The Psychological Safety of Healthcare Professional Students in an Online Learning Environment

Janna Knickerbocker

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THE PSYCHOLOGICAL SAFETY OF HEALTHCARE PROFESSIONAL STUDENTS IN AN ONLINE LEARNING ENVIRONMENT

by

Janna Fay Knickerbocker

A Dissertation

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Dedication

I dedicate this first to God in hopes that it will be used to help others. Next, I dedicate this work to my husband in appreciation for enduring my tears and frustrations, celebrating my successes, his countless sacrifices, and his occasional tough love. Finally, I dedicate this to my family and my family of coworkers, past and present, in appreciation for listening to my endless “school drama,” praying for me, and providing me with timely words of encouragement. I will always appreciate everyone's belief in me and generous understanding as I struggled through this degree.
Acknowledgment

This dissertation is the work of many. I wish to thank my participants, who were so thoughtful and articulately shared their stories. Their words made these words possible. I am grateful to my dissertation committee, Dr. Craig Shepherd, Dr. Maria Hubbard, and Dr. Logan Caldwell, for their thoughts and invaluable critiques and guidance. Finally, I extend my greatest thanks to Dr. Andrew Tawfik, my committee chair, who helped me to create a vision for this research and then patiently helped me to make that vision a reality by reading endless versions of this manuscript and pushing me in the correct direction.
Abstract

Psychological safety describes the perception of the consequence of interpersonal risk when interacting. Psychological safety is associated with improved engagement in learning behaviors in work groups and classrooms. However, little is known about the influence of psychological safety in the context of learner-learner interactions during health professional online learning. This qualitative single case study explored the influence of psychological safety on the learner-learner interactions of a cohort of occupational therapy students in an online class. Ten occupational therapy students and the instructor were interviewed about their experience of psychological safety when interacting with peers in an online class, and documents related to learner-learner interactions were collected.

The resulting themes of this study described the feelings associated with different forms of interactions requiring psychological safety: *being vulnerable, fear of being misunderstood, need to protect/protection, and group cohesion.*

Within these themes, this study described the contextual elements associated with online learning in healthcare professions and their impact on psychological safety during learner-learner interactions. Additionally, students reported interactional behaviors associated with psychological safety in online learning. Information from this study expands the knowledge of psychological safety in a new context and confirms the importance of psychological safety during high-stakes learner-learner interactions in an online environment. Information from this study could inform online learning instructors as to what signals psychological safety and suggests ways to build psychological safety into online learning courses.
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CHAPTER ONE: INTRODUCTION

Online learning is rapidly becoming integrated into healthcare professional education providing students with flexibility and a chance to learn from preeminent professors (Emanuel, 2020). Online learning and face-to-face learning show little difference in knowledge and skills outcomes; however, online learning is often associated with social isolation and a lack of deep discussion (Pei & Wu, 2019; Yücel & Usluel, 2016). This lack of deep discussion is compounded by the competitive culture of healthcare professional education, which demonstrates a low tolerance for questioning and erroneous thinking (Siad & Roberts, 2021). This is an unfortunate situation as research strongly supports the need for learner-learner interactions to teach not only foundational information but also to develop critical thinking and professional behaviors necessary for future professional work (Bernard et al., 2009; Cung et al., 2018; Moore, 1989; Uijl et al., 2017). However, studies show that students are often reluctant to participate in online learner-learner interactions that include the risk of sharing ideas, opinions, or knowledge (Cheng & Tsai, 2012; Holley & Oliver, 2010; Kang & Min, 2019). Literature attributes this lack of deep interaction to online learning's unique affordances, such as a lack of social norms and spontaneous discussions (Bolliger & Halupa, 2018; Ridings et al., 2002), issues surrounding the use of technology such as security and text base communication (Macleod et al., 2015), and issues with content and instruction that limit the demand for interaction (Joksimović et al., 2015).

Researchers have looked at conditions that improve interactions, such as the use of small class sizes (Uijl et al., 2017) and the increased presence of the instructor to provide scaffolding (Cung et al., 2018). However, another factor influencing interactions may be the degree to which students perceive the environment as open and supportive of their ideas and opinions.
One way to define this idea is through psychological safety. Edmondson and Lei (2014) defined psychological safety as “the perceptions of the consequences of taking interpersonal risks in a particular context…” (p. 24). When examining team learning behaviors within organizational settings, Edmondson (1999) described psychological safety's constructs as (a) one's willingness to risk and make mistakes, (b) having difficult conversations, (c) helping others, and (d) perception of inclusion in the team. Psychological safety is a metaperceptive concept that has garnered much attention in organizational science literature due to its positive effect on learning behaviors, innovation, collaboration, and engagement (Edmondson, 2019; Edmondson & Lei, 2014; Newman et al., 2017; Wanless, 2016; Wheeler et al., 2020; Zhu et al., 2022). However, psychological safety is a heavily context-dependent construct influenced by aspects of the environment. As a result, psychological safety's affective and behavioral components may appear differently in an online learning environment where the risk and consequences may differ (Edmondson, 1999; Kahn, 1990; Zhang et al., 2010). Additionally, while research supports that psychological safety improves voicing ideas and taking risks during face-to-face and virtual team interactions in organizations, little is known about the precipitating events, contextual elements, or the resultant behaviors associated with psychological safety in the context of online learning (Newman et al., 2017; Zhang et al., 2010). This is an unfortunate gap in healthcare professional education, where psychological safety is important to developing critical thinking, creativity, collaboration skills, and the ability to provide and accept feedback.

This study explores the role of psychological safety during healthcare professional students' learner-learner interactions while participating in online learning. A deeper understanding of psychological safety during online learner-learner interactions and its resultant
behaviors would improve instructors' and designers' understanding of psychological safety's role in encouraging the promotive interactions needed to develop critical thinking skills and professional learning behaviors. Additionally, this information would allow instructors to recognize its presence or make corrections to design or feedback to ensure its presence. It would also expand understanding of a construct in the growing online learning area. This chapter provides an overview of the research study by describing the problem of practice, the purpose of the study, the research questions, and the definitions used to discuss the study and the results.

**Problem of Practice**

Buja (2019) stated that the goal of healthcare professional education is to produce a practitioner that has a “mastery of basic physiology, awareness of best current evidence, skillful patient communication, and shared decision-making” (p. 2). Meeting this goal requires students to interact with peers to learn critical thinking skills and professionalism (Buja, 2019; Dennis et al., 2014). This idea is supported by Garrison (1991), who noted that on the most basic level, critical thinking requires the student to interact with peers and the instructor to create meaning and validate that meaning. Likewise, Bulk et al. (2019) found that developing professional behaviors requires students to interact with patients and collaborate with peers to improve communication skills. The type of interactions needed to promote the development of these skills and behaviors are collectively described as learning behaviors. More specifically, learning behaviors are defined as “an ongoing process of reflection and action, characterized by asking questions, seeking feedback, experimenting, reflecting on results, and discussing errors or unexpected outcomes of actions” (Edmondson, 1999, p.353). However, the online environment presents unique contextual challenges that can make participating in learning behaviors difficult to initiate and sustain. The research described how many factors inherent in knowledge-sharing
teams are absent in an online environment, including geographical proximity, similarity in backgrounds and experience, and nonverbal cues (Jarvenpaa et al., 1998; Khalil et al., 2020; Rogers et al., 2011). These factors further complicate the already present self-censorship and nonparticipation issues that occur during intellectual risk-taking (Bar Tal, 2017; Beghetto et al., 2020; Borup, 2016; Hew et al., 2010).

Another factor in online learning for medical professionals includes the competitive nature of healthcare education and the culture of harassment and autonomy, which further constrain interactions (Nembhard & Edmonson, 2006; Siad & Rabi, 2021). For example, Vogel (2018) noted that 75% of medical students surveyed indicated they had experienced some form of harassment and intimidation. Furthermore, Tsuei et al. (2019) described how medical students feel the need to “continuously assess themselves against what they feel is expected of them by the curriculum, peers, and internal standards” (p. 32). Likewise, during collaboration, a person must be willing to be vulnerable when taking a risk and sharing knowledge (Edmondson, 1999). The lack of social controls, nonverbal communication, and delayed feedback commonly found in online learning may heighten a health professional student's need for self-protective behaviors and limit learning behaviors. Providing a psychologically safe environment may ease fear and anxiety when engaging in learning behaviors and collaboration in online learning, which provides the foundation for developing critical thinking and professional behaviors. Edmondson (1999, 2004) found that psychological safety mitigates the need for self-monitoring and concern for embarrassment, thus promoting a willingness to participate in learning behaviors in the work environment. However, as previously discussed, psychological safety is a context-dependent construct that has not been fully explored in healthcare professional online learning. As a result,
we do not understand psychological safety's influence on learner-learner interactions during online learning, what attributes to psychological safety, or its behavioral effects on interactions.

**Purpose Statement**

The purpose of this qualitative, instrumental, single case study was to explore the role of psychological safety during learner-learner interactions in a healthcare professional education online class. This qualitative case study was done in the context of healthcare professional education, which is described by the World Health Organization (2022) as the education of persons that “provide essential services that promote health, prevent diseases and deliver health care services to individuals, families, and communities based on the primary health care approach.” Additionally, the case was situated in the context of online learning. Online learning was defined as “education being delivered in an online environment through the use of the internet for teaching and learning” and is “not dependent on their [the student's] physical or virtual location” (Singh & Thurman, 2019, p. 302). This single case study was partially bounded by an online occupational therapy course representing healthcare professional education.

Edmondson and Lei (2014) defined psychological safety as “the perceptions of the consequences of taking interpersonal risks in a particular context…” (p. 24). To ensure the presence of psychological safety, this study focused on exploring learner-learner interactions associated with learning behaviors as described by Edmondson (1999): willingness to risk and make mistakes, have difficult conversations, help others, and the perception of inclusion in the team. This study utilized frameworks consisting of constructivism, Moore's Interaction Theory, and psychological safety to conceptualize and direct all aspects of the study. In this conceptual framework, constructivism provided the philosophical lens that drove the choice of research methods and how data was analyzed and interpreted. Moore's Interaction Theory was used to
describe the context. Psychological safety was the construct at the center of the study, surrounded and influenced by the context. The study focused primarily on learner-learner interactions but recognized that the other forms of interactions might influence and overlap the presence of psychological safety during learner-learner interactions.

Research Question

For online healthcare professional students to participate in online learning behaviors needed to develop critical thinking skills and professional behaviors, it is essential that they feel comfortable with risking and making mistakes, feel comfortable having difficult conversations, feel willing to help, and feel included (Edmondson, 1999). One way to understand this feeling of comfort when risking is through the lens of psychological safety. Given that psychological safety plays an integral part in a student’s decision to interact and the content of the interaction during online learning, it is vital to understand the attributes defining the phenomenon and explore how psychological safety influences online interactions. Organizational literature has loosely defined the constructs, contextual influences, and behaviors associated with psychological safety; however, this concept has not been explored in the context of online learning and lacks qualitative descriptions in this setting.

