.4.3. **Characteristics of Doctoral Students and Support**

While there can be as many doctoral student characteristics as there are life stories and identities, seeking information on those characteristics requiring more support is relevant to those who design and manage doctoral programs. Students enter doctoral programs at various ages, not just within four to eight years after completing

their undergraduate degree. Their life circumstances lead to a wider range of needs than seen in undergraduate students, who are more likely to be within the typical age range of 17 to 22. The average age of doctoral students is approximately 30 years (Aud et al., 2011), but this figure varies according to discipline, program, and location. Therefore, doctoral students typically have more or different life responsibilities than undergraduates. Socialization would then look different for doctoral students than for undergraduates or even master's students.

Gardner and Mendoza (2010) summarize some of the findings of various authors in their book, identifying those characteristics leading to the need for support. For example, part-time students may require more support from peers and faculty to navigate the "research culture of their programs" (Weidman, 2010, as cited in Gardner & Mendoza, 2010, pp. 265–266). Additionally, older adults (who are also more likely to be part-time students) "may find difficulties in the classroom and expect more inclusion in their coursework and want more applicability to their professional goals" (Kasworm & Bowles, 2010, as cited in Gardner & Mendoza, 2010, p. 266). Further, those students with identities that have been traditionally underrepresented on their campuses or in their programs may face systemic and cultural barriers that institutions need to understand, to provide appropriate support for greater belonging (Winkle-Wagner et al., 2010). Finally, doctoral students come to know themselves as doctoral researchers and academics through their studies. Doctoral students engage in learning about various epistemologies, thereby experiencing both challenge and growth (Shinew & Moore, 2010). Support in academic identity and growing into that identity as students continue to develop from student to their professional life postdoctoral, are things to consider.

Achieving Doctoral Student Retention and Well-Being

This section will summarize some of the evidence that shows how a sense of belonging can decrease doctoral students' feelings of isolation, sustain their interest in their studies, and increase their feelings of well-being. Feelings of loneliness, abandonment, anxiety and depression, and depressive symptoms are all challenges to the well-being of doctoral students, as they weaken their belief in themselves. Every doctoral program wants their doctoral students to adjust well to their program; engage with the learning, research, and scholarly community available; and find and deepen the

scholar within. That doesn't always mean this process is easily accessible and clear, with a well-laid-out map.

A concerning characteristic about doctoral students is the greater prevalence of indicators of stress and mental health issues overall, in comparison to the general population, with anxiety and depression as the leading indicators (Flaherty, 2018). According to Eisenberg, Hefner & Gollust (2007), in the United States, one-fifth (20%) of the general population over the age of 18 experiences depression and anxiety, while 13% of graduate students experience depression and anxiety, with the bulk of the percentage being doctoral students (cited in Gould, 2014). Doctoral students' lengthy research and writing phases can be isolating, "and isolation is often an instant pathway to depression and anxiety" (p. 224).

Two research articles in the literature on doctoral students address loneliness, sometimes referred to as social isolation. Janta et al. (2014) utilize an adaptive ethnography (utilizing internet and ethnography) to unpack and explore meaning as coded on social media (netnography); the participants are local and international doctoral students. The meta-themes that evolved as the study progressed were sources of loneliness, social interactions, interactions outside academia, professional development, and online forums. The range of specific data across the various themes indicated that doctoral students can be having very different experiences, which may indicate they are undergoing very similar experiences that mean very different things to them. The point is that it is important to look at themes and similarities, but also important to interpret each comment individually. Despite the isolation and loneliness of their experiences, participants experienced less loneliness at times from being engaged with others through multiple forms of social interaction, face-to-face and online (p. 553). There were three areas that diminished isolation, social interactions with one another, face-to-face or online; working within their program or field by being a research assistant or teaching assistant, conferences, etc.; and taking informal breaks from their studies. This study supports further research into loneliness for doctoral students and socialization.

Cantor (2020) takes us through several experiences of the PhD process that result in feelings of loneliness:

> The list includes twelve sources of loneliness, which will be discussed under three headings. The first is physical isolation, where the student's spatial separation from others evokes negative feelings. The second section is concerned with those interpersonal relationships that are unsatisfactory because they fail to provide the student with the necessary support and may even be perceived as threatening. The third section identifies certain aspects of the PhD experience that are likely to make students feel vulnerable and contribute to their perceived separation from others. Some of the sources of loneliness discussed in this paper, particularly in the third section, derive from the structure of the PhD degree itself (p. 57).

Cantor normalizes the human experience of PhD loneliness and the way this loneliness arises in doctoral study and, specifically, in a student's own research. This reminds doctoral students of their community of mentors and supporters across the academy who can be there to countervail the challenges of intellectual isolation when engaging in one's research and learning to communicate about one's research topic.

Literature Reviews Highlighting Doctoral Student Well-Being

Two literature reviews on the mental well-being of doctoral research students reflect some wider perspectives. Hazell et al. (2020) is about understanding the mental health of doctoral researchers (DRs) through a mixed methods systematic review with meta-analysis and meta-synthesis of 52 published articles. This review addressed three research questions:

> 1. What is the prevalence of mental health difficulties amongst DRs [PhDs]?
>
> 2. What are the risk factors associated with poor mental health in doctoral researchers?
>
> 3. What are the protective factors associated with good mental health in doctoral researchers? (p. 2)

Findings indicate that being isolated and being female increases the risk of mental health problems. "Several studies have evidenced that isolation is toxic for" PhD students (p. 27). Factors that are most likely to be protective of good mental health are understanding the PhD as a process, feeling socially supported, having a positive supervisory relationship, and engaging in self-care.

In their literature review *Mental health and psychological wellbeing in the early stages of doctoral study: A systematic review*, Jackman et al. (2022) examine what we

can learn from early-stage-doctoral-students (ESDS) that might help to embed well-being early in the doctoral study process or dislodge risk factors to help protect well-being. The authors framed four specific research questions and systematically reviewed, synthesized, and appraised research that has examined mental health and well-being in the early stages of doctoral study:

1. What is the prevalence of mental health or well-being issues in ESDS?
2. What impact does transition into doctoral study have on mental health and well-being in ESDS?
3. What factors are related to mental health and well-being in ESDS?
4. What are the effects of interventions targeting mental health and well-being in ESDS?

To be included in the review, studies needed to be conducted with samples of ESDS; measure at least one mental health or well-being outcome in ESDS; contain original, empirical data; and be peer-reviewed journal articles in the English language.

The early stage was defined as the first year or first stage of a full-time doctoral program, or the first two years or first stage of a part-time doctoral program. Quantitative, qualitative, and mixed method studies were eligible for inclusion. Studies were excluded if they combined multiple student groups (e.g., master's students, doctoral students at later stages) and did not present data for ESDS separately. A systematic mixed studies review employing the data-based convergent synthesis design (Hong et al. 2017) was adopted to ensure that the full breadth of methodologies (i.e., quantitative, qualitative, mixed method) and evidence was obtained. After an identification, initial screening, eligibility, and inclusion screening process, 26 full-text literature reviews were included.

The findings are richly mixed, especially due to the complexity of the design and perhaps the high bar set for the first multi-method, widely engaged study focused on early-stage-doctoral-students. The article includes a healthy methodological critique, especially because the wide design doesn't really net easy answers to the four research questions. There are some findings of note in each of the articles, and what is learned here, with continued study, may benefit doctoral programs overall, whether at the onset of study or through actual completion.

Jackman et al. (2022) found evidence of the importance of scholarly community support for mental health and well-being. Supervisors were primary, and even wider supportive relationships helped meeting early challenges. Also, developing early peer connections and reciprocity—asking and answering questions for each other, for example—is highlighted in the findings. ESDS participants said that wider support networks were important to well-being and mental health. Caring relationships with family and friends made for better reported well-being, and some of the results indicated that peer caring resulted in less stress among ESDS. There was not a direct correlation between what actions among students would sustain well-being and mental health after the early stages, or in the actual completion of the doctorate.

In an article on the pandemic and Canadian graduate students, Ro (2020, Aug. 18) surveyed respondents in graduate programs, specifically inquiring about depression, anxiety, and program delays due to the pandemic. The survey was conducted in April/May of 2020 by a student association based at the University of Toronto (para. 1) and included 1,431 PhD and master's students from programs at 45 Canadian institutions (life sciences 40%; physical sciences 24%; social sciences 21%, and humanities 15%). Seventy-two percent of respondents indicated they were "experiencing worsening mental health as a result of the pandemic" (para. 2).

The challenges surrounding mental wellness of master's and doctoral students are at the forefront of the minds of many graduate deans in the Council of Graduate Schools community. In the *2018 CGS Pressing Issues Survey*, 63% of respondents strongly agreed or agreed that current graduate students struggle to maintain mental wellness more than students five years ago. This survey was sent to all U.S. and Canadian CGS member institutions in February 2018. Only 10% of respondents disagreed with the statement, and none strongly disagreed. However, even with this heightened awareness of mental health challenges among graduate students, graduate deans also seem concerned that campus stakeholders may not currently be equipped to address these challenges (Okahana, 2018, para. 2).

How institutions meet the challenge of doctoral students' stress and mental health issues are a resource issue, a risk management issue, and a liability issue, and the challenge calls for a stronger campus community of compassion. As one disability advisor for mental health stated in Gould's study (2014):

> To reduce the likelihood of developing mental-health problems, doctoral researchers should try to build a solid and trustworthy peer group in the early days of their programme. This can be accomplished by joining discipline-based societies and clubs, or networks set up by the university mental health services. (p. 224)

One large study (Eisenberg et al., 2007) identified indicators that presented a lower risk for mental health problems, and these may be considered protective factors. Two examples of these protective factors are the social support available when students are living in an on-campus residence hall or are married or in a domestic partnership. Doctoral students most often do not live on campus and are not necessarily part of a cohort. While creating university-wide peer-support structures is one option (Gould, 2014), and living in community or partnership is another option (Eisenberg et al., 2007), universities and doctoral programs can take other initiatives to make progress on the social support factors that could help.

Mental Health among Students of Diverse Identities

For both undergraduate and graduate students, the lack of a sense of belonging has been defined as contributing to mental health challenges, and is linked to depression, anxiety and stress, particularly among first-generation students and in marginalized populations of students (Eisenberg et al., 2007; Stebleton et al., 2014; Strayhorn, 2017). Students who are the first generation in their family to attend college, are of low socio-economic status, and/or are marginalized, are less likely to reach out to campus mental health services than those students who are not first-generation undergraduate students (Stebleton et al. 2014). For doctoral students, we know even less about the effects of intersectionality of identity and the doctoral students' use of on-campus mental health services. In one case study reported by Gould (2014), a doctoral student who did not reach out for help said: "I was embarrassed to ask for help…. I was afraid of being painted as 'just another emotional woman'" (p. 223). This student's peers advised her not to share her struggle with depression with faculty, because she would be seen "as unreliable and [a faculty member] would not want to work with her" (p. 224).

Female, transgender, and gender-non-conforming graduate students experience anxiety and depression at higher rates than their counterparts (Flaherty, 2018). These findings are important to note as our doctoral populations are diverse. The more the student experience is understood, the better universities will be able to design inclusive

and welcoming environments. Yet there remains a gap in understanding how to offset isolation and create a sense of belonging in doctoral education.

2.4.4. **Health Promoting & PhD-Granting Campuses**

The Okanagan Charter (2015, June, Kelowna, B.C.) includes 45+ countries who have adopted it for their institutions. It focuses on Healthy Minds, Healthy Bodies Campuses. The purpose of the Charter is to activate campuses to centre health and well-being as a priority for post-secondary institutions. Further, to embed health promotion and well-being in all aspects of campus culture, the Charter is a pragmatic collective approach towards health promotion and evidence-based research, working towards innovative approaches and interventions towards organizing well-being on campuses. The Charter encourages decisions that change and create policies centred on student well-being. Health and well-being are not limited to physical health; with the pandemic, mental health for all has been a constant topic in education and in news sources (Healthy Minds Healthy Campuses, B.C., 2018; Okanagan Charter, 2015).

The Okanagan Charter is action-based and gives campuses the opportunity to showcase programs, initiatives, promote policies and research toward a holistic approach to how institutions receive and support students. The Okanagan Charter is a call to action to find best practices to help students fulfill their full potential and realize that education and campus environments are concerned with the whole student. The university this study was conducted at has a Health Promotion Department which focuses on healthy relationships with food and substances, and invites students to take part in a transformative vision for healthy promoting universities and colleges. Further, the Okanagan Charter states, “Health promotion action builds upon the Ottawa Charter for Health Promotion, which emphasizes the interconnectedness between individuals and their environments, and recognizes that ‘health is creation and lived by people within the settings of their everyday life: where they learn, work, play and love”; and the holistic view that the charter takes includes “social well-being” and “well-being of people, places and the planet” are seen as “interdependent” (Okanagan Charter, 2015, p. 4).

Since the initial writing of this dissertation, the Okanagan Charter has been a topic of conversation, programs created and directly tied to this Charter. Further, “well-

being" and "belonging" have become more integrated into program meetings at the U.S. university I currently work at.

There is an International Health Promoting Universities and Colleges network. COVID-19 has made prioritizing well-being, health, including mental health, centre stage to all aspects of university student-focused policies, practices, messaging, and infused the importance of well-being into academic, student services, marketing, recruitment, and retention of students, in this post COVID-19 era (Do et al., 2023; Dooris et al., 2021; Kristjiansson, 2021; Squires et al., 2021).

In the Canadian Journal of Higher Education, Squires and London (2021) examined how health promotion has evolved on Canadian campuses. In their study, they looked at 10 Canadian universities who had adopted the Okanagan Charter. Their study focused on these 10 Canadian university websites, seeking specifically to understand how the university(s) communicated to their campus the health promotion work they were implementing. They sought to discover if the university(s) used the words "Okanagan Charter itself or to health initiatives and health promotion more broadly" on their website(s) (p. 106). Their findings found the Canadian campuses that were leaders were in provinces that had a history of focusing on health promotion work "within the educational sectors" (p. 107). Among the findings, University of British Columbia (UBC) was seen as the most successful leader in the Okanagan Charter work because their "health promotion was evident through the dedicated resources and consistent messaging that kept the focus on health promotion as a priority for campus (p. 108). UBC took a systems approach to health promotion work and there were leaders on campus seen as "champions" that ensured visibility, messaging, and implementation of health promotion programs and initiatives. Some research studies focus on medical education; faculty perspectives; and impact and leadership (Do, et al., 2023: Sedghi, et al., 2023). There is a lack of studies on collaborations between graduate students and professors, staff, and other students in enacting this well-being initiative in graduate academic programs. Further, there is a paucity of research on the Okanagan Charter, linking sense of belonging for students to well-being.

2.5. COVID-19, Isolation, Belonging

2.5.1. COVID-19 and Higher Education: When Isolation and Belonging Took on New Meaning

In March of 2020, the COVID-19 pandemic began to impact institutions of higher education. The pandemic brought increased discussion of well-being of students as the shift was sudden and dramatic in day-to-day living, learning, and activities.

The COVID-19 pandemic put many aspects of the world on hold. The virus, which was discovered in December 2019, introduced a medical and public health term that everyone now understands: “social distancing.” “Social distancing precluded students from gathering in learning studios, lecture halls, or small group rooms” (Rose, 2020, E1, para. 2). Social distancing forced greater use of digital technologies to connect with professors, supervisors, instructors, and peers in higher education. In addition, many students (including international graduate students) had to relocate back to their “permanent” homes in spring 2020. Members of the general population outside higher education also found themselves using technology to connect, even with people in the same city or across the street. The culture shift for graduate students in how, where, and when they engaged in their learning, and strategies to connect with their faculty and peers, was drastic. The pandemic brought with it not only the threat of illness and death, but also tremendous psychological strain (Cao et al., 2020, p. 1). These psychological impacts on college students include, among others, feelings of anxiety, worry, and fear (Mei et al., 2011, as cited in Cao et al., 2020, p. 2).

Higher education institutions closed their campuses for face-to-face classroom learning and made a sudden shift to online modalities. This was a significant change for faculty and students alike. It is important to know what students experienced through this shift, so that faculty and institutions of higher education may adapt and adjust to student needs.

As the pandemic played out, student experiences reported in studies varied due to the different political, educational, and social contexts in which they experienced the pandemic. Some of the experiences seemed universal, regardless of geography or contexts. In a study of Chinese college students, conducted using cluster sampling, researchers (Cao et al., 2020) measured levels of anxiety related to several factors. The

study used the Generalized Anxiety Disorder Scale instrument (GAD-7) to measure severe, moderate, and mild anxiety. Several findings from this study relate to sense of belonging:

- Students who lived with parents had less anxiety compared to students living alone, whose anxiety was increased (p. 2).
- Severe anxiety occurred for students who lived in rural areas, lived with families without a steady income, or who knew someone who was infected with coronavirus (p. 2).
- There was increased moderate anxiety for those students who were worried about the state of their academic progress, the economic impacts of the pandemic and what daily life would look like because of the pandemic (p. 2).

The researchers confirmed that "the mental health of college students should be monitored during epidemics" (p. 1) and that mental health issues for students can be exacerbated by the isolation mandated by quarantine. Specifically, anxiety increased "in the absence of interpersonal communication" (Xiao, 2020; Kmeitowicz et al., 2020, as cited in Cao et al., 2020, p. 2).

In the United States, here is an excerpt of what students expressed to one university, SUNY New Paltz, in an open letter:

> Many students have dramatically different circumstances now than they did before. A lot of us have been forced to live, and now study in a different environment than we were accustomed to. Some already have found their home environment to be more stressful than residing on campus. Some who support themselves financially have lost on-campus positions, internships and/or off-campus jobs. Some of us have parents who have been laid off. Some of us have family and close friends who have been infected by the virus. We have students in our community with confirmed cases. Some of your students might be sick themselves; and some may not have access to testing. Some of us have loved ones who are essential workers. Some of us are essential workers. We are all coping in our own ways of how we envisioned this semester to be… Below, you will find some points that reflect overarching feedback from students on what they would like their professors to know and/or do to provide comfort during this time and to allow us to make the most of our learning experience:
>
> 1. We ask that you take the time to check in with us, especially for those of you who plan synchronous class meetings. Simply ask a question like: "how are you all holding up?" To let us know you care about our well-being beyond our capacity to learn. Before diving straight into content and activities, give your students a moment: give them permission to collect

themselves. Some of you have already been doing this, and it is deeply appreciated and needed.

2. Create learning opportunities that foster connection between your students and reframe your efforts towards building class community. If you can, find ways for us to engage with each other, and sustain collaboration. It will be helpful for those of us who may be feeling isolated during this time and deprived of social connection. (New Paltz News, 2020, para. 3-5)

Su and Flett (2023) specifically looked at the role of "mattering and belonging" for international students (n=186) who were attending Canadian university during COVID-19. They recognized that mental health issues were an issue for graduate students and in particular international students who are in a new country. Additionally, they state that mattering and belonging are essential to well-being and to academic success. The study confirmed that COVID-19 exasperated loneliness, and mental health deteriorated for many students. Their findings are related as mental health was a factor in this dissertation research and international students expressed loneliness and isolation. Su and Flett (2023) draw attention to the importance of the international student and belonging, specifically as belonging is related to well-being and isolation towards decreased mental health issues. Learning from their study, programs do well to prioritize the first-year doctoral experience for all students, in particular international students to foster belonging and community to support mental health and well-being at the start of their programs and throughout.

COVID-19 impacted health and mental health globally for students, including doctoral students, thereby influencing mental health negatively, including depression, anxiety, and loneliness (Chrivok et al., 2020; Hamza et al., 2021; Sieropoulos et al., 2022). COVID-19 has brought to the surface, the need and responsibility of Faculties to have ways for doctoral students to create both connections and community with each other. In doing so, belonging can be increased, and as Su and Flett (2023) infer, mattering, in turn, will support doctoral students towards a more successful academic experience.

These views and findings have been reinforced through opinion pieces and blogs. A sense of belonging emerged as one of the most important ways to protect college students' mental health, and this should begin when they first come onto a campus (Lipson, 2020), whether during a pandemic or not. Ultimately, the pandemic campus closures may have influenced "how college students...think about their sense of

belonging" (Lipson, 2020). For doctoral students, belonging can look different than for undergraduates (Strayhorn, 2019; Sverdlik et al. 2018), yet meeting doctoral students' needs for belonging is also important and has a positive impact on their mental health (Jones-White et al., 2022).

Perhaps one of the lessons from COVID-19 is for institutions to be intentional when programming online places of belonging for their students. While much attention is given to first-year college students and their needs, doctoral students may be at risk of dropping out or experiencing a high level of anxiety and loneliness, given the nature of their academic work, its rigour, and the isolation they may be experiencing being away from their families and home communities. In the new post-COVID realities of online experience, now is an especially important time to assess the needs of doctoral students, their experiences with sense of belonging, and the impacts of belonging on their educational experience and their progress toward degree completion.

2.6. Learning Management Systems

Technology is pervasive in the lives of students, and "their learning experiences should reflect this to prepare them for their futures" (Periathiruvadi & Rinn, 2012, p. 166). Technology is a tool used by universities for "publishing, collaborating, and sharing educational materials among teachers, learners, and institution managers" (Prahani et al., 2022, pp. 28–29). Technology also can be geared to learning, and to addressing students' social and emotional needs, thus cultivating a sense of belonging and connectedness with teachers and among students (Cross, 2004, 2005).

The learning management system (LMS) is one technology that provides a bridge from students to their education and educational institutions. This is accomplished through a "framework that handles all aspects of the learning process"—including all elements of administration (documentation, tracking and reporting on student progress, assessment) and delivery of courses and materials—designed "as a systemic application … providing the structure of the entire learning process within an organization" (Watson & Watson, 2007, p. 28, 29). LMSs are flexible, as they now are available as apps that connect through smart phones, wearables, and tablets, as well as the traditional desktop and laptop, and therefore can be accessed from virtually everywhere. LMSs are not yet being used to their full potential, and to do so will require

the entire learning community (learners, teachers, and other education system stakeholders) to invest more time and conduct more studies (Watson & Watson, 2007).

Prahani et al. (2022) conducted a systematic critical history and review of the LMS in education, from the years 1991-2021. There is little research on the LMS and sense of belonging, and some research on the LMS as learning communities related to courses. There still exists a gap on the use of the LMS outside of courses for an ongoing interactive and connecting space for students. Further, there is a lack of research on the design of an LMS, with the academic socialization of doctoral students to their peers in mind, integrated with academic resources and activities.

Erichsen and Bollinger (2011) looked at the isolation that international students faced in traditional and online doctoral programs, asked the following questions: “What aspects of technology need to be monitored to reduce students’ everyday challenges? What kind of online delivery system has been (or should be) used to reduce anxiety or isolation among students?” (p. 323). Citing Maslow’s (1943) hierarchy of needs, they confirm that paying attention to the emotional needs of learners is the way to prepare learners to be “fit for higher learning” (Erichsen & Bollinger, 2011, p. 323)—an example, for the rigour of PhD programs.

Traditionally, online learning has been designed using traditional classroom practices (lectures, grades, group discussions) as a model, without exploring new design and delivery options evolving from online technology capacities (Norton & Hathaway, 2008). However, creating more diverse and culturally sensitive and inclusive practices within an LMS has been explored in Australia (Dreamson et al., 2017), where researchers looked at the LMS and university practices through a culturally inclusive lens. They recognized that the learning design of the LMS and policies and practices for its use were not culturally inclusive of the Indigenous peoples of Australia and they suggested design plans to enhance learning and changes to policies and practices of teaching. This example illustrates that the key to realizing possibilities for inclusion depends on how the LMS is used and designed for use.

The LMS “enables teachers to deliver flexible and feasible teaching and learning” in a variety of ways, including synchronous and asynchronous modes (Park 2011a, 2014 as cited in Dreamson et al., 2017). Intentional efforts are needed to design and

implement culturally inclusive practices through the platform. Furthermore, instructional designers and instructors need to be aware of their own biases, perceptions, and paradigms around learning to create inclusive LMS curriculum, features, and modes of delivery (Dreamson et al., 2017). Dreamson's study supports a dual purpose of providing protected spaces for community knowledge and experience sharing, while fostering connection and belonging.

Utilizing technology to create social connection in courses is not a new idea. Given that the LMS is used on virtually all university campuses for academic courses, students are familiar with their university's LMS, whether they are in face-to-face classroom settings, hybrid learning, or online courses. This ubiquity of LMSs means that there would be no additional expense to developing an LMS central to doctoral students. Faculty in higher education have implemented Facebook pages, for example, to complement the LMS used for their courses. This was reported to be successful for some students, but not for others (Gabarre et al., 2013; Miron & Ravid, 2015; Niu, 2019; Rockinson-Szapiw et al., 2014; Wang et al., 2012).

The campus LMS platform would avoid the potential privacy violations that have been demonstrated to occur with commercial social media such as Facebook (Dixit & Sacks, 2018; Goodwin, 2018; Isaac & Hanna, 2018). Surveillance increased after Google was established in 1998, collecting data and preferences from users, and it boomed after the 9/11 attacks in the United States. With the birth of Facebook in 2004, social surveillance permitted users to know things about their friends and connections. Due to the vast and quick growth of Facebook, the term "surveillance capitalism" came into play, with Facebook making a fortune by using data from users and allowing advertisers to target users with certain preferences. According to Zuboff (2019), "the goal of surveillance capital is to automate us" (p. 612). Using educational technology to connect students would avoid the danger of risk and exposure of personal information for monetary gain or data breaches, and would control what the user is exposed to, thereby avoiding exposure to distractions and manipulation through advertising and pop-ups of unrelated content.

Privacy concerns with the LMS centre more around users being able to post anonymously, and instructors being able to do surveillance on how long they interacted with the LMS through analytics. For the LMS that is tied to an institution, privacy

concerns are less than for open source LMS. In any digital environment it is not possible for a user to be totally anonymous and have total privacy. A social media site has less protection over individual data than an LMS from a higher education institution, including who the users are within the LMS community (Kumi-Yeboah et al., 2023; Mekovec, 2020).

An LMS can provide the just-in-time communication of a chat feature, like other social media, without the algorithmic manipulation and data surveillance endemic in Facebook and other social media options. Still, LMSs and learning technologies are not neutral tools; design and use are political and will shape what kinds of communities or Third Spaces are possible. The LMS may be more effective in designing modules for content and organization that are user-friendly and provide the ability to add and retrieve content at any time. Saettler (2004) cautions about "being overly optimistic" and proclaiming, "the inauguration of a new era, only to be scaled down subsequently to size" (p. 538). Still, as Saettler states, "There is hope that educational technology A.D. 2001 and beyond will begin to develop into something far more exciting and creative than it is now" (p. 539). This leads to the discussion of exploring the LMS as a "Third Space."

2.6.1. The LMS as a "Third Space"

A "Third Space" is also known as a "personal learning environment" (PLE) and has been defined as the space between home and school, or between a student's personal digital spaces of social networking, and the university-provided technological supports to assist with teaching and learning, such as the LMS (Sutherland et al., 2011). The Third Space or PLE as digital space is provided and controlled by the institution, yet is also individually controlled, giving a balance between "direction and independence that encourages student engagement" (Poot & Austin, 2011, p. 1018).

The design of a PLE requires collaboration between an instructional designer and faculty to maximize opportunities for richness, depth, and creativity (Poot & Austin, 2011). Students reported several benefits of the collaborative and creative space. As stated by one PLE practitioner in reference to this Third Space, it "allowed me/liberated me to journey, to create, to connect, to model, to inspire in ways I had never imagined

with earlier technologies," and it "enables engaging pedagogy that can be enjoyed by students and teachers alike" (Poot & Austin, 2011, p. 1019).

Internationally, online education often takes place on an LMS. Utilizing the LMS for a Third Space can foster education and community among people from all over the world in an online setting (Soja, 1996). Including instructional design for a Third Space within the LMS, can "enable the renegotiation of boundaries and cultural identities" (Rye 2014, p. 9). Isolation, and challenges in forming community when one is underrepresented on campuses, can disproportionately impact students with different identities. Therefore, examining the LMS and its possibilities for equalizing power, creating relationships, facilitating communication, and bridging belonging through technology are crucial. According to Rye (2014), a cultural Third Space has benefits and "can work as a political strategy in the fight against all forms of oppression" (p. 9). In fact, Third Space has its roots as a cultural space of equity and equalized power, away from colonised systems (Bhabha,1994).

As digitized spaces have become more common, McDougall and Potter (2019), along with Selwyn and Burnett (2019), have examined digital media and learning in Third Space. Their studies included discussions with K-12 educators, seeking to problematize inequities due to technology and its capitalistic nature. This encouraged engaging educators, parents, and other stakeholders in digital literacy discourse. The results centralized what digital literacies mean to learning, students, student voice, and as equalized spaces. The territories covered were: (a) new ways of thinking, engaging, and researching digital literacies; (b) Third Spaces as the in between of "school, and home/community"; and (c) digital media curation which has to do with cultural production and literacy practice (p. 2). Important to my study are the discussions related to mobile technologies as being socially constructed spaces based on what the users want (Selwyn, 2014), the entanglement of power and users, and the deconstruction of power in Third Space environments. Digital technology as a Third space can cross disciplines and empower new ideas and ways of knowing. It equalizes power dynamics including space. "Educational practices can 'shape-shift' to challenge epistemological power relations'' (McDougall and Potter, 2019, p. 2). The Third Space, utilizing an LMS, that is student centred, I believe, can promote the interactive discussions, deconstruction of power, knowledge sharing, and shared expertise that these researchers discuss.

More recently, Veles (2020) conducted an empirical study of cross-boundary, cross-campus, and intercultural collaborations between professional and academic staff at a university. Collaborations occurred in Third Space environments (modelled from Bhabha, 1994, Lefebvre 2014, 1991; Soja, 1996) Veles explored how university groups worked together in Third Space environments. Third Space environments may be viable for doctoral students to use for collaboration and building a sense of community; a place to share ideas and experiences.

Learning in networked environments like an LMS can be beneficial for connecting "one learner and other learners…and between a learning community and its learning resources" (Goodyear et al., 2004, as cited in Cronin, 2014, p. 406). According to Gutierrez (2008), the Third Space may "resist binary categories of formal and informal learning," thus encouraging students to "develop networks, construct identities, and develop literacies towards lifelong learning" (as cited in Cronin, 2014, p. 406).

Social networking sites have also been named as "Third Space(s)" (Wang et al., 2012)—for example, when Facebook is used in addition to an LMS for a course. The challenge here, according to Wang and colleagues, is that Facebook and LMS have different technologies and do not support the same file features and interactive capabilities. Additionally, Facebook is a page requiring scrolling up and down, meaning that posts are kept by date historically, making it challenging to search for information (Wang et al., 2012).

2.7. Theoretical Frameworks

In this final section I summarize the theoretical frameworks for this study.

2.7.1. Sense of Belonging

The data gathered for this study, both quantitative and qualitative, explore a sense of belonging (and isolation) among doctoral students. This ties to the work of Strayhorn (2012, 2019) regarding college students' sense of belonging and its relationship to educational success. The reference to belonging in this context derives from the work of Maslow (1943), who posited that humans want to belong and want to individuate. It is Strayhorn who has connected a sense of belonging to college students'

achievement, and to identities of college students (for example, first-year, STEM students of colour, those in university clubs and organizations, ethnic gay male). Strayhorn (2019) indicated the following core elements regarding sense of belonging in his theoretical model:

> a) a universal basic human need, b) fundamental motive sufficient to drive behavior, c) context, time and other factors determine importance, d) related to mattering, e) influenced by one's identities, f) leads to positive outcome and success, and g) must be set as conditions change (p.30).

In this study I use questions and instruments adapted from the work of Strayhorn, Terrell et al. (2009), Nettles & Millett (2006), and Lovitts (1996, 2001) to probe the sense of belonging among Faculty of Education doctoral students.

2.7.2. **Doctoral Student Socialization**

Doctoral student socialization, including relationships to peers, provides my second theoretical framework. This choice flows from those researchers (Gardner & Mendoza, 2010; Lovitts, 2001; Nettles & Millett, 2006, Okahana, 2009) known for their research and analyses of doctoral students acclimating to doctoral programs or exiting from their PhD programs. In my review of their works, I noted that these researchers examined various aspects of doctoral student experiences, including connections to faculty and peers; activities in which the students engaged; students' blame of themselves and/or blame of the institution when they quit a doctoral program; and several other program-specific factors. Collectively, those findings result in some understanding of doctoral student socialization into their programs. It is from these researchers that we learn the faculty-student relationship is key in doctoral student socialization and success. I incorporate items and adapted instruments from their work to understand doctoral student socialization in the Faculty of Education, and to examine what types of experiences and connections result in greater likelihood of progress or (dis)satisfaction for these doctoral students. I focused on socialization through peer-to-peer relationships, as it has been given less attention in previous studies.

2.7.3. **Third Space through Online Space**

The third theoretical framework used in this study is that of Third Space theory. Third Space originated as a theory articulating cultural and post-colonial spaces. That

is, there is one place/space (as in home), and a second place/space (as in work or school, a colonial space), and a “Third Space” that is a communal space, often tied to something outside colonial space, where identified groups, generally not colonizers, gather to communally create postcolonial space (Bhabha, 1994). In the literature, reviewers outlined notions of Third Space as digital or online space.

In this study, I imagined and designed a modest three-module prototype on Canvas as a potential Third Space for communal doctoral student connection. This was done to explore initial reactions among doctoral students of having such a Third Space, which was not home and not campus and classes, to encourage doctoral student connectedness and belonging. This is a novel aspect of the thesis and contributes to imagining what a Third Space for doctoral students might look like.

2.8. COVID-19 as a Dynamic without an Educational Theoretical Framework

Coming into the post-COVID-19 era, theories, and ways of being for educators and doctoral students are shifting and adapting. It will take some time to determine flexibility and adaptations to theoretical frameworks. With that uncertainty in mind, I move to the methodology chapter and elaborate the need for inventive and responsive methods of inquiry in the wake of COVID-19.

2.9. The Study Ahead

A lack of comprehensive scholarly understanding of attrition and PhD students’ experiences of belongingness and isolation continues to challenge higher education and garner attention in public discourse. From the literature, we know that PhD students 1) experience isolation and loneliness, 2) manage stressful multi-pronged lives while pursuing their doctorate, and 3) experience mental health challenges, like depression and anxiety. While the research literature suggests raising awareness among doctoral students about the socioemotional and academic challenges of PhD programs, it does not address the question of how the collective community might guide and empower PhD students to access the available knowledge and resources they need to help them through this specific journey and obtain their degree with belongingness, connection, and spirit intact. This would help students better understand and manage their own

discomfort, knowing that feelings of competence and incompetence will ebb and flow, and that their peers are sharing these experiences.

Sense of belonging can be key for persistence, achievement, and inclusion, perhaps especially for doctoral students, though this has been more studied in the context of undergraduate students. While research shows relationships with faculty and departments are important, more study is needed to understand how programs should be structured, and peer socialization opportunities created, to enhance a sense of belonging (McAlpine & Amundsen, 2011). And while technology decision-making is in the hands of PhD students, it would be opportune to explore the LMS as a Third Space for peer-to-peer socialization and social academic connection beyond courses, which could enhance belonging and, perhaps, improve retention and achievement outcomes for those on the journey to the PhD. Since COVID-19 has hit globally, and colleges are moving more to online environments, it seems useful and timely to study students' needs for belonging and how best to use existing educational technology, like the LMS, to this end. There has not been a study on the LMS designed as a Third Space of academic and social connection, focused on academic resources and activities for doctoral students.

In the next chapter, I explain the methodology and procedures of this mixed methods study on doctoral student experiences of sense of belonging, isolation, COVID-19, and the LMS as a Third Space.

Chapter 3.

Methodology

This Chapter provides a description of, and rationale for, the methods used to study isolation and belonging as phenomena through doctoral students' conveyed experiences. The Chapter includes an overview of the research questions; the study design, with rationale; procedures, including site and participant selection, demographics of participants, instruments and data collection methods; data analysis methods; and ethical considerations.

3.1. Research Questions

Based on the literature review reported in Chapter 2, this study was framed around the following research questions:

3.1.1. Research Question 1

What are the experiences of isolation and belonging for PhD students in the Faculty of Education before and during COVID-19?

3.1.2. Research Question 2

How did doctoral students stay in touch before COVID-19 and during COVID-19?

3.1.3. Research Question 3

How can a learning management system (LMS), such as Canvas, support a sense of belonging for PhD students?