Stake (1995) noted that in qualitative case studies, the study's goal is to understand the issue better. He used “issues as conceptual structure – and issue questions as my primary research questions- in order to force attention to complexity and contextuality” (Stake, 1995, p.16). Stake viewed research questions as flexible while providing context and structure to the case and used research questions to evaluate the collected data. Additionally, a constructivist lens suggested the need for seeking out an individual's perception of the issue within a context, which the researcher then compared to others' perceptions. Hence, this qualitative case study focused on
the following primary issue with sub-questions to further address how psychological safety appeared within the case.

Central Issue:

*How, if at all, does psychological safety influence healthcare professional students’ learner-learner interactions during an online learning course?*

Subquestions:

1. How, if at all, does psychological safety contribute to healthcare professional students’ decision to *take risks and make mistakes* during learner-learner interactions in an online learning course?

2. How, if at all, does psychological safety contribute to healthcare professional students’ decision to engage in *uncomfortable conversations* during learner-learner interactions in an online learning course?

3. How, if at all, does psychological safety contribute to healthcare professional students’ decision to *give or receive help* during learner-learner interactions in an online learning course?

4. How, if at all, does psychological safety influence healthcare professional students’ perception of *inclusion* during learner-learner interactions in an online learning course?

**Definition of Terms**

This study used terms with multiple or slightly different definitions across fields of study. To provide a clear understanding of meaning in the context of this study, the researcher defined the terms as follows:
**Intellectual risk.** Intellectual risk is defined as “engaging in adaptive learning behaviors (sharing tentative ideas, asking questions, attempting to do and learn new things) that place the learner at risk of making mistakes or appearing less competent than others” (Beghetto, 2009, p. 210).

**Learning behaviors.** Edmondson (1999) used this term to describe actions commonly occurring when a team must solve a problem, innovate, or address an issue. Edmondson (1999) defined learning behaviors as “an ongoing process of reflection and action, characterized by asking questions, seeking feedback, experimenting, reflecting on results, and discussing errors or unexpected outcomes of actions” (p. 353).

**Learner-learner interactions.** As part of the Moore Interaction Theory, Moore (1989) defined this type of interaction as interactions “between one learner and other learners, alone or in group settings, with or without the real-time presence of an instructor” (p.2).

**Metaperception.** “A metaperception is a given person’s (perceiver’s) belief regarding the view that another person or group of people (target) holds of him or her, regarding a specific type of content” (Grutterink & Meister, 2021, p. 330).

**Online learning.** Online learning has many terms associated with it, such as e-learning, virtual learning, and online education. This study used the term and definition of online learning defined by Singh & Thurman (2019) as it provided the most comprehensive definition of what occurred in the online space of the case. Singh & Thurman (2019) defined online learning as “education being delivered in an online environment through the use of the internet for teaching and learning. This includes online learning on the part of the students that are not dependent on their physical or virtual location. The teaching content is delivered online, and the instructors develop teaching modules that enhance learning and interactivity in the synchronous or asynchronous environment” (p. 302).
Professionalism (also referred to as professional behaviors). Professionalism is a multifaceted construct defined in many ways. This study associated professionalism with terms such as altruism, respect, accountability, integrity, adherence to an ethical code, and lifelong learning (Van de Camp et al., 2004). Additionally, it considered professional behaviors as the following: “taking a collaborative human-first approach, communicating with heart and mind, behaving with integrity, and practicing competently” (Bulk et al., 2019, p. 75).

Psychological safety. Edmondson and Lei (2014) defined psychological safety as “the perceptions of the consequences of taking interpersonal risks in a particular context…” (p. 24). This definition considered the metaperceptive quality of psychological safety and highlighted the significant role of context.

Self-censorship. Self-censorship is “the act of intentionally withholding information from others in the absence of formal obstacles” (Bar-Tal, 2017, p.41).

Trust. Trust is frequently defined as “the willingness of a party to be vulnerable to the actions of another party based on the expectations that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party” (Mayer, 1995 as cited in Tschannen-Moran & Hoy, 2000, p.712)

Voice or Voicing. This term implies speaking up about one’s ideas, suggestions, or concerns usually when someone in authority is present (Detert & Edmondson, 2011).
CHAPTER TWO: REVIEW OF THE LITERATURE

Introduction

To be effective as a healthcare professional, one needs to risk sharing information in a highly competitive environment with the possibility that the information may be in error (Edmondson, 2004). Additionally, healthcare team members need to be able to interact professionally with a group of peers to accomplish a goal and critically think during every patient and professional encounter (Buja, 2019; Bulk et al., 2019). For these and other learning behaviors to be applied effectively in the work environment, they must first be learned and practiced in the educational setting. However, learning these behaviors and learning in general often feels uncomfortable and risky, especially in front of peers and an instructor. This uncomfortable feeling may be compounded by a fear of being perceived as “ignorant, incompetent, negative, or disruptive,” which leads a learner to limit interactions (Edmondson, 2003, p. 3). These feelings are especially true of interactions occurring in online learning. Content analysis of interactions in online classes shows limited interactions reflecting learning behaviors. For example, Nandi et al. (2012) found that only 14-18% of the learner-learner interactions on discussion boards contained language expressing critical thinking. Only 1.72-18% of discussion board interactions included clarifying ideas, sharing opinions, advancing arguments, or providing feedback (Nandi et al., 2012). Creating an opportunity to practice these behaviors is challenging within the online setting due partly to the unique qualities of the online learning environment, such as the lack of social cues and the asynchronous nature of discourse (Bolliger & Halupa, 2018).

Research has highlighted instructional design and instructor activities to mitigate these challenges; however, it has yet to fully examine the role psychological safety plays during online
learner-learner interactions to increase engagement in learning behaviors. Psychological safety's effect on learning behaviors has been extensively researched in the organizational setting (Edmondson, 1999; Edmondson et al., 2016). Research has also begun exploring how psychological safety affects learning behaviors in health professional education and online learning; however, there is limited qualitative information on how these students describe psychological safety in the unique context of online learning (Tatiana et al., 2022; Tsuei, 2019).

This literature review describes the conceptual framework shaping the study and the literature supporting the need for the study. The conceptual framework provides a theoretical lens to guide the study of psychological safety in online learning (Figure 1).

![Figure 1](image.png)

**Constructivism**
Overarching Paradigm

**Moore’s Interaction Theory**
Context

**Psychological Safety**
Construct

**Figure 1**

*Conceptual Framework*

*Note.* This figure demonstrates the conceptual framework for this study showing constructivism as the overarching paradigm with the construct of psychological safety studied within the context of Moore's Interaction Theory and learner-interface.

The conceptual framework consists of the philosophy of constructivism holistically guiding the study with the context understood through Moore’s Interaction Theory, and the central construct being studied is psychological safety. This review first describes constructivism
which views reality as subjective and individualist and provides the justification for viewing interactions with peers as essential to constructing knowledge. Next, Moore's Interaction Theory with the addition of learner-interface describes the context of online learning with a focus on the unique qualities affecting learner-learner interactions and the attempts to mitigate these effects. Finally, the construct of psychological safety is discussed, and its role in promoting learning behaviors in the context of work teams, health professional education, and online learning. The literature review concludes with a description of the gap in research occurring when psychological safety is examined qualitatively within the context of online learning. Knowledge gained from this study will assist instructors’ and designers’ understanding of the affective impact of psychological safety on learner-learner interactions.

**Constructivism**

The initial thoughts on constructivism can be traced back to Socrates, who believed that learning was an inner experience (Hawkins, 1994). According to von Glasersfeld (1995), Giambattista Vico first termed the word 'constructivist' when describing how the knower constructs knowledge. However, Jean Piaget brought the philosophy of constructivism to the forefront with his explanations of how children construct knowledge through experience (Savin-Baden & Major, 2013; von Glasersfeld, 1995). Many subunits of constructivism followed Piaget's initial writings; however, the ontological and epistemological tenets remained the same (Adom et al., 2016).

**Ontological Tenets**

Constructivists hold that there is no single, true vision of reality. Instead, reality is “subjective and influenced by the context of the situation, namely the individual's experience and perceptions, the social environment, and the interaction between the individual and the researcher” (Ponterotto, 2005, p. 130). Additionally, this view of an individualist understanding
of reality leads constructivists to understand that there are multiple interpretations of reality based on one's perspective (Stake, 1995). In learning, this understanding of reality shapes how one views new information and how one incorporates this information into previously constructed knowledge. In research, this philosophy influences how the researcher views the relationship between the participants and the context and the participants' reporting of the experience (Bozkurt & Sousa-Poza, 2005). As a result, this view of reality significantly influenced this study's methods and methodological choices. This subjective view of reality is also reflected in the constructivist’s concept of knowledge construction.

**Knowledge Construction and Interactions**

According to constructivism, knowledge is subjective and individualistic. A person constructs knowledge and meaning through perception, experience, and reflecting on those experiences (Adom et al., 2016; Fearon et al., 2021; Savin-Baden & Major, 2013). Furthermore, a person uses knowledge to make sense of the changing environment and thus is constantly adapting through accommodation and assimilation (von Glaserfeld, 1995). Thus, knowledge and the environment are intimately linked, and learning occurs when one is exposed to new experiences and one's understanding of the environment is challenged (Ertmer & Newby, 2013). After the challenge, one assimilates new knowledge into one's mental construction of that experience, creating new meaning (Adom et al., 2016). While knowledge is ultimately a product of neurological construction, it is heavily influenced by social, cultural, and language-based interactions (Ertmer & Newby, 2013).

Gerpott et al. (2019) stated that through interactions, learners “reflect on their experiences, engage in deeper information elaboration processes, and become aware of knowledge gaps, and link new information to existing knowledge” (p.3). These interactions
influence experience, which in turn influences how a topic is interpreted and learned. The constructivist understanding of the environment's role and the learning process shapes how the researcher interprets the data (Savin-Baden & Major, 2013). Additionally, interaction is needed to construct new knowledge, which is consistent with Moore's Interaction Theory (see below) and reinforces the need for instructors to provide a psychologically safe place in online learning to encourage learner-learner interactions.

**Moore’s Interaction Theory**

According to constructivism, interactions help shape knowledge construction (Gerpott et al., 2019). Additionally, empiric research supported the essential nature of interactions in developing a quality online learning environment (Karatas et al., 2017; Wan Hussin et al., 2019; Woo & Reeves, 2007). These interactions encouraged learning behaviors, innovation, problem solving, and constructive feedback (Anderson & Elloumi, 2004; Bernard et al., 2009). However, in the early days of distance education, educators and instructional designers lacked the terminology to describe interactions common to online learning. Moore (1989) overcame this problem by defining and describing three types of interactions in distance education: learner-content, learner-instructor, and learner-learner. Moore (1989) described learner-content interaction as the interaction between the learner and the materials studied. He called this interaction the “defining characteristic of education” (p.1). The second form of interaction, learner-instructor, described the interactions between the learner and instructor, including providing feedback, synchronous sessions, and virtual meetings (Moore, 1989). The next form of interaction was learner-learner. Moore (1989) defined learner-learner interaction as interaction “between one learner and other learners, alone or in group settings, with or without the real-time presence of an instructor” (p.2). Examples included chat rooms, discussion boards, email, and
other social media tools. Later, Hillman et al. (1994) added a learner-interface. Hillman et al. (1994) described learner-interface interactions as interactions between the student and the technology-based learning medium. This type of interaction included the learning platform, mobile devices and tablets, and artificial intelligence. In general, Moore's interaction theory provided a framework for understanding the types of interactions found in online space and a way to explore the influence of the different interactions on learning. While the interactions were understood individually, Moore’s Interaction Theory acknowledges that each form of interaction may influence the other forms of interaction (Figure 2). However, learner-learner interactions were specifically used to explore psychological safety in online learning.

![Figure 2: Moore's Interaction Theory](image)

Learner-Learner Interaction

Since Moore's initial description, learner-learner interaction has garnered much attention in the literature regarding its importance in developing critical thinking and its necessity for academic success (Wan Hussin et al., 2019). Research linked learner-learner interaction to improved student outcomes through the social learning tasks of dialog and collaboration (Bernard et al., 2009; Borup, 2016; Cung et al., 2018; Cho & Cho, 2017; Jung et al., 2002; Kuo & Belland, 2016). For example, Saqr et al. (2018) used social network analysis to analyze many interactions in online learning courses in a medical college. This study showed a correlation between a high number of social networks to positive academic performance and the increase in interactions between peers when the topic was knowledge beyond the presented learning material and the peer's initial contributions. Additionally, Mehall's (2021) study of fully online business classes found a strong positive relationship between purposeful personal interaction, student satisfaction, and perceived learning. Collectively, the literature suggests the need for learner-learner interactions to expose students to new and different ideas and confirm knowledge through feedback allowing for the construction of new knowledge during health professional education (Borup, 2016; Kuo & Belland, 2016; Saqr et al., 2018).

Attributes Affecting Learner-Learner Interactions

Research has described the positive attributes of online learning that affect interactions. In online learning, students can use myriad ways to communicate with their instructor and peers, including email, chats, group texts, and virtual meeting applications. The instructor sets up opportunities for learner-learner interaction by conducting synchronous classes, assigning collaborative projects, and using break-out rooms (Wut & Xu, 2021; Yarmand et al., 2021). This
variety allows students to communicate at their comfort level. It also provides time to reflect on responses before engaging (Ertmer & Koehler, 2018). Additionally, Williams and Lahman (2011) noted that in course evaluations about discussion boards, students reflected that they liked seeing others' ideas and enjoyed having their thoughts validated or challenged. Likewise, Wan Hussin et al. (2019) found that online interactions with peers and the instructor can occur more easily, providing an opportunity to receive feedback on ideas and opinions. However, just because it is easier and preferable to interact in an online environment does not mean students do interact. Anderson and Garrison (1998) pointed out that “educational communication must be explanatory, not just confirmatory” (p.98), and research has shown that despite the extra time to reflect, students primarily interact at a superficial, confirmatory level (Nandi et al., 2012).

While the aforementioned research described positive elements of online learning, aspects of this medium can create unique challenges to learner-learner interactions. In surveys of medical students taking online courses, motivation and difficulty concentrating were commonly cited barriers to online learning (Dost et al., 2020; Mukhtar et al., 2020; Stoehr et al., 2021). Additionally, social aspects of learning are affected by the online environment. Besides participating in the same class, online students may have little in common. The students may differ in background, life experience, stage of life, and geographical proximity (Bolliger & Halupa, 2018; Jarvenpaa et al., 1998). Even something as innocuous as lacking a common time zone can make learner-learner interactions challenging. The lack of commonality is further complicated because there are often no set norms for online behaviors, and learners must rely on socially and culturally acceptable behaviors (Ridings et al., 2002). Additionally, when interacting online, one usually interacts with all the members of the class at one time and not just with those one is comfortable (Ridings et al., 2002). Furthermore, often members of the class are not visible
to each other during interactions, or there is a delay in communication leading to missed body language, no eye contact, and absent haptic communication, which impairs the student's ability to comprehend how their interactions are being received (Rogers et al., 2011; Wut & Xu, 2021). Finally, students may not be motivated to interact deeply. For example, Bolliger and Halupa (2018) pointed out that online learning tends to be goal-directed. Some students report little need for casual conversation to improve familiarity since the students may never again share a class. Collectively these studies suggest that there are inherent aspects of the online learning environment that make learner-learner interactions challenging.

Despite these challenges, scholars continue to view learner-learner interaction as integral to developing reasoning and interpersonal skills. As a result, studies have explored ways to overcome these challenges. For example, Tatiana et al. (2022) found that improving learner-interface interactions by providing a confidential and secure learning space improved learner-learner interactions. Others found improved interactions when the instructor was present during learner-learner interactions to provide scaffolding, feedback, and monitoring (Cung et al., 2018; Joksimović et al., 2015). Still, other research found that using strategies that required collaboration, such as problem-based learning, heightened learner-learner interaction (Cung et al., 2018; Joksimović et al., 2015). These adjustments to learner interface, instructor, and content interactions are linked to improvements in learner-learner interactions, but ultimately, the student must decide to participate in these interactions. To date, research into learner-learner interactions has primarily focused on their effect on motivation, student satisfaction, and achievement and has described learner characteristics such as self-directedness (Dabbagh, 2007; Joksimović et al., 2015; Karatas et al., 2017). The actual experience of participating in online classes from the student's point of view typically focused on the previously discussed challenges of interacting
during online learning while not fully examining the student’s need to feel safe in the online learning environment (Joksimović et al., 2015; Wu & Xu, 2021).

**Psychological Safety**

An important aspect of learner-learner interaction is the degree to which individuals can interact safely with peers. Psychological safety provides comfort even during tense conversations, such as when individuals risk voicing an opinion or making mistakes, during difficult conversations, providing feedback to others, and making others feel included (Edmondson, 1999). Psychological safety has been defined slightly differently over the years, especially within organizational learning. Schein and Bennis (1965) first labeled psychological safety as a construct to describe a factor needed to help people learn new behaviors within workplace contexts. Since then, others have worked to describe the emotions, behaviors, and boundaries related to psychological safety. In 1990 Kahn conducted an extensive grounded theory qualitative study of two disparate work environments- a summer camp and an architectural firm- to explore psychological factors that affect engagement. Kahn (1990) identified three conditions affecting engagement in work tasks, one of which was psychological safety. He broadly defined psychological safety as an internal state “without fear of negative consequences to self-image, status, or career” (p. 705). Edmondson expanded on Kahn's introductory work with her research on psychological safety in work environments. Her work has dominated the research on psychological safety since her seminal piece in 1999, where she defined psychological safety as “a shared belief held by members of a team that the team is safe for interpersonal risk-taking” (p. 320). Her recent definition, “the perceptions of the consequences of taking interpersonal risks in a particular context,” considered psychological safety’s contextual influences and metaperceptive qualities (Edmondson & Lie, 2014, p.324).
Researchers alter between viewing psychological safety as an individual or group-level phenomenon, while many feel that it is both depending on how long the group has been formed (Edmonson & Lei, 2014; Ito et al., 2022; Newman et al., 2017). The latter view maintains that, initially, psychological safety is an individual's perception of a group. However, as the group evolves, the perception shifts to describe how those outside the group or new members of the group perceive its safety. (Edmondson & Mogelof, 2006; Ito et al., 2022). As Ito et al. (2022) describe, “…a feeling of psychological safety among members is a prerequisite for building a culture of psychological safety in teams” (p. 472). Since the unit of analysis in this research is the individual, psychological safety is viewed as an individual phenomenon while appreciating its complementary nature. The perspective is important to consider because once one student perceives the environment is safe enough to risk successfully, others may also be inclined to risk. This complementary nature requires interactions between members to form a perception of psychological safety, thus placing psychological safety within the context of learner-learner interactions.

When examining psychological safety, care must be taken not to confuse psychological safety with trust (Edmondson, 2003). Both trust and psychological safety describe the risk of being vulnerable and making choices to limit the potential negative consequences of being vulnerable (Edmondson, 2003). However, psychological safety is a metaperceptive concept. Edmondson (2004) highlighted this in her conceptualization of the difference between psychological safety from trust as a “self” versus “other” view. Edmondson (2019) states that “trust is about giving others the benefit of the doubt, and psychological safety relates to whether others will give you the benefit of the doubt when, for instance, when you have asked for help or admitted a mistake” (p. 17). Additionally, psychological safety is a belief about a group and how
a group will view a person, and trust is a belief about an individual (Edmondson, 2004). Finally, trust can entail a wide range of time, but psychological safety is more immediate and discounts the long-term consequences of not voicing (Edmondson, 2004). The differentiation of trust from psychological safety is subtle, but it helps one's understanding of the contextual factors and the behavioral results of a psychologically safe environment.

**Contextual Factors Affecting Psychological Safety**

Research has described individual and contextual factors that influence the perception of psychological safety. A meta-analysis completed by Frazier et al. (2017) found that a proactive personality, emotional stability, and a learning orientation positively related to psychological safety. Other research finds that psychological safety is influenced less by an introversion or extroversion personality type but more by an “openness” personality type and a strong willingness to learn (Edmondson & Mogelof, 2006; Frazier et al., 2017). Additionally, self-efficacy has been found to reduce the need for psychological safety when interacting (Siemsen et al., 2009). However, individual characteristics alone do not drive the perception of psychological safety. Instead, individual and contextual qualities work together to construct a psychologically safe moment (Rimm-Kaufman, 2016; Wanless, 2016).

Psychological safety is highly influenced by context. Kahn (1990) described four factors that influence the perception of psychological safety in the work environment: interpersonal relationships, group and inter-group dynamics, management style, and organizational norms. Empirical research supports Kahn's assertion that the leader's presence and the type of leader influence the perception of psychological safety (Nembhard & Edmondson, 2006; Rimm-Kaufman, 2016; Tsuei et al., 2019). Additionally, organizational practices such as support, mentoring, and diversity practices positively influence psychological safety (Newman et al.,...
Finally, familiarity was found to increase psychological safety. In their qualitative study of clinical education, Tsuei et al. (2019) found that familiarity increased psychological safety as the students could anticipate how others would interpret their actions in a “self-reinforcing relationship” (p. S33). These contextual qualities and individual characteristics work together to create the behaviors most associated with psychological safety.