3.1.4. Qualitative and Interpretivist Paradigm Rationale

Qualitative research can be described as "immersing oneself in a scene and trying to make sense of it … to make sense of the context and build larger knowledge claims about the culture" (Tracy, 2013, p. 3). Because qualitative research has no

“distinct set of methods or practices that are entirely its own” (Denzin & Lincoln, 2005, p. 7), it gives the researcher a breadth of ways to approach data collection. A variety of qualitative research practices enables the researcher to discern important knowledge and insights (Nelson, Treicher, & Grossberg, 1992, p. 2), while “no specific method or practice can be privileged over any other” (Denzin & Lincoln, 2005, p. 7).

Qualitative methods provide a wide range of approaches for understanding a person’s experience within their own context, and the social context of the environment around them (Mason, 1996). An interpretivist-social constructivist paradigm proclaims that how we come to know and understand the world results from the social and experiential contexts in which we interact with the world (Brown, 2018). According to social constructivism, hearing from individual doctoral students would complement a qualitatively derived understanding of how experiences of isolation and/or belonging unfold, especially in the peer context. Meaning is negotiated through interaction, dialogue, observations, and the culture of research settings (Brown, 2018). Consequently, I viewed participants in my research as “active and knowing agents,” and “experts and/or coproducers of knowledge” (Brown, 2018, p. 73).

3.2. Study Design and Rationale

Mixed-methods research has increased in popularity over the last 10 years (Creswell, 2012, p. 534; Tashakori et al. 2020). It is a well-established research method that addresses the research questions of this study and calls for survey and experiential data. The mixed methods approach is defined as “a procedure for collecting, analyzing, and ‘mixing’ both quantitative and qualitative methods in a single study or series of studies to understand a research problem” (Creswell & Plano Clark, 2011, as cited in Creswell, 2012, p. 535). Depending upon study goals, mixed methods can be more effective in understanding the issue under investigation than using quantitative or qualitative methods exclusively (Creswell, 2012, p. 535). According to Johnson and Turner (2003, p. 297) the six most common methods of data collection include questionnaires, interviews, focus groups, tests, observation, and secondary data. This study utilizes questionnaires (quantitative/qualitative), in-person interviews (qualitative), and a preliminary findings and feedback session with participants (qualitative). Abbreviations in mixed methods studies used are QUAN (quantitative); QUAL (qualitative). Procedures which have both quantitative and qualitative components are

displayed with the most prominent in caps and less prominent in lowercase enclosed with parentheses. For example, the survey for this study elicited quantitative responses (i.e. how many, how often), though it also included some qualitative questions, to elicit student perspectives and elaborations. Thus, the survey results are designated as QUAN(qual) in the mixed method form. The qualitative interviews are designated as QUAL, with a QUAN(qual) reaction survey following a Canvas prototype shown to interview participants.

There are various models for mixed methods design in research. For this study, the explanatory sequential mixed methods design was chosen. Quantitative data collection was the first step. Qualitative data collection followed, to explain the findings in a deeper way than quantitative analysis alone would make possible (Creswell & Plano Clark, 2018). The paradigm for the data analysis in this explanatory mixed method study is essentially pragmatic. From historic to current researchers, pragmatism, as a "worldview" has evolved through the works of "John Dewey, William James, Charles Sanders Peirce, and Cherryholmes (1992), Murphy (1990), and Morgan (2007)" (Creswell & Plano Clark, 2018, p. 39). This is a flexible paradigm that accounts for the positivist worldview of quantitative methods and allows for the interpretive lens of qualitative methods. Pragmatists make use of whatever works (Vogt & Johnson, 2016) and whatever means are fitting to achieve a goal (Creswell & Creswell, 2018). This inclusive paradigm values empiricism and the stable realities that quantitative measures can provide, while recognizing, simultaneously, the reality of individuals, through open-ended data collection methods such as interviews.

Through the questionnaire (phase 1 of the explanatory mixed methods approach), quantitative data collection took place, with some open-ended questions added QUAN(qual). Analysis included descriptive statistics from numeric responses on the survey instrument. The interviews, Phase 2 (QUAL), supported an interpretivist and social constructivist orientation, as the data were generated together with the participants in the study. Participants were also shown a Canvas prototype of a Third Space (*Doctoral Student Connect* site), and their reactions were elicited through a quick QUAN(qual) survey. Finally, Phase 3 of the data collection, the Preliminary Findings Workshop, encouraged collaboration between the researcher and the participants in validating the findings. The first step in validation occurred through the dissemination of individual transcripts to participants for review, validation, and assurance of permission

to use. The second step was through the Preliminary Findings Workshop where participants could review and respond to the initial findings of the study. In the Preliminary Findings Workshop, participants were given the option to anonymously post on a digital wall, using the technology *Padlet*. Participants could also give feedback through the chat feature on Zoom during the Preliminary Findings Workshop and/or through conversation. Students engaged in all three ways to express their reaction to the findings.

With the conditions of the pandemic, digital media were the optimum method of conveying the study proposal to potential participants, disseminating instruments, collecting data, and analyzing data. Seligmann and Estes (2020) describe digital fieldwork as an "advantage" by providing "access to a potentially meaningful part of people's lives" (p. 182). In this study, I saw and heard from participants from their own surroundings, including other countries and time zones. I observed during interviews on Zoom (online) that participants spatially appeared closer (via webcams) than in a face-to-face space. As a result, I could detect their facial reactions, upper body non-verbals, and to some extent, they could detect mine. I was very aware of my own eye contact and explained to them when I looked down, I was taking notes. I am a paper and pen notetaker. I did not want any participants to assume I was not paying attention or looking at my phone.

To a greater extent than face-to-face interviews, the Zoom interviews were intimate. As a researcher I met family members, cats, dogs, saw glimpses of art or other artifacts or background styles that the student allowed me to see.

Figure 3.1, depicts the steps in the explanatory mixed-methods approach taken in this study: Step 1, Phase 1, QUAN(qual) data collection; Step 2, QUAL data collection; Step 3, QUAN(qual) reaction survey to a Canvas student connect prototype, Step 4 analysis of the data from Step 1 and Step 2 for *Preliminary Findings Workshop*; Phase 4, QUAL qualitative data collection through digital wall, Padlet for participant response; and Step 5, final data analysis, interpretations, and findings.

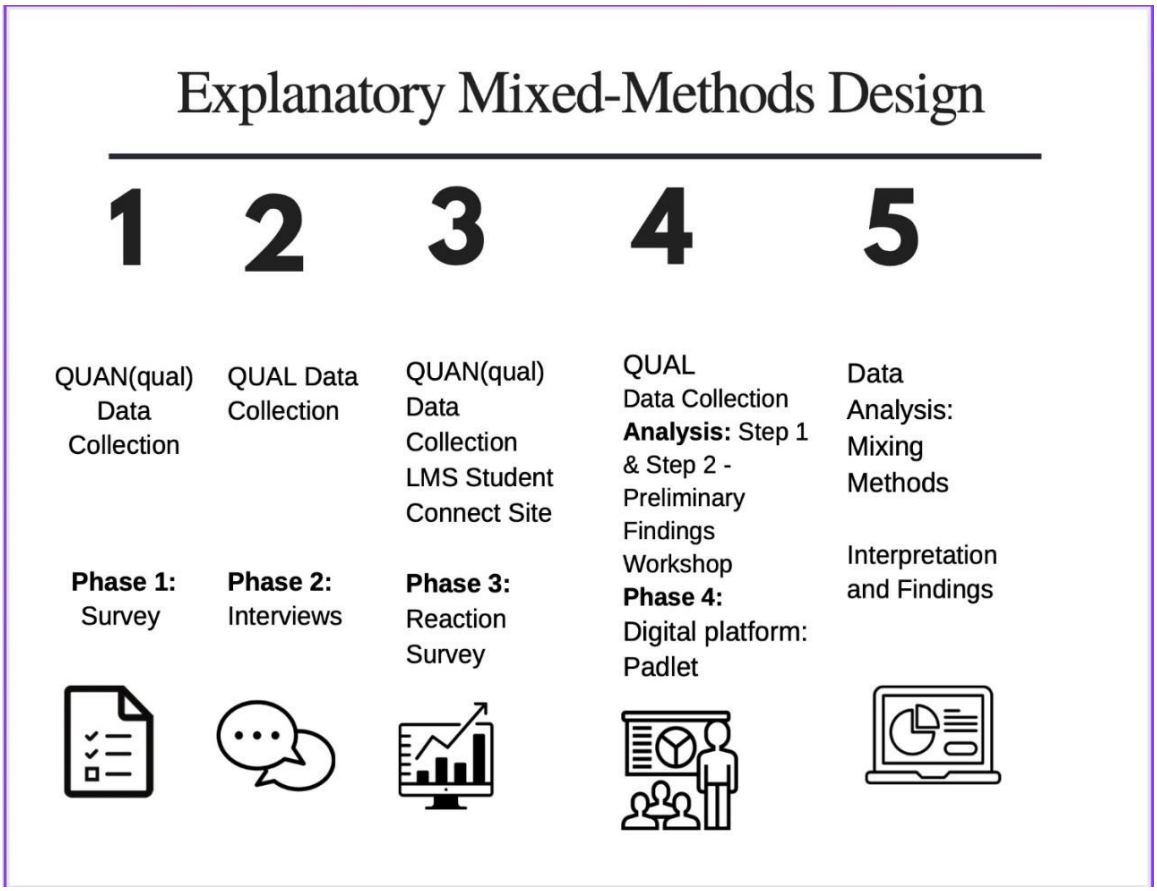

Figure 3.1 Steps to Explanatory Sequential Mixed Methods Design of This Study

3.2.1. Quantitative Rationale

Quantitative methods involve “variables or research that can be handled numerically” (Vogt & Johnson, 2016, p. 356). This approach “strives to accurately describe, predict, explain, and ultimately control (in a positive sense of solving problems) the natural and human world” (Vogt & Johnson, 2016, p. 357). Data are collected in “precise and structured measurement using data collection instruments and procedures that are high on reliability, validity, and cross researcher agreement” (Vogt & Johnson, 2016, p. 356). Survey research measures a “social reality” through identifying statements and/or characteristics of a population, establishing exact numeric responses and enabling statistical analysis (Sukamolson, 2007).

Quantitative instruments can measure respondents’ attitudes and reactions to or opinions about the same topic. This allows a researcher to reach a larger population and discover commonalities and differences within contained questions and responses. In

this study, a structured questionnaire afforded the opportunity to sample a larger group than would be possible through interviews, and to provide some baseline data on commonalities and differences connected to the chosen variables of the study.

Rating scales can be used to examine an array of attitudinal variation, such as intensity about agreement, amount of effectiveness, importance, satisfaction, and defined experiences (Vogt & Johnson, 2016). In my questionnaire, the width of rating scales varied from 4 to 11 points. The questionnaire also included comment boxes for participants to add more detail to their answers through free-form text, as well as some open-ended questions. Note that comment boxes are not questions; they provide an opening for participants to add words to a closed-form or forced choice question.

3.2.2. **Interviews Rationale**

This study used semi-structured interviews because they provided the opportunity to hear the stories of Ph.D. students' lives, thus capturing the phenomena of belonging, community, and isolation in participants' own words. Interviews allowed an openness for respondents to reflect and share in a more organic way than possible through the questionnaire. Personal narratives brought a richness of context, insights, and understanding that complemented and strengthened the quantitative data. According to Lawrence-Lightfoot (Walsh, 2014), participant stories create "a subtle and complex narrative that allows us to see the universal in the particular" (Walsh, April 30, 2014). Further, the "[s]tory makes the implicit explicit, the hidden seen, the unformed formed, and the confusing clear" (Chou et al., 2013, as cited in Wang & Geal, 2015, p. 196).

"Interviews are guided question-answer conversations," or an "inter-change of views between two persons conversing about a theme of mutual interest" (Kvale & Brinkmann, 2009, p. 2). Interviews are commonly used as "part of a multi-method approach" (Brown, 2018, p. 80). The interviewer's questions function as "a walking stick to help some people get on their feet" (Fontana & Frey, 2005, p. 695). Face-to-face interviews are considered the "gold standard" for qualitative research (Barbour, 2014). They are not a "neutral tool," but rather part of an interactive process "that leads to a contextually bound and mutually created story" (Holstein & Gubrium, 1995, p. 696). This view of the interview is known as the new "empathetic approach," which is more

considerate and ethical towards the individual or groups being interviewed (Holstein & Gubrium, 1995, p. 696). The interviewer becomes an advocate and partner in the study and can use the results for social advocacy and to change lives for the better (Holstein & Gubrium, 1995, p. 696).

The collection of interviews followed “polyphonic recording;” they are not integrated into one or collapsed for reporting purposes (Fontana & Frey, 2005). This is a powerful technique as the multiple perspectives stay intact; “differences and problems are discussed, rather than glossed over” (Krieger, 1983, as cited in Fontana & Frey, 2005, p. 709*).* Each interview was reviewed in its entirety separately prior to analyzing for codes and themes that were congruent across transcripts and other data collection methods.

3.2.3. **Rationale for LMS Prototype Reaction Survey**

The prototype LMS *Doctoral Student Connect* site was intended to provide a platform where doctoral students could stay connected. It is expected that it would stay relevant and student-centered since students themselves would add content and respond to each other.

Veletsianos (2010) uses the phrases, “not yet fully researched” and/or “[not yet] researched in a mature way” (p. 15) to describe emerging uses of technologies. Adopting this language, there is a “not-yetness” to imagining Canvas as a Third Space of engagement, information, and connection for doctoral students outside of a course. Ross (2018) describes this as a speculative method approach. Some studies on LMSs have included supplementing a course on an LMS (face-to-face or online) with a Facebook page to facilitate student engagement with each other and with course content (e.g., Wang, Woo, Quek, Yang, 2012). Laurillard (2008) focused on educational technology to creatively solve problems. Laurillard’s work with pedagogical design and learning for teacher professional development using educational technology (LMS) further inspires possibilities for the LMS as an andragogical design and learning place for doctoral students to build social-academic communities and collaborations. However, there has been little research on LMSs as a source of information (program and otherwise), interactive content, and to connect for academic socialization among doctoral students.

This portion of the interview/study used the prototype LMS as a digital platform to engage doctoral students in imagining the not-yetness of Canvas as a socio-academic connection hub. The not-yetness offered a conceptual handle for digital education approaches that “help us stay open to what may be genuinely surprising about what happens when online learning and teaching meets emerging technologies” (Collier & Ross, 2016, as cited in Collier & Ross, 2017, p. 11). There is encouragement in the field of educational technology to work in the not-yetness towards “intelligent problem solving” and “inventive problem-making” (Michael, 2012). This portion of the research gave doctoral students an opportunity to engage with portions of the prototype LMS to envision a future they might want to see or create (Ross, 2017). The prototype reaction survey questions were modified from other studies who focused on the usefulness of Facebook as an LMS site for classrooms (Kalelioglu, 2017; Wang, Woo, Quick, Yang, & Liu, 2012). The adapted questions were about the usefulness of an LMS for student peer connection purposes.

3.3. Procedures: Site and Participant Selection

3.3.1. Introduction to Procedures

The procedures for this study included the following steps:

1. Submitted and received ethics approval from Simon Fraser University.

2. All consent forms for the study were put into SurveyMonkey, an online survey platform. Participants used this platform to indicate that they had read the consent and agreed to participate in the survey, interviews, Canvas *Doctoral Student Connect* site*, and*/or Preliminary Findings Workshop (the four Phases of the Study).

3. The survey, Phase 1 of data collection, was put into SurveyMonkey, the online survey program, resulting in a digital survey.

4. The survey was distributed with an invitation (and digital poster) to active doctoral students in the Faculty of Education through email sent from the Graduate Studies Office to 249 matriculated doctoral students. The email contained digital consent forms for all phases of the study along with the study details.

5. Participants entered Phase 1 of the study, through the email link provided for the consent for the online survey (Phase 1). The survey link was at the end of the consent form.

6. Interview participants (Phase 2 of data collection) volunteered through the final question on the Phase 1 survey, question 55. Interviews lasted no more than 75 minutes. Interviews were digitally recorded on Zoom. The last 15 minutes included a prototype of a Canvas *Doctoral Student Connect* site.

7. Though interviewees signed a digital consent form prior to the interview, I went over this form as a reminder and received a verbal yes, prior to beginning to record each interview.

8. When sensitive topics came up or the participant seemed distressed, unsure, or lost (without direction on something), I offered the participant information on relevant resources such as the university counseling centre, writing resources, writing groups, etc.

9. An anonymous brief reaction questionnaire (SurveyMonkey link) to the Canvas prototype was put in the chat at the end of the Zoom interview session.

10. A $50 Amazon card was sent to each interview participant through their email, within 24 hours of the interview.

11. All interviews were transcribed using digital software for initial audio transcription, and then reviewed by the researcher and interviewee(s).

12. Transcriptions were sent to participants, and participants had the opportunity to contact me if they objected to their transcript being used, and/or wanted additional identifiers or parts of the transcript blocked out (to protect confidentiality) and not used in the data collection/analysis.

13. Digital files were encrypted and password-protected on my computer, with a copy saved to the university platform in a secured digital folder as a back-up.

14. Paper notes were placed in a locked file cabinet.

15. Data was analyzed from the survey (Phase 1), and interviews and reaction survey (Phase 2).

16. Participants were sent an email for Phase 4 of data collection, the Preliminary Findings Workshop. There were three advertised dates and times that students could choose to attend based on their schedules.

17. The Preliminary Findings Workshop consent included information on participant anonymity, the timing of the workshop, and instructions on how to provide feedback to the researcher.

18. Participants entered the Preliminary Findings Workshop through Zoom. The chat was made available to participants to use for questions or comments. The workshop lasted 15-20 minutes.

19. At the end of the Preliminary Findings Workshop, participants were provided a link in the chat to a Padlet digital wall. On the wall of the digital board were broad themes, categories that had been discussed in the Preliminary Findings Workshop, to which they could respond. There was unlimited space on the digital wall to add other categories, themes, and comments. Additionally, they could post comments underneath any and all of the themes. This was an opportunity for participants to corroborate the findings, disagree with the findings, and/or add something else. This was a method of collaboration and validity for participants and the researcher to come together and engage further in the study findings. When participants were finished, they exited the Padlet.

20. Feedback and information from the Preliminary Findings Workshop were integrated into the findings.

21. The consent forms remained on the SurveyMonkey site until the end of data collection. An excel spreadsheet of consent forms was uploaded to a secure university platform for storage. This ensured protection from loss or damage.

3.3.2. **Site Selection**

The study was conducted within a Faculty of Education at a medium-size comprehensive, public university in Western Canada. There are three campuses, and doctoral students in Education were invited to participate from all three campuses. Participation was digitally mediated due to COVID-19 and included participants in widely dispersed locations. Some participants were domestic, and some international and spread across the globe, as necessitated by COVID-19 and campus shut-downs.

3.3.3. **Participant Selection**

The survey participants were selected through “purposive sampling;” that is, the participants were chosen deliberately to be directly relevant to the research questions and the phenomena being studied (Schwandt, 2015, p. 127). Purposive sampling is defined as a nonprobability sample chosen for characteristics that align with the

objectives of the study. “Relevance may also be a matter...choosing a unit on the basis of prior knowledge” of a population and the objective of a study (Schwandt, 2015, p. 127).

The inclusion criteria for participants in this study were that they had to be enrolled as doctoral students in the Faculty of Education. Education doctoral students who were not currently enrolled were excluded from participating because the study concerned peer connectedness among current doctoral students. All matriculated doctoral students in education received a survey and were invited to participate in the study. The survey received approval from the Graduate Studies office, and it was this office that sent out the information on the study to all 249 active doctoral students. The email included a digital poster developed by me to describe the study, as well as links to the consent form and to the survey. The rationale behind this process was to keep student email addresses private. Students who chose to participate gave consent by providing their contact information in consent forms and through agreement to be contacted for an interview. This step was taken to provide privacy for students, contributing to trust in the study. The Graduate Studies office sent the communication to education doctoral students on three different occasions in the Fall of 2020: once in September, once in October, and once in November. The students who filled out the consent form and started the survey were counted as survey participants. In total, 33 doctoral students participated in the survey portion of the study, or 13% of the eligible participants.

The interview participants were selected through “convenience sampling” in the form of a question at the end of the survey (Phase 1) that invited the participant to an individual interview session (Phase 2), which was then scheduled. This matched the convenience sampling definition of readily accessible participants, and ensured matching the population inclusion characteristics (Creswell, 2012, p. 145). There were 25 people who signed up for interviews, and 23 who were interviewed during the interview period. Two interviews did not occur, because I inadvertently missed the responses to the invitation, only to discover them after the analysis and preparation of the preliminary findings workshop was underway. The decision was made not to conduct these two interviews, as the research project had already moved to the next phase of data collection. All interviews that did occur, were scheduled in November and December of 2020. Those who were interviewed received their transcripts to review for a

period of two – three weeks, occurring from February to mid-March 2021. Transcripts sent to participants had highlighted words or blacked out words that were identifiers of the student interviewee. Participants could indicate other parts of the transcript they were not comfortable with or decided they did not want included in the analysis. The main issue for student interviewees at the time of the interviews and sharing of transcripts was being identified, as they were all still doctoral students in programs.

For the final phase of data collection, Phase 4, purposive sampling was again used. All those who participated in the interview and survey were invited to the preliminary findings workshop. A total of 10 people signed up for the Preliminary Findings Workshop. An email was sent to all participants with the dates and times of the Preliminary Findings Workshop, which occurred in May 2021. The same workshop was given three times, on three different days within the same week to accommodate student schedules.

3.3.4. **Survey Sample**

The survey contained demographic questions which solicited information on the following: (1) nationality of student; (2) ethnicity; (3) gender; (4) age; (5) time in Canada; (6) first language; (7) phase of study; (8) program enrollment; and (9) progress in program. See Table 3.1.

Table 3.1 Survey Participant Demographics (1 of 3)

Baseline for Sample,	n =33	
Nationality of Student	n	%
Domestic	23	69.7%
International	9	27.7%
Preferred no answer	1	3.03%
Gender		
Female	27	81.8%
Male	4	12.1%
Nonbinary	2	6.1%

Ethnicity	n	%
East Asian	1	3.03%
Southeast Asian	3	9.09%
Caucasian	25	75.7%
Latin or South American	26	78.7%
Middle Eastern	4	12.1%
Other	1	3.01%

Age		
Under 30	2	6.1%
30 to 39	11	33.3%
40 to 49	9	27.3%
50 to 59	9	27.3%
60 or older	2	6.1%

Time in Canada		
Born in Canada	18	54.5%
Lived in Canada 5+ yrs	4	12.1%
Lived in Canada 2-4 years	2	6.1%
Lived in Canada 1-2 years	3	9.1%
Does not live in Canada	6	18.2%

Table 3.2 Survey Participant Demographics (2 of 3)

Baseline for Sample,	n=33	
First Language	n	%
English	26	78.8%
Arabic	1	3.03%
Spanish	1	3.03%
Brazilian Portuguese	1	3.03%

Phase of Study	n	%
Coursework	7	21.2%
Preparing for Comp Exam	3	9.09%
Comp Exam	4	12.1%
Doing Research & Writing	19	57.6%

Table 3.3 Survey Participant Demographics (3 of 3)

Baseline for sample n=33		
Program Enrollment	n	%
Arts & Education	1	3.03
Educational Psychology	2	6.06
Technology & Learning Design	3	9.09
Educational Theory & Practice (eTap)	4	12.10
Education Theory & Philosophy of Education (eTap)	1	3.03
Curriculum & Pedagogy (eTap)	2	6.06
Languages, Cultures & Literacies	5	15.10
Langues, Cultures et Littératies (en Francais)	6	18.20
Mathematics Education	7	21.20
Educational Leadership	2	6.06
TOTAL	33	
Progress in Program	n	%
Making good progress	13	39.40
Slower than expected	18	54.50
Progress stalled	2	6.06
TOTAL	33	

3.3.5. Interview Participant Sub-Sample

The sub-sample of interviewed students represented the following programs within the Faculty of Education, a) Educational Theory and Practice (ETAP): Curriculum and Pedagogy, b) Educational Psychology, c) Mathematics Education, d) ETAP: Philosophy of Education, e) Educational Technology and Learning Design, f) Languages, Cultures and Literacies, and g) Langues, Cultures, et Littératies (en Français) The sub-sample included 9 International students, two of whom were located outside of Canada at the time of the interview and seven of whom were located inside of Canada; 14 domestic students; 2 males, and 21 females. The age of interview participants ranged from under 30 to over 60. Phase 2 and Phase 3 of data collection were drawn from this sub-sample of Phase 1.

3.4. Procedures: Instrument Development and Data Collection Methods

3.4.1. Survey Instrument

Formulation of the Survey with Contacts and Permissions from Researchers

In consultation with Dr. Wanda Cassidy (who has experience as a Faculty administrator), I developed an online, 55-question SurveyMonkey survey. The survey solicited information on student demographics (informed by Canadian census categories) and experiences of isolation and belonging in the Ph.D. program, with a few items added on technology use and experience with Canvas. Many of the remaining items were compiled from instruments developed by other researchers and adapted for use in this study and used with permission.

In April 2020, I contacted Dr. Steven Terrell, one of the researchers who created and validated the Doctoral Student Connectedness Scale (DSCS) (Terrell, Snyder, & Dringus, 2009). This scale was developed for doctoral students in fully online programs. The instrument was relevant to this study because it focused on "relationships and bonding," that is, the "connectedness" of student experiences while in their doctoral program. The items from the DSCS – 18 questions that required choosing a numeric response on a Likert scale from 1 (strongly disagree) to 5 (strongly agree) – were quick to complete and not taxing for participants to answer, so they were included as a central part of the survey. Of these 18 questions, nine measured connectedness to student peers and the other nine measured student connectedness to faculty. The DSCS scale, as adapted for this study, was approved for use by Dr. Terrell. The original scales were adapted to clarify language, meaning: the US survey uses "faculty" in relation to professors and instructors. In Canada, "Faculty" may also refer to an academic unit within a university. In addition, this tool was developed for online students only, and students in the dissertation phase. I thought it was important to use this scale for doctoral students (online or face-to-face) and those students who were in the coursework/pre-comprehensive exam phase, as well as the participants the scale was originally used for, students in the dissertation (research and writing) phase. To view the original instrument and the adaptations made, see Appendix A1.

Dr. Catherine Millett, who wrote *Three Magic Letters: Getting to Ph.D.* (Nettles & Millett, 2006), was contacted using the web site ResearchGate, and a telephone appointment was set up. Dr. Millett and I discussed adapting the Doctoral Student Finances Experiences Achievements (DSFEA) survey from her study with Dr. Nettles, sections B-3 and B-15, for use in my survey. Permission was granted.

I contacted and spoke with Dr. Okahana, who oversaw The Ph.D. Project (Okahana, 2009), a large 7-year study which included 29 American and all Canadian research universities. As discussed in the previous Chapter, his study focused on completion and attrition, and his work was helpful in thinking through doctoral student studies and the state of attrition for doctoral students. At the time, Dr. Okahana and his team developed an exit survey that was being used at the University of Maryland. He sent me a copy of the survey and gave me permission to use it and share it.

Dr. Lovitts is author of *Leaving the Ivory Tower: The Causes and Consequences of Departure from Doctoral Study* (Lovitts, 2001), a large study on doctoral students who did not complete, Dr. Lovitt's (2001) study is one of the seminal works that I hope to build on through my own studies. Included in her work was a question around institutional blame or individual self-blame. That question was incorporated into my survey instrument, and an additional nine questions were derived from her study for the interviews. I had email communication with Dr. Lovitts to apprise her of my use of her questions. Other doctoral student seminal research studies used were these: Gardner and Mendoza 2010; McAlpine and Amundsen (2011), and Nettles and Millett (2006).

Finally, one of my doctoral committee members mentioned Dr. Bruno Latour and a recent questionnaire in the form of an activity Latour developed related to COVID-19 (Latour, 2020). Latour's COVID-19 reflective questions inspired one question for the survey, and several questions for the interviews.

During the iterations and edits of the survey with Dr. Wanda Cassidy, a decision was made to include questions and comparison scales to inquire about the impacts of COVID-19 on isolation or belonging. These included students' level of engagement in university activities before and after the onset of COVID-19.

Design of the survey

The survey incorporated multiple types of questions, including demographic, multiple-choice, rating scale, Likert scale, matrix, drop down, and open-ended. For the more discrete items, such as demographics, the questions were in the form of yes/no, multiple-choice, and dropdown. Some demographic questions used a multiple-choice format. Multiple choice questions asked a respondent to choose from a list of answers, and some of those included simple yes or no responses. Other survey questions used rating scale methods. For example, some questions employed a rating scale from 1 to 10 or an agreement scale from 1 to 5. Some open-ended questions were also included to allow survey respondents to convey their thoughts, feelings, perceptions, and experiences of isolation and belonging in their own words.

3.4.2. **Interviews**

The interviews fall under the category of "elicitation of stories of experience" (Schwandt, 2015, p. 172). Questions were semi-structured to help participants recall their experiences and follow their own patterns of recollection. Zoom video interviews were conducted with first, second, and third-year doctoral students, and those at the all-but-dissertation stage (ABDs), with cameras on. These interviews provided an opportunity for deeper reflection one-on-one and were intended to develop a better understanding of doctoral students' experiences at different points in the program. Interview participants were volunteers from the survey sample. Participants were represented in the interviews from each stage from the three sample populations (See table 3.1 for the three samples).

Table 3.4 Percentage (and number) of respondents per stage in study

Stage of participants represented in the interviews	Percentage (#) of respondents
In process of completing coursework	21.0% (5)
Completed coursework & preparing for comprehensive exams	9.0% (2)
In research and writing of dissertation process	58.0% (13)
Did not specify and could not tell from transcript	12.0% (3)

According to Schwandt (2015), the “elicitation of stories” through interviews, leans towards a naturalistic approach with the aim to generate “in-depth data that are the product of the empathetic relationship between interviewee and interviewer as peers” (p. 172). Fourteen main questions guide the semi-structured interviews (Appendix A2). As described earlier, nine interview questions were derived from Lovitts (2001), specifically related to peer influence connected to isolation and belonging, and five Covid-19 interview questions (with three modified) from Latour (2020). To answer all 14 questions, a time of up to 60 minutes was allowed for the Zoom one-on-one interviews.

Canvas Prototype with Final Questions During One-on-One Interview

During the last fifteen minutes of the 75-minute interview, interviewees were invited to view a prototype of a *Doctoral Student Connect* Canvas site (3 modules). This portion of the data collection related to research question 3, concerning doctoral students’ sense of belonging, attitudes, perceptions, and utilization of Canvas as a Third Space. See Appendix A3 for the details of the process using the LMS Doctoral Student Connect Canvas site.

Those who volunteered to be interviewed were contacted during the Fall term of 2020, and all interviews took place in November and December of 2020, as described above with the Canvas prototype and the prototype reaction survey. Data collection was completed by the beginning of Spring term 2021.Transcripts were sent to participants in Spring Term 2021 for verification and approval for use (See Appendix A4) for the Canvas Prototype Review Survey Questions).

3.4.3. Preliminary Findings Workshop Procedures

The Preliminary Findings Workshop was the last step in the data collection, Phase 4. An email with an embedded digital poster of Preliminary Findings Workshop days and times was emailed to those doctoral students who participated Phases 1-3 of the study. Ten doctoral students indicated interest in the workshop. An email was sent to each doctoral student in advance of the event with directions on how to enter Zoom anonymously and what was going to occur during the Preliminary Findings Workshop, including how they could provide feedback anonymously.

The Preliminary Findings Workshop invited a collaboration between researcher and participants and provided an additional opportunity for data collection. Materials for the workshop consisted of a PowerPoint with an overview of the findings and themes from previous phases of the research. Participants were directed to a digital link for a Padlet (a digital board) which had each theme from the findings listed. Participants could then add to or comment on the themes if they chose to do so. Some participants chose to talk with me instead of using the Padlet, and their comments were noted. Others used the Padlet, and some did not choose to comment. See Appendix A5 for more details of the Preliminary Findings Workshop process. The Preliminary Findings Workshop occurred in Summer term 2021.

3.4.4. **Positionality**

My positionality is important to note upfront and throughout the analyses, as inferences and assertions may reflect my own experiences and pre-judgements. I am aware that my positionality shapes the study and its interpretations, as this is a reality of inquiry. I am a doctoral student within a Faculty of Education. I am a White, heterosexual, cisgender female, and an international student, who was raised working class and is currently middle class. I brought to the research some commonalities of the doctoral student environment, such as the context of an education doctoral program, knowledge of faculty and students, as well as my own diversity in identity, thought, perceptions, and understandings of the doctoral experience. Procedurally sending transcripts to participants for their review and offering a Preliminary Findings Workshop for feedback on the findings (participants could attend and validate or disagree) were ways to check my own interpretations of the findings, and ensure through more than one method that the findings were validated and verified by the participants themselves.

3.4.5. **Overview of Data Analyses**

Analysis of the different types of data processed in the following order: 1) the survey instrument responses (quantitative/qualitative), 2) the in-person interview transcripts (qualitative), then 2b) the brief survey of the response to the *Doctoral Student Connect* prototype demonstration (quantitative/qualitative) and 3) the Padlet from the Preliminary Findings Workshop (qualitative). The final step of my analysis (4) involved triangulating the data, a process I describe in more detail below.

3.4.6. **Quantitative Analysis**

I used SPSS (Statistical Package for the Social Sciences) version 26 and SAS (Statistical Analysis System) to analyze the quantitative data from the survey. The rating scales used to measure individual responses were represented numerically. Descriptive statistics compared findings to the normal distribution, accounted for outliers, described the average response (mean) for questions, most common responses (mode), and how closely the responses were grouped (standard deviation). Alpha Chi and Fisher's Exact tests were used due to the small sample size. With these latter two tests, reliability and consistency of the data can be measured. Surveys that were not completed were noted, and completed questions were tallied represented by *n* = total number of responses.

Responses to the Doctoral Student Connectedness Scale (Terrell, Snyder, & Dringus, 2009) were analyzed using Cronbach's alpha coefficient to determine internal consistency related to student connectedness to peers, and student connectedness to faculty to gauge the meaning of the peer connectedness scores. The sample included diverse groups of doctoral students in the Faculty of Education (1st year, 2nd year, 3rd year, and ABD), so the responses were put into two groups: those students who were still in courses and/or preparing for the comprehensive exam, and students who were past their comprehensive exam. Two groups were the best way to analyze the data due to the small sample sizes. These groups were compared to one another utilizing Fisher's Exact Test (a more efficient test due to sample size); the *Pearson Correlation* test was used to measure the linear correlation pre-COVID-19 and during COVID-19.

The data were downloaded from the university licensed SurveyMonkey platform as an Excel spreadsheet. Due to some glitches in the survey, not discovered during the pilot, I asked a long-time faculty member with greater knowledge of statistics to assist in double checking all data entries to ensure accuracy and no duplication. When this was verified, a quantitative codebook was created. I reached out to the university's statistics office for assistance and guidance in this process. I produced descriptive statistics, for example bar and pie charts of actual responses with percentages. The statistics office ran statistical analyses using SAS, as this was their preference. The statistical tests included the following: 1) tests for reliability (internal consistency) of adapted scales (Cronbach's alpha coefficient); 2) tests for statistically significant associations (Fisher's exact test due to small sample size) between variables; and 3) tests for correlations

(Pearson Correlation Coefficients) between groups. The university statistics office met with me regarding the statistical analyses, aiding in my understanding of the analysis and the strengths and weaknesses of statistical programs, like SPSS versus SAS. Definitions for each of the statistical tests used for this study are provided in Appendix A6.

3.4.7. **Qualitative Analysis**

Using NVivo, a thematic analysis was conducted on responses to the open-ended survey questions, interview transcripts, and notes. This is a common approach, in which portions of text are coded "according to whether they appear to contribute to emerging themes" (Schwandt, 2015, p. 65). Themes were informed by my theoretical understanding and an inductive approach to the analysis (Schwandt, p. 65). Patterns in the emerging themes were recorded. The integrity of the qualitative research was carefully maintained through documentation of steps in data collection and analysis, data storage (secure), anonymity, and member checking. Besides using NVivo to analyze the qualitative data sets, I cross-checked findings through hand-coding and use of online digital whiteboards.

The qualitative data was reviewed in several ways: 1) I reviewed the qualitative data for themes; 2) I looked at specific, detailed responses to understand what participants were saying; and 3) I reviewed the qualitative data as they related to each research question. By going through the data multiple times, I was able to see the data from different perspectives. The themes I generated from the data, through the context of the study and student stories, in relation to my research questions provided a rich picture. Through the context, use of a pragmatic approach, analysis of context and text, aided in giving a more complete understanding of the findings (Greenwood & Levin, 2005, p. 53; Perakyla, 2005, p. 870; and Zamawe, 2015).