**Behaviors Associated with Psychological Safety**

The behavioral results of a psychologically safe environment demonstrate its positive outcomes. Clark (2020) noted that when psychological safety is high, individuals work harder at learning and problem solving. However, when low, “they shut down, self-censor, and redirect their energy toward risk management, pain avoidance, and self-preservation” (Clark, 2020, p.4). A psychologically safe environment thus promotes creative sharing and innovation because it decreases the fear of embarrassment (Edmondson, 2004; Newman et al., 2017). Furthermore, a literature review completed by Newman et al. (2017) demonstrated that psychological safety created more voicing behaviors and knowledge sharing in work team members. In addition to knowledge sharing, a meta-analysis by Frazier et al. (2017) found a strong relationship between psychological safety and learning behaviors. Likewise, Ito et al.’s. (2022) concept analysis found that psychological safety promoted learning behaviors, less oppressive behaviors, and high-quality communications. A summary of the factors and behaviors associated with psychological safety can be seen in Table 1. Of note, a large majority of research describing psychologically safe behaviors has been conducted in the work environment viewing psychological safety at the group level with limited research on its behavioral attributes in the education setting at an individual level.
### Table 1

**Factors and Behaviors Associated with Psychological Safety**

<table>
<thead>
<tr>
<th>Factors Influencing Psychological Safety</th>
<th>Behaviors Resulting in Psychological Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open and proactive personality type</td>
<td>Problem solving</td>
</tr>
<tr>
<td>Individual self-efficacy</td>
<td>Innovation</td>
</tr>
<tr>
<td>Involved and supportive leadership</td>
<td>Increased voicing</td>
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<tr>
<td>Familiarity</td>
<td>Knowledge sharing</td>
</tr>
<tr>
<td></td>
<td>Learning behaviors</td>
</tr>
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</table>

### Psychological Safety and Learning Behaviors

Psychological safety is associated with behaviors that are beneficial to learning in various contexts (Durand et al., 2022; Frazier et al., 2017; Tatiana et al., 2022). Edmondson described how in work teams learning behaviors such as asking questions, seeking feedback, and discussing problems, similar actions needed to promote critical thinking, were positively correlated to psychological safety (Edmondson, 1999). Additionally, research is beginning to examine psychological safety's influence on certain aspects of health professional education, including providing feedback, simulation training, and clinical instruction. Finally, limited research has examined online learning to determine if the positive influence on learning behaviors found in other contexts applies to online learning. Collectively, the research in the areas of work environment, health professional education, and online learning supports psychological safety's effect on learning behaviors while demonstrating the gap in understanding its influence qualitatively in online learning.

### Psychological Safety and Work Teams

Psychological safety is a construct that came from organizational science; therefore, a great deal of research has focused on learning behaviors in this context. Psychological safety
helps people overcome their defensiveness when presenting differing opinions and is also
directly linked to team innovation (Edmondson, 1999, 2016; Zhu et al., 2022). Research also
showed that in organizations, psychological safety mediates between team design (leaders and
context) and learning behaviors (Nembhard & Edmondson, 2006), motivation to learn and team
learning (Harvey et al., 2019), and interpersonal relationships and learning behaviors (Carmeli et
al., 2009). A systematic literature review completed by Newman et al. (2017) found “positive
associations among employee perceptions of psychological safety and learning behaviors…” (p.
526). This research substantiated Edmonson's (1999) early claims that psychological safety
promoted learning behaviors that lead to problem identification and solving in work settings.
One would assume that psychological safety would have the same effects in other contexts;
however, psychological safety has not been fully explored in educational contexts. In a work
setting, one's livelihood and professional identity may be more at risk, thus changing the effect of
psychological safety compared to other settings, such as education, where one's intellect and self-
efficacy are at risk.

**Psychological Safety and Health Professional Education**

The primary objective of a health professional education is to produce a practitioner that
has the necessary knowledge and skills to be effective while at the same time can critically think
and engage in professional behaviors (Buju, 2019). One unfortunate side effect of this
challenging mandate is that health professional education is often competitive and at times even
uncivil (Bolding et al., 2020; Siad & Rabi, 2021). For example, a survey of 247 occupational
therapy students in the United States found that 21% were occasionally bullied by their clinical
supervisor with actions such as being repeatedly reminded of errors or mistakes and criticized for
work and effort (Bolding et al., 2020). Additionally, Molloy and Bearman (2019) described
another side effect as vulnerability-credibility tension. For example, students feel a great deal of
tension between appearing competent and receiving good evaluations and exposing vulnerability
when asking questions to ensure understanding of the material to appropriately care for future
patients (Huffman et al., 2020; Molloy & Bearman, 2019). Additionally, feelings of vulnerability
and incompetence are heightened by the fact that 93% of occupational therapy students
characterize themselves as perfectionistic (Wagner & Causey-Upton, 2017). The incivility and
the vulnerability-credibility tension add to the discomfort experienced when asking questions or
challenging ideas in front of peers and instructors (Williams et al., 2016). In contrast,
psychological safety helps a student engage in learning behaviors with peers that facilitate
critical thinking despite that discomfort (Wanless, 2016). Psychological safety does not remove
the risk but only provides a sense of comfort and security supporting a person engaging in risk
(Williams et al., 2016). Furthermore, Harvey (2019) found that psychological safety moderated
between one's need and desire to learn and the actual learning outcomes in peer learning groups.
Psychological safety is only beginning to be noted in the health professional literature. Its
influence on learning and learning behaviors in health professional education has primarily
focused on providing feedback, simulation training, and clinical education (Johnson et al., 2020;
Kang & Min, 2019; Thyness et al., 2022).

Receiving and providing feedback between peers and instructors is a valuable tool in
education to promote error reduction, provide an opportunity to construct new ideas, and teach
knowledge-sharing skills. However, the healthcare organizational culture views mistakes as
something that should be punished (Kolbe et al., 2020). Furthermore, Johnson et al. (2020)
accurately state that “medicine, in particular, has a powerful hierarchy,” and a student may
choose to limit their risk by staying quiet (p. 560). “The key question for any learner
contemplating what to volunteer during a feedback conversation is 'What is the likelihood that I will be respected, accepted and assisted or the opposite, that I will be humiliated, reprimanded, or judged as inept'” (Johnson et al., 2020, p. 560). Johnson et al.’s (2020) qualitative study on feedback between an instructor and student found that students were constantly assessing the psychological safety of the situation. When the instructor's response suggested psychological safety, the student would risk more. While supporting the role of psychological safety in promoting learning behaviors during feedback, this study looked only at learner-instructor interactions, and learner-learner interactions are also important to critical thinking.

Psychological safety has received a great deal of attention in simulation training. Simulation training teaches skills, critical thinking, and aspects of professionalism, such as collaboration and communication with team members. Simulation training is often completed with and observed by peers and the instructor; thus, students must be willing to risk making a mistake and not knowing in front of this group (Huffman et al., 2020; Johnson et al., 2020). Kang and Min (2019) found that nursing students felt psychologically unsafe during simulation practice describing it as “feeling unready, anxious about having mistakes exposed, worry about damaging teamwork, and fear related to evaluation” (p. 7). In addition, some simulations required the student to work collaboratively with members of different health professional schools, thus removing the element of familiarity with peers while increasing the demand for interpersonal communication. Purdy et al. (2022) found that simulation training forged relationships with other disciplines, and if the simulation was psychologically safe, then that positive relationship carried over into future collaborative encounters. Besides collaboration and communication, students learned and practiced aspects of professional behavior during the simulation, such as accepting responsibility for actions and integrity (Jowsey et al., 2020).
Accountability and demonstrations of integrity often occurred during the debrief, a period of significant vulnerability for the students. Jowsey et al. (2020) found that student observers' positive feedback helped to create a psychologically safe space for the debriefing discussion. As a result, the student must negotiate the psychological safety of the instructor-learner interaction and the learner-learner interaction. While simulation training may be similar in interactional dynamics to online learning, it does not provide the same affordances as an online learning context. As a result, it is unknown if psychological safety is perceived in the same way in online learning as simulation training.

Finally, clinical education places a student with peers and clinical instructors in an actual work context. Thyness et al. (2022) found that when interacting with clinical instructors, medical students did not feel psychologically safe, describing it as a “fear of being perceived as bothersome, stupid, incompetent or unprofessional if they said or did anything” thus, the students often chose to not interact with the instructor (p. 4). However, in a psychologically safe environment, research showed learners expressed less need to self-monitor their interactions (Tsuei et al., 2019). In one study, Tsuei et al. (2019) explored psychological safety in peer/mentor relationships in medical school. They found that if psychological safety was high, students could more fully express and engage with the mentor, leading to a fuller learning experience. The students were “more comfortable exploring challenging topics, taking risks and experiencing failures, and acknowledging the limits of their understanding in front of the group” (Tsuei et al., p.32). However, clinical education has a power dynamic similar to simulation training, which may not reflect learner-learner interactions in online learning. Additionally, since clinical education follows didactic education, the expected level of knowledge and skill is higher for clinical education, making it less forgiving of errors and questioning but more demanding of
innovation than online health professional education (Grenier, 2015). This expectation could influence the level of risk associated with learning behavior, thus altering the description of psychological safety in clinical education when compared to online learning. The experience of psychological safety in an online health professional education context has not been fully explored; however, studies have looked at psychological safety in other forms of online learning.

The research in the context of online learning found a positive relationship between psychological safety, knowledge sharing, and achievement (Roberts & Rajah-Kanagasabai, 2013; Tatiana et al., 2022; Zhang et al., 2010). For example, Tatiana et al. (2022) used correlational analysis to note a strong relationship between psychological safety, academic engagement, and academic performance in a survey of higher education online students. Zhang et al. (2010) used a multipart survey to determine that psychological safety was positively associated with a person's intention to share and suggested that psychological safety may mediate between a person's intention to share and actual knowledge-sharing behaviors in online learning communities. Similarly, Catyanakika and Rajasekera (2021) found that psychological safety was positively correlated to social presence and knowledge sharing. Roberts and Rajah-Kanagasabai (2013) looked at knowledge sharing and engagement through the lens of posting behaviors of online students. They found that online privacy concerns, perceived psychological safety, and self-efficacy predicted a person's likelihood to post. These studies support psychological safety's role in online learning as it relates to engagement in learning behaviors; however, these correlational studies do not fully describe how it influences learning behaviors or what factors influence the perception of psychological safety.

**Summary**

Learning behaviors such as challenging others, asking questions, and seeking feedback are skills learned in the didactic portion of health professional education and are required
throughout one's professional career. Students must be willing to risk participation in learning behaviors to develop these skills and gain the necessary knowledge. However, participating in learning behaviors is a challenging and often uncomfortable interaction heavily influenced by the unique attributes shaping the learning environment. Learner-learner interactions occurring in an online learning environment are no exception. While designers and instructors have found ways to increase the number of interactions, the quality of these interactions has not had a corresponding increase. Just as psychological safety has played a positive role in improving learning behaviors during organizational interactions, research is beginning to explore its effect on learning behaviors in the educational context.

Evidence generally supports a positive correlation between psychological safety and learning behaviors during online learning (Catyanadika & Prjasekera, 2021). However, research on psychological safety in the didactic portion of health profession education and online learning is generally sparse. Additionally, research on psychological safety in online learning has leaned heavily on correlational studies to describe its influence on learning behaviors, creating a gap in understanding how or why this relationship exists. Furthermore, most correlational studies used a survey of psychological safety based on responses from employees in a work environment with numerical ratings of an agreement, thus limiting open-ended responses (Edmonson & Lei, 2014). Because online health professional education is a different context, the words used to describe psychological safety and behavioral results may differ. Finally, research does not indicate what signals to an online instructor psychological safety’s presence or absence or what aspects of the context or content may contribute to the perception of psychological safety. This qualitative case study looks to address these gaps in research.
CHAPTER THREE: METHODOLOGY

Introduction

As discussed in Chapter One, this study explored the role psychological safety plays in learner-learner interactions during a healthcare professional online class. This study explored the phenomenon of psychological safety during the following types of interactions between students in an online class: taking risks and making mistakes, uncomfortable conversations, giving or receiving help, and inclusion. Additionally, this study described what contributed to the perception of psychological safety and what behaviors were associated with its presence during learner-learner interactions.

This chapter describes how this study was designed to address those issues. This chapter includes how the conceptual framework was used to guide all study design decisions, followed by a description of the research methods and design, participants, setting, data collection, data collection procedures, data analysis, trustworthiness, and subjectivities.

Application of Conceptual Framework

The conceptual framework of this study influenced the decisions made regarding methodology and methods. As previously stated, constructivism was used as the overarching philosophical lens, with psychological safety describing the phenomenon of the study and Moore's Interaction Theory framing the context of learner-learner interactions during online learning.

Constructivism research “seeks to understand how individuals make sense of their everyday lives in their natural settings” and stresses the importance of individualistic interpretations of reality (Adom et al., 2016, p. 6). These ontological tenets and epistemological understandings were reflected throughout data collection and analysis. First, the researcher
aimed to understand psychological safety by seeking the individual's constructed meaning and expression of psychological safety. To accomplish this, psychological safety was viewed as an individual-level construct while acknowledging the potential influence of its group-level effect. Next, constructivism accepts that context greatly influences reality (Ponterotto, 2005). This study sought to discover contextual aspects such as the media, peers, and instructor interactions that influenced psychological safety during learner-learner interactions. Also, this study used contextual elements to bind the study firmly. Finally, constructivism recognizes that reality is the result of perspective, not something that can be measured and that the researcher and participant co-create knowledge (Savin-Baden & Major, 2013; Ponterotto, 2005). In alignment with these basic tenets, this study used a qualitative research approach and case study methodology to answer the research questions.

**Methods and Design**

**Qualitative Approach**

A qualitative research approach was chosen for this study as it was congruent with a constructivist philosophy and provided the rich descriptions needed to holistically describe psychological safety in the context of online learning (Savin-Baden & Major, 2013). Accordingly, Merriam (2009) defined qualitative researchers as individuals “interested in understanding the meaning people have constructed, that is how people make sense of their world and the experiences they have in the world” (p.13). Unlike quantitative research, qualitative studies are not limited by preset terms to describe psychological safety or a set number of resulting behavioral outcomes but instead rely on rich descriptions to convey what is learned (Merriam, 2009). Additionally, qualitative research recognized the close link between phenomenon and context (Creswell & Poth, 2018; Merriam, 2009; Njie & Asimiran, 2014). As a result, qualitative research focused on rich descriptions obtained through various methods was
used to understand the issue comprehensively. Specifically, this qualitative study used an instrumental, holistic, single case study methodology to provide an in-depth understanding of the role psychological safety played in the context of learner-learner interactions in online learning.

**Case Study Methodology**

The purpose of case study methodology is to provide an in-depth, holistic description of a process or issue considering relationships (Noor, 2008; Stake, 1995). Case study methodology is described as particularistic in its focus on specific issues in a bounded fashion (Merriam, 2009). The issue focuses on the topic of study and works to set boundaries on the case. This study primarily followed Stake's (1995) more constructivist tradition but did not ignore the contributions and structure Yin (2018) provided when making methodological decisions.

**Case Study Design Decisions**

The researcher made several case study design decisions to ensure the issue was fully addressed. These decisions included how the study was bounded, the study's intent, the case's size, and the unit of analysis. The researcher first defined the case being studied and then placed boundaries on the case to delimit and focus the study on the phenomenon (Merriam, 2009; Nijie & Asimiran, 2014). Stake (2008) stated that to maximize understanding of the case, they [the researchers] ask, “Which issues seek out compelling uniqueness?” or “What can be learned here that a reader needs to know?” (pp. 126-127). Case study literature described how a case could be bounded by definition, context, time, and place (Nijie & Asimiran, 2014). This study was bounded primarily by the definition of psychological safety and the context of online learning. The context was further limited to courses taught in a healthcare professional program during one semester. Hence, the case for this study was defined as interactions and subsequent
contextual elements requiring psychological safety during one healthcare professional online class. In addition to defining the case, the researcher determined the study's intent. The intent of this study was to understand the issue of how psychological safety influences healthcare professional students' learner-learner interactions during online learning. This intent was consistent with Stake's (1995) description of an instrumental case study where the issue is the focus of the study.

Next, the size of the case was considered. Yin (2018) stated that the objective of a single case study was to “capture the circumstances and conditions of an everyday institution” (p.49). This objective aligned with the study's issue as learner-learner interactions are common in online learning. However, one potential concern of a single case study was that the case selected was not representative of the issue (Yin, 2018). Literature suggested fieldwork before beginning the study to guard against the challenges of the single case design (Merriam, 2009; Yin, 2018). Fieldwork for this study included speaking with the instructor about the course design, contents, typical student enrollment, and problems that may arise during the study.

The final decision made was the study's unit of analysis. This study used a holistic unit of analysis to explore only one part or unit of the case. This study focused on psychological safety during learner-learner interactions within one class, thus limiting extraneous variables such as the course of study that may have influenced results. Furthermore, a holistic single case study allowed the focus to remain on the individual, which is consistent with viewing psychological safety initially as an individual construct. Finally, a holistic single case study's narrow focus was consistent with the constructivist philosophy which seeks to understand individuals and their perceptions (Bozkurt & Sousa-Poza, 2005; Savin-Baden & Major, 2013). This study achieved a particularistic but holistic presentation of a case by making the previously mentioned design
decisions. Despite these careful decisions, case study methodology presented several challenges to overcome.

**Challenges of Case Study Methodology**

The case study methodology was not without its challenges and critiques. Savin-Baden and Major (2009) pointed out that case studies generate a rich description of a case but “may lack the appropriate theoretical grounding” (p. 155). This study stayed close to the conceptual framework detailed in Chapter 2 by remaining focused on the research questions yet open to all interpretations of reality. Additionally, the case study methodology allowed different forms of data collection and analysis, which could have led to an incoherent research product (Savin-Baden & Major, 2009). This research study described data collection and analysis procedures in line with the conceptual framework to overcome this challenge. Finally, selecting and bounding a case could create a lack of generalization. As part of maintaining a constructivist stance, the researcher accepted that generalization was limited by changes in context and time that alter the perception of reality; thus, striving for an irrefutable description of a phenomenon was inconsistent. However, Stake (2008) argued that “it is intuition that persuades both researcher and reader that what is known about one case may very well be true about a similar case” (p. 134). In alignment with constructivism and the case study methodology, this study sought to provide an in-depth description of the case so that the reader may make generalizations based on their interpretation and intuition. Despite these challenges, an instrumental, holistic, single case study remained the best methodology to address the research questions and fill a gap in knowledge by providing a thick description of psychological safety in online learning interactions.
Participants

Creswell and Poth (2018) noted that a characteristic of strong case study research was reporting multiple perspectives. This study used purposeful sampling from one healthcare professional class to select students for participation and achieve multiple perspectives (Creswell & Poth, 2018). The context of this study was healthcare professional education, and an occupational therapy class was used to represent that context. The primary selection criterion was that students were a part of the case, which means that the participants had to be students in the Occupational Therapy Modules of Practice XI-Community (OT Community) class in the study setting. Additionally, the participants had to be willing to discuss their online learning experience and have experienced psychological safety. Students who had taken previous online classes in undergraduate school were preferred but not required.

Based on the information provided by the program, the cohort of 20 occupational therapy students included in this case consisted of 10% male, 90% female, 90% white, and 10% other ethnicities with an age range of 20-24. Out of the cohort of 20 students, ten students chose to participate. Demographically, the ten participants were 100% female, 90% white, and 10% other ethnicities, 20% between the ages of 20-22, and 80% between the ages of 23-25. Most of the participants had a Bachelor of Science degree in exercise science or kinesiology (80%), and one had a bachelor's degree in health profession and the other a bachelor's degree in child and family studies. The OT Community class was the participants' first online class in occupational therapy school. However, all students in the study had previous experience with online classes, with 50% reporting taking over ten online classes, 20% reporting seven to nine online classes, 20% reporting four to six online classes, and 10% reporting three online classes. See Table 2 for the outline of demographic information. Because of the competitive nature of admission into the
Doctor of Occupational Therapy (OTD) program and the program's admission criteria, students admitted to the program typically had higher GPAs and GRE scores, demonstrated good interpersonal skills, and worked or volunteered in service-oriented jobs. Additionally, the OT Community class instructor participated in the study. The instructor was a white female and taught in OT programs for over 15 years and has a Ph.D. in Occupational Therapy.

Table 2

Characteristics of Student Participants

<table>
<thead>
<tr>
<th>Characteristic</th>
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<th>%</th>
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</tbody>
</table>

Before initiating recruitment, the researcher obtained IRB approval from the setting of the case and the researcher's university (Appendix A). The researcher contacted the appropriate faculty within the occupational therapy department to arrange to meet the students, explain the purpose of the study, and provide the link to the participant information form. The researcher
used this form to create a participant pool. This form, found in Appendix B, was created in Google Forms and once completed, was automatically returned to the researcher. These forms were printed and stored in a locked box that only the primary researcher could access. Additionally, the instructor was contacted and agreed to participate in the study.

Research does not provide a set number of participants required for a case study. Many qualitative researchers suggested continuing with data collection until saturation is obtained but gave no set guideline on how many participants it takes to reach saturation (Guest et al., 2006). Creswell and Poth (2018) suggested no more than four to five cases in a study, while Guest et al. (2006) reached saturation after twelve interviews. Guest et al. (2006) found that aspects of the study can influence the number of participants needed to reach saturation. For example, a more structured interview, such as the one used in this study, required fewer participants (Guest et al., 2006). Likewise, a more homogenous participant pool and a wide experience of the phenomenon required fewer participants for saturation (Guest et al., 2006). This study used a cohort of demographically similar students, all sharing the experience of occupational therapy school. Also, psychological safety is an experience common to those working in a group in many contexts. In addition, a pilot study was completed to evaluate the interview protocol and even though these students were no longer in the didactic portion of their OT education, after four interviews using an evolving format, subtle themes began to emerge. As a result, this study used all ten students from the participant pool from the Occupational Therapy Modules of Practice XI-Community class.

Setting

This study occurred at a midsized public university in the southern region of the United States and recruited participants from the Occupational Therapy Department under the College
of Health Professions. Specifically, the case study was contextually bounded by the interactions, students, and instructor in the Occupational Therapy Modules of Practice XI-Community class.

The university had approximately 11,500 students in its 88 undergraduate and 52 graduate programs. The OTD program accepts 24 students into a cohort program each year. The cohort for this study had 20 students. The three-year OTD program provided an entry-level occupational therapy doctoral degree and was accredited by the Accreditation Council for Occupational Therapy Education.

This study was bounded by the Occupational Therapy Modules of Practice XI-Community class. This class occurred in the Spring semester of this cohort's second year of OTD school. It was the cohort's first fully online class, but they had previously participated in a hybrid class, so they were familiar with the learning management system. This online class had numerous opportunities for interaction, creating a need for psychological safety, including discussion board posting of reflections, peer teaching, and a group project. The objective of the class was to identify and understand the different ways occupational therapy services are delivered in the community.