Open coding was used to analyze the open-ended responses on the survey. The themes that arose from those responses were compared to the qualitative interview responses. In the coding steps, NVivo was used, as well as hand coding methods, e.g. the use of post-it notes, a physical white board, a digital whiteboard, and MS Word documents to code themes and or to revisit parts of the analysis. Using both digital forms of analysis and physical forms of analysis helped to keep the analysis fresh, and

to check myself, since seeing it in a different medium kept me from inadvertently glossing over data unintentionally. I interacted with the data sitting at a computer or standing, and laid out on a floor or on a dining room table, or on a whiteboard, with post it notes.

Steps in qualitative data analysis were as follows:

1. Reviewed each transcript and revisited audio recordings to check my understanding and ensure correct words were used.
2. Videos were watched a second time to review for emotion coding where it may be relevant to the analysis.
3. Reviewed all data twice before developing themes or categories of responses. Coded each theme or category.
4. Sorted and grouped responses from the interviews by each research question. Developed a primary code list.
5. Using NVivo, transcripts were coded per question, for all transcripts and by categories and themes.
6. Reviewed all transcripts a final time. Separated and grouped codes and themes that were relevant to the research questions.
7. Steps 4 – 6 were repeated for the open-ended questions on the survey instrument.
8. Triangulated the data.
9. Reviewed the literature and noted where findings were congruent with the literature and where they were different.

3.4.8. **Preliminary Findings Workshop**

Participant verification of the findings

Valdiviezo and O'Donnell (2014) discuss Lather's approach to validation of analysis. It is important "to develop methods or 'self-corrective' techniques that check and recheck the truth claims of the research process to ensure biases are not overlooked further presenting misrepresentation or potential harm to vulnerable communities." One of the strategies recommended in this "self-corrective" check of validity is "having members of the community being researched check the accuracy of the conclusions" (p. 463).

In my own study, interview transcripts were sent to respondents in February/March to review (Spring Term), with the Preliminary Findings Workshop scheduled at the end of May (Summer Term). This preliminary finding verification event was like that of a previous study I had conducted (DeMark & Van Wingerden, 2017), but more rigorous in that respondents had more time (2 weeks) to carefully review, comment and make any changes/additions to the transcripts. Further, all participants were invited to review and comment on the data analysis through the Preliminary Findings Workshop. This member checking strategy (respondent validation) helped to strengthen the validity of my findings (Birt, Scott, Cavers, Campbell & Walter, 2016). It was up to students whether they wanted to comment or add anything to the data after they heard the presentation. Some students met with me one-on-one and did not feel the need to enter the Zoom space anonymously or wait to give feedback. Participants' comments were collected, reviewed, and coded for any themes, and were added to the Findings section. Participants had the opportunity to share their experiences through (open ended survey questions, individual interviews, Canvas Prototype review, preliminary findings workshop), and check their own data (a) review one-on-one interview transcript, (b) comment on coding and on preliminary qualitative findings, and (c) interact with researcher about the coding and preliminary qualitative findings. This validity checking process thereby acknowledges the co-constructed nature of knowledge and facilitates participant agency and participant shaping of the knowledge (Birt et al., 2016; Creswell & Poth, 2016; Lather, 2003).

In relation to mixed methods, Creswell and Plano-Clark (2018) discuss the validity of the study beginning with the design, purpose, and rationale for mixed methods (p. 290). Greene, Carcelli, and Graham (1989, 2006) list 16 rationale for mixed methods research, as cited in Creswell and Plano-Clark (2018); they include: "triangulation"; "complementarity"; "development"; "initiation"; and "expansion" (p. 290). Validity in a mixed methods study, often brings "new insight" and "added value" (Creswell et al., 2018, p. 291).

> mixed methods can help develop improved, culturally sensitive measures; elucidate surprise quantitative findings; reconcile what people say on instruments with their personal experiences…design programs attuned to local community needs…and they illustrate the value that can be found in understanding a research problem through mixed methods insights" (Creswell et al., 2018, p. 291).

3.4.9. **Triangulating the Data**

The final phase of analysis involved triangulating the data. Triangulating the results from all the methods of data collection afforded the opportunity to critically review and integrate themes and data to understand more deeply the extent of student isolation, and the influences towards belonging and peer belonging on isolation for doctoral students. Through comparison of the survey data, interviews, responses to the Canvas prototype for doctoral student connection and the preliminary findings, discovery of similarities and differences among the respondents took place and is examined in Chapter 4. Data triangulation helped to inform and layer my understanding of any relationship of isolation or peer belonging to attrition, persistence, retention, and what connects and disconnects students to either belonging or isolation.

Trigger warning:

Content in Chapter 4 contains language and themes that refer to suicide, which some readers may find distressing. This warning is based on trauma-informed practices that recognize that people may be retraumatized by certain content, and should be offered choices about whether to engage with it. As trauma-informed practices are becoming more prevalent in many settings, this warning seeks to centre the reader's physical well-being and mental health by creating awareness and giving choice to prevent situations of retraumatisation (Office of Health & Disparities, 2022, UK.gov).

Chapter 4.

Findings: Isolation and Belonging

> I feel sometimes that if the University, Faculty, or program can…
>
> behave more actively, maybe we will save some people's lives.
>
> (International doctoral student, Phase 2, QUAL)

4.1. Introduction

Many PhD students experience feelings of isolation at different points of their education journey, whether it is due to the academic work itself, work in isolation during research and writing, lack of connections to community. They may be on a campus surrounded by people, yet still feeling isolation when they have no sense of a community to be a part of or reach out to, lacking knowledge of resources available to them and how to access those resources (grant funding for research, research and writing resources, finding places of connections to other students, infrequent contact with supervisor or professors). Feelings of isolation and lack of belonging can be detrimental for doctoral students. Doctoral students who do not complete their degrees face mental and emotional suffering that can look like depression, anxiety, and/or hopelessness (Casey et al., 2023; Garcia-Williams et al., 2014; Hazell et al., 2021; Hazell et al., 2020; Liu et al., 2022; Tommasi et al., 2022; Waight & Giordano, 2018; F. Zhang et al., 2022; L. Zhang, 2023). In the most extreme cases, non-completion can lead to students taking their own lives (Casey et al., 2023; Garcia-Williams et al., 2014; Lovitts, 2001; Satinsky et al. 2021).

The findings presented below reflect the voices of doctoral students from the Faculty of Education at a Canadian university. Research questions were addressed through four phases of data collection: findings derived from scalar and open-ended survey items (Phase 1, QUAN/qual); themes developed from individual interviews with doctoral students (Phase 2, QUAL); quantitative and qualitative findings from a survey designed to gather doctoral students' reactions to a Canvas *Doctoral Student Connect* site prototype (Phase 3, QUAN/qual); and qualitative findings from a Preliminary

Findings Workshop (Phase 4, QUAL). The findings from the four phases were then integrated according to a mixed-methods paradigm (Creamer, 2018).

There is a crucial difference between “mixed methods” research and what Creamer calls “mixed-up methods.” True mixed-methods research is designed for, and relies on, each method contributing its strengths to the research design such that they offset the weaknesses in the other methods employed. In this study, mixed methods were used to discover and explore student demographics, involvement in doctoral student and/or university activities, and community; to gain deeper insight into student perspectives, thoughts, and experiences related to their doctoral studies, and the phenomena of isolation, and belonging. Further, the mixed-methods sequence was built on imagining an LMS, such as Canvas, as a space of connection and belonging. The data were analyzed at each phase of the study, per methodological choice, and then compared, combined, and integrated into what are the findings. The methodological choices at each stage were based on the research questions and on the processes available to collect data from doctoral students during the COVID-19 pandemic. The specific use of quantitative and qualitative methods was arranged in phases, to build on each phase of data collection in order to gain deeper insights into and understanding of doctoral students’ experiences. The mixed-methods design intentionally allowed opportunities for participants to check and validate the findings from the first three phases of the study through participant review of their transcripts and a Preliminary Findings Workshop. These opportunities for member checking were also an avenue to gather any data that might have been misinterpreted or missed in the data collection and analysis processes.

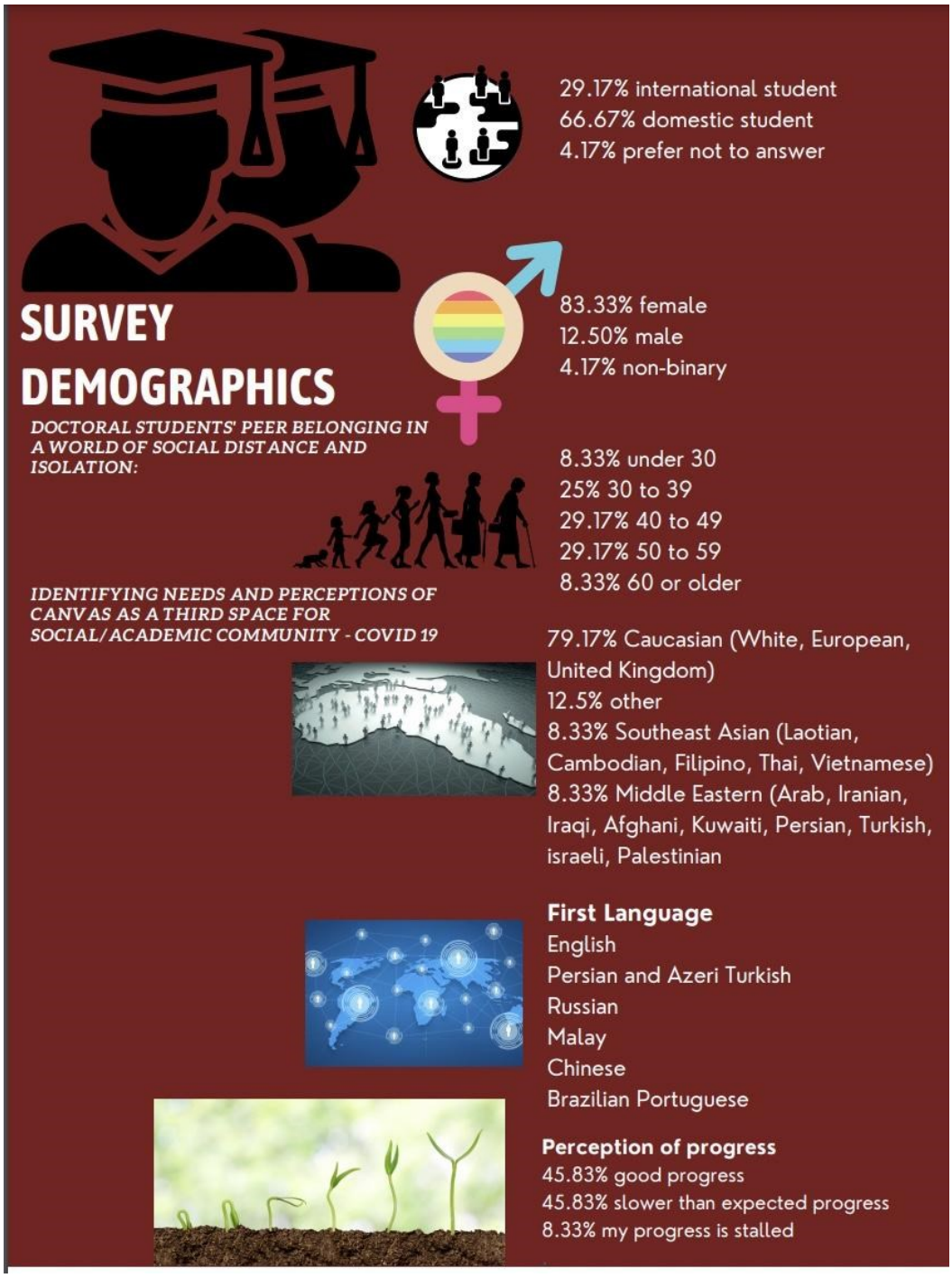

Figure 4.1 Survey Demographics: Who Were the Respondents? Phase 1
Creative Commons Images.OnlineWebFonts.COM; onlinewebfonts.com/icon/507141; www.shutterstock.com, image-vector/world-population-day-design-elements-people-2313634869; sehloff.eu, https://www.sehlhoff.eu/wp-content/uploads/2022/11/Gender-Hinweis.jpg; Shutterstock.com; Life cycle of human from kid to old. https://www.shutterstock.com/image-illustration/life-cycle-human-kid-old-2025044330?irclickid; Africa Population. Adobe Stockl#3\086004; Adobe Stockl#76998771, World Map Projection Over Blue by Syda Productions; Adobe Stockl#65209696, Plants growing from soil-Plant progress.

Figure 4.1 gives the reader a brief reminder of respondent characteristics of study participants (full demographics are listed in Chapter 3). Doctoral students were diverse in first language, ethnicity, and age. International students made up 29.17% of the respondents, with 66.67 % of respondents' domestic students, while 4.17% preferred not to answer. Thus, the sample was largely domestic students. Students were split in how they felt about their progress in their program, whether good or slower than expected. This data was collected during COVID-19, a mere 8.33% of doctoral students felt their progress was stalled, with an even split of 45.83% stating they were making "good progress," and the same percentage (45.83%) stating their progress was "slower than expected." Over 83% of participants were female, and most participants were between 40 and 60 years of age, with 25% in their 30s, 8.33% younger than 30 years of age, and 8.33% older than 60 (Phase 1, QUAN/qual). A further breakdown in age of international students only showed that 11% of the international student participants were under 30 years of age; 33% of the international student participants were 30 to 39 years of age; 33% were 40 to 49 years of age; and 22% were 50 to 59 years of age. Including the international students, the population of the group of participants is older than the average population of doctoral students in Canada, which is between 25 and 34 years old (Looker, 2018; Statistica Canada, 2022), reflecting that education doctoral students typically pursue their studies during or after an established career. With a basic understanding of the attributes of this study sample, we move into the research question(s) and findings.

Twenty-three (23) interviews were conducted. Every interviewee described an experience of isolation as a doctoral student, including those living within families. Most responses described a visceral experience, a state of being that they were acutely aware of. Survey (Phase 1, QUAN/qual) respondents' described isolation in their own words as "the sense of being alone"; "feeling disconnected from others"; "feeling lost"; "feeling stuck during research and writing"; "feeling disconnected academically and socially"; "unsure where or whom to turn to for guidance"; and "feeling forgotten – no one reaches out." The following sections will delve more deeply into students' experiences.

4.2. Research Question 1 (RQ1)

4.2.1. (RQ1): What are the experiences of isolation and belonging for PhD students in the Faculty of Education before and during COVID-19?

> I imagine if I feel isolated from others, it happens, and I will be extremely disappointed and heartbroken. Because I'm very dependent on the connection with others. That is one of the important reasons I chose psychology and education as my whole life (Fall, international student, Phase 2 QUAL).

Doctoral students defined isolation based on their own experiences as doctoral students. For them, the kind of isolation they felt during their doctoral studies was unique to them, and not something that they had experienced before. As the data presented below further details, isolation can have damaging effects on students and may contribute to them taking a leave from their program of study. Belonging is something students seek through an individual and/or community, when they first arrive to begin their program, and again during the research and writing stages. Belonging can contribute to engagement and persistence. Finally, both belonging, and isolation are a "felt sense," and the student determines themself whether an experience is one of isolation or one of belonging.

In addressing the research questions, I will repeatedly tack between survey (QUAN/qual) and interview data (QUAL) to provide as complete an understanding as possible of doctoral students' experiences of belonging and isolation. Some data will be repeated, since some themes overlapped between belonging and isolation. Differences between the impact of the isolation versus the impact of belonging will be noted in some contexts discovered in the findings.

4.2.2. RQ1, Finding 1. Doctoral Students Experience Isolation

The analysis of the open comments and open questions in the survey (Phase 1, QUAN/qual) were coded and grouped by general themes, as procedurally identified in Chapter 3. Themes were then identified. These themes are displayed in Table 4.1. The themes will be explained further in the appendix to Table 4.1.

Table 4.1 Themes of Isolation from Open Comments, Phase 1, QUAN/qual

Theme and Definition	Survey [Phase 1]	Theme re-emerged in Interviews [Phase 2]
***Identity** [Gender, Age, Ethnicity and Female, and White Male, Parent]	✓	✓
***Power and Hierarchy** [Students recognize there is a power structure]	✓	✓
***COVID-19** [Learning and socializing looked different]	✓	✓

Note: Survey Open-Ended Comments Summary

**Identity.*

Overall, survey takers (Phase 1, QUAN/qual) believed their identities were a factor in their sense of belonging and/or isolation. Women over 50 expressed the most trepidation about fitting in with younger students. They wondered what they would have in common with younger students. Some women expressed their perception of ageism from others; some women perceived that men were favoured in their program, and being a woman of colour from a Middle Eastern country was stated by a respondent to impact belonging.

Men were a smaller sample size of participants, and one male from the survey (under 40, white) described his identity as being a “punching bag.” He stated he “understood” why that was the case and “was supportive of other identities.” Two men in the interviews (Phase 2, QUAL) over 60 expressed that they wanted more discussion-based conversations on issues and research with other students. These men were in the research and writing phase, having completed courses and comprehensive exams. Even though these types of discourse opportunities were not present for them, they stated it “did not affect their belonging in their program.”

Students who were parents expressed in the survey and in the interviews, specifically related to the onset of the pandemic, that they had lost the ability to participate with other students, as everything was online. They were in situations with children, caretaking, and mentoring. Some had older parents they were caring for; some had both children and parents they were caring for. They were working, doing their

school, and doing their children's school, all from home, and sometimes with one shared home computer. This was a factor in isolation and lack of belonging.

The perception of women and age, women and being an international student, and/or women and being a parent as a barrier to sense of belonging and a factor in isolation emerged in Phase 2 (interviews). The only identities from this sample and interviews sample that stated their belonging was not impacted by their identity were two men over 60.

** Power and Hierarchy.*

Doctoral students recognize there is a power structure and hierarchy, and yet do not understand how this system works. In the survey and in the interviews, students overall did not know the roles within the hierarchy and structure of the university, the Faculty of Education, and their program. Doctoral students were unsure who to reach out to, how to reach out to them, and when to reach out if they had a question and/or to gain information about a process. This hesitancy to reach out, and lack of understanding of how to navigate as a student, included with program professors and thesis supervisors. Overall, it was evident that professors and supervisors who reached out to students, decreased isolation for those students, while those professors and supervisors who did not reach out, increased isolation for doctoral students in this study. In Phase 2 of this study (interviews) it was evident that professor and supervisor interactions were important to offset isolation for doctoral students.

**COVID-19.*

The impact of the pandemic was most noted in the survey when participants described being on what they called “empty campuses.” This was especially noted by international students in both the survey (Phase 1) and the interviews (Phase 2). Some international students lived on or near the campus and due to social distancing, perceived a barrier to getting to know other students. Those who were prevented from entering Canada, felt the isolation and impact of the pandemic as they were participating online from different countries and some from different time zones. For most students in the survey and interviews, the pandemic increased isolation. However, two students in the survey noted that COVID-19 expedited their thesis work, and one mentioned COVID-19 (in 2020) had saved time in not having to travel to campus.

As mentioned, all respondents recognized the feeling of isolation as a doctoral student. Only two respondents (both male) stated that they did not feel isolation at the time of the interviews. Interviewees often mentioned recognizing isolation in other students and feeling it needed to be addressed. Further, isolation was linked with lack of progress toward completion. Isolation was described as a continual loop in which students were caught and felt powerless to change. Figure 4.2 highlights coded themes from the interviews.

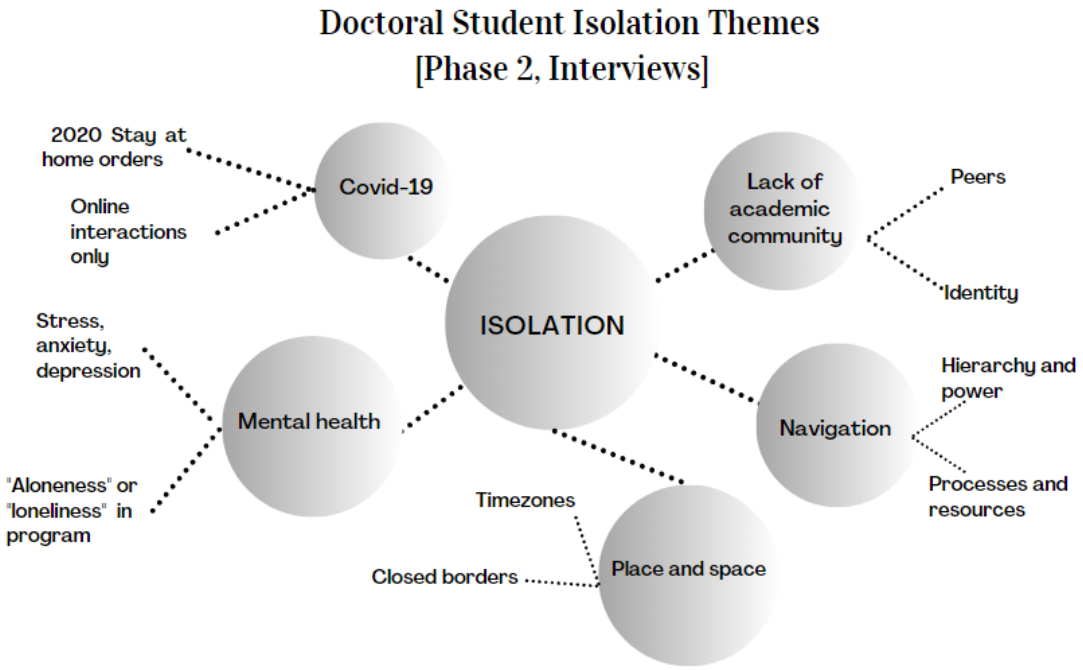

Figure 4.2 Isolation Themes, Doctoral Student Interviews, Phase 2, QUAL

The emergent themes of experiences of isolation from the interviews related to COVID-19, Mental health, Place and space, Navigation, and Lack of academic community. From these main themes stemmed subthemes: COVID-19 [2020 Stay at home orders; Online interactions only]; Mental Health [Stress, anxiety, depression; “Aloneness” or “Loneliness” in the program]; Place and Space [Timezones; Closed Borders]; Navigation [Hierarchy and Power; Processes and Resources]; and Lack of academic community [Peers; Identity].

Similar experiences began to emerge within groups that had similar characteristics and/or identities and were from historically excluded populations. The

next section examines in greater detail the contexts of isolation among and amidst groups.

4.2.3. A Closer Look at Specific Contexts of Isolation

To provide greater context to the identities of doctoral students and the experiences they reported, I now explore themes that emerged through findings from both the survey (Phase 1, QUAN/qual) and interviews (Phase 2, QUAL). Understanding the specific contexts students provided through the integration of the survey and interview data sets the stage for deeper insights into the experiences of these participants. Data collection from Phase 4 (QUAL), the Preliminary Findings Workshop, will be integrated when it is relevant to a particular finding.

4.2.4. RQ1, Finding 2. COVID-19 Increased Feelings of Isolation for Doctoral Students

Overall, COVID-19 increased isolation for doctoral students. Specifically, isolation was compounded by the shifting of school, work and other relationships online, coupled with the stay-at-home orders. COVID-19 was a contributing factor to the isolation the students were experiencing at the time of the interviews in fall of 2020.

While COVID-19 was a factor in increased isolation for doctoral students, isolation existed for these participants pre-pandemic. Isolation is condition doctoral students often have to grapple with. This has been noted by researchers and is discussed in the findings. Ali and Kohun (2006) posited that isolation was the largest contributing factor for doctoral students leaving their programs. It is important to keep this in mind as we investigate COVID-19's impact on isolation.

In this study, both types of isolation—general isolation and isolation during COVID-19—are parsed out and, at times, integrated. The participants in this study had been in their doctoral programs prior to the pandemic. The pandemic impacted universities in Canada in March of 2020, and the data collection occurred in fall of 2020. Therefore, there was a viable opportunity to capture experiences of isolation pre-pandemic and at the onset of the pandemic, adding depth and a layer of complexity to the findings on isolation.

Isolation and Restrictions of Place, Phase 1 QUAN/qual

Students' living arrangements pre-COVID and during COVID did not change overall for this survey study sample; however, "not being able to enter Canada" was a reality for international students who started their programs online from another country. Other students moved away from Canada after the onset of COVID-19 so they could shelter with family (such as parents) during the pandemic. Students who were parents had their school-age children at home all day for several months. They had additional responsibilities to ensure their child(ren) had access to online education, and the students had to be present to assist their child(ren) through the transition while they themselves were navigating their own doctoral programs online, often with one shared home computer. Further adding to these stresses, the pandemic limited where people could physically go to gather, to obtain supplies, to learn, and to work.

Therefore, the theme of place and space for these doctoral student participants related to both the felt sense of a place and space, and to the accessibility of physical places and spaces. For example, students were not on campus in buildings, were unable to cross international borders, and had to navigate different time zones for learning and online education. Though online classes had the same people virtually, building relationships prior to COVID-19 occurred organically: students went together to grab dinner during a class break; they had casual conversations with a professor before class, at break times, or after class; and they moved through the physical spaces of the campus, where the "university" as a place was more realized.

> I would like the department to go back to having gatherings once or twice a year so doctoral students in the program can communicate and see each other – I miss those gatherings – it feels way more isolated since COVID and not seeing other people. (Survey respondent, Phase 1, QUAN/qual)

Participants shared a sense of loss of relationships and relationship building as well as a loss of the signs, sounds, and activity of the university spaces that were present prior to COVID-19.

4.2.5. RQ1, Finding 3. There Is a Relationship Between Identity and Isolation (Perceived and Experienced)

Identities of Doctoral Students and Impact of Isolation

In Phase 1 (QUAN/qual), participants were asked to respond to the survey statement “I believe my identity(ies), (e.g., gender, race, ethnicity, disability, sexuality, nationality, etc.) has influenced others towards me and has impacted my sense of belonging and/or isolation during my doctoral journey.”

Fifteen out of 30 respondents (50%) agreed or strongly agreed that there was a relationship between their identities, how others treated them, and their sense of belonging or isolation. Twenty-two out of the 33 respondents supplemented their responses with comments. The intersectionality of identities is suggested in some of these open-ended responses. Themes from the open-ended “please elaborate” question are found in Table 4.2.

Table 4.2 Survey Themes and Participant Quotes on Identity Experiences of Isolation and Belonging, Phase 1 QUAN/qual

Themes	Example Quotes	Survey Answers (*N=22)*
Gender/Female	"Being a woman"	6
Sexism in the program	"I observe an undercurrent of…sexism…with this department, not only personally, but directed towards several other female students"	
Age/Ageism	"I am in my mid 50's and sadly, I believe that has led to a feeling of disconnect/isolation from other students and…professors"	4
Parent	"I am an older student with a fulltime job and young adult/teen children"	
Sexual Identity & Peers	Knowing someone else "who is out too…and …affirming allies made it easier and increased acceptance"	3
Comfort with Self	"Being more open about my sexuality has attracted more peers and I have made more solid friendships as a result of being more comfortable with who I am"	
Nationality & Peers	"I am stranded outside Canada because of my nationality. On the other hand, I've been bonding relatively well with my peers because most of them are international/female/non-white/outside Canada"	3
Ethnicity/Woman of Colour	"Being a woman of colour" from [Middle Eastern country]	2
White Male	"Being a white male is a bit of a punching bag position sometimes…I understand the reasons…I support people's voices"	1
Disability	"I've also observed discriminatory behaviours to those that have invisible disabilities"	2

International Students and Isolation

The nine international students represented in the interviews (Phase 2, QUAL) all reported experiences of loneliness, hardship, feeling on the "outside," and wanting community. COVID-19 exacerbated these feelings, as during the lockdown some students were living in student residences on empty campuses, in a new country, while others were in a different country and a different time zone from other members of their graduate cohort. Though it was reported that there was a cafeteria and computer lab open at the main university campus, these students either were not aware of these openings or, due to the shelter-in-place orders, did not attempt to explore open rooms in buildings.

International students particularly wondered how to make connections with other doctoral students successfully. Some felt their identity was a barrier in getting to know domestic students:

> I feel like in a way … when I talk to someone who is not an international student, I feel like they do have some reservation. Maybe just…like maybe they're afraid to [reach out to me]? Well for me, I should be the one who's afraid of, like, you know, I mean, I come into your culture, into your environment, I feel like if I said something that might offend you? But I feel like in a way they [domestic students] feel like this. I think they [domestic students] feel the same way as how I feel like, you know, like I shouldn't talk to her… (Firefly, international student, Phase 2 QUAL)

In the interviews, the international students unanimously shared their experiences and found themselves in a dilemma of feeling alone and wanting connection with other students, especially domestic students. International student interviewees identified barriers that fostered isolation, such as assumptions that domestic students had their own lives, their own friends, and were busy. A few international students recalled their experiences of unrealized plans with doctoral peers. For example, they made plans using WhatsApp, only to have those plans cancelled at the last minute. This left international students feeling confused, disappointed, alone, and like outsiders.

Acclimating to a new country and to a doctoral program provides distinct challenges. These quotes from international students best capture the environmental contexts:

> It's a lot of barriers that I have to remove because I've never, in all my life, gone out of the country...you know, to live outside the country. I went out of the country just for vacation and I came back. (Apple, international student, Phase 2 QUAL)

> It was so hard coming to a new country. It scares you...and then you feel like you don't belong...like I tried to fit myself in the new place, the new community that I'm in, you know what I mean...and then at the same time, I have to try to fit myself in the program. (Firefly, international student, Phase 2 QUAL)

> I could have used more information at the beginning, like what are all the things you need to remember about like registering for your next classes and why you are having to take these particular classes? Like what's the rationale?... The expectation feels sometimes like we're just expected to float along and do these requirements, but there's no substance or context for why, or what, or why it is part of this doctoral journey. (Crisp Air, international student, Phase 2, QUAL)

International students and first-year students were mentioned by other students in the interviews as groups that need support and ways to connect with other students, and with resources, at the onset of their program.

First-Year Students and Isolation

A first-year student, new to the academic community, largely does not have ready-made connections with others. Students mentioned the lack of robust orientations and the large amount of coursework in doctoral programs, with no preparation or context for how to navigate, manage, and balance their other life responsibilities. Two examples are provided here:

> It's an isolating structure we all enter into, and it's intimidating as a new doctoral student because you're like, oh, it's the five-hour classes and let's read this whole book in the next three weeks. (Acorn, domestic first-year student, Phase 2, QUAL)

> Actually, I have some moments that I feel upset. There was no belonging for me… I feel there should be some space for doctoral students to meet up or be friends. This was my first year. I only got one class. There was no teacher and student connection, only the video the teachers made for learning that I could see any time. (Fall, international first-year student, Phase 2, QUAL)

Regardless of their discipline, whether they were domestic students or international students, living inside or outside Canada, first-year students expressed disappointment that there was not more community within their doctoral program. As first-year students (whether currently or reflecting), all participants expressed an eagerness, an anticipation of what the doctoral path would be. All of those who identified as female, non-binary, and international students, revealed they had some apprehension and anxiety when starting. The two male interviewees did not convey any trepidation or anxiety in starting their programs. All students (including the two male students) wanted to know what to expect; how to navigate the program, the college, and university systems and processes, to be successful as doctoral students.

Older Students and Isolation

Age was mentioned as a barrier by the majority of the "over 50" female doctoral students before they officially began and/or when they began their program. One international student, Crisp Air, stated,

> Being older was isolating, I thought the other students would be much younger. (Interview respondent, Phase 2 QUAL)

> You do not list "age" as one of the identities that influences others towards me. I am in my mid 50's and sadly, I believe that has led to a feeling of disconnect/isolation from other students and perhaps also from professors. (Survey respondent, Phase 1 QUAN/qual)

Through the survey analysis of the open comments, the following questions arose:

> Would generationally diverse students have things in common? (Phase 1 QUAN/qual)
>
> Will we be able to relate to one another? (Phase 1 QUAN/qual)
>
> Would older students connect in feeling part of the community with younger students? (Phase 1 QUAN/qual)

In the interviews, most older students, including the two male domestic interviewees, expressed wanting to have more discourse with students after beginning their program. Age was not a factor for the older male students, and their observations were, most of the students appeared younger, and that younger students appeared busy with full schedules and lives. This was the same observation mentioned by international students related to domestic students and connection. The difference being that older students attributed their observations to diverse generations of students, as being in dissimilar life stages.

4.2.6. RQ1, Finding 4. The Unknowns of the Doctoral Program Foster Uncertainty and Isolation

Beyond the First Year – Navigating the System and Isolation

Twenty-three (23) interviewees expressed uncertainty related to what was expected of a doctoral student. Whether students were in the coursework/pre-comprehensive exam phase or in the research and dissertation writing phase, participants in the study made statements reflecting on the start of their programs, after the orientation for new students had taken place.

Students found they needed information and support in how to sustain and progress in their work at different junctures, such as embarking on their research and dissertation writing. Specifically, students indicated the need for additional support regarding:

(a) the environment and culture of the program,

(b) the academic workload in courses, and strategies to meet expectations of reading and writing week to week,

(c) steps they should take for funding their research,

(d) steps to secure a campus job or other resources,

(e) who to go to for questions, and

(f) the way to ask a question of or approach professors – whether there was a protocol or a "right" way to do it.

Behind these needs, implicitly, was the desire to stay in good standing academically, personally, and in their relationships with professors. Interviewees were concerned about creating a lasting favourable impression with professors and supervisors from the start.

4.2.7. RQ1, Finding 5. Lack of Outreach and Programmed Supports Can Lead to Isolation

Twenty-five percent of survey respondents provided an answer to the open-ended question "Anything else you want to share that you want [the university] to know about your doctoral experience and or future desire for experiences?" In their responses, students identified wanting and needing more outreach from the Faculty of Education or their program. Two domestic interviewees put it this way:

> I think ... (admin, especially) has been lax in reaching out to grad students in helping to coordinate social experiences. (Smo, domestic student, Phase 2 QUAL)

> I am surprised that there is little outreach from my department. Because I work full-time, I don't have the capacity to participate in the [university] community like I did when I was an undergraduate or master's student. (Willow, domestic student, Phase 2 QUAL)

> Peer support might have made a difference for me in being more efficient. I think so. (Survey respondent, Phase 1 QUAN/qual)

> I have little sense of here-there with the Faculty of Ed., overall, pre and post pandemic...I regret the lack of a robust online forum for grad

> students to learn about our work, exchange ideas, etc. Also, as a place-space to learn about Faculty work, papers published for example. (Survey respondent, Phase 1 QUAN/qual)

Respondents consistently stated their desire and need for support, mentorship, or follow-up from an initial orientation to gain the necessary knowledge and skills to maneuver successfully through the social and academic spaces of doctoral studies.

A bit bewildering to most participants was the discovery that being a doctoral student was predominantly an independent journey, not one of academic camaraderie with students and professors. All 23 interviewees indicated that they expected to be embedded in a community involving discussions, networking, work with professors, and peer engagement with other doctoral students. Each interviewee expressed surprise and/or disappointment that there was not an automatic or given embodiment of community when they entered their doctoral programs. Overall, students thought and felt that programs should do more to connect students with information, peers, and professors in their programmes.

As Snowy, a domestic student (Phase 2, QUAL), put it,

> I did not expect my doctoral programme to be an independent study.

Isolation in Identifying Resources and Community for Doctoral Students

Interviewees (Phase 2, QUAL) expressed wanting and needing "extra support" – for instance, "contact with someone studying the same topic" – and wanting more peer and supervisor interaction. As one student stated, "I would have felt less isolated" with regular contacts and support. Two others elaborated:

> I do have waves of feeling isolation when I don't know how to write in a certain way, you know, like, we're writing a lot. (Acorn, domestic student, Phase 2 QUAL)

> When it's the first or second class, they like to ask us, 'So, what are you doing? What is your research about?'...and so many times I'm like, I don't know what I'm doing, and I'm still trying to figure out what I'm doing...I don't even know what I want to do. (Harvest, international student who over time became a domestic student, Phase 2 QUAL)

Students who were further ahead in their research and writing, having completed their coursework and their comprehensive exams, indicated "feeling lonely" in Phase 1 (QUAN/qual). Coursework gave them regular connections, but once courses were over,

they felt they were “on their own.” The following example quotes from the survey (Phase 1, QUAN/qual) reflect the experiences of interviewees as well:

> I lost the possibility of seeing people I hadn’t seen in a while and to just talk. (Survey respondent, Phase 1 QUAN/qual)

> Courses are over...it’s isolating...I’m studying for comps [comprehensive exam] ...when that ends…then feeling very isolated and unsure – just like when I was at the beginning of the program – how do I do this? And how do I keep momentum [progressing]? (Survey respondent, Phase 1 QUAN/qual)

Isolation in Supervisory Relationships, Program Hierarchies, and Power Imbalances

Data from both Phase 1 (QUAN/qual) and Phase 2 (QUAL) suggested that doctoral students’ experiences of isolation lead them to “feel vulnerable.” Students who struggled the most had little to no contact with their supervisors, or they felt they had to have a sizable chunk of work done before meeting or contacting their supervisors. It was confusing to these students when they heard about other doctoral students who had “regular contact” and/or “ease” in their supervisory relationships. Doctoral students who did not have regular contact expressed “hesitation to reach out” or were “unsure how to reach out” to their supervisors.