**Data Collection Methods**

Constructivism views knowledge as residing in the individual and is constructed through an individual's unique perception and experience (Fearon et al., 2021; Savin-Baden & Major, 2013). Understanding a participant's unique knowledge requires getting close to the individual and the context. Stake (1995) and Merriam (2009) suggested using interviews, and documents as sources of data collection to reach this objective when using the case study methodology. The following describes each form of data collection, how it is aligned with the research question, and how it contributes to the holistic understanding of the case.
Interviews

Merriam (2009) noted that “interviewing is necessary when we cannot observe behavior, feelings, or how people interpret the world around them,” and it is the “best technique to use when conducting intensive case studies” (p. 88). However, Creswell and Creswell (2018) cautioned that the researcher's presence may bias responses and that not all participants are articulate and perceptive. Consequently, this study used a semi-structured interview protocol to guide the conversation and explore the participants' responses for a deeper understanding. Additionally, the researcher acknowledged that the researcher and the participants co-constructed the meaning of the experience, which may have influenced interpretation. The interviews were used to determine the emotions, thoughts, contextual elements, and behaviors associated with the constructs of psychological safety in online learning.

The students’ interview protocol for this study reflected the research questions. It was based on a psychological safety survey created by Edmondson's (1999) research on the learning behaviors in work teams. According to a systematic literature review of psychological safety, this survey measure was the most widely used measure of psychological safety and had a strong predictive validity when measuring team psychological safety (Edmondson, 1999; Newman et al., 2017). This study modified these survey questions to focus on exploring the experience of psychological safety in the context of interactions during online learning while still retaining the constructs of taking risks and making mistakes, engaging in uncomfortable conversations, giving or receiving help, and feeling included. The interview questions were behavioral and experiential questions to understand the context of the experience and the behavioral consequences of psychological safety (Merriam, 2009). Additionally, the interview protocol contained feeling questions to focus on the affective description of psychological safety when interacting with
peers and the instructor (Merriam, 2009). The researcher trialed the interview protocol and modified it based on four pilot interviews. The interview protocol is found in Appendix C. The alignment between the research questions, Edmondson's (1999) psychological safety survey, and the participant interview protocol is found in Appendix D. The interview protocol for the instructor focused on the instructor’s role in creating psychologically safe interactional space.

The researcher conducted each interview using Zoom videoconferencing. While Zoom interviewing presents unique challenges, such as connectivity and interruptions, the research found it a beneficial medium for conducting interviews (Archibald et al., 2019; Gray et al., 2020; Oliffe et al., 2021). Gray et al. (2020) and Oliffe et al. (2021) reported that participants were more relaxed and more apt to disclose personal information. Additionally, participants appreciated the convenience of the Zoom interview (Gray et al., 2020).

**Documents**

Yin (2018) suggested that “the most important use of documentation is to corroborate and augment evidence from other sources” (p. 114). In this study, documents were used in that manner but were also used to provide contextual and background information to understand better how the case was situated (Savin-Baden & Major, 2013). This study used personal documents, such as screenshots of discussion board posts, and practical documents, such as class-specific documents and class or university policy.

The researcher examined screenshots of one discussion board post and associated replies to note the learning behaviors. The discussion board posts were from the first few weeks of class and required the student to articulate an opinion or idea and provide feedback to their peers on their opinions or ideas. Examples of these posts and replies can be found in Appendix E. These posts served to verify the participants' behavior mentioned during the interview. The posts also
served as a direct reference to an activity when interviewing participants. The instructor provided screenshots of the posts and replies and securely emailed them to the researcher to ensure authenticity.

This study used several practical documents provided to the researcher by the instructor to aid in understanding the context of the case. The instructor provided the syllabus and description of assignments to determine the level and amount of interaction expected. Additionally, these documents provided an idea of the primary modes of interaction (emails, discussion board posts, synchronous classes, and face-to-face). Finally, the syllabus contained a stated policy on expected online behavior that may have influenced how students interacted. The university's policy on online behavior retrieved from their website further illuminated how online interactions may have been influenced. Since these documents were generated either directly by the instructor or the university, no further authentication was needed.

**Data Collection Procedure**

Data collection for this study was a fluid process but generally followed the timeline illustrated in Figure 3. Data collection began following IRB approval from all participating universities. Case study methodology required several forms of data collection. The procedure for each data collection method is discussed individually, followed by how all data was stored and protected during the study.
Figure 3

Timeline for Data Collection

*Note.* This figure demonstrates the general timeline for data collection.

**Interviews**

During the first week of class, the researcher worked with the instructor to distribute the participant information form to obtain a participant pool. Based on the responses from the participant information form, the researcher contacted ten participants and the instructor to set up interviews. The researcher emailed consent forms and a timeline to all interview participants. Once signed and returned via secure email, a time was arranged to conduct the one-hour Zoom interview. The participants were sent a direct link to the meeting that used the researcher's personal ID and unique passcode to ensure privacy. Before the interview, the researcher asked participants to ensure they had a good connection to Zoom and were in a location that limited interruptions and distractions but was still comfortable. Before starting the interview, the researcher asked the participant to consent to the recording and provide a pseudonym. Once recording, the researcher reviewed the purpose of the study and the consent form and answered any questions. The initial interview lasted 60 minutes. The researcher “…must seek to probe into, and seek clarification about, how key events, incidents, and behaviors grounded in the data are shaped by context” (Timonen et al., 2018, p. 6). In addition to recording the interview, the
researcher noted the interviewee's body language, verbal concerns, and avoidance of words or subjects (Seidman, 2019). After every interview, the researcher completed field notes and memoing containing observational and methodological notes and notes on personal biases or prejudices and initial impressions (Groenewald, 2004). During member reflection, the researcher reinterviewed previously interviewed students using Zoom for approximately 30 minutes to clarify and affirm emerging codes and elaborate on ideas (Tracy, 2010). Finally, the researcher asked the participants to meet in a focus group for a final Zoom videoconference to ensure the veracity of the themes and ask any questions or provide feedback (Tracy, 2010). This final meeting allowed the participants to glimpse how their time had contributed to the overall study and knowledge of psychological safety. All interviews were recorded using Zoom videoconferencing and later transcribed using a transcription service. Once transcribed, the interview was printed and downloaded to a password-protected cloud service. A copy of the transcript was securely emailed to the participant for verification during the second interview.

**Documents**

During the first week of class, the researcher asked the instructor to distribute the participant information form to the students and provide the researcher with the syllabus, assignment list, and any stated online behavior policy. Also, at that time, the instructor and the researcher determined what discussion board posts would be copied and emailed to a secure email. After the discussion board and replies had been completed, the researcher emailed a reminder to the instructor, asking her to supply that documentation to the researcher.

**Data Protection and Storage**

This study generated a great deal of data on paper and electronically from various sources. Care was taken at all times to protect the identity of the participants and their
information. The researcher asked each interviewee to provide a pseudonym that was used for transcription, notes, and documents. The chosen pseudonym was only connected to the participant's name on the participant information sheet. All paper documentation, interview notes, printed copies of correspondence, participant information, or discussion board posts were stored in a locked storage box only accessible to this researcher and faculty advisor. All electronic correspondence, transcriptions, notes, and recordings were stored on a password-protected cloud storage system (Google Workspace with additional security). Discussion board posts had nonparticipating students' names blacked out, and the researcher replaced participants' names with their chosen pseudonyms. Additionally, all transcriptions used the participant's pseudonym and were transcribed using a website with TLS 1.2 data encryption and secure servers. Zoom video conferencing was used for all recordings, which encrypted the session and the cloud storage of the recording. All interviews used the researcher's personal id to ensure privacy and were locked once the interview began.

Data Analysis

The objective of the analysis was to break apart the case and organize and summarize the data to express an understanding of the case (Bloomberg & Volpe, 2019; Stake, 1995). Stake (1995) noted that people work to construct an understanding of a case by “seeing parts separately and how they relate to each other” and then seeing how these parts may be related to something familiar to us (p. 72). To do this, Stake suggested using categorical aggregation with instrumental case studies. Stake's term, categorical aggregation, was most closely related to thematic analysis (Savin-Baden & Major, 2013). According to Braun & Clarke (2006), thematic analysis was “a method for identifying, analyzing, and reporting patterns (themes) within data” (p. 79). While there are no set guidelines for completing a thematic analysis, many authors
offered suggestions on how to complete this form of data analysis. This study used steps described by Braun and Clark (2006) and Creswell and Guetterman (2019). Although this analysis was described in steps, it was an iterative and recursive process, finalizing in a report reflective of the study's findings (Bloomberg & Volpe, 2019).

**Step 1. Prepare and Organize the Data**

Creating a case study database increased reliability by enhancing the audit trail (Merriam & Tisdell, 2016; Yin, 2018). The database contained transcribed interviews with notes, documents, a section for the research journal, and consent forms. The documents collected are sorted by type and cataloged with supporting data, such as an annotative bibliography for documents and a cover page with each interview's name, time, and location.

In addition to organization, a certain amount of preparation was involved before analysis. Merriam and Tisdell (2016) suggested reviewing the literature before and during analysis to become familiar with ideas related to the topic. Once the literature was reviewed and the data was organized, the next step was to become familiar with the data.

**Step 2. Exploration and Familiarization with the Data**

Before coding, Yin (2018) suggested “playing with the data,” looking for “patterns, insights, or concepts that seem promising” (p. 167). Likewise, Bloomberg and Volpe (2019) suggested that the researcher should obtain an overall sense of the data and note any “big ideas” (p. 236). During this initial data exploration, the researcher wrote memos on the transcripts or documents that suggested answers to the research questions and looked for any contrary evidence that stood out for further follow-up. These initial thoughts and contrary evidence were written in the research journal. An example of the research journal can be found in Appendix F.
Whereas exploration was looking at the data holistically, the next step, coding, was examining the data particularly.

**Step 3. Coding**

According to Saldaña (2013), a code is “a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data” (p. 3). Flick (2014) described codes as organizational bins of information that simply describe a segment of data but alone tells one little of what is going on in the data. Data in this study was hand-coded using *in vivo* codes. *In vivo* codes allowed the researcher to understand how individuals make sense of the world through language, which is a tenet of constructivism (Savin-Baden & Major, 2013). The researcher coded half of the interviews. The codes were then grouped under descriptive headings which were defined, and specific sources cited. These groupings then acted as a codebook for the other half of the interviews. An example of the codebook can be found in Appendix G. The codebook was added to when new codes from the second half emerged. A second person read excerpts from the interviews and, using the codebook, coded parts of the interview to verify coding descriptions. All data was coded before the researcher began thematic analysis.