Supervisors were often mentioned in the interviews, and to a lesser extent in the survey, as an important relationship for doctoral students. Students *not in regular contact with their supervisor* expressed wanting check-ins, like some of their peers had. One survey respondent’s statement expressed a sentiment common to both domestic and international students:

> [Doctoral students] want someone to check-in with them…to see how they are doing. (Survey respondent, Phase 1, QUAN/qual)

Students are keenly aware of the power differential between themselves and professors. No matter what walk of life or what profession they are from, they feel this differential. One domestic respondent put it this way in an interview:

> How do you ask a question of a professor that you…how do you even reach out to somebody appropriately, a professor that you haven’t had contact with, but you really want to ask them some questions, or you know what I mean? Like, I still struggle with that. And yes, I mean, I teach at the university and it’s so weird. It’s such a weird thing to be

> like you, I mean, I'm like, oh, wait, why am I acting like I'm in kindergarten? (Misty, domestic student, Phase 2 QUAL)

Another domestic interviewee said:

> When I see, when I hear what people's problems are, a lot of it has to do with, like feeling like you have legitimacy to be there, that...because academia is hierarchical, it's like we need to keep bringing people together in a community to demystify…that power dynamic that that holds in our brains, (Acorn, domestic student, Phase 2 QUAL)

> I think you need people to listen to you who understand how to navigate the system. So, it's like every system has a way, ways of working. You know…I don't really understand who all the administrators are and how they work together and what they're responsible for. (Acorn, domestic student, Phase 2 QUAL)

> I wish I would have understood that the supervisor relationship was collegial and that I was more relaxed around faculty – easier after being in the program. (Survey respondent, Phase 1 QUAN/qual)

Students felt unsure of appropriateness and frequency of communication within the hierarchy – which included professors and supervisors; a strong point was made about not understanding the processes for grant funding, and other resources available for doctoral students. Two interviewees reflected that they wished they knew how to apply for grant funding for their research at the beginning of their program, so they could have started the grant funding process. One of the two did receive a grant for their research.

Isolation in the Context of Professor and Student Classroom Interactions

Feelings of isolation were sometimes described in relation to professors' lack of awareness of their students' identities or the intersectionality of these identities in a classroom setting. Students are unsure how to address these challenging classroom environments:

> Two professors this term, two men are having a negative impact on me. They're very white male patriarchy-centred in the research that they use and reference...they don't often address actual education issues...I know it's not all me, other colleagues are feeling it...they're feeling a lack of intersectionality and understanding of intersectionality (Crisp Air, international student, Phase 2 QUAL).

Students expressed a desire for their professors to be aware of their identities as individuals and as collectives, and for these differences and identities to be a bridge to

learning, rather than seen as a barrier. Students want to know they belong and have made the right decision to pursue doctoral studies. They need interactions that are welcoming and take their needs into account. One domestic student interviewee responded:

> Some faculty are standoffish, like you need permission, like I've heard from [one professor's] doctoral students that, you know, they have to get her permission if they want to submit an abstract to a conference…and that's so very kind of authoritarian, but to me, I couldn't function well like that, like […] maybe some students do. But for me, I guess that personal connection and the sense of trust is really important (Swaying Trees, domestic student, Phase 2 QUAL).

Students were clear they did not want to make a mistake within the hierarchy of their programs. Relationships with professors, supervisors, and administrators seemed crucial to doctoral students. The perceptions for the doctoral students were the manner in which they successfully navigate these relationships could dictate whether a student received funding, a job, and reputation in their field. Though all these students have previous academic experiences and degrees, they do not always know what they need, or how to change something that is not working for them. Students need to be listened to, and they need help to understand the structure of the social academic environment, the etiquette involved, and how to successfully weave their way through. An important sub-finding is: *Doctoral students are hesitant or do not reach out for help.* Experiences of isolation, for some students, impacted their well-being and mental health.

4.2.8. RQ 1, Finding 6. Mental Health Is a Factor in Isolation for Doctoral Students

Isolation and Mental Health Challenges

Mental health was another main theme. Students expressed increased feelings of stress, anxiety, and depression due to the workload, pressure (this could be pressure they put on themselves pressure from outside commitments/relationships, financial pressure, and work pressures, including different pressures depending on where they were in their programs) and isolation. Some students faced mental health challenges before starting their doctoral programs, and others mentioned facing new mental health issues after the start of their programs. Some students attributed worsened mental health to the COVID-19 pandemic, while others said they had struggled with their mental

health only since becoming a doctoral student. The sense of isolation or loneliness in their program was mentioned as a contributor to mental health challenges.

Due to stress, elevated expectations, and the long time span of a doctoral program, mental health issues are more likely to occur during doctoral students' studies than during the studies of undergraduate and master's students; this is widely documented in the literature (Ali & Kohun, 2006; Byrom et al., 2020; Evans, 2018; Jackman et al., 2022; Janta et al., 2014; Levecque et al., 2017; Mackie & Bates, 2019; Metcalfe et al., 2018). The challenges of a doctoral program may initiate or worsen a mental health issue, as some students expressed in the interviews. Students participating in this study expressed concern for peers, who they recognized might be facing mental health challenges. Others came to recognize that they had developed a mental health diagnosis or that their mental health deteriorated during their doctoral program.

> I think it's from me, because I was, when I first moved here, I felt so insecure and I felt so, so, anxious. You know, I'm anxious all the time...I remember talking to other doctoral students at that time, I feel like they're, they're so, they were more advanced than me, because they're so far in the program, right? I think that's the reason why I feel so anxious. I'm so intimidated, like, do I belong in this program? I mean, am I in the wrong program? You know what I mean?...I just try to, to like give myself a chance to try to find where I fit in the program...So, I try to like, you know, make friends, so I try to make friends in the program, but then I, you know, how do you make friends if you feel intimidated by them? (Fireflies, international student, Phase 2 QUAL)

> It can be crippling, especially if you have a lot going on mentally...you expect you would perform like you normally do...and everybody's kind of already made their own lives and have their own friends...they're busy and that's understandable...having that sense of reality that you can have a group of people who are – you are on the same path, at different stages of the same journey, but at least you can pass ideas by each other and bounce ideas off one another. In many respects, I find that missing, not a lot of people here where I get that kind of support. (International student, Phase 2 QUAL)

> Once covid happened one month went by, two months went by, three months went by...like, Ok, then one of my colleagues who was my friend, who's also an international student, [was the one] who actually checked on me; and that was mainly because I guess I didn't have much connection with my colleagues from Canada, it just never happened, and I don't blame them. [International student, Phase 2 QUAL]

> First year students need different things just because we're at different stages in our doctoral journey...maybe if I had an activity that kind of

> re-energized me or refocused, like, OK, I can, you know, get through my methods section or something like something that I leave feeling motivated to – like a renewed sense of motivation, because I sometimes just feel bogged down, like, What am I doing? You know like, Where am I going with this?...maybe issues around students' mental health and like foregrounding mental health – maybe in pre-pandemic time this wasn't talked about. And so maybe what the pandemic has done is, it has brought these front and center kind of mainstreamed them and they're bigger and they're forcing faculties that are forcing programs, administration to look at ways to actually, ok, we need to support these students. It's a surfaced thing that I think people didn't necessarily want to address before. Yeah, I think I would hope that the focus they've put on checking in with students, and I think that should remain a focus going forward. (Holiday, domestic student, Phase 2 QUAL)

Without programs and universities tracking doctoral student departures, whether short-term or permanent, the data to help educators understand the underlying causes for students leaving doctoral programs will remain disturbingly vague. This leads to the question of whether students take leave from their doctoral programs, and if so, why.

4.2.9. RQ 1, Finding 7. Isolation Can Result in a Leave from Doctoral Education

In survey responses, doctoral students listed isolation as one factor in a decision they had made to take an educational leave. The following section offers a broader understanding of how experiences of isolation have had a negative impact on doctoral students, and raises the question, could these negative impacts of isolation go beyond an educational leave and eventually lead to attrition for a doctoral student.

Isolation as a Reason for Educational Leave Phase 1 QUAN/qual

Roughly 21.2% of the survey respondents indicated they took an educational leave of at least one term during their doctoral program. Through multiple-choice answers, the highest-ranked reasons for taking a leave were: 1) Work commitments; 2) Family obligations, 3) Health reasons, 4) COVID compassionate leave offered by the university, and 5) Financial reasons. However, isolation was frequently a write-in response under the choice "Other." Here, respondents mentioned their feelings of "loneliness" in their program, "feeling isolated" in their program, having "lost track of cohort" (peers), and feeling that the "dissertation process is lonely" (Phase 1 QUAN/qual). Though these students evidently returned to continue their studies (since they were enrolled at the time of the study), it does raise the question of how many

students do not return, why they do not return, and what the university might do to prevent their departure.

> I don't want to reflect poorly on the [university] program or the Faculty because I know they're trying, but it's just the last eight months, it's been tough in terms of feeling isolated from not only the people in my program, but my actual work, like my writing, my dissertation...I took that compassionate leave that the Faculty offered in the summer...I was getting a little too distant from my work...and she [supervisor] referred me to a student ahead of me she knows I'm really close with … and well, so she's like, you need to talk to XXXXX about this and she can help you figure this out. [Holiday, domestic student, Phase 2 QUAL]

> I am currently working full-time on top of trying to complete my dissertation, so I have found I don't have a lot of time to participate in some of the online events that the FoE or my program offers due to scheduling conflicts. These constraints have been amplified since the pivot to remote teaching...I took compassionate leave during the Summer 2020 term. (Survey respondent, Phase 1 QUAN/qual)

> The dissertation was much harder to dedicate time to than I thought it would be. I spent a month working 8 hours a day writing as well as I could, but then I had to take a few months break...I don't have anything to compare it to. (Survey respondent, Phase 1 QUAN/qual)

Participants expressed many barriers to their PhD work, e.g., "dedication of time" required in the research and writing phases; COVID-19 and workload impacts; getting "distant" from their research work, and isolation in the research and writing stage of the doctoral program. The next section addresses the question of whether a connection with one person could make a difference to a doctoral student, who may be struggling for one or more reasons with their progress and work of the PhD.

4.2.10. **RQ1, Finding 8. One Person, One Experience Can Foster Belonging**

PhD students' interactions with others often fostered or secured belonging for them. Table 4.3 highlights themes of belonging coded in the survey responses and interviews. Experiences that students interpreted as belonging included those of being welcomed, supported, and given information. Students who were new noted campus jobs and orientations as activities that promote belonging. Interestingly, students who were past their coursework and actively involved in their own research named Faculty-run programs, such as a thesis writing group, as places of belonging. See Table 4.3.

Table 4.3 Student-Expressed Experiences of Impact of Others on Their Belonging Phase 1 QUAN/qual and Phase 2 QUAL

Interaction	Role	What They Did
Supervisor	Dissertation supervisor/advisor	Reached out and stayed connected with the student
Professors	Those who taught their doctoral courses	Acted welcoming and approachable
University staff	Those who worked at the university whom doctoral students met	Acted welcoming
International students	New to campus or in another country and new to taking classes online at the university	Expressed appreciation for professors or other students they connected with
First-year students	New to campus and their program	Attended orientation, took jobs on campus
Research & writing students	Students who had completed coursework and comprehensive exams	Attended workshops and writing groups

Professors other than the student's supervisor were identified as important to the experience of belonging, especially in creating a more level power structure and a comfort zone that allowed doctoral students to approach them with questions and/or to experience care. Professors who students took courses with were often their first contacts in the academic experience. As one student stated:

> I have three professors for three different courses…they read the paper I wrote, and they chose me…they want me here…and that made me feel like I belong. (Artistry, international student, Phase 2 QUAL)

Another student stated:

> When I was having initial problems in the program, I had an instructor who listened...they came back to me and spoke to all the right people and said we figured it out. We're sorry...here's this new path forward, how does it look? Somebody just looked at me, they heard me...then everything fell into place. (Acorn, domestic student, Phase 2 QUAL)

Students associated a sense of belonging with the academic community and with academic relationships (with supervisors, other professors, and peers). Students experienced a felt sense of belonging or knowing when, they were valued; their contributions led them to extend knowledge in the field or build on knowledge in discussions. Supervisors and professors were obviously important to doctoral students,

but peers with whom they could talk about their research, classes, and other elements of their lives were essential as well.

In the interviews, students shared experiences of belonging in their initial courses with their professors:

> I felt a sense of belonging in one class on campus. It was an Education course where the faculty member made this a priority and some of the people I met remain my friends today. Other than this course, I have literally met no one else during my doctoral journey and have for the most part kept to myself. (Breezy, domestic student, Phase 2 QUAL)

A related example came from Artistry:

> In our first meeting, he [the professor] started saying some welcoming words in Portuguese and that was nice. I feel that the same happens with my colleagues when other professors speak short sentences in their language....one of my teachers speaks Japanese and Chinese and Cantonese...They [professors] say something [in those languages] and then I can see their [peers'] faces lighten up on the screen like, 'oh you know how to say this in my language'...that makes us feel more welcome and that we do belong. (Artistry, international student, Phase 2, QUAL)

In Stage 4 of data collection, *t*he Preliminary Findings Workshop, one student posted anonymously on the digital wall (Padlet) created for students to comment on the themes of the findings and anything that might have been missed. Under the theme of "Belonging and Importance of Belonging for Doctoral Students," this student participant stated:

> I think this is a critical area [Belonging and Importance of Belonging for Doctoral Students] that enhances trust and ability to move beyond pleasantries to critical engagement. (Anonymous, Phase 4 QUAL, Preliminary Findings Workshop)

People and programs that were responsive to student communications – e.g., university staff, professors, advisers, and supervisors who communicated back to students in a timely way (to emails and questions) – fostered a sense of care and belonging. When students' questions and needs were responded to, students felt an investment of care from professors and program staff. Related survey responses included these (Phase 1, QUAN/qual):

> Students, staff, administrators, like everyone, all of them, this university, everyone together added to the sense of belonging. And because of all of them, I feel like I belong.(Survey respondent, Phase 1 QUAN/qual)

> Everyone is really helpful, really welcoming, really warm and kind. (Survey respondent, Phase 1 QUAN/qual)

> There are all these really awesome services that actually are about helping you navigate the system...I've plugged into these systems...I feel really supported actually...like a walking advertisement for university services...they're good people there. (Survey respondent, Phase 1 QUAN/qual)

Most students (62.5%) agreed or strongly agreed that, overall, they had experienced a sense of belonging in their doctoral studies (Phase 1 QUAN/qual). It was very apparent that just one relationship, with a supervisor, professor, or peer made a difference towards feeling connected and academic-social belonging. This finding was reinforced by the interviews. Surprisingly, interviewees even mentioned university-wide communications as contributing to their sense of belonging in an important way. For example, one domestic interviewee stated:

> All the systems [the university] has (Canvas, go [campus name], campus email, etc.) make me feel that I belong in [the university]… and Zoom has worked well. (Yellow Leaves, Phase 2 QUAL)

University programs, professors, staff, and systems can be said to influence a student's sense of connection and belonging – showing that doctoral students are aware of and sensitive to their environment, and although they are perhaps established in their careers, this is a process they have not encountered before and seek and appreciate supports that are in place for them. Additionally, students expressed the desire for feedback from professors on their work in courses. Feedback from instructors was mentioned as a need for doctoral students. The feedback from instructors was more valuable than getting a good grade for some doctoral students.

Doctoral student supervisors are extremely important to doctoral students. The next finding discusses some of the impact supervisors have on their students.

4.2.11. **RQ 1, Finding 9. Doctoral Supervisors Are the Number One Relationship and Factor in a Doctoral Student's Sense of Belonging**

Supervisors seemed to be the most important influence on their doctoral students' sense of belonging, as well as their degree progression. This was evident during the one-on-one interviews. In fact, in my data there were more comments about supervisors and the impact of supervisors on experiences of belonging and isolation than any other topic. Whether they had regular contact or minimal contact, the supervisor was a main topic of conversation for doctoral students. While survey results showed that doctoral students rely on each other for emotional and academic support, neither a cohort nor an individual student has the power to help a doctoral student progress. That power lies with the supervisor and the committee. A student's sense of self-efficacy and knowing they are progressing, is related to their interactions with, and feedback from, their supervisor.

Supervisors who made a personal connection and showed support were one way that doctoral students defined sense of belonging:

> She [my supervisor] reached out, touched base and said, 'you know, let's meet, let's talk about things, let's map out a schedule'...so ...I think she's good that way because she has a sense of when, perhaps, I was getting a little too distant from my work...so [my supervisor] was really good at pulling me back into focus. [Holiday, domestic student, Phase 2 QUAL]

> My supervisor...she has been great, very supportive. She's absolutely amazing. She's like the best supervisor you can wish for...and she's also so knowledgeable...she gives you tons of great advice...she really added to my sense of belonging... She helps me not just with studies but also with mundane things, like how to find a family doctor. She's always very open to us, like she tells me, you can ask me about anything, like any advice you need. [Windy, domestic student, Phase 2 QUAL]

> When you ask that question [would you please describe experiences in your doctoral journey that have influenced your sense of belonging?], two people immediately came to my mind, my supervisor and one of her doctoral students who is two years ahead of me...When I was applying to the program, and you know, reaching out to professors and talking to them, my supervisor was very accommodating...I was nervous about just kind of cold calling her, but she was very open to meeting and talking about my research interests...and we were meeting on Skype, and [one of her students] walked by her office and she called [the student in] and said, oh here's a potential student. And she made that connection to me and like she [supervisor] was just very always very open, is always very open and warm and supportive...and then like

> meeting [the student] at that point was very serendipitous...she has been a really great support and mentor for me...and so I think for me, it's been kind of all the mentoring from having been through the program...and I can't say enough about my supervisor...I hear horror stories about people saying, oh, I haven't seen my supervisor, talked with them in three months or whatever, and I'm like, oh, my God, I almost...you know...talk to her like every week, almost depending on where I am and what I'm doing. (Swaying Trees, interview, Phase 2 QUAL)

Some students whose supervisors included them in scholarship, through collaboration on a grant or on research activities, felt a positive sense of belonging with their supervisor and with other students under their supervisor. This sort of action supported students' connection to one another and increased comfort and ease with the supervisor. A representative comment is:

> My supervisor included me in a research team, and our supervisor put a couple of us together to work on a grant. (Yellow Leaves, domestic student, Phase 2 QUAL)

The supervisor, through bringing their students together for academic work, created an avenue for community, belonging, and mentorship that continued for this student, including connecting with another student for a conference paper.

> I meet with my supervisor regularly and get regular feedback and this makes all the difference in the world. I know others are not experiencing this. (Anonymous, Phase 4 QUAL, Preliminary Findings Workshop, Padlet)

> I think this is an area that needs to be explored in greater detail. The discrepancy between students' experiences in connecting with their supervisors is stunning. Are there basic minimum standards or criteria that hold both parties accountable? (Anonymous, Phase 4 QUAL, Preliminary Findings Workshop, Padlet)

Students are aware of each other's experiences, and they highlighted supervisors as an area of satisfaction, disappointment, and confusion about why experiences between students and their supervisors are so different. This is an area where students feel powerless to address challenges – and no one said they had too much contact with their supervisor, or too much feedback or mentorship. Students expressed a strong need for regular contact with and mentorship from supervisors. They want accountability for supervisors.

Survey responses also indicated that supervisors who conducted regular meetings or supervisor “check-ins” to see how students were doing, without students having to take the initiative, promoted a sense of belonging. Supervisors who “welcome their doctoral students right away” and provide a “consistent touch point of contact” had a positive impact.

Programs that had regular virtual meetings were most noted in the interviews for creating opportunities for building relationships and community. One student described that their

> [The] program has a weekly meeting, weekly virtual meeting, a social gathering every Friday...the coordinator …of the program, is the host. (Survey respondent, Phase 1 QUAN/qual)

Another student mentioned:

> My supervisor organized a breakfast club for students, and we met regularly...I met other classmates. (Survey respondent, Phase 1 QUAN/qual)

Connections with professors, staff, peers, and the institution can occur through university activities. The next section discusses how participation in university activities is linked to doctoral students’ sense of belonging.

4.2.12. **RQ1, Finding 10. Participation in University Activities Is Linked to Belonging**

Survey respondents were asked “Which university activities have you participated in?” The choices were writing retreats, grant writing workshops, research assistantships (RAships), teaching assistantships (TAships), tutor marker positions (TMship), Graduate Students Association meetings, graduate student clubs, International Student Office events and activities, student-organized reading/study groups, faculty-organized reading/study groups, Other, or None. Response rates are illustrated in Figure 4.5, N=30).

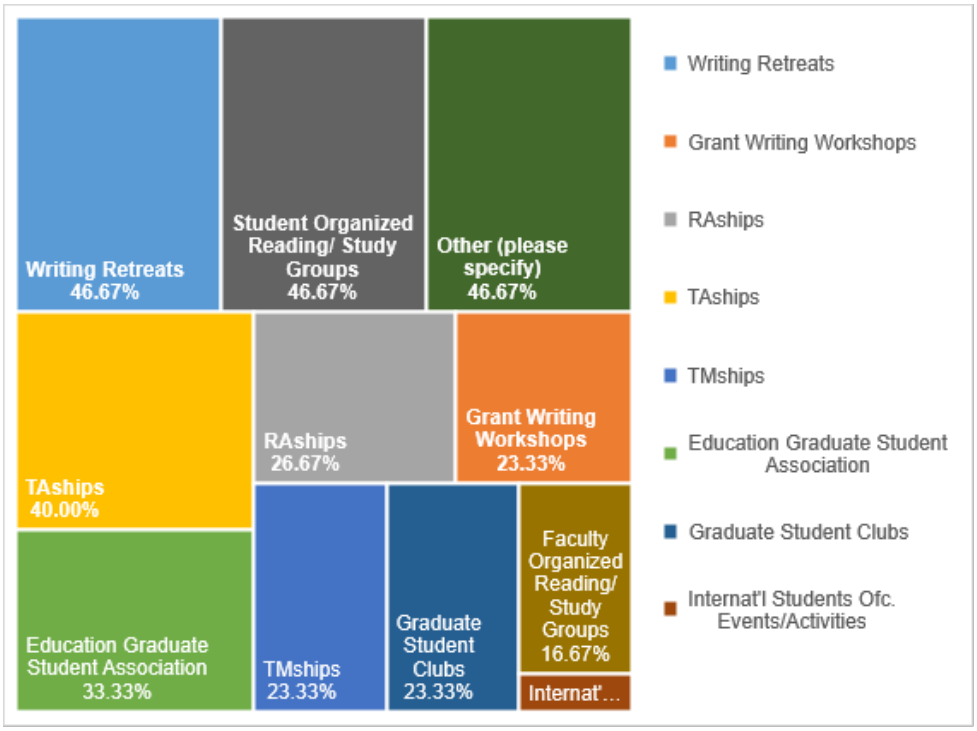

Figure 4.3 Participation in University Activities and Programming, Phase 1 QUAN/qual

Students could select all options that applied to them to answer the question about their involvement in university activities. As depicted in Figure 4.3, close to half of the respondents (46.67%) participated in organized writing retreats, and the same proportion took part in student-organized reading/study groups. Forty percent of respondents indicated TAships; one third of respondents attended Graduate Students Association meetings; just over a quarter (26.67%) had RAships; 23.33% attended grant writing workshops and graduate student clubs; 16.67% attended faculty-organized reading/study groups; and 3.33% attended International Students Office events and activities.

Table 4.4 shows student responses which indicated activities they participated in that were programmed through their library, faculty, or program. Almost half of respondents (46.67%) wrote about activities not listed in the closed-form choices, using a comment under the “Other” option. In the “Other” write-in, students stated they had participated in the following activities: (a) guest speakers, (b) a faculty-organized conference, (c) TAship, (d) research library activities, (e) orientation meetings online, (f) social gatherings online, (g) a faculty-organized academic journal, (h) potluck parties, (i)

book club, (j) faculty-programmed speaker series, and (k) social media PhD lab group. A follow-up question on the survey asked how participating in university activities made students feel, with up to seven options that students could choose. The results are in Table 4.4 (N=30).

Table 4.4 Participating in University Activities Contributed To…(Survey Responses, Phase 1 QUAN/qual)

Feeling connected to the institution	73.33%	N=22 responses
Feeling like I'm part of a community	76.67%	N=23 responses
Feeling connected to my doctoral student peers	63.33%	N=19 responses
Feeling a sense of community within my department	63.33%	N=19 responses
All of the above	0%	N= 0 responses
None of the above	13.33%	N=4 responses
*Other (please specify) *"The aspect of my Doctoral studies that has made me feel most connected to my departmental peers was being registered in the seminar classes (EDUC 927, 928)"	23.33% "feeling connected to my disciplinary domain" "My learning things – peripheral subjects and skills – not otherwise available"	N=7 "learning from other students and faculty" "feeling that I am missing out because I am not in Canada"

A small proportion (less than 20%) of respondents chose "Other." Their comments overwhelmingly spoke of being connected to an academic experience and peers. Students referred to belonging through seminar classes, learning from each other, and learning from faculty. University programming such as orientations, speakers, and events that socially mixed professors, administrators, and students contributed to feeling connected and belonging.

All participants indicated that they took part in at least one academic activity outside of classes, and sometimes more than one. Most students who participated in university-organized activities named writing retreats as the most popular choice, followed by Other (Table 4.4). The International Students Office was the least popular choice, though this is not surprising since my sample consisted primarily of domestic students. Grant writing was another activity that students in the sample participated in at a lower level of involvement. See Figure 4.3.

Text write-ins for the category of “Other” mentioned the following activities: a faculty-organized research conference, a university-organized conference on teaching, faculty-organized activities related to research, an academic journal operated by the Graduate Students Association, and the teaching support union. Involvement in such activities related to a felt sense of community and/or connection to the faculty, peers, community, and institution.

The next section will delve more into doctoral students’ relationships with peers, including their participation in academic activities and the impact of these on belonging.

4.2.13. **RQ1, Finding 11. Socialization of Doctoral Students Sets the Stage for Sense of Belonging: Social and Academic Belonging Leads to Persistence**

Doctoral students make a significant investment in their graduate education. Previous research has indicated that networking and academic activities are perceived to influence the value of students’ investment in an advanced degree (Pascale, 2018). Socialization with peers and faculty helps doctoral students develop professional skills, knowledge, and behaviours that may promote success in their chosen fields (Brim, 1966; Brim & Wheeler, 1968; Gardner & Mendoza 2010; Pascale, 2018; Strayhorn, 2012, 2019). Phase 1(QUAN/qual) sought to reveal the ways that doctoral students participated in various academic activities, and with whom.

Patterns of Doctoral Student Participation and Socialization in Activities Pre-COVID-19 and After the Onset of COVID-19

In the survey, participants were asked to identify ways that they participated in academic activities (including campus jobs) as doctoral students before COVID-19 and after the onset of COVID-19. One key finding was that respondents indicated that *after* the onset of COVID-19 they participated at a higher rate in online student-organized study groups outside of class. That is to say, the response “very often” was indicated at a higher rate after. At the same time, the response “never” was also chosen at a higher rate after COVID-19 started. Clearly, the isolation of sheltering in place and social distancing impacted students differently. The response “sometimes” stayed consistent pre-COVID-19 and during COVID-19 (Table 4.5).

Table 4.5 shows student participation in specific activities before COVID-19 and after COVID-19 began (highlighted in gray with an asterisk) for comparison purposes.

Table 4.5 Comparison of Student Participation Before and After COVID-19 Phase 1 QUAN/qual

Before COVID-19, Students Participated in

***After COVID-19, Students Participated In**

Statement	Never %	Seldom %	Sometimes %	Often %	Very Often %	N=
in-person student-organized study group outside of class	16.67	30.	33.33	13.33	6.67	30
***online** student-organized study group outside of class	36.67 *33.33	26.67 *20.	16.67 *23.33	13.33 *3.33	6.67 *20.	30 *30
faculty- or program-sponsored **in-person** social activity outside of class time	6.67	30.	33.33	23.33	6.67	30
academic workshop presentation at university outside of class time	16.67	23.33	30.	23.33	6.67	30
***online** academic workshop or presentation at university outside of class time	*30.	*26.67	*16.67	*10.	*16.67	*30
a discussion of academic issues **in person** outside the classroom with other doctoral students	13.33	3.33	26.67	46.67	10.	30
a discussion of academic issues **online** outside the classroom with other doctoral students	20. *13.33	23.33 *20.	23.33 *40.	10. *6.67	23.33 *20.	30 *30
seeking and receiving feedback from other doctoral students about academic work **in person or online**	13.33 *13.33	10. *23.33	50. *36.67	20. *16.67	6.67 *10.	30 *30
socializing informally with other doctoral students outside of class on campus	23.33	23.33	30.	10.	13.33	30
socializing informally with other doctoral students outside of class off campus	23.33	23.33	33.33	13.33	6.67	30
*socializing informally with other doctoral students **online**	*20.	*30.	*16.67	*6.67	*26.67	*30
a discussion of career plans and ambitions **in person or online** with other doctoral students	10.	26.67	33.33	20.	10.	30
*a discussion of career plans and ambitions **online** with other doctoral students	*33.33	*20.	*23.33	*16.67	*6.67	*30

More than half of the doctoral students participating in this research (63.33%) reported having participated in a faculty- or program-sponsored social activity outside class time before the onset of the pandemic. (Table 4.5)

Building Relationships within an Identity and/or Across Identities Fosters Belonging Phase 1, Quan/qual

Table 4.2 detailed ways in which doctoral students' minoritized identities could complicate their pursuit of belonging. Examples given were being female, an older student, a woman of colour, etc.

At the same time, those who were comfortable with their identities came to share an affinity with others in their group and experienced belonging with them. For example, students who were open about their sexual identity had experiences of belonging with others. Similarly, international students sometimes felt both separation from their homes and a kinship with other students who were not from Canada.

> Thankfully there is a peer in my cohort who is out too (sexual identity), and 2 affirming allies in our cohort, made it easier for both of us and the cohort increased acceptance as a result. Thankfully. (Survey respondent, Phase 1, QUAN/qual)

> I am stranded outside Canada because of my nationality. On the other hand, I've been bonding relatively well with my peers because most of them are also international/female/non-white/outside Canada. I feel like I belong in my cohort, but not [at the university] because I've never been physically there. (Survey respondent, Phase 1, QUAN/qual)

> Being more open about my sexuality has attracted more peers and I have made more solid friendships as a result of being more comfortable with who I am. (Survey respondent, Phase 1 QUAN/qual)

4.2.14. **RQ1, Finding 12. Belonging is Easier to Experience in Cohort-Based Program**

At the institution studied, a cohort refers to a group of students who are admitted to the same program at the same time and usually complete most of their courses together. Occasionally students who are admitted at the same time may not be able to begin their courses at the same time – for instance, due to difficulty in getting a student visa, organizing a move to a new country, or being a full-time versus part-time student. Students may also fall out of sequence with their cohort if they need to take leave from their studies for health or other reasons.

Students who were in cohorts were markedly more likely to report feelings of belonging and did not experience isolation as much as students who were not part of a cohort. Students in cohorts and in classes often connected via social media and/or emails in addition to the university's course management system.

> I actually worried about how I would connect with my cohort...but I think because we were so small and we, I don't know...I think we automatically clicked, and we worked well together, and the connectedness came through different avenues of support definitely in our work...we would work together on papers and like we would have study groups. We met once a week on Wednesday up on campus for the whole morning and even though we were doing our own papers and stuff, we had created that study environment for us...and that was facilitated, I think, by our professors as well...and we just kind of formed more structures of support, whether our weekly study sessions together or we have a WhatsApp group [social media] groups chat that we use a lot. So, this was all pre-pandemic...there's an overlap...we have a year two seminar...so, you know, the incoming PhD students can meet some of the older PhD students. (Swaying Trees, domestic student, Phase 2, QUAL)

One domestic student in a cohort expressed the strength of caring for one another, that they experienced within their cohort. They posted and celebrated successes, like publications, and when one student in the cohort wanted to quit, they contacted the rest of the cohort to try to prevent it. The interviewee said,

> [Snowcapped] can't quit! We can't let that happen! (Autumn, domestic student, Phase 2 QUAL)

Consequently, the interviewee reached out to the student, the cohort rallied around them, and the student remained.

Members of cohort groups had the easiest time building peer relationships, including during COVID-19. Cohorts had ready-made connections through social media, like WhatsApp chats, and email conversations to work together. Two students in a cohort went to each other's houses during COVID-19 to be together during online classes.

4.3. Ideas for socialization towards belonging from student participants themselves

Student participants had ideas for how to minimize isolation and increase a sense of belonging to their program and to the faculty as well as their peers. Table 4.6 illustrates these suggestions from doctoral students. These ideas were integrated from the survey (Phase 1) and the interviews (Phase 2). The Preliminary Findings Workshop (Phase 4) entries, that mirrored findings from Phase 1 and Phase 2 are denoted with an * asterisk and capital *X. This is noted when the student ideas related to one or more of the following: increasing belonging, increasing peer belonging, and/or minimize isolation (See Table 4.5 note).

Table 4.6 Doctoral student participant suggestions to increase belonging and minimize isolation

Participant suggestion	Increase belonging	Increase peer belonging	Minimize isolation
Space and place for students to gather	x	x	x
Regular communication and check-ins With supervisors	x		x
Events that include professors and students	x	*X	x
Peer buddy or mentor for first-year students	x	x	x
Continue compassionate leave			x
Programming for student academic and social connections	x	*X	*X
Programming for international students and first-year students to build connections and community	x	*X	*X
Mandatory student orientations, programming, events	*X	x	*X
Annual program get-togethers with food, students, and professors	x	x	*X
Student-facilitated peer reviews, events, book clubs	x	x	*X
Online option for participation	x	x	x
Awareness of university events & activities	x	x	*X

*Preliminary Findings Workshop (Phase 4), students indicated the ideas would work across categories, meaning, ideas would increase "belonging"; "peer belonging" and/or "minimize isolation". These ideas are noted in each column with an *X; while other ideas from Phase (1) and Phase (2) are noted with an x.

Students' ideas reflected some of the activities that were currently in place. Through the interviews, as the researcher and a doctoral student myself, I was made aware of events and activities I did not know of (e.g., thesis work online, book club), and

I was able to share with participants activities I was aware of, such as the online research writing group. In fact, the interviews proved an apt occasion to share such information.

Prior to the pandemic, research and thesis writing groups were offered in person; these moved online during and after COVID-19, suggesting that the pandemic spurred the university to pivot in how it offered its services to students. Students in programs that held weekly program check-ins, student conferences, book clubs, or other events expressed more connection and belonging. Students mentioned wanting and needing space(s) to gather, a suggestion that is explored further in this chapter.

In the Preliminary Findings Workshop (Phase 4), students were presented with the preliminary findings from Phase 1, Phase 2, and Phase 3 of the study. Only students who had participated in both Phase 1 and Phase 2 (most participated in Phase 3, N=18 out of 23) were invited to Phase 4. Participants in Phase 1 and Phase 2 had opportunities to suggest ideas to minimize isolation, increase "peer belonging," or both. students suggested that the idea would "minimize isolation" and/or increase "peer belonging," as shown in Table 4.6. A unique response, different from others, was the idea of educating students on a sense of belonging and options for community both informal and formal. One participant from Phase 4 stated the following:

> I think it would be useful to let doctoral students know that their sense of belonging throughout the program can be impacted by the frequency with which they engage in seminars, conferences, writing groups, clubs, etc. If they opt out, there is generally a higher likelihood of isolation and disconnection from others in the program. Opting in and attending events and having an informal WhatsApp group for instance has been foundational to my sense of belonging in this program and community (Preliminary findings workshop respondent, Phase 4 QUAL)

4.3.1. The Importance of Peers to Belonging

Pre-COVID, doctoral students discussed academic issues with peers in person and online, though more often in person (see Table 4.8). During COVID-19, online discussions of academic issues with other doctoral students also occurred. The frequency of such conversations varied from sometimes to often or very often (66.67%), revealing that students were finding ways to connect with each other regarding

academics online after COVID-19 began. The proportion was, however, lower than what students indicated they did face-to-face before the pandemic began (83.34%).

Survey responses showed that doctoral students sometimes asked each other for feedback, and this did not change much from pre-COVID to during COVID-19. The proportion was just slightly lower during COVID-19 (63.34% vs. 76.67%).

A slight difference is shown related to socializing informally with other doctoral students on or off campus. The proportion of “sometimes to very often” stayed at (53.33%). However, after the onset of COVID-19 there was a jump in doctoral students indicating they were socializing very often with other doctoral students *online*, versus pre-COVID-19, when socializing occurred on or off campus (Table 4.8). With shelter-in-place orders and social distancing, this finding indicates that classes weren’t the only activity that was increasingly happening online; social interactions were too.

While doctoral students were connecting online socially, their survey responses suggested they were *not* discussing their career plans with other doctoral students. This could be a result of COVID-19 and the unknowns related to the length of the pandemic and resulting impacts on careers. People were being laid off from businesses; schools and colleges were largely closed; research plans were delayed; compassionate education leave was increasing, etc. Career plans and ambitions may have dwindled due to the impact of the pandemic (Table 4.8).

The survey asked students whether they socialized with other students outside their program, and 53.3% indicated that they did. Of the 53.3% that did socialize with students outside their program, 96% indicated that socializing with other doctoral students outside their program improved their sense of belonging at the university; only 4% indicated that socialization outside their program did not improve their sense of belonging. This question did not have a pre-COVID and COVID comparison.

In line with the findings, students wanted organized ways to connect with other students, which includes students from other programs within the faculty. Whether they connected with students outside their program or not, there are many students who would like to make these connections, and 96% believe that it would improve their sense of belonging to the university.

Students had the opportunity to provide comments on how and why connections with students outside their doctoral program improved their sense of belonging. A sampling of these comments are informative here. In an open-ended response item, one participant remarked that maintaining connections outside their program,

> [Connecting with other doctoral students] makes me feel normal despite the challenges of doctoral work. (Survey respondent, Phase 1 QUAN/qual)

Others stated,

The more connections we make outside the classroom, the more we feel like we belong. (Survey respondent, Phase 1 QUAN/qual)

> They [connections with other students] make me feel worthy of being in the program, because I can see the struggles of others, and the little triumphs as well as big triumphs, like publishing a paper or defending a thesis. (Survey respondent, Phase 1 QUAN/qual)

Sixty percent of doctoral students surveyed indicated that they would like to socialize with other doctoral students outside their program but had not yet had the opportunity to do so. This is important, because those who experience an inability to create their own connections may simultaneously observe students who appear to have their own circles of friends and support, resulting in an increased sense of loneliness and lack of peer friendships and support. As one student wrote:

> I feel a negative attitude from others...I lose the significant meaning...I will quit the program and try to find an environment where I can find, you know, a friendly connection with others. (Fall, international student, Phase 2 QUAN)

Respondents indicated that the sense of belonging with doctoral peers was very important to them, with 96.67% indicating they either agreed or strongly agreed. The most common reasons that doctoral students connected with one another were for academic support (86.67%), social support (66.66%), and emotional support (60%). Though having a sense of belonging with peers was agreed to be important to doctoral students at the time of the survey, only 36.66% agreed or strongly agreed that they had a strong sense of community or connectedness with peers. This finding shows the importance of peers and peer relationships to doctoral students, and that, in fact, peers make a difference for doctoral students in the areas of academic support, social support, and emotional support.

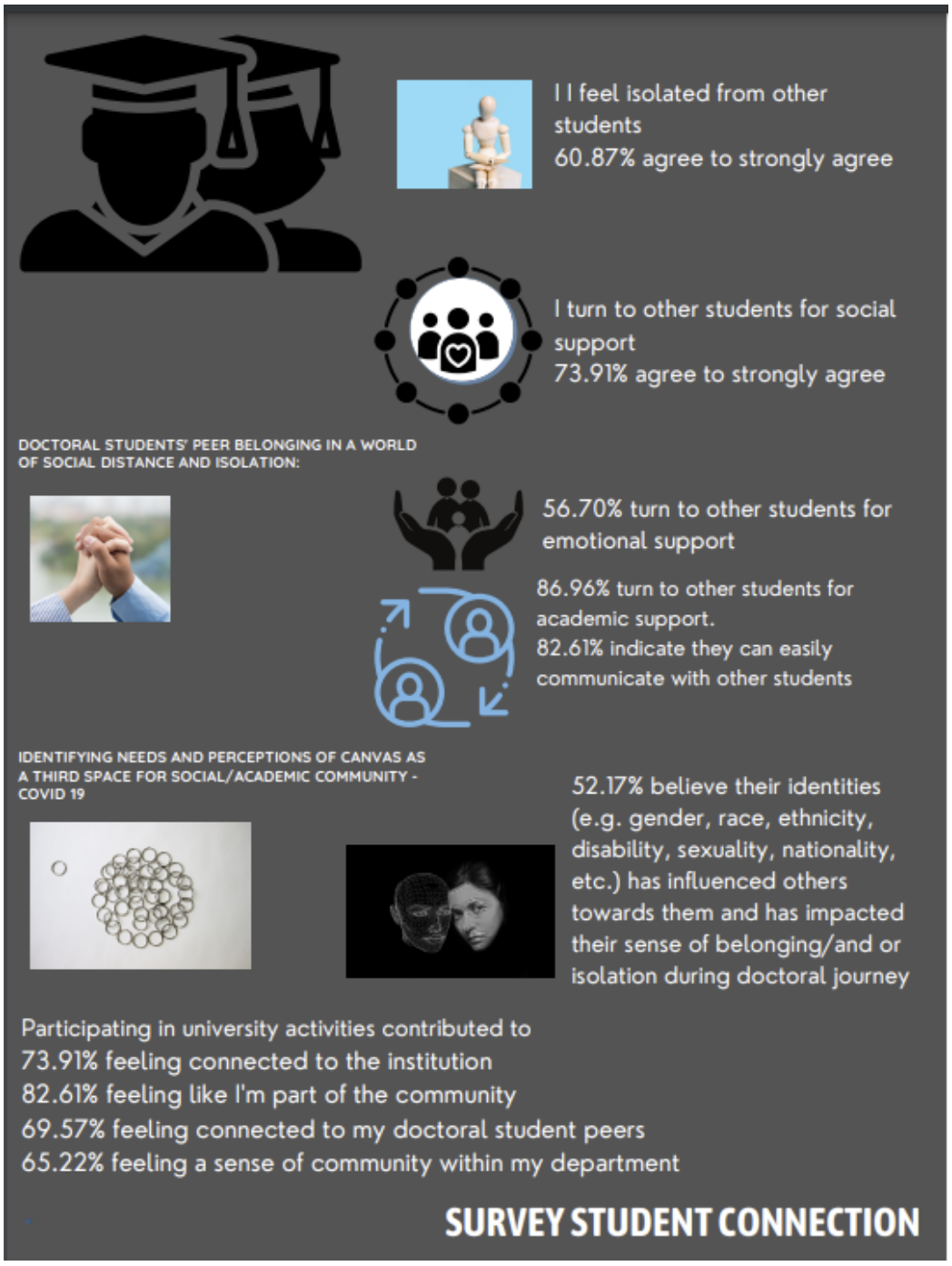

Figure 4.4 Survey Statistics on the Doctoral Student Experience, Phase 1 QUAN/qual

Creative Commons Images. OnlineWebFonts.COM; onlinewebfonts.com/icon/507141; Shutterstock.com, image-photo/wooden-human-figure-on-blue-background-1650498799; https://www.shutterstock.com/image-photo/wooden-human-figure-on-blue-background-1650498799; Canva Graphics, Community Social Unit;Canva Supportive Community Icon; Gede Wirayasa, ekaysdsgn's; SAM Designs Canva, Community Line Icon; JackieSchwabe Reclaim Your Identity, https://www.jackieschwabe.com/2020/11/dealing-with-job-loss; Fizz Bubbles, Canva, dkidpix from Getty Images

Figure 4.4 illuminates some of the ways that doctoral students interact with each other and depend on each other. It is noteworthy that 56.70% reported turning to other students for emotional support, while 86.96% turned to other students for academic support, and 82.61% indicated they can easily communicate with other students. In relation to identities such as gender, race, ethnicity, disability, sexuality, nationality, etc., 52.17% of students believed that their identities did have an influence on how others viewed or interacted with them, and therefore impacted their sense of belonging or isolation. Those who participated in activities at the university reported that this helped them feel more connected to the institution (73.91%), like they were part of the community (82.61%), felt connected to doctoral student peers (69.57%), and (65.22%) felt a sense of community within their program.

In the interviews, most respondents recalled realizing at some point that meeting others and forging relationships was something they needed to initiate themselves. Some doctoral students, including those in their first year and international students, stated that meeting others in their program was difficult. They longed to have even one peer student with whom they could study or talk, and someone they could talk to who would answer their questions related to navigating issues, advice, and guidance.

While in the interviews students appeared to expect a built-in community with other students, professors, and their programs, in the survey, students indicated a belief in the importance of taking the initiative to connect with other students. Another interesting finding is that students reported feeling both belonging and isolation, at almost exactly the same percentage, at the time they took the survey. (Table 4.7.).

Table 4.7 Importance of Doctoral Student Peer Interactions and Peer Belonging

	Strongly Disagree	Disagree	Neither Disagree/ Agree	Agree	Strongly Agree	Importance
It is up to students to connect with each other	6.67% (2)	20% (6)	13.33% (4)	46.67% (14)	13.33% (4)	60%
I feel like I belong with other students	3.33% (1)	13.33% (4)	30% (9)	43.33% (13)	10% (3)	53.33%
I feel isolated from other students	6.67% (2)	13.33% (4)	26.67% (8)	43.33% (13)	10% (3)	53.33%

This finding reflects that the doctoral journey has both elements of isolation and belonging. It is the impact of the isolation, and the possibility for students to access supports, community, and resources that would make a difference to the negative impacts of isolation.

4.3.2. Summary for Research Question 1

Research Question 1 referred to the experiences of doctoral students. The findings establish that doctoral students do have experiences of both isolation and belonging and detailed the contexts of both phenomena in the doctoral student journey. While COVID-19 did increase isolation for doctoral students, the isolation was felt largely in lack of connection with other students, and with a lack of access to gathering spaces doctoral students were used to. Additionally, the routines of how and where they attended classes, and the nuanced activities that occurred in physical spaces, that were missing online. Isolation and belonging were similarly influenced, through peers, professors, and supervisors; by participating in a cohort vs. a non-cohort program; by access to university-organized programs outside of class time; and by mental health. Students expressed that supervisors were the most important factor to doctoral students' progress, and in some cases, students felt belonging to their supervisors, if they were in regular contact. However, the study also established that peers are most important for supporting doctoral student persistence, and for providing a different relationship for

academic and social connection. It has been established that doctoral students' peers matter to doctoral students. The next section considers the question of how, during a pandemic, students stayed in touch with one another.

4.4. Research Question 2 (RQ2)

4.4.1. How did doctoral students stay in touch before COVID-19 and during COVID-19?

Students were asked in Phase 1 (QUAN/qual) how they stayed in touch with their peers prior to COVID-19 and after the onset of COVID-19. Twelve choices were presented, and students ranked these choices from 1 to 12. Table 4.8 shows the survey results in order of the top six methods students used to stay in touch before COVID-19 and after the onset of COVID-19.

Table 4.8 The top six ways that students kept in touch with their doctoral student peers pre-COVID-19 and at the onset of COVID-19

Before COVID-19	Onset of COVID-19
#1 Face-to-face	*#1 Phone/Text
#2 WhatsApp	*#1 WhatsApp
#3 University email	#2 Zoom
#4 Phone/Text	#3 University email
#5 Canvas	#4 Phone/Text
#6 Facebook	#5 Canvas
	#6 Facebook

*tied as a student choice for #1 at the onset of COVID-19

It is interesting to note that WhatsApp moved from position 2 to 1 at the onset of COVID-19, and Zoom, which was not in the top 6 before COVID, was now at position 2 as utilized by doctoral students. It is important to note that university-supported communication channels (university email and Canvas) appeared in both lists. This shows that students used university platforms like email and Canvas to keep in touch with their doctoral peers, and these were not displaced by social media and other methods after the onset of COVID-19.

Face-to-face was not in the top 6 at all at the onset of COVID-19, highlighting that the shelter-in-place orders and social distancing were a factor when this study took

place. Aside from face-to-face, WhatsApp, and Zoom, all other methods of communication stayed the same before COVID-19 and at the onset of COVID-19.

4.4.2. RQ 2, Finding 1. Doctoral Students Relied on WhatsApp, a social media app, for Connection Before COVID-19 and During COVID-19

Face-to-face conversation was the primary way students kept in touch with doctoral peers before the onset of COVID-19, while WhatsApp was second. When the COVID-19 pandemic began, WhatsApp tied with phone/text as a number one choice, with Zoom emerging as a second choice. Before COVID-19, only two participants indicated that they had used Zoom. Therefore, Zoom increased greatly as a method used by students to keep in touch after COVID-19. University email was in the third spot before and during COVID-19, and Canvas was in fifth spot before and during COVID-19. Students kept in touch with doctoral peers using the university email and Canvas systems, though they used these less than other means.

4.4.3. RQ 2, Finding 2. Technologies Used Pre-COVID-19 and During COVID-19 Linked to a Sense of Belonging for Doctoral Students

It is valuable to examine doctoral students' use of social media technologies since COVID-19, which, unlike earlier pandemics, pushed all of us into the digital realm for most, if not all, communications (Byrnes et al., 2021, p.83). For this sample of doctoral students, social media and phones linked with their sense of belonging with others. When COVID-19 began, social media, particularly WhatsApp, remained a consistent method of maintaining contact with doctoral student peers.

From the survey, three methods ranked by students were significantly associated with their sense of belonging in doctoral studies (Fisher's Exact test, $p<0.05$). The two that were significantly associated with sense of belonging methods *before* COVID-19 were face-to-face conversation and mobile phones (texting or phone calls). During COVID-19, sense of belonging in doctoral studies was significantly associated with one method: Facebook (see Table 4.9).

Table 4.9 Association of sense of belonging in doctoral studies with doctoral student methods used pre-COVID-19 and during COVID-19 to stay connected with doctoral peers

Sense of belonging and methods to stay connected	Fisher's Exact Test p
(used before the Covid-19 pandemic to stay socially connected with your doctoral student peers) Face-to-face	0.0305
(used before the Covid-19 pandemic to stay socially connected with your doctoral student peers) Mobile phone (texting, phone calls)	0.0013
(used during the Covid-19 pandemic to stay socially connected with your doctoral student peers) Facebook	0.0015

Facebook was the only form of social media where pages can be viewed by a large audience that was listed in the top six ways that students stayed in touch with one another before COVID-19 and during COVID-19, both times in sixth place. Facebook is a social platform that, by its nature, can be more widely accessed by others on the Facebook platform, hence a sense of belonging could be a feasible outcome of its use. WhatsApp, though listed as social media and in a higher slot in the list of social media used by students, is really for communication with specific individuals or specified groups of people. It does not offer a capacity for viewing by a broad audience nor ease of viewing what people posted. While it is still a community, it is mainly used for specified communication and chats.

University email was also a favoured method of communication both before COVID-19 and during COVID-19. Universities may be able to capitalize on this when determining how to foster engagement and social academic interaction, in circumstances where more interaction needs to happen online. Universities continue to develop hybrid models of education, and student needs and demands continue to change. Despite the downfalls of social media (O'Neil, 2016; Zuboff, 2019), doctoral students participating in this study still used it as the primary mode to connect with one another.

Students were asked in the Phase 3 survey QUAN/qual (N=18) to list ideas of technologies doctoral students could use to connect with each other (these were not listed as options like on the Phase 1 survey). Sixteen of the 18 respondents suggested such platforms as, for example, Discord, Telegram, Viber, Circle, and LinkedIn. These were chosen because, as one student explained,

> It [made] life simpler to use tools that I already use/go to daily. (Survey respondent, Phase 3, QUAN/qual)

Another mentioned LinkedIn,

> Because after graduation we cannot use Canvas anymore, if we wanna keep touch with each other, or recommend each other, we may need a more general platform. (Survey respondent, Phase 3, QUAN/qual)

Further, students mentioned wanting

> non-political/less public social media or online platforms such as Discord. (Survey respondent, Phase 3 QUAN/qual)

During Phase 3, a student highlighted how social media can be desirable for connection, but on the other hand, can also be "depressing":

> WhatsApp, Telegram, Facebook, Instagram. Pros: they are readily available and highly visual. Cons: lack of privacy, not everyone can have the desire or opportunity to use them, they may seem overly positive and thus depressing to those who may not have a lifestyle as exciting. And overall people tend to paint a very rosy picture of themselves and their life on social media. (Survey respondent, Phase 3 QUAN/qual)

Other ways that students thought technology could be used by the faculty to promote belonging are described in Table 4.10.

Table 4.10 Ways the Faculty Could Use Technology as a Bridge for Community and Belonging (ideas reflected in Phase 1, Phase 2, Phase 3, Phase 4)

Tech Means	Quote	Result
Faculty-hosted online sessions	Faculty-hosted sessions on a range of topics – students could get to know faculty and one another, and get some mentorship.	Familiarity/Mentorship
Student online conferences	Online conferencing which, would be opened once a month to all students from one program, where a couple of students would present their work and others would provide feedback.	Peer feedback/Faculty information
Faculty online panels	Panels where faculty would respond to students' questions and all other students can hear the answers.	Access to professors for questions
Online meetings with Supervisors	Regular individual meetings with supervisors. Many faculty have this practice, but not all.	Discuss student progress
Regular research team meetings	Regular research team meeting to discuss research.	Network and accountability
Social events online	An online social event scheduled where students could form chat rooms and hang out with their friends.	Community

(Ideas reflected in Phase 1, Phase 2, Phase 3, Phase 4)

4.4.4. Summary for Research Question 2

Before the COVID-19 pandemic, face-to-face conversations and mobile phones were key means of developing belonging. During COVID-19, Internet or cellular-enabled technologies became central to all aspects of communicating with peers. Though social media apps were the most used, university communications were still included in the top six ways that doctoral students kept in touch with their peers.

This study sheds light on why doctoral students kept in touch (academic purposes) and how they believed technology could be used to foster a sense of belonging for doctoral students. The data revealed doctoral students' longing for

academic and social connections within their scholarly work. The next chapter considers findings related to Research Question 3, the role of LMS in student belonging.

Chapter 5.

Findings: Belonging and the LMS

> An increasing body of literature suggests that both physical and digital spaces can shape students' belonging and connectedness at university. By attending to these spatial dimensions, we can better appreciate the complexity between space and belonging.
>
> (Wong,2023, p. 2)

5.1. Research Question 3 (RQ3)

5.1.1. How can a learning management system (LMS), such as Canvas, support a sense of belonging for PhD students?

To address this question, I will revisit what students indicated in the survey when asked about sense of belonging and isolation (see Figure 5.1). Among thirty-three respondents, 89.4% indicated that they were more isolated in their doctoral studies since the onset of COVID-19; 85.7% indicated that having a sense of belonging was important to them; and 94.4% chose the statement that peer connections improved their sense of belonging. Further, half of the students indicated they wanted to connect with peers outside their own doctoral programs. This suggests there would be value in providing an avenue of connection for students with other students. Since the onset of COVID-19, we know that 89.4% of doctoral students feel more isolated and are spending more time online. In the next section, I examine the possibility of an online space for doctoral students to connect across programs.

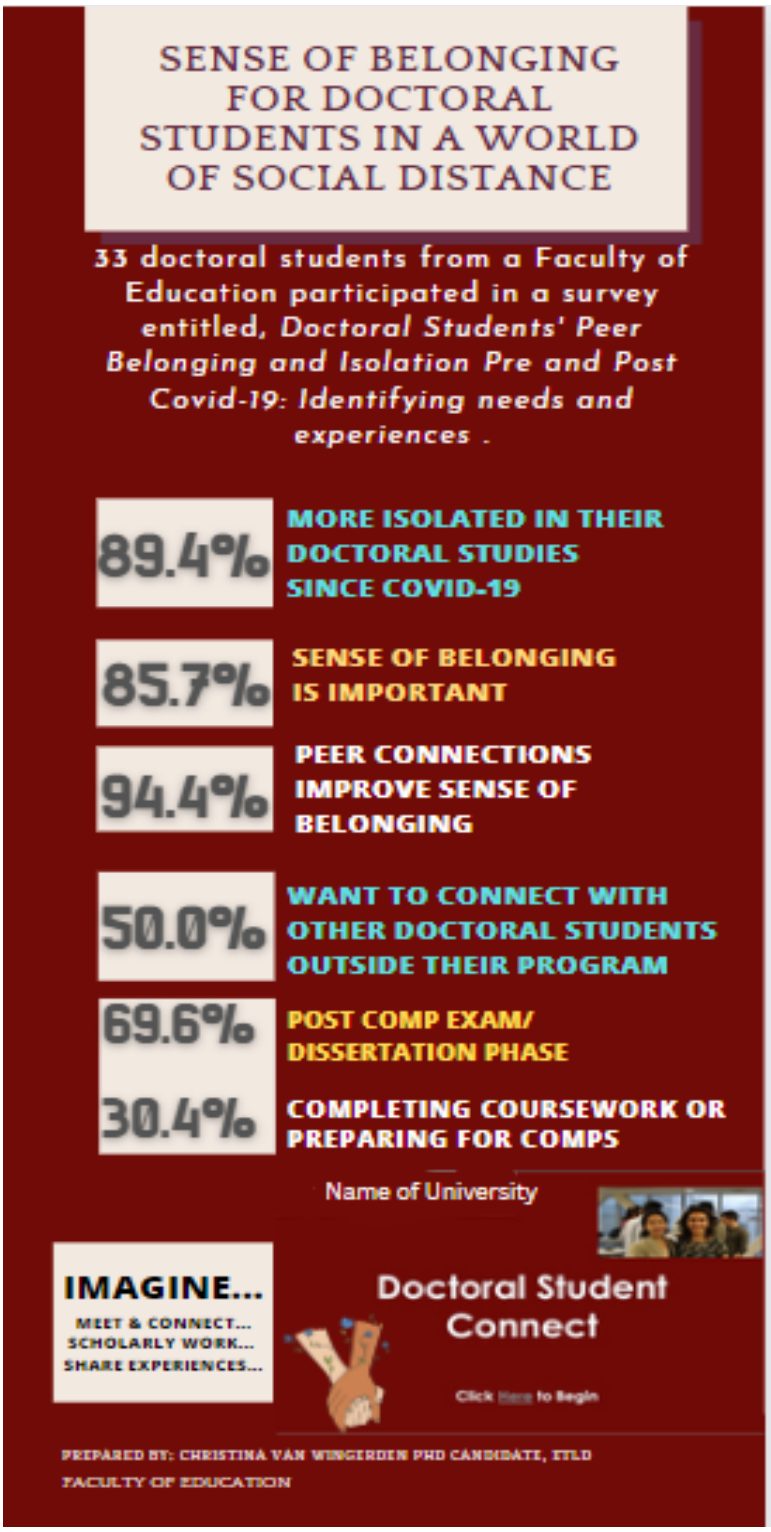

Figure 5.1 Survey Results (QUAN) Indicating the Importance of Sense of Belonging to Doctoral Students

Creative Commons Images. Helping Hand Illustration by photo3idea, Solidarity; Shutterstock, Creator: IANS_ARCHICredit, No relief for Indian students waiting to join Canadian universities, visa delays continue.

An important finding to note is that 69.6% of respondents were in the research and writing phase of their programs (in other words, they had passed their comprehensive exam), while 30.4% were completing coursework or preparing for comprehensive exams.

5.1.2. RQ3, Finding 1. Doctoral Students Find Canvas Useful During Their Doctoral Programs

To understand the potential of Canvas as an online connecting space for doctoral students outside courses, the study examined the faculty's use of Canvas to communicate with doctoral students, and the frequency with which students checked Canvas for course and program information.

In looking at Canvas use before and during COVID-19, two associations were indicated. The extent of faculty use of Canvas for communicating with students, and the frequency with which doctoral students checked Canvas for program and course information, were associated both before and during COVID-19.

When online environments gained prominence during COVID-19, Canvas was not among the top three methods students used to stay in touch with their peers. However, approximately half the doctoral student respondents paid attention to Canvas notifications and felt Canvas was useful during their doctoral studies (Table 4.8; Figure 5.2).

According to the survey responses, professors did not frequently communicate through Canvas. The overall positive reaction to Canvas depicts statistics hovering around 50% for checking Canvas notifications. This does open possibilities for the use of Canvas outside courses. Perceptions of Canvas are crucial as a motivator for student use (Yang & Kang, 2021) and in this study overall, doctoral students found Canvas useful.

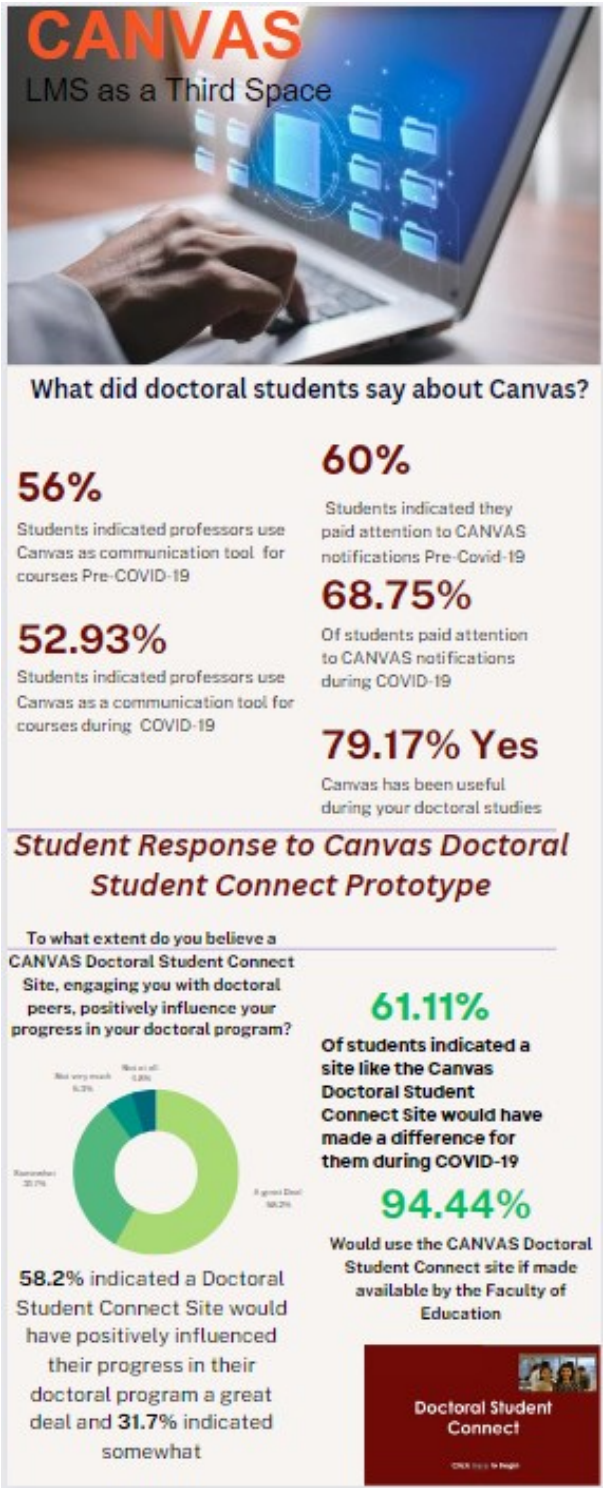

Figure 5.2 Survey (QUAN/qual) What Students Said About Canvas
Creative Commons Images https://www.freepik.com/premium-photo/online-documentation-database-process-automation-efficiently-manage-files-document-management-system-knowledge-documentation-enterprise-with-erp-corporate-business-technology_27634285.htm

5.1.3. RQ 3, Finding 2: Canvas Doctoral Student Connect Site Prototype Affirmed as a Wanted and Needed Space for Connecting with Doctoral Peers (QUAN/qual)

Response to Doctoral Student Connect Site

Respondents were shown a Canvas *Doctoral Student Connect* site during the last fifteen minutes of their individual interviews. The site had three rooms (modules), which each interviewee was asked to consider. The development of the Canvas prototype was inspired by my own experiences as a doctoral student and what I was hearing from other students (both Canadian and international) about their experiences and struggles. In my experience, doctoral students find each other – even if they are at different universities. Shared experiences that others understand can connect doctoral students to encourage one another over hurdles.

My research began after I had been in the program for two years. During that time, I met other doctoral students at conferences, through my program, and in my work. Creating a space on Canvas was an opportunity for students to connect, to find other students in the same stages they were in, and to provide information and ways for students to engage with one another, whether it was by meeting other students, engaging in scholarly work like writing or conference proposals, and/or sharing experiences with others. In addition, a space on Canvas allowed students to participate when they wanted to and how they wanted to, and they could retrieve information as needed. The Phase 1 (QUAN/qual) survey results encouraged the prototype as an intervention to introduce to interviewees (Phase 2, QUAL). In the Phase 1 survey, students responded that Canvas was important, and they utilized Canvas. The Phase 1 survey showed that belonging was a need of doctoral students, and they wanted a sense of belonging academically within their programs and Faculty, among their peers, and the introduction of a prototype could be an intervention for isolation and a pathway for connection and belonging.

5.1.4. Canvas Prototype

Emmioglu, McAlpine, and Amundsen (2017) examined doctoral students' feelings of belonging, their feelings of being an academic, and the reverse. Through journaling and coding, they found that the activities in which students felt like they were

an academic, and that they belonged to an academic community, involved collaborations with other academics, and involved activities such as publishing, conferences, etc. Emmioglu et al. (2017) coded activities to be doctoral specific or general academic. The initial coding was done through a study that McAlpine and Amundsen conducted on student identity as academics. This is important to this discussion as many of the activities they described mirror what is available to students on the *Doctoral Student Connect* prototype. This suggests the activities doctoral students could engage in on *Doctoral Student Connect* could be of value to help them feel part of the academic community and increase their sense of belonging. Therefore, a well-designed LMS can provide the structures for students to do academia, and assume academic identities, through practices such as peer collaboration, writing, groups, conferences, etc.

Figure 5.3 Canvas Doctoral Student Connect Site
Creative Commons Image. Meet Up at the London Tatoo Convention.
https://www.flickr.com/photos/barbasboth/10091741923/in/photostream/lightbox/

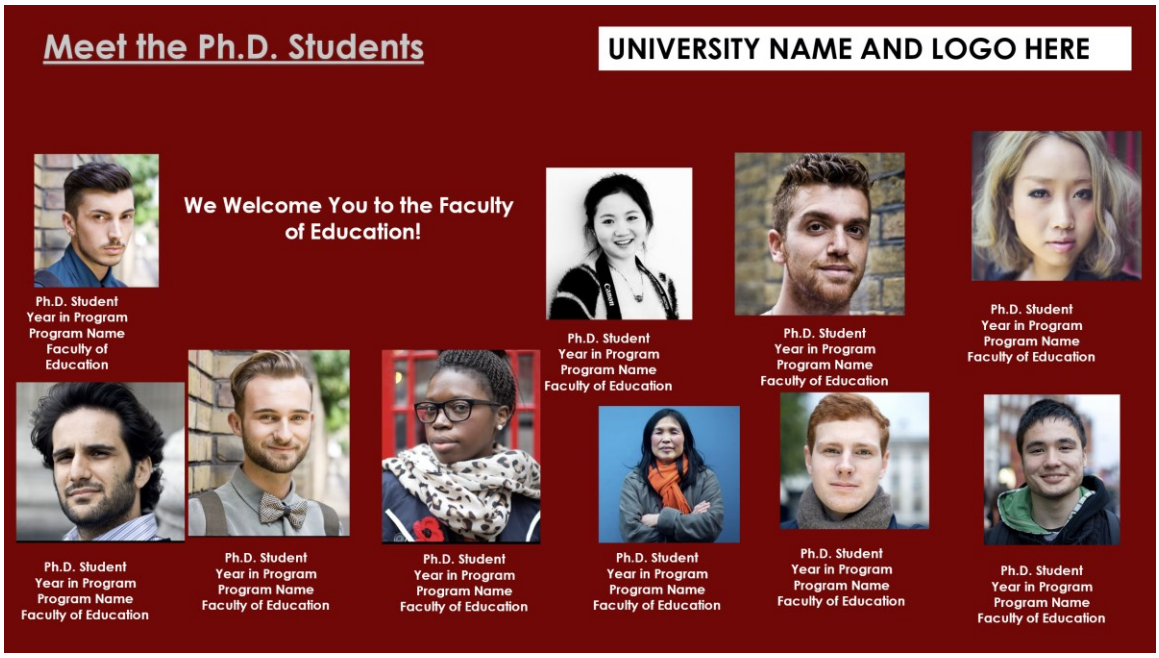

Figure 5.4 Meet the PhD Students, Canvas
Creative Commons Images. Get this image on: Flickr | License details
Creator: barbasboth ; #49 Juno; #44 Shanae; #42 Andreas; #37 Waka; #31 Johnny; #25 Marco, #24 Diego; #10 Shirley, #3 Lucas; #30 Connor. Copyright: Barbara Asboth

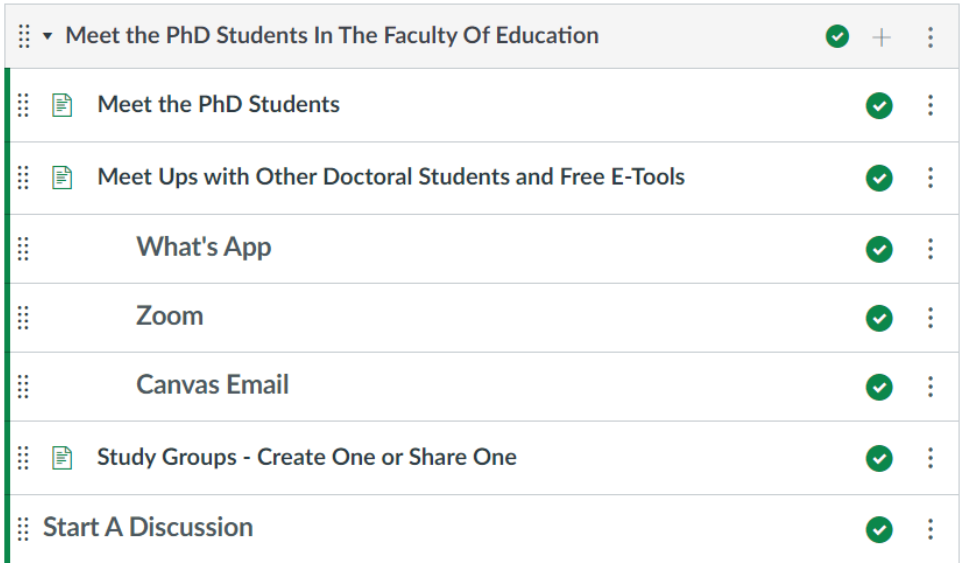

Figure 5.5 Module 1: Meet the PhD Students in the Faculty of Education

Meet the Ph.D. Students

A PowerPoint with a slide for the administrators and faculty with their picture and a link to their research on the university's website, a slide for each program within the

Faculty of Education with a picture of the doctoral student and program. This is what comprises the “Welcome to the Faculty of Education” and “Meet the PhD Students”.

The design of the Canvas site, with the “Meet” pictures and a voice recording with a welcoming message, was inspired by a platform I had built on Canvas for university student employees (university students employed in student positions as part of financial aid packages or student employment on campus) in a large student affairs university organization. I had assessed the platform with ethics approval for a U.S. university (Van Wingerden, 2021). For the purposes of my PhD research, I expanded this idea from a place for meeting others in an organization, to a place for meeting other PhD students. The specific areas within the “Meet the PhD Students” module, which included the other programs within the Faculty of Education, with photos and programs, was designed based on students' desire to connect with other students, including those from other programs, as confirmed by the Phase 1 Survey (QUAN/qual). Students who had connected with students in other programs in Phase 1, indicated that those student connections increased their sense of belonging to the university. An area that provides information and instructions on free e-tools and using WhatsApp, Zoom, and Canvas email was inspired by international students, who indicated they might not have used these tools before coming to Canada. International students expressed the wish to connect with domestic students. Providing instructions is part of welcoming all students and giving them tools, they can use to connect with other doctoral students. The ability to create study groups or join an in-progress study group gives students access and opportunities to connect with other students for academic work. The “start a discussion” area gives students the opportunity to ask a question or talk about something of interest to them with other doctoral students, or to ask for a community response.