**Step 4. Develop Themes**

Thematic analysis reviews and reorganizes the codes into larger groupings reflecting a particular theme. According to Braun and Clarke (2006), “a theme captures something important about the data in relation to the research question and represents some level of *patterned* response or meaning within the data set” (p. 82). Thematic analysis tended to be more intuitive and abstract (Savin-Baden & Major, 2013). As a result, researchers suggested developing themes related to the research questions and theoretical framework (Merriam & Tisdell, 2016; Yin,
Appendix H demonstrates a sample of rounds of thematic analysis. The research questions and theoretical framework provided a general lens through which to view the data and not prescribe strict, pre-existing themes. The developed themes described the role of psychological safety in online learning derived from the codes generated from the data structured around the constructs of psychological safety. Based on Yin's (2018) suggestions, the researcher attended to all data and incorporated all plausible rival explanations. The initially developed themes were exhaustive, distinctive, sensitive to the data, and conceptually congruent (Merriam & Tisdell, 2016). The initially developed themes were then reviewed by a peer and further conceptualized.

Step 5. Review and Connect Themes

The initial themes were reviewed and compared to the data to ensure that they accurately reflected the codes and context (Braun & Clarke, 2006). The researcher verified the initial themes using a focus group discussion with participants and later themes with a peer review. Next, the researcher created a thematic table with definitions to demonstrate the relationship between the themes and subthemes, ensuring a holistic representation of the case (Braun & Clark, 2006; Creswell & Guetterman, 2019).

Step 6. Name and Define Themes

Each theme was named based on what it was describing. The researcher created a table containing elements that “identify the story each theme tells” (Braun & Clarke, 2006). The table contains a definition of the theme and a description of the theme, including the contextual elements, key characteristics, and origin (Bloomberg & Volpe, 2019). Additionally, it contained key quotes from the data that exemplified the theme, which was then used during interpretation.
Step 7 Interpret the Results

The final step, interpretation, involved describing the answers to the research questions. Additionally, the interpretation considered what was known about psychological safety in the literature and compared it to what was found in this study, noting any differences because of the novel context. As part of the interpretation, the researcher reported compelling quotes from the data, provided examples from multiple perspectives, and noted contradictory evidence. The result was a vivid description of the themes, how the themes were connected and supported by literature, and how the themes answered the research questions.

Trustworthiness and Ethics

Stake (1995) noted that the goal of research from a constructivist perspective was to “construct a clearer reality” and a “more sophisticated reality” from multiple views of reality (p. 101). However, this acceptance of multiple views of reality questioned if this study represented the best view of reality. To this end, two methods were used during the study to ensure that it was the best view of reality and that this study would be considered trustworthy.

Stake (1995) suggested the use of triangulation as a “deliberate effort to find the validity in the data observed” and as a way to fulfill the researcher's “ethical obligations to minimize misrepresentations and misunderstandings” (p. 109). This study used data sources, and investigator triangulation to validate the results. For data source triangulation, this study collected different perspectives on the experience of psychological safety in online learning by asking different students about various experiences that required psychological safety during the course. These experiences were derived from Edmonson's (1999) widely used psychological safety survey to ensure that the constructs students described were those associated with psychological safety. Furthermore, the instructor was interviewed about the issue to provide
another point of view and documents were collected to corroborate the codes and categories developed during the analysis (Creswell & Poth, 2018; Stake, 1995). For investigator triangulation, the researcher used a peer to review the analysis and “ask hard questions about methods, meanings, and interpretations” (Creswell & Poth, 2018, p. 263). Furthermore, Tracy (2010) suggested that using member reflections determines the accuracy of the analysis and provides an opportunity for additional data or elaboration on certain points. In this study, the researcher asked participants to review the transcript and initial thoughts that emerged from the interview and later asked them to review preliminary themes and codes that emerged after all data was analyzed.

Additionally, the researcher provided thick descriptions of the experience of psychological safety and the context of online learning to enable the reader to construct their own meaning of the case based on their experiences (Stake, 1995). Finally, the interpretation of the data was considered the researcher's constructed version of reality (Lauckner et al., 2012). As a result, the researcher used reflective and analytical memos and a research journal to provide transparency to the analysis process, elucidate any bias, and allow for constant comparison of the codes with the data to ensure reliability and replication of the study (Creswell & Creswell, 2018; Lauckner et al., 2012).

**Ethics**

Prior to engaging the participants, the researcher obtained IRB approval from the participating university and the researcher's university. The IRB approval assured that no harm would come to the subjects, that privacy and confidentiality were maintained, and that deception was not used in this study. However, other ethical issues may have arisen during data collection and analysis. Because an occupational therapist conducted this study in the setting of an
occupational therapy degree program, the AOTA Code of Ethics (2020) was used to guide all ethical decision making. The AOTA Code of Ethics is grounded in core values guided by the principles of beneficence, nonmaleficence, autonomy, justice, veracity, and fidelity. These principles directly applied to this study and were in line with ethical conduct in qualitative research described by Savin-Baden and Major (2013).

Subjectivities

The researcher plays a primary role in data collection and analysis in qualitative research. Because of this primarily interpretive role, Creswell and Poth (2018) suggested stating the researcher’s personal stance and positionality to the subject so the reader can appreciate how the researcher is positioned within the study.

Personal stance

The researcher’s stance about psychological safety came from her experiences of psychological safety in online learning classes. The researcher’s experience of a psychologically unsafe online class made her more guarded during interactions and limited her willingness to engage in learning activities. Her experience in a psychologically safe class created a desire to learn from others and share her knowledge. As a researcher, she looked to see if others have had similar experiences. The researcher was curious how others have experienced psychological safety in online learning, but she wanted to hear their accounts fairly. Yin (2018) noted that a case study researcher needs to be open to contrary evidence to avoid being swayed by a preconceived stance. Consequently, the researcher needed to be careful not to over-empathize with expressions of a similar experience to her own or discount the experience if not similar. Furthermore, the researcher’s personal stance was influenced by constructivism. Congruent with the constructivist philosophy, she believes that every individual has an interpretation of reality
based on their unique experiences. The researcher worked not to judge the “rightness” of these experiences when interviewing but instead remained open to understanding their reality. Her role as the researcher was to gather, represent, and interpret these realities; thus, her experience may influence the findings. This study utilized two member reflections and peer review to mitigate this influence and ensured that her interpretation of the participants’ reality was agreeable to the participant and valid. Just as the researcher’s personal stance had the potential to color data collection and interpretation, the different roles she played during the study may have influenced interactions that occurred during data collection.

**Positionality**

Stake (1995) stated that “the case researcher plays different roles and has options as to how they will be played” and “…makes continuous decisions about how much emphasis to give each role” (p. 91). The researcher assumed the role of a teacher as the research intended to inform others about a topic. Discussing the purpose of the research with all involved may have influenced how they view online learning and psychological safety. The researcher hoped that instructors would read the study and be influenced to make changes or, at minimum, recognize the role of psychological safety in their online interactions. However, the researcher recognized that she could offend the instructor in this study in her role as an evaluator. There was a chance that this research could point out some shortcomings in the instructor’s teaching style and revealing that information to her could damage any future relationship. To this end, the researcher was guided by the ethical principles of veracity when reporting findings while at the same time exercising diplomacy in interactions with the instructor. Additionally, when interviewing, the researcher recognized that she was introduced as a working occupational therapist to the participants, who were occupational therapy students. Because the occupational
therapy field is small, the participants may have been slightly intimidated by this dynamic and wished to appear favorably during the interview. The researcher worked to alleviate this by emphasizing her current role as a student and using language that was familiar to the participants. Finally, this researcher’s role as an interpreter best described how she positioned herself in this study. She viewed the case as an outsider and explained the meaning of the words and behaviors that the data supplied in a new way or with new knowledge. In other words, this study represented her constructed knowledge based on the experience and knowledge gained through research and prior experiences. In conclusion, the various roles this researcher assumed in the study and her personal stance provided the lens through which she performed all aspects of the study.

**Summary**

This study aimed to describe psychological safety’s role in learner-learner interactions during a healthcare professional online learning course. This study used a conceptual framework using constructivist philosophy as the overarching theoretical lens and Moore's Interaction Theory with specific attention to learner-learner interactions and constructs of psychological safety to frame and conceptualize salient aspects of the study. A deep understanding of the topic was required; therefore, a qualitative study using a case study methodology guided how this topic was studied. This case was bounded by the topic of psychological safety and the context of learner-learner interactions that occurred during the Occupational Therapy Modules of Practice XI-Community class. The researcher chose ten participants and the instructor from the 2021 cohort of occupational therapy students in the healthcare professions college at a midsouth university. Multiple forms of data were collected, including documents and interviews. Data
were then thematically analyzed. The themes were described using a thematic map and discussed in the study’s findings.
CHAPTER FOUR: RESULTS

Introduction

This single case study showed how the influence of psychological safety was slightly nuanced as learners engaged in learner-learner interactions within an online class that was part of an occupational therapy (OT) program. This chapter describes the qualitative results, including a description of the case and the qualitative themes that emerged from examining psychological safety during online learning. The first section presents an overview of the case and pertinent contextual elements not previously described in Chapter 3. The next section explores the themes and subthemes related to the four areas of learner-learner interactions that require psychological safety, described in the research questions. Finally, this chapter concludes with a summary of the study's findings.

Case Description

The researcher bounded this study in part by the setting and participants of the case. As previously stated in Chapter 3, the case was set in a midsized public university in the southern region of the United States. Specifically, the case was an online class in the OTD program. This OTD program consisted of five semesters of didactic education followed by three semesters of fieldwork and capstone completion for a total of three years of education required to complete the program, graduate with a clinical doctorate, and prepare to sit for the board examination. The OTD program used a cohort model to matriculate students through the program. Of the twenty students in this cohort, ten students and the instructor were chosen to participate. Pseudonyms were used throughout in place of the students' names. The researcher used the Occupational Therapy Modules of Practice XI- Community (OT Community) class to bind the case. This class occurred in the student's fifth semester and at the end of the didactic portion of their education.
The class was primarily online; however, as part of the class, they were divided into small groups to lead a health promotions class at various sites across the city. Most self-paced modules consisted of an introductory video discussing the content and assignments, a reading assignment or looking at a concept map of ideas, a video of a concept, and a knowledge check of some form. The instructor encouraged learner-learner interaction through discussion boards, a peer teaching activity, and a community project requiring coordination and collaboration between the learners. The discussion boards required the students to reflect on their community experience and describe how they effectively or ineffectively applied OT theory when organizing and leading the class. She utilized the Canvas learning management system. The instructor kept the discussion board responses hidden from the student until the student posted his/her initial response on the discussion board. She also used Flipgrid and Google Docs for certain assignments. The students reported using these technologies in previous classes, so they were familiar with their navigation. To promote a psychologically safe learning environment, the instructor set up an area in the learning management system that students could post questions anonymously for each major assignment. In addition to setting up the class features and adding content, the instructor's presence influenced the psychological safety of the interactions during the course; thus, was important to a comprehensive understanding of the case.