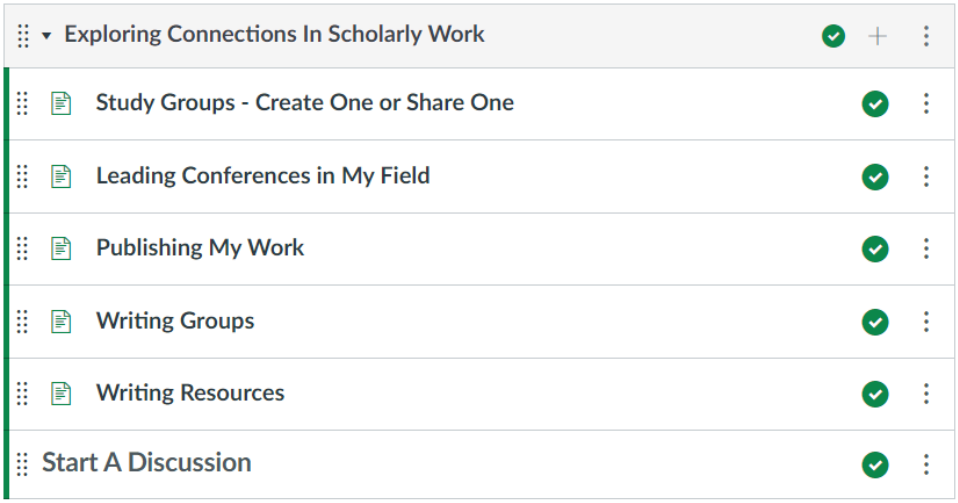

Figure 5.6 Module 2:Exploring Connections in Scholarly Work

Module 2: Exploring Connections in Scholarly Work

Students indicated strongly in Phase 1 of the study that they would value peer connections in academic work. Module 2 gives them the opportunity to create or share study groups with other doctoral students in the Faculty of Education.

The Leading Conferences in My Field area is designed to obtain information from professors in the programs of the Faculty of Education. Professors can put together a list of conferences that they recommend for students. There is a myriad of conferences; understanding which ones are recommended by professors in one's program would be beneficial for students. Additionally, students can learn who is attending conferences, so they might work on a conference proposal together, share travel costs, and encourage one another to attend or submit conference proposals – thus building community related to academic work.

Doctoral students fill out yearly progress reports that include their progress and participation in teaching, service, conferences, and publications. But where do students find out how to participate in such activities? Module 2 provides resources for doctoral students, approved by the Faculty of Education, about writing conference proposals for conference papers and articles for publication, as well as other published work on open sources. Additionally, this module mirrors the conferences in obtaining and listing recommended journals from professors in each program of the Faculty of Education. A student can click on their program to see what journals and publication sources are

recommended for doctoral students. Another important facet of this module is a caution regarding predatory journals that often target doctoral students to elicit publishing fees, luring them to publish in disreputable venues.

Writing groups can be extremely helpful for doctoral students at any stage of their journey. Module 2 publicizes these Faculty and/or university writing groups, library workshops, and resources, and provides an opportunity for students to form or join a writing group. Every module has the option to start a discussion post for the doctoral student community.

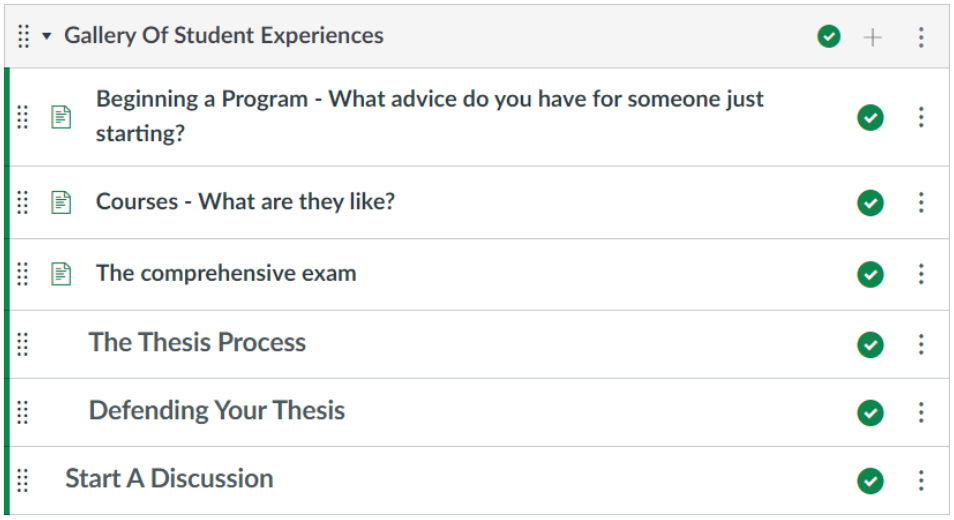

Figure 5.7 Module 3: Gallery of Student Experiences

Module 3: Gallery of Student Experiences

This module was designed in response to student desires for mentorship and for better understanding of how to navigate doctoral systems and processes. In this module, a student who is on the Canvas site can sign in on Flipgrid (an application on Canvas) and load a video sharing their experiences related to one of the prompts: “Beginning a program – What advice do you have for someone just starting?,” “Courses – What are they like?,” “The comprehensive exam,” “The thesis process,” and “Defending your thesis.” There is the video option, an audio-only message option, or an option to type their response within the prompt they choose. Over time, a section called “Tips from other Doctoral Students” will be constructed and placed within each of the prompts. The tips would be a culmination of the advice that doctoral students had given within each prompt over time.

This Gallery of Student Experiences, more than any of the others, could mimic a community of practice, with the idea of students who have gone before newer students sharing what they know in an online format. Newer students eventually participate and add to this module. Over time, there will be a rich library of doctoral student experiences that may have other uses for the Faculty. For example, they could be used for new student orientations, for the comprehensive exam phase, or defense stage of a doctoral student journey.

5.1.5. **Participant Response to Canvas Prototype**

After viewing the overview of the Canvas *Doctoral Student Connect* site prototype described above, each participant in my study was given a link to an anonymous eight-question survey (Phase 3, QUAN/qual). The first question asked for their thoughts regarding the use of a Canvas site to connect them to their doctoral student peers. The 18 respondents used words such as “wonderful,” “great,” “excellent,” “useful,” “good,” and “great idea” to describe the site. Three themes emerged from the open-ended comments to the *Doctoral Student Connect* site, (1) useful/accessible, (2) a way to connect to a community, and (3) secure and convenient.

Students were also asked to what extent they believed using one medium (e.g., a Canvas site) would be beneficial to connecting with other doctoral students. They were given a drop-down menu of options to choose from, which included “All of the above,” “None of the above,” and “Other.” Responses to this question were provided by 12 out of 18 survey respondents. These responses are summarized in Table 5.1.

Table 5.1 Survey: Doctoral Student Response to Benefits of Canvas Doctoral Student Connect Site

Category	Percentage, n=12
Learning about conferences in your field and students attending conferences	75.0%
Getting acquainted with other doctoral students in your program	66.67%
Learning of other doctoral student experiences	66.67%
Forming and/or joining writing groups	66.67%
Forming and/or joining study groups	58.33%
Writing conference proposals	58.33%
Writing research proposals	58.33%
Writing your thesis	58.33%
Studying for comprehensive exams	50.0%
Writing towards publication	50.0%
All the above	58.33%
None of the above	0%
Other [e.g., reading suggestions; centralized resources; events; collaboration; discourse; supporting each other, etc.]	41.67%

5.1.6. RQ 3, Finding 3. Doctoral Students Willing to Participate and Contribute to a Canvas *Doctoral Student Connect* Site

When students were asked if they would be willing to add their picture and information to a Canvas *Doctoral Student Connect* site, all 18 respondents answered yes. When students were asked if they would be willing to share their experiences related to courses, comprehensive exams, conferences, writing, etc., on a *Doctoral Student Connect* site, all 18 respondents indicated yes, they would. When asked if besides sharing information on the site, they would participate in a *Doctoral Student Connect* site as illustrated in the prototype (if it was made available by the Faculty of Education), all but one student said yes. The student who indicated “no” wrote in the comments that they were at the end of their program. Thirteen of the 18 students who completed the questionnaire on the Canvas *Doctoral Student Connect* site offered additional comments on the use of the tool.

5.1.7. RQ 3, Finding 4. Doctoral Students Identify How a Canvas Doctoral Student Connect Site Creates Community, Connection, and Support

Students were asked to comment on the *Doctoral Student Connect* site (Canvas prototype). Thirteen out of 18 respondents answered. Themes identified in their

responses were that the *Doctoral Student Connect* site would provide (a) student connection, community, and a place to go; (b) an opportunity to learn from other students; (c) student-to-student support; and (d) an opportunity to share notifications of events and other academic activities, and thus produce a sense of belonging. Another theme was students liked the idea of using something other than social media, like the *Doctoral Student Connect* for more of a closed group of doctoral students. One student indicated that students might not trust sharing their experiences with other students.

Doctoral student participants were asked to what extent they believed having a Canvas *Doctoral Student Connect* site would positively influence their progress in their doctoral program. All 18 respondents answered, with 11 indicating it would positively influence their progress “a great deal,” 6 indicating, **“**somewhat,” and 1 indicating “not very much.” No one selected “not at all.”

Finally, students were asked if a Canvas site like *Doctoral Student Connect* would have made a difference during COVID-19 (Figure 5.2). All 18 respondents answered, with 61% indicating yes, it would have made a difference, and approximately 17% saying no; another 22% commented. See comments in Table 5.2.

Table 5.2 Open Comments: Would a Canvas site like the Doctoral Student Connect make a difference during COVID-19 (QUAN/qual, Phase 3)

It's slightly isolating to be at home working on this [PhD], but I have been able to create a bit of a community through a couple of colleagues and my supervisor, and it helps that one of the students has the same doctoral supervisor.
Having completed coursework, there are no opportunities to engage in discussions that are helpful to one's work. You can only listen to yourself so much; I cherish the moments when I can connect with someone who understands the journey.
Of course, it would! And especially now that my coursework has ended and I'm turning to my own research—I'd value some kind of social-interactive platform because there are still many questions I'm exploring, and things I'd like to converse about—especially research and writing.
Yes, I think this tool would be more helpful during the pandemic than in normal circumstances. In normal circumstances, I would suggest regular face-on-face meetings with peers and faculty from a prospective program as a major way of connecting.

During the Preliminary Findings Workshop Phase 4 (QUAL) students had the opportunity to add to themes on a Padlet. They could see what others had written. Table 5.3 has comments from the Padlet which occurred after the preliminary findings were shared.

Table 5.3 Preliminary Findings Workshop Comments Phase 4 QUAL

Theme: Place or Space	Theme: Canvas Student Connect Site
so many emails - can't get through them all	one stop for information; one stop for peer connection
would like one spot to find out information for doctoral students	resources for conferences, publishing
want to find information about faculty	connecting with other doctoral students for social and academic purposes
would like a forum or space for doctoral students to connect with each other and important information [one person commented on the above post and said] I think a specific forum would really be helpful! A one-stop shop!	courses, comprehensive exam
During the pandemic, I really wanted to do one or two safe and distanced meetings on campus and was really shut down by all levels of service and the department. Given these are public buildings, and given we are adults and subject to public health rules, I found this particularly frustrating and alienating.	sharing experiences

5.2. Summary for Research Question 3

Over 60% of the doctoral students who were in the research and writing phases of their programs responded positively to the Canvas *Doctoral Student Connect* site and its potential utility for them. Additionally, their responses about contributing to the site suggest that such a site would have active participation.

5.3. Outliers in the Data

While general trends in responses are useful to observe, some unique responses are also worthy of mention. Some outlier responses from this study included the following:

COVID-19 helped one student progress and get finished faster, and for a few others reduced travel and therefore saved them time.

Further, one respondent in the survey indicated that the questions from the survey were

> difficult to answer; do not feel connected to my cohort; I have one student whom I feel close to. (Survey respondent, Phase 1 QUAN/qual)

This survey respondent was the outlier in the survey and interviews,

> Someone who was part of a cohort yet did not feel connected to their cohort (Survey respondent, Phase 1 QUAN/qual)

Related to the identity question and whether identity influences sense of belonging or isolation, one respondent took the time to answer in optional open-ended comments

> Hesitation.

It's unclear what the respondent wanted to convey. The fact that they took the time to write that they were hesitant, is an outlier response, and may be something to pay attention to when asking questions related to identity. There was not a way to determine if they had discomfort with the question, or hesitancy to share how others respond to their identity. There is no concrete answer to this respondent's word choice in the comment section.

5.4. Expanding the Use of the Doctoral Student Connectedness Scale (DSCS)

The Doctoral Student Connectedness Scale (DSCS) was created for online doctoral students in the research and dissertation writing stage of their programs. With permission, the DSCS was used in this study for doctoral students who attended a

Faculty of Education doctoral program in person before COVID-19, then online after COVID-19 began.

The DSCS was also used in this study to measure doctoral student connectedness in the coursework and pre-comprehensive exam phase of study, as well as during the research and dissertation writing portion of their studies, as the instrument was intended. A reference to “faculty” in this scale refers to professors or instructors.

As discussed in Chapter 3, this scale has a series of questions. Some of them are related to student-to-faculty connectedness and some are related to student-to-student connectedness (Terrell et al. 2009). The questions in this scale related to connectedness are broken down as follows (Terrell et al., 2009, p. 114):

Table 5.4 Doctoral Student Connectedness Scale (DSCS) Questions and What They Measure

The scoring is completed by rating each sentence on a Likert Scale of 1-5. 1(strongly disagree) to 5 (strongly agree). Numerics to the left denote the specific question that is correlated to the factor of connectedness. There are two factors: student to student connectedness and student to faculty connectedness. Original instrument and questions.

Student to Faculty Connectedness in Research and Writing Phase

2. I feel that I am encouraged to ask questions to the faculty about the dissertation process.
4. I feel a spirit of community between the faculty and myself while I am working on my dissertation.
6. When I ask questions or submit work to my dissertation advisor, I feel like I receive timely feedback.
7. I communicate with faculty members about the dissertation process on a regular basis.
11. I feel that I am receiving adequate support from the faculty while I am working on my dissertation.
12. I feel that the feedback I receive from the faculty is valuable.
14. I feel confident that the faculty will support me while I am working on my dissertation.
16. I feel I can trust faculty while I am working on my dissertation (e.g., rely on faculty members to follow through on commitments, keep confidences, treat people with respect and help me learn).

Student-to-Student Connectedness in Research and Writing Phase

1. I feel that students currently working on their dissertation care about each other.
3. I feel connected to other students in the program who are working on their dissertation.
5. I feel like I can easily communicate with other students about the dissertation.
8. I feel like fellow students who are working on their dissertation are like a family.
9. I communicate regularly with other students who are working on their dissertation.
10. I feel I can trust other students who are working on their dissertation.
13. I feel a spirit of community between other students and myself while working on the dissertation.
15. I feel like I can rely on other students who are working on their dissertation for support.
17. I feel like I can easily communicate with other students who are working on their dissertations.

Language of Questions, Modified with Permission for Coursework and Comprehensive Exam Phase

1, I feel that students care about each other.
2. I feel that I am encouraged to ask questions to the faculty members.
3. I feel connected to other students.
4. When I ask questions or submit work, I feel like I get timely feedback from faculty members.
5. I communicate with my faculty Pro tem or Supervisor on a regular basis.
6. I feel like fellow students are like a family.
7. I communicate regularly with other students in my program
8 I feel like I can trust other students in my program.
9. I feel the faculty provide me with sufficient academic support.
10. I feel the feedback I receive from faculty members is valuable.
11. I feel a spirit of community between other students and myself.
12. I feel that I can trust faculty members to follow through on commitments, keep confidences, treat me with respect, and help me learn.

An important question to consider is the reliability of the DCSC scale when adapted for different groups of doctoral students. As a reminder there were two ways the DSCS scale was adapted. One, the original intention of the scale was with online doctoral students in the research and writing phases of their program. In this study, it was adapted to measure face-to-face and online contacts as well as coursework and pre-comprehensive exam phase of study, and the research and writing phase of study.

Internal Consistency and Reliability of the DSCS Even with Modifications to the Questions for Coursework and Pre-Comprehensive Exam Students

It is important to note that the internal reliability and consistency of the DSCS scale (Terrell et al., 2009) was proven through the Cronbach Alpha Coefficient test on all questions, and overall. See figures 5.8 and 5.9.

Cronbach Coefficient Alpha	
Variables	Alpha
Raw	0.921400
Standardized	0.927352

Cronbach Coefficient Alpha with Deleted Variable				
	Raw Variables		Standardized Variables	
Deleted Variable	Correlation with Total	Alpha	Correlation with Total	Alpha
q35DSCSCOURSEWORK1	0.913096	0.904339	0.925162	0.912638
q35DSCSCOURSEWORK2	0.182069	0.928679	0.225532	0.937128
q35DSCSCOURSEWORK3	0.886676	0.910899	0.833394	0.916053
q35DSCSCOURSEWORK4	0.675303	0.915818	0.664405	0.922178
q35DSCSCOURSEWORK5	0.559982	0.919277	0.493443	0.928163
q35DSCSCOURSEWORK6	0.737172	0.912991	0.715644	0.920343
q35DSCSCOURSEWORK7	0.615570	0.928474	0.591242	0.924765

The CORR Procedure

Cronbach Coefficient Alpha with Deleted Variable				
	Raw Variables		Standardized Variables	
Deleted Variable	Correlation with Total	Alpha	Correlation with Total	Alpha
q35DSCSCOURSEWORK8	0.852695	0.908508	0.893047	0.913840
q35DSCSCOURSEWORK9	0.789175	0.910035	0.808828	0.916956
q35DSCSCOURSEWORK10	0.737723	0.914050	0.736669	0.919584
q35DSCSCOURSEWORK11	0.120824	0.930159	0.155830	0.939380
q35DSCSCOURSEWORK12	0.941308	0.903974	0.935981	0.912232
q35DSCSCOURSEWORK13	0.852695	0.908508	0.893047	0.913840

Figure 5.8 Cronbach Coefficient Alpha, Internal Reliability, Modified Questions for Doctoral Students in Coursework

Cronbach Coefficient Alpha	
Variables	Alpha
Raw	0.902528
Standardized	0.903783

Cronbach Coefficient Alpha with Deleted Variable				
	Raw Variables		Standardized Variables	
Deleted Variable	Correlation with Total	Alpha	Correlation with Total	Alpha
q38DSCSDISS1	0.408075	0.901338	0.422611	0.902842
q38DSCSDISS2	0.644639	0.894278	0.653282	0.895578
q38DSCSDISS3	0.712383	0.891946	0.701471	0.894022
q38DSCSDISS4	0.746009	0.890725	0.757805	0.892185

The CORR Procedure

Cronbach Coefficient Alpha with Deleted Variable				
	Raw Variables		Standardized Variables	
Deleted Variable	Correlation with Total	Alpha	Correlation with Total	Alpha
q38DSCSDISS5	0.632229	0.895210	0.616122	0.896769
q38DSCSDISS6	0.645817	0.894720	0.646721	0.895789
q38DSCSDISS7	0.599103	0.896715	0.610438	0.896951
q38DSCSDISS8	0.573295	0.896912	0.550092	0.898866
q38DSCSDISS9	0.666106	0.893575	0.649394	0.895703
q38DSCSDISS10	0.476514	0.899605	0.488325	0.900804
q38DSCSDISS11	0.505645	0.899749	0.511121	0.900091
q38DSCSDISS12	0.619000	0.895171	0.612685	0.896879
q38DSCSDISS13	0.404656	0.901926	0.382797	0.904064
q38DSCSDISS14	0.579326	0.896592	0.575297	0.898068
q38DSCSDISS15	0.537550	0.898381	0.549026	0.898899
q38DSCSDISS16	0.363871	0.902809	0.374633	0.904314
q38DSCSDISS17	0.527119	0.898679	0.528600	0.899542

Figure 5.9 Cronbach Coefficient Alpha, Internal Reliability of DSCS Instrument

The importance of the validity and reliability of the DSCS is valuable and attests to the scale itself and that it can be used for all doctoral students. Participants who were in the research and writing phases of their degrees did experience a sense of loss or isolation, markedly with peers more than supervisors, though there are some differences with supervisors as well. See Table 5.5.

Table 5.5 Doctoral Student Connectedness Scale and Mean Score Differences Between Courses/Pre-Exam and Post Exam Research and Writing

Courses and Pre-Exam *N*=10	**Questions**	**Mean**	**S.D.**
1.Student-to-faculty connectedness	2,4,6,7,11,12	4.15	.737855
2.Student-to-student connectedness	1,3,5,8,9,10	4.31	.715034
Research and Writing N=20	**Questions**	**Mean**	**S.D.**
1.Student-to-faculty connectedness	2,4,6,7,11,12,14,16	3.81	1.054201
2.Student-to-student connectedness	1,3,5,8,9,10,13,15,17	3.34	.940326

Notice the scale uses the words “I feel” – this supports how students described their isolation and belonging at the beginning of the findings. Students who are in coursework and pre-comprehensive exams realized and observed more care between students. The DSCS instrument scores showed a difference between the coursework/comprehensive exam and the research and writing phases. By integrating the DSCS findings with the survey and interview findings, it appears that there are touchpoints in a doctoral journey where programs could offer extra opportunities for support and connections to student peers and supervisors. Students want academic connections within their doctoral journey. While connections outside the doctoral program may be helpful, students told me that it is hard for those who are outside a doctoral degree process, or who have never done a doctoral degree, to understand the requirements, the time, and the emotional and physical labour required to complete the PhD.

Chapter 6.

Discussion

> A department's culture is also embedded in and revealed by the opportunities it provides for academic and social integration. Some departments have structures in place to help students plan their programs and choose advisers; others leave students to their own devices.
>
> (Lovitts, p. 261)

6.1. Summary of Findings

Inspired by the social problem of PhD student attrition, this study explored PhD students' experiences of isolation and belonging. The findings compared with those of Strayhorn (2012, 2019), who found that a sense of belonging was a need for doctoral students. This study sought to examine the importance of peers to doctoral students' sense of belonging. A Canvas *Doctoral Student Connect* site prototype was developed to facilitate connection among doctoral students. The design goal for this prototype was to bring doctoral students together on a single platform, that was already accessible at the university. The prototype was presented to participants, and they completed a survey that asked whether they thought it would be a viable use of educational technology to address isolation among doctoral students.

The study addressed the research questions in the following ways. With regard to the experiences of isolation and belonging for doctoral students before COVID-19 and during COVID-19, the study produced the following findings:

- Students do have defined experiences of and familiarity with the phenomenon of isolation and belonging directly related to their doctoral journeys.
- Isolation and belonging were experienced before COVID-19 occurred.
- During COVID-19, students experienced increased isolation academically through the lack of in-person contact, social distancing, and stay-at-home orders.
- Interestingly, COVID-19 did not seem to have a large impact on a student's perception of their progress. In fact, two students (one domestic and one international) reported getting through their dissertation process faster, noting the benefit of not having to travel to campus as a time saver.

- A sense of belonging was experienced through involvement with professors, staff, and peers. Most important were supervisors, who had the largest impact on sense of belonging for doctoral students.
- Sense of belonging occurred when supervisors checked in with their doctoral students and engaged doctoral students in collaborative work, such as a research project or a grant application with other doctoral students.

To the question of how doctoral students kept in touch with one another before COVID-19 and during COVID-19, in-person connection was the number one method before COVID-19. Mobile phones and social media apps that featured chat were popular among doctoral students both pre-COVID-19 and during COVID-19. WhatsApp, a social media chat and video call was the number one method of connection after COVID-19. The use of Facebook and phones/text were found to be significantly linked to students' sense of belonging through a Fisher's Exact Test. Something interesting to note is the mean age of the doctoral students, which was higher than the average age of doctoral students in Canada. Facebook is typically used by older persons, while Instagram is used by younger persons.

With regard to the final research question, how an LMS might be used as a tool to foster sense of belonging for doctoral students: students who examined the Canvas *Doctoral Student Connect* site prototype unanimously indicated the value of such a site. Doctoral students stated they would contribute to the site, and use the site if it were available during their doctoral studies, to connect with other doctoral students around scholarship activities important to their progression in their programs, and yearly doctoral student evaluations (progress reports).

From the findings detailed in Chapter 4 and Chapter 5, I would like to focus the discussion on three larger themes that encapsulate the importance of belonging, peers, and technology. These themes are Systems and Navigation, Socialization, and Technology as a Third Space.

6.2. Systems and Navigation

Students unanimously stated they needed support in navigating university, program, funding, and other processes and systems related to their time as a doctoral student. Students in this study also named this support as essential for first year and international students. Navigating university systems was found to be connected in

important ways to students' identity development as they become doctoral students. No participant in this study felt prepared to appreciate what it meant to be a doctoral student. This lack of preparedness manifested in students not understanding how to manage a larger academic workload, what the expectations of a doctoral student were, what mentorship opportunities were available, and how to secure needed financial and other resources. Further, the etiquette of communicating within the systems of the program, the hierarchy of the Faculty, and administrative systems, were mysterious to doctoral students.

An important finding was that doctoral students do not readily seek out faculty (Golde 2005), resources, professors, or supervisors when they are experiencing feelings of isolation. Additionally, doctoral students do not always realize what they need and may pass up important workshops or other training sessions that would support them – or, because the need has not appeared to them yet, they do not find the value in the training (Collins and Brown, 2020). The danger of not preparing our students, and not speaking with them about belonging and isolation, is related to a systematic review of mental health, which found that not seeking help could lead to suicidal ideation among PhD students (Satinsky et al., 2021). If students are to reach out for help, they need to know the how, the who, and the when to readily seek the guidance they need for a particular situation. McAlpine and Amundsen (2011) talk about doctoral students and the importance to their sense of belonging that they feel like an academic. Though there are disruptions along the way, integrating doctoral students with the support they need can support resilience and perseverance. Situations where there are too many negative experiences and the supports are not perceivable, can lead doctoral students to withdraw (Emmioglu et al., 2017, p. 74).

Some studies have examined cultural capital and community capital as lenses by which to understand doctoral student needs through identity. The barriers these studies aimed to understand were, the isolation doctoral students felt, the lack of support that doctoral students perceived, and the difficulty doctoral students had navigating what was expected. These barriers impacted their belonging, mental health, ability to feel successful, and understand how to navigate program expectations (Espino, 2014; Holley & Gardner, 2012; Vance-Berg, 2021). The findings of these studies resonated with those of my own – doctoral students do not readily perceive the processes and how to

navigate them, leading to further isolation. In the present study, except for two male doctoral students, all participants experienced anxiety about the unknown.

Navigation of systems is tied to the socialization of doctoral students. To understand and gain the knowledge and skills needed to succeed as doctoral students requires that programming and systems of navigation be made known to students when they arrive on campus (Lovitts, 2001, Strayhorn, 2019). There are some studies that focus on first-generation doctoral students and the importance of socialization, welcoming, and inclusion for them (Holley & Gardner, 2012). In the present study, I found that all doctoral student participants expressed a need for information, knowledge, and support, as well as the social connections to the academic community to propel them forward when they first enter their programs.

Doctoral students who had completed comprehensive exams and were in the research and writing stages particularly struggled with isolation. A study (Ciampa & Wolfe, 2023) that focused on Vygotsky's (1978) social cognitive theory of learning posited that for doctoral students, the social learning is invaluable to their learning processes, reducing isolation and creating a community of practice with other doctoral students and a professor. Ciampa and Wolfe's (2023) study took place in a doctoral course. The findings showed that "belonging in a peer-review group enabled them to confront, challenge, and clarify some of the misconceptions and ambiguities related to the dissertation writing and feedback process." Additionally, the move from a "private activity" to a "public activity" worked to "demystify dissertation writing" (p. 494).

Ciampa & Wolfe's (2023) findings relate to how doctoral students in the present study struggled with isolation, and yearned for peer connections and community in the research and writing phases of their programs. Through a community of practice, the doctoral students in Ciampa & Wolfe's study were able to develop confidence, become critical readers and writers, and develop a community of social and emotional practice, in an academic setting. These findings parallel my own. One question I have is whether a community of practice is sustainable without a facilitator in the case of doctoral students? I would imagine that as students graduated, they would leave the community of practice or move into other more career-focused groups. I imagine a space that functions like a community of practice in the sense that students deposit meaningful information, and engage in practices that are relevant to their academics and

progression. New students would come on at the time of orientation, and there would continue to be students engaged in the *Doctoral Student Connect* site as each orientation brought new students and users. A sort of student mentorship could form through the artifacts of experiences, and the information continuing to evolve and build on the *Doctoral Student Connect* site, that would be helpful to users and to those new to the site.

In their research, McAlpine and Amundsen (2011) identified challenges of academic work that mirrored my findings, related to navigation in an academic context. They provided direct participant quotes to highlight some of the students' experiences: a) "doctoral student questioning isolation and lack of clarity of expectations; b) doctoral student questioning scholarly contribution; c) new academic questioning lack of support and lack of clarity of expectations; and d) supervisor-student conversation about someone else's challenge of the student's doctoral work"; and "Yet, while national policy contexts vary, the experience of doctoral education is very much locally situated through day-to-day interactions amongst doctoral students, supervisors, other academic, and academic related staff, each with different roles, intentions, and perhaps hopes" (pp, 1–2).

To summarize, the earlier doctoral students receive an orientation to the academic community, and the more information and connections with other students they have, the more comfortable they feel in the academic context. The more students have information, connections with others, and socialization of the academic community to learn with and socialize with in academic contexts, the better they can understand and navigate systems within the institution and their programs. Socialization is important for doctoral students in the academic context, and we'll turn to that next.

6.3. Socialization

In Strayhorn's (2012) studies from 2008–2011, which largely focused on ethnic minorities and included both master's and doctoral students, it was clear that "socialization matters for graduate students, regardless of the academic field or discipline" (p. 96). Socialization is linked to a sense of belonging, and it gives graduate students a positive sense of empowerment to meet expectations and complete academic tasks, including research and writing.

Sense of belonging that is powerful for graduate students is directly tied to persistence (Strayhorn, 2012, p. 96). Sense of belonging translates to graduate students feeling more confident in their interactions with faculty and peers, earning higher grades, succeeding, and feeling increased satisfaction with their experience (Strayhorn, 2019, p. 133). So, pursuing the idea of connection for doctoral students in a virtual or technological context is worth investigating.

Students' experiences of isolation and belonging in their doctoral programs is a big and broad issue. Research Question 1 focused on whether isolation and belonging were factors in a doctoral student's journey. This study found that, indeed, doctoral students described experiences of both isolation and belonging, and these were directly related to the academic community and their scholarship. Other studies have tied these phenomena to attrition and retention (Ali & Kohun, 2006; Gardner and Mendoza, 2010; Lovitts, 2001; Nettles and Millett, 2006; Strayhorn, 2012).

Establishing what belonging meant for doctoral students, and the extent of their desire for belonging, was another important focus in the present study. This study found that belonging is indeed important to doctoral students, particularly after they completed their courses and transitioned to the research and writing phase.

Strayhorn (2019) stated:

> Previous research has established that graduate students' persistence (or, conversely, attrition) is a function of students' socialization to their role as a graduate student as well as their role as a bona fide member of the professional field in which they aspire to work (p. 126).

Strayhorn (2019) also found that how socialization is experienced by doctoral students is personalized to them; it is important to have mechanisms that engage doctoral students with knowledge, information, and connections to others in the program through orientations and programming that equips them, with a sense of where they fit in the academic schema they are entering. Strayhorn's findings are like those of other researchers (Gardner and Mendoza, 2010; Lovitts, 2001; Nettles & Millett, 2006), which suggest that orientation events are not sufficient to accomplish the socialization needed. Lovitts (2001) explains that what happens to students when they enter the academy has a considerable influence on their experiences throughout their program. The academic

social context in which students find themselves, is shaped by how the institution and program present themselves to students.

In 2016, McAlpine and Amundsen wrote a book for doctoral students and early career researchers. They based it on a longitudinal study of doctoral students, and provide some proactive ways to connect students with others at the beginning of their programs. The correlation to these findings is that McAlpine and Amundsen, through their research, recognized a need for doctoral students, and those who had completed their PhD, to be connected to other students and graduates, and to hear stories of their experiences in the PhD program and in their early post-PhD career. From their research, McAlpine and Amundsen came up with terms like “nested contexts” and “identity-trajectory” that provide an understanding of the needs of the individual related to their education and surrounding academic communities, and an understanding of the individual development of the doctoral student and early career researcher (p. 4). Their study was 10 years in length, and they had 48 participants from Canada and the UK.

An aspect of McAlpine and Amundsen’s work (2016) that is important to denote is the difference between their studies and the other seminal works used in this dissertation. They inquired about the needs of the students as early career researchers when they were finished with their PhD and worked backwards to identify what students and early career researchers needed to attain their goals. In their work, McAlpine and Amundsen sought to understand factors that contribute to attrition for doctoral students.

6.4. Embedded Community

Involvement

Previous research has suggested that those who are more involved with the department, program, and institution, in turn created relationships with others that fostered community. As a result, these students are more likely to complete their programs than students who are comparatively isolated (Lovitts, 2001).

Students in this study assumed that they would be automatically embedded in a community from the start of their doctoral studies, and were disappointed to discover that this was not the case. However, doctoral students who got involved with the university, Faculty, and/or program activities (e.g., events, clubs, jobs, etc.) indicated

that through these involvements, their sense of belonging increased. Students who did not get involved experienced more isolation and indicated less belonging than students who participated in events and activities through the university.

McAlpine and Amundsen (2011, 2016) stated that students should cultivate larger academic networks beyond their supervisors. This included others in their field of interest, professors, students, and staff. These networks were “critical interactions,” which happened outside the student and supervisor relationship (2011, p. 25). McAlpine and Amundsen found that students who were well networked were able to receive support from different people in different ways. This left the supervisor as the primary relationship to provide direction, feedback, and help students advance in their degree requirements.

Supervisors and Professors

Supervisors and professors were stated to be the most important initial contacts and influences of doctoral students’ sense of belonging. All students, including both those in favourable relationships with supervisors and those who had little contact with their supervisors, mentioned this quite often. This finding mirrors other research that identified the supervisory relationship as the single most important relationship in graduate studies (Gardner and Mendoza 2010; Golde 2005; Lovitts 2001; Nettles and Millett 2006).

Students experience barriers and difficulties in their educational pursuits, such as lack of confidence, stressors, doubt, and at times difficulty persisting. McAlpine and Amundsen (2011) found that “the supervisor was rarely sought out for help with these difficulties, and was not frequently named as an important person influencing progress” in their study. They found in their study that “students do not want to share certain types of difficulties with supervisors viewing such difficulties as evidence of lack of ability” (p. 34). Additionally, they stressed the importance of helping students expand and “maintain a network of relationships” that may benefit them as future academics (p. 35). Giving students opportunities to network and make connections, and get connected to others, can prove to be helpful to students in their programs and as early career professionals.

Identity

The experiences of identity and belonging have recently been studied with undergraduates in the learning sciences community. Jaiswal et al. (2022) focused on attrition rates and attribute lack of belonging to "the inability of students to develop an identity and sense of belonging" (p. 1). Their study presented identity and belonging as elements that developed in conjunction with one another. Their findings comport with those of the present study: students who are involved in program/university activities feel more connected, and are more likely to stay, than students who are not so involved. In the present study, identity was found to develop as students progressed through their program.

Identity construction and community are important to doctoral student learning and development, according to McAlpine and Amundsen (2011); their work in part looked at how doctoral students "learn from and contribute to academic practice" (p. 8). The supervisory relationship with students, and what it evokes, related to both positive and negative emotions. This relationship can "influence how (doctoral students) situate themselves amongst their colleagues as they undertake academic work, and through this work develop their identities" (p. 10). McAlpine and Amundsen also stressed the importance of "informal academic activities" as "workplace learning," stating, "Institutional inattention to these aspects of the doctoral experience ignores the ways in which students are developing webs of intellectual and personal relationships of value for their futures" (p. 10).

In my study, interviewees were asked to define belonging and what it meant to them as students. Belonging, like isolation, was defined by the students' experiences. It was described by them as a felt sense, and they were able to identify specific contexts or actions from others where belonging occurred. A point that McAlpine and Amundsen made in their research (2011) was that students develop their own agency and negotiate relationships beyond the supervisor. This is related to developing their identity as they grow towards their academic professional self. Through connections and a broadened network outside the supervisory relationship, students gain belonging and identity, and see themselves as academics, which contributes to feeling like they are part of the academic community.

Diverse Identities

A prominent finding in the present study was that feelings of isolation on the part of international students were related to their difficulties in building relationships with domestic students. Similar findings have been noted before (Brown, 2009; Walsh, 2014). In this study, international students' experiences with domestic students, including their hesitancy to reach out to domestic students, are not a surprise. Janta et al. (2014) and Brown (2009) discovered that for international students the differences in "cultural issues and language difficulties" can act "as a hindrance to socialising with domestic students" (Janta et al., 2012, p. 556). Research has shown that this is due to the absence of "integration between student groups" and "limited social interaction" between international students and domestic students (p. 556).

Identity is important to note on the smallest level, as according to Graham & Massyn (2019), "studies of doctoral attrition do not usually reflect variations in demographics and characteristics to the needed extent, which allows this problem to remain unnoticed, unverified, and unresolved" (p. 192). Additionally, though enrolment continues to increase for doctoral programs, and non-traditional student enrolments have increased also, most studies focus on what higher education institutions consider "traditional student" models, "assuming full student social and academic engagement, without regard to factors that may affect persistence in non-traditional students" (Barron, 2014, as cited in Graham & Massyn, 2019, p. 192). Cox (2005) studied assumptions of the non-traditional student (e.g., parent, caregiver, place bound, older) and online education in community colleges. The findings showed that assumptions were made about non-traditional students wanting online education, and about online education being accessible to them. One large factor for the non-traditional students in the Cox study referred to "technological literacy" (p. 1776). Understanding the needs of doctoral students from diverse backgrounds, identities, and levels of education for accessible resources, experiences, and learning environments is important for inclusive education.

Regarding sexual identity, in this study student participants who found others who affirmed their identities were able to report experiences of belonging, finding support with others, and being comfortable with themselves, which brought feelings of belonging.

Most of the respondents in the present study identified as women, and a few identified as non-binary. Clearly intersectionality exists (e.g., being an older woman, being a woman of colour, being a woman and a caretaker and/or parent, being from a different culture, and other identities). More women are entering PhD programs (Statistics Canada, 2022a; Jamieson & Naidoo, 2007; Johnson et al., 2000; Naidoo, 2015), where traditionally doctoral programs served male students (Graham & Massyn, 2019, p. 189). It is important that institutions attend to gender dynamics in learning, as well as keeping up-to-date on changing demographic trends and diverse identities in doctoral studies.

In reflecting on the identity development of doctoral students as scholars, I find myself concerned about students who enter their studies with diverse identities, especially when they feel physically or emotionally isolated. It is important for institutions to be aware that doctoral students are maintaining and balancing multiple identities; in doing so, some students may experience a sense of loss of an identity when their new emerging identity as a doctoral student is heightened (Foot et al., 2014). Connecting with others provides a "sense of reassurance"; the feeling "we are not alone struggling"; and a feeling of experiencing support from others. Lack of self-efficacy was associated with "fear of the future," "not knowing where we fit," and "fear of failure" (p. 109).

Self-inefficacy and pluralistic ignorance

Efficacy is strongly related to engagement, and is defined as a "positive, fulfilling, work-related state of mind that is characterized by vigour, dedication, and absorption" (Schaufeli, Salanova et al., 2002, p. 72, as cited in Schaufeli & Salanova, 2007, pp. 179-180). Self-inefficacy is a term related to factors in burnout (Schaufeli & Salanova, 2007). Burnout is associated with diminished individual accomplishments, emotional exhaustion, and depersonalization (p. 178).

Schaufeli & Salanova (2007) compared Spanish students and Spanish employees. Students saw their work as more psychologically or emotionally draining due to academic demands, and they exhibited exhaustion. This exhaustion can lead to cynicism, a "detached attitude towards one's study, and feeling incompetent" (p. 180). The concept of self-inefficacy is clearly relevant to the experiences of students in the present study. The PhD is an arduous process that can lead to discouragement, cynicism, and peaks of exhaustion. Isolation may lead to and contribute to self-

inefficacy, as students are left with few emotional, physical, and psychological reserves to stay determined and tenacious. Lovitts (2001) referred to this as pluralistic ignorance: this is when we feel like we are the only one struggling, not knowing that others are as well. Doctoral student isolation that is associated with negative feelings and outcomes needs to be disrupted, as it is a barrier to progression and success.

Educating students on socialization and belonging

Preparing students for the doctoral experience requires more than orientation. The doctoral academic journey is quite different from undergraduate or master's level academics, including its socialization. Sverdlik et al. (2018), through a systematic literature review, uncovered "university factors" and "student factors" affecting students' completion, achievement, and well-being (p. 364). The researchers broke these categories down further into specific items for university factors and specific items for student factors. Sharing findings like these with doctoral students could help students understand what to expect, external factors, internal factors, and resources and supports they could identify when they come upon psychological, emotional, physical, and/or academic barriers. In the Preliminary Findings Workshop, one student shared that it would be helpful to know more details of, and be prepared for, the doctoral student experience in advance:

> I think it would be useful to let doctoral students know that their sense of belonging throughout the program can be impacted by the frequency with which they engage in seminars, conferences, writing groups, clubs, etc. If they opt out, there is generally a higher likelihood of isolation and disconnection from others in the program. Opting in and attending events and having an informal WhatsApp group for instance has been foundational to my sense of belonging in this program and community. (Student respondent, Preliminary Findings Workshop, Phase 4, QUAL)

Doctoral Students and Socialization as a Need

Doctoral students' identities continue to develop as they go through their doctoral program. Supporting doctoral students in making connections with others throughout the progression of their program fosters their new and developing identities, and the realization of their success as scholars and experts in their fields (Foot et al., 2014, p. 111). Foot et al.'s findings show that identity can influence a student's experience, their assumptions and perceptions coming into a doctoral program. Several other studies have examined how students' gender, race, and international student status have

influenced their experiences as doctoral students (Carter et al., 2013; Seagram et al., 1998; Strayhorn, 2012, 2019; Ulku-Steiner et al., 2000). These further indicate the impact of identity on the journeys of doctoral students. In the present study, age was the only facet of identity mentioned in the survey and in interviews by students over the age of 50.

Overall, students participating in this study experienced a gap in the organizational culture and the systems in place to support the equitable participation of traditional and non-traditional doctoral students in community, with professors and peers.

6.5. COVID-19

The COVID-19 pandemic, with the associated shutdown and closed campuses, deepened isolation for doctoral students. Most students found isolation hard, since school, work, and caretaking or parenting all had to happen in one place, with no other places to go (e.g., campuses, libraries, or cafes). This period of the long shutdown took its toll on doctoral students.

For first-time doctoral students, it seemed strange to be a university student and not have a physical connection to campus and other students. However, for a few students, COVID-19 helped them progress and finish their studies faster, perhaps due to reduced travel time to campus, and lack of other responsibilities in the places where they were sheltering. In the Faculty of Education, students found the online supports helpful, and students who knew about the online supports (e.g., research workshops, writing groups) liked attending them. Other students did not know how to get connected to academic work with others, and sometimes they felt alone and overwhelmed, especially if they were not well connected to a supervisor.

Programming for Connection During COVID-19

Programs that had weekly check-ins during COVID-19 helped their students fare better throughout the pandemic. Participants in my study said they felt the online check-ins that had at least one faculty member attending, and allowed students to drop in, were comforting. In fact, one student mentioned that even though they could not attend, they felt a sense of belonging just by knowing that the drop-in was an option. Students talk to

each other, so when students knew of other students having regular check-ins and did not have those options through their program or with their own supervisors, they felt greater isolation – even desolation sometimes – and were overwhelmed by the temptation to give up. The students who made the greatest gains in their sense of belonging during COVID-19 were those who had regular check-ins with their supervisors. These kept them going, and one student related that she felt her supervisor knew she would be stuck and reached out to her. That one action helped her to stay motivated and engaged in the work.

We can surmise that COVID-19 can be instructive to educators in addressing belonging moving forward post-pandemic. In fact, some students preferred the online environment. It is important to pay attention to the research studies and what they tell us about belonging and isolation. The online modality has had its benefits, including a calling in to all students to participate in online activities that, before COVID-19, were only offered in-person. COVID-19 can be a training ground for inclusivity of our classroom and other university environments.

6.6. Students Desired a Place or Space to Gather

The place and space that the doctoral students expressed a desire for included both an online space and a physical space dedicated to doctoral students. In the Preliminary Findings Workshop (Phase 4), students indicated virtual and in-person options were needed so that more students could participate. The student programming for research and writing support provided online for the first time during COVID-19 was something that students wanted to continue. Students also indicated they wanted the Faculty Speaker Series to continue after the fall of 2020, in the first year of the pandemic. Students felt there should be both face-to-face and online options for student participation.

Some students believed that orientations and Faculty events, such as the Faculty Speaker Series, should be mandatory for students to attend, perhaps taking the form of a seminar course in the first year. Students who had experienced these events believed that by making attendance mandatory, as part of a course requirement and/or program requirement, those students who had not attended would experience greater belonging and less isolation. Students who did attend noted that the content, including a

presentation from the president of the university, First Peoples' land acknowledgements, etc., was impactful and fostered awareness of and belonging to the larger community.

Belonging presents itself in previous research and in this study as both a need and a factor in persistence for students. This brings the discussion to peer socialization.

6.7. Peers

The respondents shared their need to belong in their academic programs and with one another. The need for feedback on academic work was the most common one described by doctoral student respondents. They wanted to engage in scholarship together, and to form and build relationships that continued and deepened over time. As one respondent to the survey reflected, they were surprised that at the end of their program they had just one peer relationship when they thought they would have at least three or four peer relationships.

Socialization is a way to help navigate new spaces and experiences, as well as to offset loneliness and separation. To be with other students going through similar processes, and to share camaraderie, was believed to be important to persistence. Ali & Kohun (2007) stated about doctoral students and doctoral student socialization that "balanced emphasis on the social and academic life ensures a better integration of students into the doctoral program and appears to pave the road to a better quality of education" (p. 48). Relatedly, Nettles and Millett (2006) stated that an "increase in perceptions of peer interactions was…positively associated with students' satisfaction with their doctoral programs" across five fields (p. 168). Just one peer relationship and/or one supervisor relationship can make a difference in belonging.

Interactions with peers can serve both social and academic purposes, and this was indicated in the survey findings reported in this study. Nettles and Millett (2006) were the source for the questions adapted for this portion of the survey. Their research indicated that peer interactions were highest among doctoral students in the social sciences, and this appeared to be true for the present study of Faculty of Education students. Nettles and Millett also found that full-time, continuous enrollment predicted positive peer relationships, while a delayed or lengthened time to degree completion meant doctoral students in education viewed their social relationships with peers more

negatively (p. 157). Students' perception of their experiences and relationships with peers (and faculty) have been found to be directly related to their perception of the environment of their "academic programs/departments" (Gardner & Mendoza, 2010, p. 50). Further, Strayhorn (2012, 2019) suggests that socialization at the graduate level is directly related to persistence, including graduate students seeing themselves as part of their community as graduate students and as part of the field they are in (p. 126).

A sense of community aids persistence by combatting the isolation that all my participants expressed feeling at some point in their PhD. As McAlpine and Amundsen (2011) stated, "a focus on the student-supervisor relationship alone is not sufficient to encompass and do justice to either the complexity of networks that doctoral students establish, nor the range of academic work undertaken" (p. 23).

To examine the question of how an LMS might help foster a sense of belonging for doctoral students, we next review the findings related to technology.

6.8. Technology as a Third Space

The findings of this study clearly show that digital technologies are important for doctoral students to stay in contact with each other. Newer technologies play an important role in supporting different kinds of belonging, as was the case at the onset of COVID-19. Students had to pivot away from face-to-face interactions, and found their connections through social media chat applications, texting, and heavier reliance on technology to relate to work, school, families and friends for both the personal and business sides of life. If nothing else, COVID-19 has increased our awareness of the various ways technologies can facilitate learning and social connections, when in-person presence is limited or not possible.

As a reminder, the Third Space is a space between home and school where students can network and have discussions. The Third Space has also been seen as an equalizer, meaning there are no hierarchies, and every voice is wanted and welcomed. To explore the possibilities for digital technologies to provide a Third Space for doctoral students, I examined doctoral students' need for connection. Among the respondents to my survey, 94.4% indicated that peer connections improve their sense of belonging. Further, half of the students indicated that they wanted to connect with peers outside

their own doctoral program. This supports an avenue of connection for students and their peers.

People strive to be accepted by others, valued and respected as competent, qualified individuals worthy of membership in a defined group or particular social context. Strayhorn (2019) links sense of belonging in a particular context (e.g., department, classroom) to the outcomes of adjustment and achievement for students in academic settings. When online environments gained prominence during COVID-19, Canvas was not the most common means for students to stay in touch with their peers, though it was in the top six methods they reported. Half of the survey respondents indicated that they paid attention to Canvas notifications and that Canvas was useful for their doctoral studies. This finding was consistent before COVID-19 and during COVID-19 but appeared constrained to the context of coursework. These findings place the LMS in the same place it has been found to occupy in other studies: it is underused, and not a "main event" for teaching and learning outside of specific courses.

Perceptions of Canvas are crucial as a motivator for student use (Yang & Kang, 2021), though the design and approachability of the Canvas site and the value of the learning materials and exchanges within the site are important to the value and motivation to use a Canvas site for something other than a course.

6.9. Summary – Sense of Belonging Supports Academic Persistence – An intervention for Attrition

When I began the thesis, attrition rates were a troubling 40-60% of doctoral students. The findings of my study link peer belonging with support and persistence for doctoral students in having someone to talk to who understands the experiences and requirements, and to ask questions of or share things they may not be comfortable sharing with a supervisor. Additionally, peers can serve as mentors in providing answers and assistance in navigating a doctoral program when they have been in a doctoral program ahead of a newer student.

Supervisors are important to doctoral students. The literature reflects the importance of supervisors to PhD students and their success (Cockrell & Shelley, 2011; Golde 2005; Gardner and Mendoza, 2010; Jairam and Kahl, 2012; Lovitts, 2001;

Satinsky et al., 2021). Lack of a relationship with supervisors, and the hierarchy and power students realize exists, are factors that contribute to isolation. Programs should ensure that students and supervisors begin building a relationship through consistency in requirements for meetings, check-ins, and timelines for different stages of the PhD.

Students wanted a community that integrates the social and academic, and they struggled without it. Facets of identity such as age (over 50 in particular), gender, ethnicity (a woman of colour; a white man), and sexual identity also influenced the assumptions and experiences of doctoral students. An unexpected element that was brought up in the interviews was the mixing of master's students and doctoral students in classes. Some wondered why they were in classes with master's students and found that the resulting class discussions were too broad and not sufficiently related to the doctoral student's task or field.

The survey data confirmed that doctoral students' experiences of belonging are tied to activities they are involved in and the ways that students have found to be digitally connected. Students who participated in university academic or social activities largely found that their sense of belonging improved with either the department, program, and institution. Some indicated meeting peers as a way of feeling connection and belonging. The survey results also detailed the impact of COVID-19 on doctoral students' isolation. Various on-campus activities fostered connectedness before COVID, and their absence exacerbated isolation during COVID-19.

The survey results did not find a reliable connection between isolation during COVID-19 and lack of doctoral student progression. While there were students who expressed feelings of isolation, stated that their research plans were delayed, and took COVID compassionate leave, there were also students who did not experience a hindrance to their academic progress. In some cases, COVID facilitated academic progress due to the convenience and flexibility of Zoom meetings, and to the fact students did not have to spend time travelling to class.

The survey analysis also did not yield results linking the frequency of use of an LMS (in this case Canvas) with peer connection. Students did indicate that Canvas was useful in their doctoral studies, and Canvas was listed among the top five ways to stay in

touch with peers in doctoral studies. Therefore, exploring the use of Canvas in contexts other than courses seemed warranted.

Throughout the survey there were opportunities for students to expand on their responses to closed-form questions. Themes that developed from these responses spoke to the importance of peers and sense of belonging; to isolation as a barrier; and to the potential of digital technology to foster a greater sense of belonging and the ability to find support in their doctoral experiences. The qualitative findings offered depth and elaboration to the quantitative findings, which allowed me to make new connections. Supervisor support, academic support, and checking in with students connected thematically with respect to faculty-related factors. External factors such as caregiving responsibilities and the effects of COVID-19 were highlighted in the findings. In this study, external factors were related directly to the demands of academics and the process of pursuing a doctorate. Some examples of internal factors are mental health concerns, doubt, self-inefficacy, and the feeling that an individual is the only one struggling. There certainly could be a tension between internal and external factors, with one influencing the other.

The transparency and openness of the respondents in the interviews gave the researcher deeper insight into their real-life stories of success, isolation, belonging, and struggle, surfacing an array of current issues that the survey had limited ability to capture. Through the mixing and integration of the quantitative and qualitative findings, the research questions were more fully addressed. Inductive themes emerged largely through the interviews that provoked deeper understandings and questions related to doctoral student needs.

The findings of this study support implementing a Canvas *Doctoral Student Connect* site as a pilot with existing and newer students. This intervention to isolation could also be an intervention to attrition. The site could be linked to resources the university provides for research, writing, and any graduate student clubs or organizations. Additionally, information about grants for research and other types of funding and resources could be housed on the Canvas *Doctoral Student Connect* site.

Students wondered whether the Faculty paid attention to their feedback on their academic progress reports. If they were to go to an ombudsman with concerns, would

retaliation occur? Students invest in their degree financially, emotionally, and with their time, sometimes to the detriment of other areas of their lives. Speaking up where there are power differences, is not an option for many students, yet they want accountability in the accessibility, support, and time supervisors are giving to them as students. If doctoral programs are moving away from an “apprenticeship” model, orientations and recruitment materials for students should lay out clearly what is expected of students, what students can expect in navigating their doctoral process, and what social academic supports and resources are available along the way. It also behooves the Faculty to ensure through words and actions, such as programming for students, that there are standards for supervision of doctoral students and that those standards are followed. Doctoral student attrition rates are somewhat a reflection of, as Lovitts (2001) stated, “what happens to doctoral students” once they arrive that informs progress, completion, or non-completion of doctoral programs.

This study and others cited in this work clearly demonstrate that belonging reduces isolation and diminishes attrition. The challenge is how to provide the frameworks for students to be able to thrive and understand the contexts of both isolation and belonging in their PhD journeys.

Chapter 7 offers theoretical reflections, discusses the limitations of the study, policy implications, and recommendations for further action and research.

Chapter 7.

Conclusion

> By exposing students to meaningful experiences, engaging students with their peers and faculty, and providing the support needed for them to overcome challenges, we can effectively foster their sense of belonging in graduate school, thereby effectively transforming them from “outsiders” into “insiders” with all rights and privileges thereof. Graduate students thrive and excel where they feel like they belong.
>
> (Strayhorn, 2019, p. 138)

7.1. Introduction

The attrition of doctoral students from their programs is the central problem that motivated this study. Cassuto and Weisbuch (2021) stated that attrition is “disturbingly high” for arts and sciences PhD students, explaining that out of eight students, only four are expected to finish (p. 167). Since belonging is associated with retention and persistence in higher education (Strayhorn, 2019, 2012), the needs of doctoral students related to belonging, isolation, and the importance of peers was the focus of the study. Persistence in the face of challenges is essential for degree completion; therefore, attending to students’ sense of belonging in an embedded, intentional way could be a positive step toward diminishing attrition rates. This study focused on Canadian universities and students, which included domestic and international students.

The purposes of the study included (a) exploring doctoral student needs and well-being related to isolation and belonging, (b) seeking to understand the importance of peer relationships to belonging, (c) exploring a reimagined LMS specifically built for doctoral students as a virtual Third Space to connect, and (d) inquiring whether students’ participation in university activities prior to and during COVID-19 influenced belonging. Finally, the methods doctoral students used to communicate with peers before and during COVID-19, and whether they perceived COVID-19 as a factor in isolation or belonging were two threads throughout the study.

7.2. Main Findings

Five main findings are important to highlight:

1) Sense of belonging is a need for doctoral students.

2) Doctoral students seek peer connections for social-academic reasons.

3) While social media platforms, especially chat platforms, were consistently used by doctoral students (pre-COVID-19 and during COVID-19) for connection with peers, doctoral students unanimously expressed the desire for an LMS Third Space such as the prototype *Doctoral Student Connect* site developed for this study. Relatedly, Albakri & Abudlkhaleq (2021) found that viewed through a constructivist lens, Blackboard (which is an LMS similar to Canvas) had the ability to facilitate “immersive learning experiences" (p. 132). Their study built on the work done by Lave (1991) and Lave & Wenger (1991) on communities of practice, suggesting Blackboard is a way that “learners engage in the community of professionals, moving towards full involvement in the socio-cultural environment, which makes the educational process look like the process of joining a society” (p. 132).

4) University-organized activities, employment, and programming are directly related to doctoral students’ belonging and feeling part of the community.

5) Regular contact with the doctoral student supervisor is not only desired, but essential. According to participants in this study, doctoral students who have consistent contact with their supervisors are more likely to feel successful, see progress, and experience feelings of belonging and connection. Those who did not have regular contact with their supervisors expressed a notable absence of a supervisor, lack of contact compared to their peers, and feelings of confusion. The experiences seemed drastically different in some cases. As Lovitts wrote, “A student’s relationship with his or her adviser is probably the single most critical factor in determining who stays and who leaves” (Lovitts, 2001, p. 270).

The findings of this study concur with those of Lovitts (2001), who continued: "Departments…need to do more to raise faculty’s consciousness about the importance of being more supportive of, and interested in, graduate students, their ideas, research,

and professional development" and "Departments need to regard new students as an investment that needs to be mentored along" (p. 271).

7.3. Theoretical Framework Reflection and Moving Forward

Theories that informed this work and emerged as a result of the findings are Maslow's work on sense of belonging as a human need, Mezirow's transformative learning theory, which relates to identity development; Strayhorn's sense of belonging theory relating to well-being, persistence, and community in higher education settings; Bhabha's Third Space theory as an equalizer for doctoral students to engage in community with other doctoral peers; and Lave and Wenger's communities of practice theory in application of creating sustainable communities online that will result in mentorship and welcoming of newer members. Finally, the integration or threads of these theories that support collective knowledge in communities of shared experiences and requirements, such as, doctoral students.

7.3.1. Transformative Learning Theory and Doctoral Students

Stevens-Long et al.'s (2012) article "Passionate Scholars: Transformative Learning in Doctoral Education" examined doctoral students' experiences and their development as scholars. Through transformative learning theory (Mezirow, 1991), Stevens-Long et al. (2012) focused on the transformative outcomes (cognitive development, personal development, behavioral development) of doctoral study and transformative learning experiences (learning process, interpersonal relationships, and curricular content/structure); this included "world contexts" and "socioemotional states" (p. 187). The doctoral program they examined was multi-disciplinary and focused on self-study. Particularly relevant in the present context is that students knew the program involved self-directed study and was multi-disciplinary.

A compelling element of the study was the researchers' take on what might be a "disorienting dilemma" for doctoral students in such a program. As they stated, "students shape their studies in consultation with faculty mentors. This demand may create a disorienting dilemma as those in authority are not telling students what to do but inviting them to decide for themselves" (p. 191). Further, another key insight from the study related to "whole-person learning" and Mezirow's emphasis on "discourse and dialogue."

Discourse and dialogue, identified by Mezirow as central to a transformative learning experience, are represented through items such as “community support, faculty as colleagues, and bonding with students. These relationships were often described in terms of the affirmation and challenge from faculty mentors and student peers that produced a more holistic and student-centered learning experience” (Stevens-Long et al., 2012, p. 192). This discussion relates to my findings from the interviews regarding students’ desires for community with professors and students, discussions related to student and professor research topics, support in “navigating,” and “knowing what to expect” and “what to do and how to do it.”

7.3.2. Sense of Belonging Theory and Doctoral Students

Strayhorn’s (2019, 2012) research on belonging, largely conducted with marginalized undergraduate and graduate students, urged scholars and programs to examine student experiences closely. Specifying intentional socialization of students from the beginning, Strayhorn’s model called the *Hypothesized enhancement of socialization theory with sense of belonging* (p. 136) operationalizes doctoral students’ meaningful social engagement through academic activities that reflect doctoral students' need for sense of belonging.

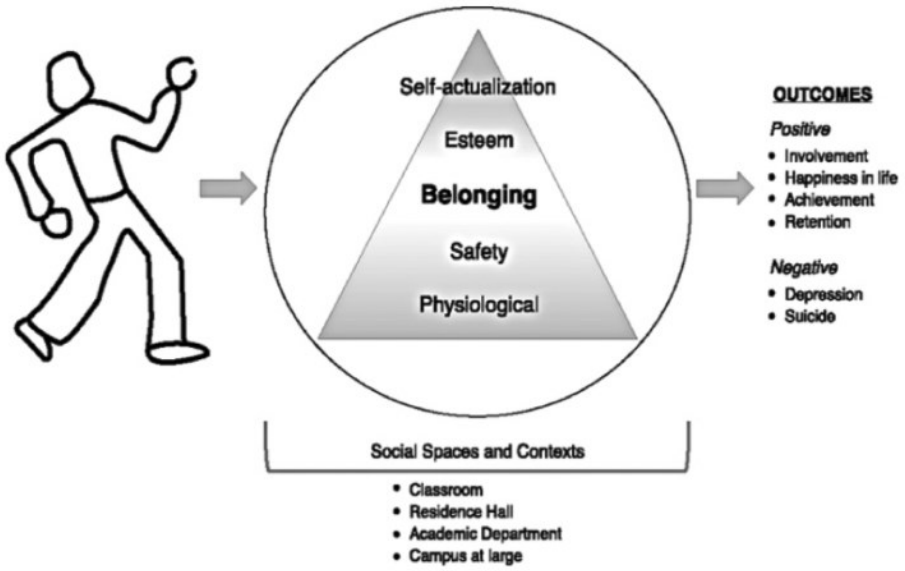

Figure 7.1 Strayhorn’s Hypothesized Model of Sense of Belonging (Strayhorn, 2012, p. 25)

Strayhorn's model (Figure 7.1) is based on the premise that sense of belonging is a need (Maslow, 1943) and what occurs for students when coming into college spaces. He states, their basic needs are "triggered," which "drives their behavior(s) to satisfy those needs. Satisfaction of physiological and safety needs gives way to belongingness needs (in college) and, should they be satisfied, individuals experience esteem and self-actualization needs" (Strayhorn, 2012, p. 125)

In reflecting on Strayhorn's theory, I think there is value in combining the insights provided by the model with an element of student agency and authorship. The extent to which the model places responsibility on graduate programs leaves me wondering how sustainable the model is over time. Strayhorn's model could be expanded to include student leadership and responsibilities through student-led building of communities of belonging for doctoral students within their programs and Faculties. The focus on the potential of the individual in Strayhorn's (2019) latest model of belonging and educational mission (p. 163) has me wondering how it would be enacted by programs, professors, and supervisors, with their competing demands for research, supervision, and teaching. For doctoral students and doctoral programs, I am wondering how pragmatic the model would be in action, given the workload of professors and the relatively small staff of doctoral programs versus undergraduate programs, without student-centred leadership and student-led programming. However, based on the findings at the time of the present study (the data were collected in the Fall of 2020), shared leadership between the Faculty, graduate programs, and doctoral students could possibly create a more sustainable environment for fostering belonging and persistence among doctoral students.

7.3.3. Third Space Theory, Personal Learning Environments, and Defining Space and the Canvas Doctoral Student Connect Site

The idea of a Third Space encapsulates what I believe doctoral students are seeking: a space with deconstructed power relationships and shared leadership. It is a space where power and hierarchy are left to the side, and students can get on with the work at hand, creating and co-creating this space as their needs arise and as they continue to build community within a doctoral student framework. Those new to the space would see the digital footprints of doctoral students who have gone before them, perhaps creating a sort of community of practice or, rather, peripheral situated learning

(Lave and Wenger, 1991), a natural progression and mentorship through other students' experiences and student connections. Doctoral students would move on at graduation, and new students, through orientations, would continue to be invited to join the Canvas *Doctoral Student Connect* site at the beginning of their programs. Newcomers could explore the three modules and any content that was of interest to them at any time during their program. They would find previous or current doctoral experiences in categories, and they could add their own in the Gallery of Student Experiences, the "third room" (module). In the Gallery of Student Experiences, students would find themselves embedded in the digital artifacts of those who have come before. They would have the ability to select videos, texts, and audio of other students' experiences related to that category. The potential of this virtual community, which provides interactions with student stories, is expressed in the "third room." Further, the first module, meeting other PhD students, could be a connection point for students to reach out to one another. The second module, scholarly work, gives ways for students to find and share information, including collaborations on academic work and scholarship activities.

The site could offer opportunities for participation no matter the location or time zone of participating doctoral students. The Third Space platform, the Canvas *Doctoral Student Connect* site, enhances the presence and visibility of everyone on the site. The activities and invitations to connect and collaborate foster community learning. Additionally, there is potential for increased skill building with peer feedback and discussions, thereby creating opportunities to understand where people are from, their topics of interest, barriers, challenges, and celebrations throughout the work. This could create a diverse community where peer support and increased understanding of other doctoral students in the Faculty would emerge, thereby forming pockets of community and belonging:

> Third space accounts seek to make visible the overlapping, interwoven and hybrid nature of social learning and literacy. Fundamentally, third spaces are hybrid spaces where diversity is celebrated (Guitierrez et al., 2009, p. 287).

Doctoral students participating in this study unanimously embraced the idea of the Canvas *Doctoral Student Connect* site. A pilot of this site with doctoral students and an evaluation would be required to assess the feasibility of the site, its use in real time,

and the benefits to doctoral student belonging, persistence, and retention, which would be expected to reduce attrition.

7.4. Future Work

An important question arises for educators, institutions, and students: How can we design and co-create academic online learning environments as socially constructed, where academia is a focus within a context of belonging? Such environments should include program planning, social-academic spaces, and social-academic connections that are accessible, with a focus on integrating social connections with academic work and resources. Would the LMS effectively serve as an inclusive site of community and belonging for students? The design and use of these online environments could be tested and evaluated – providing more insight into doctoral students' experiences of belonging. Future work could explore what happens to the LMS when it is designed as a connection site. Do students naturally take over the leadership of this site? How active would students be? Would it serve as just another repository of information, or would students create communities on the LMS and share experiences that are readily available for students new to the site?

Barnacle and Cuthbert (2021), editors, whose authors examine how the PhD might look in the future, engage in the argument of reviewing the historical requirements of a PhD in light of a changing and global world. COVID-19 gave Faculties and institutions opportunities to be innovative and use online platforms. Also, insight and illumination on the impacts of isolation and graduate school requirements on mental health. Through technology, increased global communities and connections, beckons conversations as we are grappling with can education happen as it always has, and/or what could we learn and know moving into the future of higher education? Increased collaborations globally could change how research and PhD programs are configured. Evaluating PhD programs and their relevance to the economic, social, and political landscapes of Canada and internationally is prudent given the balance of the future of education, demands and trends of fields of study, and employment rates for PhDs.

A lingering question is how do universities with PhD programs view attrition? Is it expected, planned for, and higher in some programs than others? Does it matter to universities why doctoral students leave their programs? Do PhD programs and PhD

degree granting institutions care to know why and what happens to them after they exit a program? Do they go on to another institution? Do they stop out all together. Implementing exit surveys for every PhD student, including those that take a break and have not returned, would provide insight into barriers and successes of PhD programs related to the doctoral student experience.

The findings support a pilot of a Canvas *Doctoral Student Connect* site and an evaluation of its potential as a place of belonging and community for doctoral students. The pilot would build on McAlpine and Amundsen's (2011) view of broadening networks for doctoral students through connections with peers, attendance at conferences, and other activities across the college and institution. Through these experiences, doctoral students build networks and opportunities for collaboration in discussion and/or their academic work. Additionally, I believe if the LMS is to be a community platform, rather than a teacher-learner platform, students should take the lead to facilitate, generate content, learn from each other, and share their experiences through their questions and formation of study groups, conference proposal writing, etc. In this way they will take a social constructivist approach to build a learning community of doctoral students that has the potential to spill over to professional practice, depending on student interests. Having doctoral students co-creating and contributing to the *Doctoral Student Connect* site would promote flexibility in design and content to stay relevant to doctoral students' social-academic needs, including community and belonging. The value, use, and sustainability of the LMS used in this way would require further research and evaluation.

I was moved and surprised by the depth of emotions that students expressed in relation to their doctoral experiences (whether joy and satisfaction, curiosity and confusion, or anxiety and sadness). Future studies could explore Mezirow's notion of disorienting dilemmas with sensory theory. Intrigued by how experiences in learning and social learning are realized and felt through the senses of doctoral students is another area future research could explore most specifically at certain stages – for example, first year, comprehensive exam, research and writing phase, defense and completion – as they relate to belonging and isolation. This may provide some insights for doctoral students and help them understand their own process. Perhaps findings could be used in orientations to let students know what the journey might look like and suggest ways they can prepare themselves to navigate through disorienting dilemmas.

Doctoral student orientations often occur before the term begins. I propose to share with students the *Doctoral Student Connect* site and send them an LMS email invitation to the Canvas *Doctoral Student Connect* at this time. Each term, as new students are admitted into the program in the Faculty of Education, they would be invited to the Canvas site. LMS analytics would be one way to determine the use of the site. A short survey at the end of each term would indicate how valuable the site was to students, and in what ways. Since the participants in this study were mostly in the research and writing phase of their doctoral work, having two comparison groups would glean data on how doctoral students were feeling, progressing, and the student connection to their academic work, the program, and peers. One comparison group would be those students completing coursework and the comprehensive exam phase; the second comparison group would be those who are post comprehensive exam and, in their research, and writing phase. Through two comparison groups the Faculty could realize differences in use of the site for two main stages of the program. Doctoral student use and need for the Canvas site, and whether the students found the *Doctoral Student Connect* site to meet their social and academic needs with peers. Additionally, through evaluation of the site and the stage of degree progress, important information related to isolation, anxiety, belonging, progression, or feeling stuck, stalled, or hopeless, would be an intervention that programs could use to educate doctoral student on these hills and valleys of the degree progress for them individually, ensure access and awareness to doctoral student supports, and give direction on programming resources and supports for doctoral students.

7.5. Limitations and Constraints

One limitation of this study is the small sample size of the survey. In part, this may have stemmed from ethical constraints on participant recruitment. The Ethics Board made it clear that students should not feel obligated to participate in the research if they knew the researcher. Therefore, all recruitment communications were circulated through administration, rather than by the researcher herself. Given the frequency of email communications from the university, students may not have attended to the invitation as readily as they would have if the invitation had come directly from a fellow student. Fatigue associated with constantly being online during the pandemic, as well as survey fatigue, could also have kept students from participating.

Some participants seemed to struggle with the consent form being part of the survey itself. Often, they hit “done” at the bottom of the survey and could not get back to the actual survey. One student did not understand that all boxes had to be marked (a rank order question) to advance to the next question. In hindsight, the researcher would not require participants to rank every item in those questions, instead having respondents choose their top five from the list. Additionally, considering that not everyone is familiar with electronic surveys (this was just after COVID-19) is a consideration when writing survey instructions for participants. Having more detailed instructions, even if they seem redundant, might be helpful to anyone taking an electronic survey, especially if their experiences with these were limited.

In future studies, I think it is important to focus more intentionally on identities, including gender, parenting/caretaking, international student status, first-year status, and whether one had completed their courses and qualifying exam. The addition of affinity focus groups, to hear the complexities of student lives in community, would aid in realizing how sense of belonging and/or isolation impacts students within communities in different and intersecting ways. International students, women, parents and caregivers expressed greater isolation than other students overall. These latter groups would be a good start to focus groups seeking deeper understanding of their contexts and experiences.

Despite it being published over 20 years ago, the findings on self-blame from Lovitts’ (2001) study questions were echoed in the present study. Self-blame can be connected to stress, anxiety, and despair because students blame themselves for not completing their degrees. In correspondence with Dr. Lovitts (personal communication, January 4, 2022), she suggested that future studies reword the question from her study (2001), which was “Who are you likely to blame if you do not finish your PhD?” (responses were myself and the institution). She thought, and I agreed, that deeper and more usable information would be gleaned by the question if worded as follows: “If you did not complete your program requirements and complete your Ph.D., who would you consider most responsible?” This could include the following answer choices: yourself, your advisor, your committee, your program, or your department, along with an “other” option so participants could include other possibilities. By changing this question, researchers would gain “a more refined understanding of the attribution of cause/level of institutional responsibility” (B. Lovitts, personal communication, January 4, 2022).

Through reframing the language, we might learn more about what happens to students psychologically through their doctoral student progress, which includes degrees of both success and failure.

The “disorienting dilemma” that is part of transformative learning has been lingering in my mind as I have conducted this study. It is important to note that while first-year students and international students were perceived by study participants to be the most vulnerable groups with respect to isolation, most of the participants in this study were past the comprehensive exam phase of their studies and pursuing their individual research. The doctoral student journey clearly brings needs for belonging and support at every stage, and not just the beginning.

Finally, to have a fuller picture and a balanced view, doctoral supervisors would need to be included in future research to explore their experiences, barriers, and challenges when supervising doctoral students. Such a study would inquire into the support that professors may need in their roles as supervisors, researchers, and professors. The care required for doctoral supervisors to sustain the level of support students were hoping for in the findings is a question that requires further study. In the vein of belonging, focus groups could be conducted with those who supervise students and PhD student alumni. To eliminate potential anxiety and/or risks some might feel, the focus groups could involve alumni and supervisors from across programs, or alumni and supervisors who were retired. A combined discourse about supervisor/supervisee relationships might inform programs about how to structure, program, and implement best practices for both PhD students and their supervisors.

7.6. Research During COVID-19

I can see as an educator the impacts that the extended period of exclusively online study during COVID-19 has had on students. What I have observed is that traditional settings and modes of education may be somewhat outdated and not meeting student needs. Or it may take time for students to ease back into social relations with one another and with faculty in face-to-face settings. I am reflecting on this as my study occurred during the pandemic, and I believe that the pandemic was itself a “disorienting dilemma” for doctoral students. For most students, COVID-19 limited their sense of belonging. I suspect that in some ways, for doctoral students, their self-agency, their part

in creating their experiences as doctoral students, may have been limited by the pandemic. We have the opportunity, going forward from this event, to meet students' needs for belonging and engagement in academic activities with each other, with professors, and with the institution.

7.7. Implications of the Study for Faculties

My study also suggests that faculties could think deliberately and intentionally about the role of socialization in the process of belonging. At the university where this study was carried out, socialization activities such as orientations and faculty speaker series were important to the sense of belonging for students who attended them. Study participants who attended and found these types of activities were ways to connect and feel belonging suggested finding ways to incentivize or make mandatory for PhD students these types of events. The following are actionable insights from the study:

- Recognize that orienting students to navigate the doctoral student experience requires more than one orientation event.
- University-organized activities and employment opportunities would better engage doctoral students towards participation and foster a sense of connection with programs and the institution.
- Supervisors are the superstars for the doctoral student: Consistent connection makes a difference.
- Consistent frequency of contact from supervisors should be built in and should not be something that students must take the initiative to ask for.
- Existing LMS systems can be repurposed to support a much-needed sense of belonging for doctoral students.
- Programs should use the Doctoral Student Connectedness Scale, which measures belonging for doctoral students in their research and writing phase (Terrell, Dringus et al., 2009), in both the pre-comprehensive exams (courses) phase and after the comprehensive phase.

Though originally developed for online learning, the modified DSCS scale used in this study of doctoral students was informative and had high reliability. This simple quantitative instrument could give programs specific insight into where students are excelling and where they are struggling regarding their relationships with their program scholarship activities and peers.

7.8. Implications for institutional and program policy: Okanagan Charter Centres Health and Well-Being

Movements like the Okanagan Charter (2015) create higher education collaborations towards the same vision internationally. Part of this vision is, “social well-being” as interdependent with the well-being of people, places, and the planet” (p. 4). The charter as an active part of a campus, provides spaces for students to voice and participate in programs and policies, that highlight wellness and embody belonging in campus departments. The Okanagan Charter gives collaborative opportunities in exchanging ideas and learning from other charter campuses.

Well-being is defined by the World Health Organization:

> “To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment” (WHO, 1986, p. 1 as cited in Squires & London, 2021, p. 101).

Sense of belonging (community, connectedness) is a crucial “social determinant of well-being” (Haim-Litevsky, et al., 2023) and is necessary to student well-being. In the study by Squires and London (2021) included a “lack of visibility of the work” and supporting students beyond “student services to classroom experiences” (p. 10); going beyond what services campuses offer to the student experience is a need in order to make something that may seem invisible, isolation, visible and triaged through sense of belonging and the student experience.

A review of policies through the framework of the Okanagan Charter, with the intention of sense of belonging as part of social well-being may bring to the attention of programs, areas of campus that are siloed either by location, or lack of outreach.

Building an advisory group (p. 111), focused on student well-being combining students and alumni or professors, could prove fruitful in program admissions policies, educational leave policies, as well as doctoral student supervisor/apprenticeship roles and responsibilities, and student expectations. Well-being through the lens of belonging could support procedures and student experiences related to milestones in a program, e.g., the comprehensive exam, the research proposal, ethics acceptance, conducting and writing research policies

Recommendations from Haim-Litevsky, et al. (2023), e.g., building an advisory group, using a systems approach to implementing the Okanagan Charter, and engaging and collaborating with those outside of campus, like “national and international healthy campus networks to share evidence-based strategies and collectively advance well-being coming out of a global pandemic” (p. 111).

The Okanagan Charter, as an internationally recognized charter, nestled in the context of higher education, would be a fitting place to centre the work of doctoral student belonging and retention.

7.8.1. The Okanagan Charter, Doctoral Students and Signaling

As an international charter, adopted by many institutions, there are aspects of the charter vision, which create dialogue and the opportunity to learn from other institutions and programs. In learning about students and what they notice on the horizon and in lived experiences at our institutions, relates to how we signal to them that they are welcomed and wanted.

Through this research and reflecting on the Okanagan Charter, poses questions, e.g., how can Faculties embrace the vision and call to action of the Okanagan Charter? What are other Faculties at other institutions doing? What can we learn from struggling doctoral students about promoting healthy spaces for doctoral students to thrive? On a macro level, within our own institutions, where are the touchpoints, the places, the activities for collaboration to explore well-being for doctoral students? At the micro level, what can we as a Faculty, and a program within our Faculty, do to signal to students’ information related to doctoral student processes, online accessibility, the support resources that exist, and how to locate them; and opportunities for community and engagement related to academic activities. Reflecting on McAlpine and Amundsen’s work (2011, 2016), it seems important to give students opportunities to expand their academic networks and avenues for collaboration. The identity trajectory McAlpine and Amundsen (2016) talk about recognizes that doctoral students are developing their own identity as academics. Broadened networks give them opportunities to negotiate and navigate relationships and collaborations within an academic setting/field.

In a vein of collaboration, between program and student - what can PhD students author themselves through their own initiatives if given a framework, such as the *Doctoral Student Connect* site? Is new student orientation a good place to start to invite students and get them into a space with a built-in community and ways to interact and learn if they want it?

The Okanagan Charter would be a relevant frame to study doctoral students' view of campus culture and supports related to the Charter's call to action of promoting health and well-being on charter affiliated campuses.

7.9. Internal Policies and Procedures

Students had questions about accountability and supervisors, consistent standards for supervision, equity in student experience with supervision, and what they could expect from this important mode of mentorship. This is something that could be revisited within programs and Faculties. For instance, if universities have guidelines in place for supervisors and doctoral students, such as an agreement or learning contract, are those being utilized consistently? A learning contract that sets out expectations could serve as a catalyst for a conversation between supervisor and student, so both know what is expected of them and what to expect from one another.

Should policies and procedures be revisited for doctoral programs that include shared responsibility for communication on the part of the supervisor and the student? Is there the possibility of paid graduate students in employee positions assisting to organize student events, student and professor mixers, a volunteer mentoring program, or is the capacity not there during times of low enrollments and budget issues, and some universities still recovering from the pandemic?

7.10. Closing thoughts and suggestions for further study of the LMS

The Third Space, in this context, is betwixt and between the solely academic and the solely social. Oldenburg and Brisset (1982) have described a space which engages people with the opportunity to experience distinctiveness and wholeness (p. 266). The distinctiveness, in this case, is recognizing that sense of belonging matters for doctoral

students. With that, providing an intentional space to connect with their peers. In a designated online hub with peers, a by-product could be that some of their questions could be answered by one another. As experiences are shared, doctoral students could become resources for each other. In Third Spaces, students can be academic scholars, socializing with other academic scholars. The possibility exists for encouragement to arise organically, as students are empowered through learning and receiving guidance from each other and engaging in new experiences with a community of peers.

Third spaces can also be spaces in which to pursue social justice by challenging oppressions and seeking equity (Bhabha, 1994). Historically, the Third Space was a place where marginalized students gathered and challenged the perceptions of the colonizer and the colonized; it offered a place to work through oppressive systems and experiences. Such a space could offset what might feel oppressive and isolating. Through having a Third Space, Doctoral students may find similar ways to connect with one another, realizing that they are not the only ones, minimizing isolation and pluralistic ignorance while working through their own experiences of perceived oppressive structures, or experiences. Processing in community may ease anxiety and support students to a better place of coping and resilience.

Indeed, the Third Space for doctoral students (digital or in-person) could be whatever the students themselves created it to be to meet their needs for socio-academic connections and discourse around research. It would afford the opportunity to equalize power and reduce isms found in social norms. By challenging those norms, they could create for themselves their own space of academic, individual, and scholarly identity. The use of educational technologies like the LMS opens more territories to be explored, especially since the disruption of the pandemic. This study informs the reimagining of ways to utilize the LMS for purposes beyond a repository for course materials and processes. As Strayhorn indicates, “socialization begets sense of belonging” (2012, p.98) for graduate students, and in turn, “sense of belonging begets success” (2012, p. 99). The LMS can be reimagined into a Third Space of belonging.

At a Faculty Forum, I was in a breakout room with my supervisor’s wife, and she said that in her PhD program they had a picture of a hill on a whiteboard in a public place, and students used to add stick figures of themselves when they passed their comprehensive exams or other milestones, as a way of showcasing accomplishment

(Faculty Forum, February, 2021, personal communication). Students could realize their community, congratulate one another, see that they were progressing, and celebrate that progression as they moved to the next level. From small visuals to programming orientations and follow-up information sessions to program events and peer mentors, there are countless opportunities to imagine well-being related to belonging, living, studying, and working in physical and virtual communities that encourage, celebrate, and spur doctoral students on.

Due to COVID-19, in education, we have experienced and observed more virtual global collaborations than before the 2020 pandemic. In the book, *The PhD at the End of the World*, editors Barnacle and Cuthbert (2021) explain that the book is based on the work of Latour, who believes the PhD research needs to transform to global collaboration to tackle climate change and global problems (p. 1). McAlpine (2021), another highlighted scholar in the book whose work has informed the present study, also envisions a PhD working collaboratively across disciplines and active in addressing climate change and "other kinds of social change." The composition of collaboration and teams would evolve with a shared focus, McAlpine (2021) states, "thinking globally" and "acting locally" (p. 95). These types of collaborations would create communities of collaboration and belonging.

We must consider belonging, the well-being of students and health promotion as part of healthy campuses. Perhaps going back to Maslow's hierarchy of needs where sense of belonging is a stated need - building on fundamentals of belonging, a foundation of health and well-being, we can identify best practices of belonging and well-being. If belonging and well-being as a value of action infiltrates campus cultures, attrition rates will naturally decline, as PhD students find those places of resource, well-being, rejuvenation, support, and celebration in our Faculties and programs. And considering the above, collaboration on the most pressing issues of our time.

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Appendix A.

Survey Instrument

Phase 1 Survey as Submitted and Approved by the Ethics Committee

Information and Consent

Thank you for agreeing to participate in this survey of doctoral students' experiences of belonging in their graduate studies. Your responses are particularly important at this time because of the Covid-19 pandemic and the on-campus shutdown of the university. You will notice that some parts of the survey will ask you to differentiate your responses *before* and *after* the Covid-19 shutdown.

This study is being conducted as part of my doctoral research in the Faculty, under the supervision of Dr. Wanda Cassidy, Dr. Kevin O'Neill, and Dr. Suzanne Smythe.

The survey takes approximately 20-25 minutes to complete and consists of mainly closed-ended questions with a few open-ended questions. Survey responses are anonymous, and your identity will not be revealed in any way. By responding to the questions in this survey, you are volunteering to participate in this survey, and granting me permission to collect and use the data for research purposes. You have the right to withdraw your participation in this research at any time.

The survey is adapted, with permission, from the works of Faucher, Jackson, and Cassidy (2014), Latour (2020), Lovitts (2001), Nettles and Millett (2006), and Terrell, Snyder, and Dringus (2009).

If you have any questions regarding this survey or the study, please contact: Christina Van Wingerden (Principal Investigator): [principal investigator's email], [principal investigator's phone number}. If you have any concerns about this research, please contact the [University] Office of Research at [office of research's email address]. For an inquiry related to conflict of interest (COI) or an adverse event related to completing this survey, please contact [professor responsible for COI/adverse events] at [professor's email address]. If you wish a summary of the survey results, please contact the principal investigator upon completion of the study in Spring 2021.

This survey is being delivered using SurveyMonkey, a [university] secure survey tool.
Thank you in advance for your participation.

☐ I consent to the Survey

PART A: BACKGROUND INFORMATION

This information is collected to assess whether there are commonalities and/or differences in students' experiences due to their program stage, living situation, and/or background characteristics.

Instructions: Please select the BEST response for each of the following questions.

1. I am:

___An International student
___A Domestic student
___Prefer not to answer

2. I identify as:
___Female
___Male
___Non-binary
___Prefer not to answer

3. My age is:

____Under 30
____30 to 39
____40 to 49
____50 to 59
____60 or older
____Prefer not to answer

4. I identify with the following racial/ethnic group(s). (Please check **ALL** that apply)

___Indigenous/Aboriginal (First Nations, Inuit, Metis)
___African/Caribbean (Black)
___East Asian (Chinese, Japanese, Korean, Taiwanese)
___Southeast Asian (Laotian, Cambodian, Filipino, Thai, Vietnamese)
___South Asian (Bangladeshi, Indian, Indo-Canadian, Pakistani, Sri Lankan)
___Caucasian (White, European, United Kingdom)
___Latin or South American (including Mexican)
___Middle Eastern (Arab, Iranian, Iraqi, Afghani, Kuwaiti, Persian, Turkish, Israeli, Palestinian, etc.)
___Other (please specify):_____
___Prefer not to answer

5. How long have you lived in Canada?

___I was born in Canada
___5 years or longer
___2 - 4 years
___1 – 2 years
___less than 1 year
___I don't live in Canada

6. What is your first language?_____

7. I am enrolled in the following doctoral program in the Faculty of Education. (Choose **ONE**)

___Arts Education
___Educational Psychology
___Educational Technology and Learning Design
___Educational Theory and Practice (eTap)
___Languages, Cultures and Literacies
___Langues, Cultures et Littératies (en Français)
___Mathematics Education
___Other (please specify)_____

8. How long have you been a doctoral student in the Faculty of Education? (Choose **ONE**)

___I am in my first year
___I am in my second year
___I am in my third year
___I am in my fourth year
___I have been enrolled for longer than four years

9. What phase of your doctoral studies best describes your progress to date? (Choose **ONE**)

___ I am completing my required coursework.
___ I have completed my course work and am preparing for my comprehensive exam.
___ I have completed my course work and comprehensive exam.
___ I am doing research and writing my dissertation.

10. Based on where I am in my doctoral studies, from my own perspective, I believe I am making: (Choose **ONE**)

____Good progress
____Slower progress than expected
____My progress is stalled

11. Have you ever taken a break of one semester or more from your doctoral studies?

___ No
___ Yes

11 a. If yes, for what reason(s)? (Choose **ALL** that apply)

___Financial reasons
___Family obligations
___Health reasons
___Work commitments
___I was not happy with my doctoral program
___I felt lonely and isolated in my doctoral program
___Covid-19 Compassionate Leave (for self or to care for another)
___Other [Please specify] _____

12. The following statement **BEST** describes my living situation ***before*** the Covid-19 shutdown:

____I live on campus by myself
____I live on campus with one or more people
____I live off campus by myself
____I live off campus with one or more people

13. The following statement **BEST** describes my living situation ***after*** the Covid-19 shutdown:

____I live on campus by myself
____I live on campus with one or more people
____I live off campus by myself
____I live off campus with one or more people
____I moved in with family
____I left the [university] campus areas and returned to live in my home community
____Other (please specify) _____

PART B: STUDENT PEER CONNECTEDNESS

Questions 14 through 23 are adapted from *The Doctoral Student Finances, Experiences, Achievements, Section B-3 with permission (Nettles & Millett, 2006).*
These questions address your feelings of connectedness to your peers, often expressed as a sense of belonging and inclusion in the group.
Instructions: Choose the response listed below each question that **BEST** reflects your agreement or disagreement with each of the following statements.
In my doctoral studies…

Statements…	**Strongly Disagree**	**Disagree**	**Neither Disagree/ Agree**	**Agree**	**Strongly Agree**
14. It is up to students to connect with each other	1.	2.	3.	4.	5.
15. 1 feel like I belong with other students	1.	2.	3.	4.	5.
16. I feel isolated from other students	1.	2.	3.	4.	5.
17. I turn to other students for social support	1.	2.	3.	4.	5.
18. I turn to other students for emotional support	1.	2.	3.	4.	5.
19. I turn to other students for academic support	1.	2.	3.	4.	5.
20. I can easily	1.	2.	3.	4.	5.

communicate with other students					
21. There is a strong sense of community (or connectedness) among students	1.	2.	3.	4.	5.
22. Having a sense of belonging with my doctoral peers is important to me	1.	2.	3.	4.	5.
23. I believe my identity(ies) (e.g. gender, race, ethnicity, disability, sexuality, nationality, etc.) has influenced others towards me and has impacted my sense of belonging/and or isolation during my doctoral journey.	1.	2.	3.	4.	5.

23a. Please elaborate on your answer to Q 23 above.

PART C. ENGAGEMENT IN [UNIVERSITY] ACTIVITIES WITH PEERS

Questions 24 through Question 39 are adapted from *part b, Your doctoral experience (Doctoral Student Finances, Experiences, Achievements survey, Nettles & Millett, 2006).*

Instructions: Since the start of the academic year, **September 2019,** How often have you participated in the following with other doctoral students? Some statements ask for your response ***before*** and ***after*** the [university] Covid-19 shutdown on March 13th. (Choose the **BEST** answer for each question)

Before Covid-19 shutdown: **Statements**…	**Never**	**Seldom**	**Sometimes**	**Often**	**Very Often**
24. Participated in an ***in-person*** student organized study group outside of class	☐	☐	☐	☐	☐
25. Participated in an ***online*** student organized study group outside of class	☐	☐	☐	☐	☐
Participated in a faculty or program-sponsored ***in-person*** social activity outside of class time	☐	☐	☐	☐	☐
27. Participated in an academic workshop or presentation at [the university] outside of class time	☐	☐	☐	☐	☐
28. Discussed academic issues ***in person*** outside the classroom with other doctoral students	☐	☐	☐	☐	☐
29. Discussed academic issues ***online*** outside the classroom with other doctoral students	☐	☐	☐	☐	☐
30. Sought and received feedback from other doctoral students about my academic work ***in person or online***	☐	☐	☐	☐	☐
31. Socialized informally with other doctoral students outside of class ***on campus***	☐	☐	☐	☐	☐
32. Socialized informally with other doctoral students outside of class ***off campus***	☐	☐	☐	☐	☐
33. Discussed your career plans and ambitions ***in person or online*** with other doctoral students	☐	☐	☐	☐	☐

After Covid-19 shutdown… **Statements**…	**Never**	**Seldom**	**Sometimes**	**Often**	**Very Often**
34. Participated in an ***online*** student-organized study group outside of class	☐	☐	☐	☐	☐
35. Participate in an ***online*** academic workshop or presentation at [university] outside of class time	☐	☐	☐	☐	☐

36. Discussed academic issues ***online*** outside the classroom with other doctoral students	☐	☐	☐	☐	☐
37. Sought and received feedback from other doctoral students about my academic work ***in person or online***	☐	☐	☐	☐	☐
38. Socialized informally with other doctoral students ***online***	☐	☐	☐	☐	☐
39. Discussed your career plans and ambitions ***online*** with other doctoral students	☐	☐	☐	☐	☐

PART D: ENGAGEMENT WITH [UNIVERSITY] ACTIVITIES

Instructions: Please answer the following questions. Choose all answers that apply.

40. Which [university] activities have you participated in:

(Mark **ALL** that apply) [Reviewers, doctoral committee - this whole questionnaire is electronic/online, so "marking" or "ticking" is handled in the electronic construction of the document - no worries there, participants will be able to "Mark ALL that apply"]

a. Writing retreats
b. Grant writing workshops
c. RAships
d. TAships
e. TMships
f. Graduate Students Association meetings
g. Graduate student clubs
h. International students office events and activities
i. Student organized reading/study groups
j. Faculty organized reading study groups
k. Other [_____]
l. I have not participated in [university] activities outside my coursework [note: if this is selected respondent moves to Q 41]

40a. Participating in [university] activities contributed to (Mark **ALL** that apply):

1. Feeling connected to the institution
2. Feeling like I'm part of a community
3. Feeling connected to my doctoral student peers
4. Feeling a sense of community within my department
5. All of the above
6. None of the above
7. Other [please specify]

41. Do you socialize with doctoral students outside your program area?

a. yes
b. no

41a. If yes, do these peer connections improve your sense of belonging at [the university]]?
Yes
No
Please explain your answer

41b. If no, would you like to connect with other doctoral students outside your program area?
Yes
No
Please explain your answer

PART E. ATTITUDES TOWARDS PROGRAM COMPLETION

The following question (42) is adapted from *Lovitts (2001, pp. 31, 129).*
42. Who are you likely to blame if you do not complete your program requirements and obtain a PhD?

Choice**(s)**	**Strongly Disagree**	**Disagree**	**Neither Agree/Disagree**	**Agree**	**Strongly Agree**
Myself	1.	2.	3.	4.	5.
The Institution	1.	2.	3.	4.	5.

42a. Please elaborate.

Instructions:
If you are doing course work and/or preparing for your comp exam, go to PART F, and skip PART G.
If you passed your comp exam and are working on your dissertation, skip PART F, and go to PART G.

PART F: STUDENT CONNECTEDNESS IN COURSE WORK/COMP EXAM

(For those who are completing coursework and/or preparing for the comprehensive exam.)
[Questions 43 through Question 55, adapted from *The Doctoral Student Connectedness Scale - Terrell, Snyder, & Dringus, 2009]*
Instructions: Choose the response that **BEST** reflects your agreement or disagreement with each of the following statements.
In my program …

Statements…	**Strongly Disagree**	**Disagree**	**Neither Disagree/Agree**	**Agree**	**Strongly Agree**
43. I feel that students care about each other	1.	2.	3.	4.	5.
44. I feel that I am	1.	2.	3.	4.	5.

encouraged to ask questions to the faculty members					
45. I feel connected to other students	1.	2.	3.	4.	5.
46. I feel like I can easily communicate with other students	1.	2.	3.	4.	5.
47. When I ask questions or submit work, I feel like I get timely feedback from the faculty members	1.	2.	3.	4.	5.
48. I communicate with my faculty ProTem or Supervisor on a regular basis	1.	2.	3.	4.	5.
49. I feel that fellow students are like a family	1.	2.	3.	4.	5.
50. I communicate regularly with other students in my program	1.	2.	3.	4.	5.
51. I feel like I can trust other students in my program	1.	2.	3.	4.	5.
52. I feel the faculty provide me with sufficient academic support	1.	2.	3.	4.	5.

53. I feel the feedback I receive from faculty members is valuable	1.	2.	3.	4.	5.
54. I feel a spirit of community between other students and myself	1.	2.	3.	4.	5.
55. I feel that I can trust faculty members to follow through on commitments, keep confidences, treat me with respect, and help me learn	1.	2.	3.	4.	5.

56. Is there anything else you would want to tell us about feelings of isolation or belonging, in relation to your peers? Please elaborate.

57. Is there anything else you would like to share about your experiences during this phase of your graduate work? Please elaborate.

PART G: STUDENT CONNECTEDNESS IN DISSERTATION PROCESS

(This Part is for those who have passed the comp exam and are working on their research/ dissertation.) [Questions 58 through Question 74, adapted from *The Doctoral Student Connectedness Scale from* - Terrell, Snyder, & Dringus, 2009]

Instructions: Choose the response that **BEST** reflects your agreement or disagreement with each of the following statements.

While I am working on my dissertation…

Statements…	**Strongly Disagree**	**Disagree**	**Neither Agree/Disagree**	**Agree**	**Strongly Agree**
58. I feel that students care about each other	1.	2.	3.	4.	5.

59. I feel encouraged to ask my Supervisor questions	1.	2.	3.	4.	5.
60. I feel connected to other students working on their dissertation	1.	2.	3.	4.	5.
61. I feel a spirit of community between my committee members and myself	1.	2.	3.	4.	5.
62. I feel like I can easily communicate with other students about my dissertation	1.	2.	3.	4.	5.
63. When I ask questions or submit work to my Supervisor, I feel like I receive timely feedback	1.	2.	3.	4.	5.
64. I communicate with my Supervisor on a regular basis	1.	2.	3.	4.	5.
65. I feel that my peers working on their dissertation are like a family	1.	2.	3.	4.	5.
66. I communicate regularly with other students who are	1.	2.	3.	4.	5.

working on their dissertation					
67. I feel I can trust other students who are working on their dissertation	1.	2.	3.	4.	5.
68. I feel that the feedback I receive from my Supervisor is valuable	1.	2.	3.	4.	5.
69. I feel a spirit of community between other students and myself	1.	2.	3.	4.	5.
70. I feel confident that my committee will support me academically	1.	2.	3.	4.	5.
71. I feel like I can rely on other students who are working on their dissertation for academic support	1.	2.	3.	4.	5.
72. I feel I can rely on other students who are working on their dissertation for social/emotional support	1.	2.	3.	4.	5.
73. I feel I can trust my Supervisor and Committee members to follow through on	1.	2.	3.	4.	5.

commitments, keep confidences, treat me with respect, and help me learn					
74. I feel like I can easily communicate with my Supervisor	1.	2.	3.	4.	5.

75. Is there anything else you would want to tell us about feelings of isolation or belonging, in relation to your peers? Please elaborate.

76. Is there anything else you would like to share about your experiences during the dissertation phase of your graduate work? Please elaborate.

PART H: TECHNOLOGY USE AND PEER CONNECTEDNESS

Instructions: Please answer the following questions related to your technology use. Some of the questions ask for your responses ***before* and *after*** the Covid-19 shutdown.

77. Please **RANK the top five** most common methods you used ***before* the Covid-19** shutdown to stay socially connected with your doctoral peers. (1=most common; 2= second most common; 3=third most common, 4=fourth most common, 5=fifth most common)
___Face to face
___Social media chat
___[University] email
___Mobile phone (texting, phone calls)
___[University] Canvas course(s) email or chat
___Facebook
___Instagram
___WhatsApp
___Twitter
___Pinterest
___LinkedIn
___Other (please specify)_____(add text box)

78. Please **RANK the top five** most common methods you used ***after* Covid-19** shutdown? (1=most common; 2=second most common; 3=third most common; 4=fourth most common; and 5=fifth most common)
___Face to face
___Social media chat
___[University] email
___Mobile phone (texting, phone calls)
___[University] Canvas course(s) email or chat
___Facebook
___Instagram

___WhatsApp
___Twitter
___Pinterest
___Linked In
___Other (please specify)_____(add text box)

Please choose the best answer to the following questions ***before Covid-19 shutdown***

Question	Not Likely	Likely	Very Likely
79. To what extent did faculty use Canvas to communicate with you?	1.	2.	3.
80. How likely were you to pay attention to Canvas notifications?	1.	2.	3.

Please choose the best answer to the following questions ***after Covid-19 shutdown***

Question	**Not Likely**	**Likely**	**Very Likely**
81. To what extent do faculty use Canvas to communicate with you?	1.	2.	3.
82. To what extent do you pay attention to Canvas notifications?	1.	2.	3.

83. How often did you check Canvas for information about your courses or program ***before*** the Covid-19 shutdown?
Less than once a week Once a week Twice a week More than twice a week

84. How often do you check Canvas for information about your courses or program ***after*** the Covid-19 shutdown?

Less than once a week Once a week Twice a week More than twice a week
[circle is sliding scale]
85. Has Canvas been useful to you in your doctoral studies?
a. Yes
b. No
85a. Please elaborate.
85b. What other platforms or modes of communication would you suggest? Please elaborate.

PART I: RECOMMENDATIONS

86. Overall, I experience a sense of belonging in my doctoral studies.

Strongly Disagree Disagree Neither Disagree /Agree Agree Strongly Agree
[circle is sliding scale]
86a. Please elaborate and provide examples, if possible.
87. During the Covid-19 pandemic did you feel ***less or more isolated*** in your doctoral studies?

87a. Please elaborate.

88. What has the Faculty of Education done well to foster a sense of belonging during the Covid-19 shutdown? Please elaborate.

89. What could the Faculty of Education have done better to foster a sense of belonging during the Covid-19 shutdown? Please elaborate.

90. Which Faculty of Education activities suspended during Covid-19 shutdown would you like to see resumed, and which activities would you like to see abandoned? Please elaborate.

91. Is there anything else you would like to say about feeling a sense of belonging or isolation with peers that you have not communicated?

PART J: IN-PERSON INTERVIEW OPTION

92. Would you be interested in participating in a one-on-one online or in-person audio-recorded interview (75 minutes maximum) to share more of your experiences of belonging and/or isolation in your doctoral studies? (ADD a separate survey link here to fill out if they are interested to include the following information)

a. Yes [link to acquire contact information]
b. No

This survey is *not* connected to your responses. Your survey responses are anonymous.

Yes, I would like to participate in an individual interview.
Name:
Email:
Phone:
Best time of day to reach me: ____ morning ___afternoon ____evening
Preferred method of contact: ___phone ___email

Contact for interviews: Christina Van Wingerden [email address] [phone number]
I will be in touch with you to arrange a time.
You will receive a $ gift card for your participation in the interview. Thank you.

Thank you for your participation in the study.

Appendix B.

Interview Questions & Brief Survey Questions regarding Doctoral Student Connect Site LMS Prototype

Zoom Interview Questions

Welcomed participant. Asked a few welcoming questions and check in questions about how they were and time. Introduced myself. Went over consent, though they had already signed, and received verbal consent as well. Individual Interview Questions 75 minutes (face-to-face or Zoom)

a) Please describe what it means to have a sense that you belong in your academic program.
b) Please describe what it means to have a sense that you belong in connection to your peers in your academic program.
c) Please describe any experiences of isolation in your program. Describe what isolation is to you and how it has impacted you.
d) Please describe the influence or lack thereof of your fellow doctoral students on your sense of belonging.
e) Please describe the influence or lack thereof of your fellow doctoral students on your experience of isolation.
f) Please describe experiences in your doctoral journey that have influenced your sense of belonging.
g) Please share experiences which led to feelings of isolation in your program.
h) Please share examples of people who are or have been especially important in influencing your sense of belonging, either positively or negatively, and what did they do?
i) Please describe the importance of your fellow doctoral students on your feelings of isolation or lack thereof.

Reflecting on your experiences and the Covid-19 shutdown, what do you think is needed related to the following questions:

j) How would you minimize isolation for doctoral students?
k) How would you increase belonging for doctoral students?
l) Are there measures you would recommend to assist in helping students feel connected to their student peers and faculty as a result of Covid-19?
m) What makes activities favorable in your opinion and consistent with sense of belonging to student peers and the faculty?
n) What difference can be made through reimagining how doctoral students engage with others in their program in times of social distancing? Would what you reimagine be beneficial for doctoral during times of not social distancing?
o) Anything else you want to share that you want [the university] to know about your doctoral experience and or future desire for experiences?
p) Anything I didn't ask you that you wished I would have asked? Please state the question and your response.

End of face-to-face interview. Have laptop in room open to Mock-Up Design for a Doctoral Student Connect Canvas site. Interviews were on Zoom, use of shared screen for Doctoral Student Connect Canvas site.

Appendix C.

Canvas Doctoral Student Connect Site

Note: For a Zoom interview, if a student chose Zoom over face-to-face, or if the border is still closed and/or shelter in place or social distancing required, I can preview the modules by sharing my screen. I can then give them the link for the survey in the chat function of Zoom.

Transition to laptop; 10 minutes to review three module designs in Canvas

- **Module 1: Meet the Ph.D. Students in the Faculty of Education** [Student Connect org chart model with picture of doctoral students, their program, and, when clicking on the picture, a welcome message and brief sentence or two about their research interests.]
- **Module 2: Exploring Connections in Scholarly Work** [Conferences (different types, who is attending, writing conference proposals); Writing and Research. This is a place where students can connect with each other for writing groups and peer support. This module has resources and ways to connect and get support. A discussion board and blog format for those who want to share questions, experiences, advice.]
- **Module 3: [Gallery of Student Experiences.** Click on picture of student and hear an audio- recorded message of their experiences and advice or tips for success.]

Appendix D.

Survey: Evaluation of Canvas *Doctoral Student Connect* Site

Survey link is embedded within the Mock-Up on the laptop with these questions:

7-10 minutes Embedded Survey Link with the following questions: (Mix of open-ended and multiple choice)

a. What are your thoughts regarding using a Canvas site to connect doctoral students with their peers?

b. To what extent would using one location (Canvas *Doctoral Student Connect*) to connect with other doctoral students concerning attending conferences, writing conference proposals, writing towards publication, and studying for comprehensive exams?

4=a great deal; 3=somewhat; 2=not very much; 1=not at all.

Please explain your response.

c. If the Faculty made such a tool available to you, would you use it?

4=a great deal; 3=somewhat; 2=not very much; 1=not at all.

Please explain your response.

d. Can you think of other ways to connect doctoral students to each other using technology, the web, and social media?

Please explain the possible pros and cons of these suggestions.

e. To what extent would having a Canvas site that connects doctoral peers positively influence your own progress through your doctoral program?

4=a great deal; 3=somewhat; 2=not very much; 1=not at all.

Please explain your response.

f. Would something like this have made a difference for you during Covid-19?

4=a great deal; 3=somewhat;2=not very much; 1=not at all.

Please explain your response.

End of mock-up survey.

Appendix E.

Statistical Tests Definitions

Following are the definitions of the statistical test methods used in this study (Salkind, 20210):

Cronbach Coefficient Alpha – a measure of the internal consistency of items on an instrument when the items are scored as continuous variables (e.g., *strongly agree to strongly disagree*).

Fisher's Exact Test - To compute the exact probability of outcomes in bivariate values, i.e. a 2x2 table. Fisher's is a nonparametric test to analyze data in categories and by ranks. Especially useful in small sample sizes to discover significant associations or not.

Pearson Correlation Coefficient - A numerical index that reflects the relationship between two variables, specifically how the value of one variable changes when the value of the other variable changes. Useful for discovering statistically significant correlations between two variable groups or not.

Appendix E.

Ethics Approval

SFU RESEARCH ETHICS

Minimal Risk Approval – Delegated

Study Number: 2020s0265
Study Title: Title of Study: Doctoral students' peer belonging in a world of social distance and isolation: Identifying needs and perceptions of Canvas as a Third Space for social/academic community - Covid19

Approval Date: July 28, 2020
Principal Investigator: Van Wingerden, Christina
SFU Position: Graduate Student

Expiry Date: July 28, 2021
Supervisor: Cassidy, Wanda
Faculty/Department: Educational Technology and Learning Design

SFU Collaborator: N/A
External Collaborator: N/A
Research Personnel: N/A
Project Leader: N/A

Funding Source: N/A
Funding Title: N/A

Document(s) Approved in this Application:

- Study Detail, version 4 dated 2020, July 24
- Consent Form – Interview, version 3 dated 2020, July 27
- Consent Form – Survey, version 2 dated 2020, July 16
- Consent Form – Workshop, version 4 dated 2020, July 27
- Interview Questions, version 1 dated 2020, July 7
- Email to students, version 2 dated 2020, July 24
- Recruitment Poster, version 3 dated 2020, July 27
- Survey, version 1 dated 2020, June 28
- TCPS2 Certificate – Christina Van Wingerden, uploaded 2020, July 7

The application for ethical review and the document(s) listed above have been reviewed and the procedures were found to be acceptable on ethical grounds for research involving human participants.

The approval for this Study expires on the **Expiry Date. An annual renewal form must be completed every year prior to the Expiry Date. Failure to submit an annual renewal form will lead to your study being suspended and potentially terminated.** The Board reviews and may amend decisions or subsequent amendments made independently by the authorized delegated reviewer at its regular monthly meeting.

This letter is your official ethics approval documentation for this project. Please keep this document for reference purposes.

This study has been approved by an authorized delegated reviewer.