The instructor, referred to as Dr. Ellis, is a clinical assistant professor with a Ph.D. in Occupational Therapy who has taught in occupational therapy programs for over 15 years. Dr. Ellis has taught 10-12 online or hybrid classes. She attended courses on evidence-based development and instructing online classes. Dr. Ellis is supportive of online education for certain OT classes and feels that “it has a lot of opportunity to really engage people and to tap into learners who aren’t going do well sitting in a class or … are so stressed about having to speak in
Dr. Ellis taught this cohort in four previous classes, with each meeting several hours a week, so at the time of the study, she was familiar with the students, and they were familiar with her. According to her and the students, Dr. Ellis was highly present in the online class—rapidly responding to questions, providing timely feedback, and scaffolding the interactions to encourage meaningful interactions. However, she chose to not interact with the students on the discussion boards until all students had posted their initial post and replies so she does not risk “shaping their responses” (Dr. Ellis). Additionally, she had weekly virtual office hours to encourage private questions or clarifications. As the class leader, Dr. Ellis’s influence on creating a psychologically safe space for student conversations cannot be ignored. Kayla described how the instructor made them feel that any question or opinion was valued. Kayla stated, “I think that she [the instructor] fosters that sense of feeling the same, like among each other.” While the instructor was a significant part of this case, the primary focus of this study was learner-learner interactions.

The OT Community class was the ten students’ first online class in occupational therapy school; however, they had experience with online learning classes in the past. Table 3 describes the characteristics of each student participant. When discussing their views on online learning, the students reported common issues regarding online learning, such as distractions, lack of kinesthetic learning, and isolation. Nevertheless, they reported a generally positive attitude towards online learning, enjoying the convenience of not attending class in person and the self-paced nature of the online course. Additionally, they felt that the OT Community class was a good fit for online learning as it demanded less hands-on skills-based training but instead focused on skills related to planning and conducting community-based activities. Due to their previous experience with online learning, the students were well-versed in the behavioral norms
associated with learner-learner interactions during an online learning course. Despite this, Dr. Ellis directed students to the university's Student Code of Conduct for the policies on expected online behaviors. Although this publication did not specifically reference online behavioral expectations, it did describe harassment, invasion of privacy, lewd, indecent, or obscene conduct, and retaliation in broad terms that could be referenced when determining unacceptable online behaviors. However, none of the OT students interviewed mentioned a need to reference this publication because of the level of professionalism expected as part of the OT curriculum.

Additionally, the participants from this OT cohort reported that they felt comfortable interacting with their fellow classmates outside of class; however, in class situations, the students tended to be “very reserved” and “very uncomfortable in large groups” (Dr. Ellis). During the interviews, the students were thoughtful and eager to share their experiences of interacting online with their classmates. They easily recalled instances and discussed feelings and behaviors surrounding the influence of psychological safety during certain types of conversations with their peers during online learning.

Table 3

Characteristics of Each Student Participant

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Gender</th>
<th>Age</th>
<th>Race/Ethnicity</th>
<th>Number of Online Classes</th>
</tr>
</thead>
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<td>Lindsey</td>
<td>Female</td>
<td>23-27</td>
<td>White/Caucasian</td>
<td>&gt;10</td>
</tr>
<tr>
<td>Nicole</td>
<td>Female</td>
<td>23-27</td>
<td>White/Caucasian</td>
<td>&gt;10</td>
</tr>
<tr>
<td>Lisa</td>
<td>Female</td>
<td>23-27</td>
<td>White/Caucasian</td>
<td>&gt;10</td>
</tr>
<tr>
<td>Kayla</td>
<td>Female</td>
<td>23-27</td>
<td>Hispanic/Latin</td>
<td>&gt;10</td>
</tr>
<tr>
<td>Abigail</td>
<td>Female</td>
<td>18-22</td>
<td>White/Caucasian</td>
<td>&gt;10</td>
</tr>
<tr>
<td>Elizabeth</td>
<td>Female</td>
<td>23-27</td>
<td>White/Caucasian</td>
<td>7-9</td>
</tr>
<tr>
<td>Daisy</td>
<td>Female</td>
<td>23-27</td>
<td>White/Caucasian</td>
<td>7-9</td>
</tr>
<tr>
<td>Allison</td>
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<td>18-22</td>
<td>White/Caucasian</td>
<td>4-6</td>
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<tr>
<td>Lucy</td>
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<td>23-27</td>
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<td>4-6</td>
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<tr>
<td>Lauren</td>
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</tr>
</tbody>
</table>
Results of Thematic Analysis

The focus of this study was to understand the influence of psychological safety during learner-learner interactions during an online course. The researcher analyzed interviews with the instructor and students and documents such as the university policy, course syllabus, and discussion board posts and replies. The researcher then organized the results of the analysis into themes and subthemes related to the four research subquestions. See Table 4 for consolidation of themes and subthemes. The first thematic result describes the influence of psychological safety on health professional students’ decision to take risks and make mistakes (original construct) and is operationalized as *being vulnerable* within this educational context. The next result explains the influence of psychological safety on the psychological safety construct related to uncomfortable conversations, largely characterized as a *fear of being misunderstood*. The third construct focused on a healthcare professional student's decision to give or receive help from peers during this online class as contextualized by the theme of the *need to protect/protection* in this case study. The last type of interaction describes how psychological safety influences a healthcare professional student's perception of inclusion (final construct) during learner-learner interactions and is thematically described as *group cohesion*. The following discussion describes how the case supports each theme and subtheme.
Table 4

*Themes and Subthemes*

<table>
<thead>
<tr>
<th>Theme</th>
<th>Subtheme</th>
<th>Subtheme</th>
<th>Subtheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being Vulnerable</td>
<td>Perfectionism</td>
<td>Hiding in Online Places</td>
<td>Mitigating Risk</td>
</tr>
<tr>
<td>Fear of Being Misunderstood</td>
<td>Lack of Social Cues</td>
<td>Public/Permanence</td>
<td>Self-Censorship</td>
</tr>
<tr>
<td>Need to Protect/Protection</td>
<td>Professionalism</td>
<td>Formulaic Praise</td>
<td>Evaluation of Feedback</td>
</tr>
<tr>
<td>Group Cohesion</td>
<td>Familiarity</td>
<td>Shared Experience</td>
<td></td>
</tr>
</tbody>
</table>

**Taking Risks and Making Mistakes as ‘Being Vulnerable’**

Results of this study showed that one of the most salient aspects determining students' willingness to risk and make mistakes with their peers was their impression and management of being vulnerable (Table 5). This resistance to vulnerability negatively influenced how students perceived the psychological safety of the learner-learner interactional space. Further analysis suggested this fear seemed to originate from a need always to appear *perfect*. Additionally, the way some learner-learner discussion spaces *hid* aspects of the interaction from the viewer affected how vulnerable the students felt, thus affecting their willingness to risk. As a result, students described efforts to *mitigate those risks* and make the interactions more psychologically safe.
Table 5

Psychological Safety when taking Risks and Making Mistakes: **Being Vulnerable**

<table>
<thead>
<tr>
<th>Subtheme</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perfectionism</td>
<td>“Personality style characterized by striving for flawlessness and setting excessively high standards for performance accompanied by the tendency for overly critical evaluations of one's behavior” (Stoeber &amp; Otto, 2006, p. 2)</td>
</tr>
<tr>
<td>Hiding in Online Spaces</td>
<td>Learner-learner discussion spaces created in the learning management system by the instructor which keep aspects of the interaction hidden from the viewer.</td>
</tr>
<tr>
<td>Mitigating Risk</td>
<td>Behaviors students engaged in to decrease their vulnerability during learner-learner interactions.</td>
</tr>
</tbody>
</table>

**Perfectionism**

The OT students demonstrated aspects of perfectionism when engaging in interactions involving risk or potential error. Learner-learner interactions involving risk and potential error required the students to be vulnerable, undermining the desire to appear perfect. As a result, the students viewed these interactions within the online environment as generally psychologically unsafe, using words such as “guarded” (Kayla), “heart-pounding” (Lucy), “fearful” (Elizabeth), and “very uncomfortable” (Allison) to describe these situations. Lisa said, “I hold myself to a really high standard, so I want to do like a perfect job.” This is problematic because perfection does not allow for the vulnerability needed to intellectually risk or chance errors needed for learning. Consequently, an attribute the students consistently described when taking a risk, such as asking a question or providing an answer, was a desire not to be judged ignorant or incompetent by their peers. Nicole explained, “Maybe I'll just say this one really dumb thing and like everyone will think I'm stupid.” Likewise, Daisy stated, “My worst fear is like they read it
and they’ll know right away that it wasn't correct.” Kayla expressed a similar sentiment describing how when asking a question, she worried her peers would think, “Why doesn't she know this content? Or like, why wasn't she paying attention when we covered this?” Similarly, Lindsey feared being seen as incompetent by her peers if she made a mistake during the online class stating, “They see that [mistake], and they're like, 'yeah, she doesn't know what she is doing.’”

Beyond internal feelings of perfectionism, students habitually compared their performance with peers’ performance to judge their relative performance. Daisy admitted that she often gets “caught up in comparison.” Lisa further explained:

We’re all very motivated to get a good grade cuz that's what's gotten us into our programs in the past is having good grades, so if I know someone else has done it [an assignment or discussion post], then I can compare what I need to do and ...make those adjustments.

This constant comparison caused the students to feel less psychologically safe if their work did not meet the set standards dictated by the assignment guidelines or the often unspoken group consensus on whose work was best. Lindsey stated, “I get a little bit more nervous, especially already seeing and starting that comparison of what my work is compared to everyone else's,” thus driving herself to be perfect.

In conclusion, most students expressed a strong desire to appear perfect during learner-learner interactions, which negatively influenced how psychologically safe students felt when displaying vulnerability in the online space.

**Hiding in Online Spaces**

Another impact on the student’s sense of psychological safety was how the discussions were designed in the learning management system. This online class had intentionally designed
spaces for interactions that affected a student’s perception of vulnerability and, by extension, psychological safety when interacting with peers. One such feature was a section of the learning module where students could anonymously post questions to the instructor. The participants widely endorsed this feature as a way to seek answers without appearing ignorant or incompetent in front of peers within the online forum. Dr. Ellis found that students were “more willing to post questions when they can do so anonymously.” From a student perspective, Elizabeth supported this finding stating, “It [the anonymous post] kind of helps protect yourself and you’re less worried about what other people think,” and Lucy described this feature as “...nice because I think that ... it takes off some of the risk.” The quotes suggested that the student's ability to post questions anonymously lessened their feelings of vulnerability in front of their peers and increased the likelihood that they would ask necessary questions.

In addition to anonymous posts for questions, many OT students described how the hidden discussion response influenced their psychological safety. As a result of this feature, students could not read responses to a discussion board prompt until they first posted their reply to the prompt. The opinions of this feature were not as strongly positive when compared with the anonymous feature. Some appreciated that it forced them to state an opinion not swayed by peer input. Lauren commented, “you can't read other people's and bias your answer.” However, they felt that the lack of a “model answer” (Lindsey) as an example for at least the format made them “more risky” (Abigail) by increasing the chance of appearing ignorant or incompetent in front of peers, which added anxiety to interaction. Lauren further explained that sometimes the prompt can be interpreted in different ways, and the hidden discussion responses “makes it a little scary because you’re like, ‘what if I just did this [interpreted the prompt] totally wrong?’” These hidden online spaces generally moved the class towards feeling more psychologically safe when
risking questions, opinions, and potential mistakes; however, students noted that more was needed to overcome appearing vulnerable to their peers when interacting.

**Mitigating Risk**

While discussing conversations involving risk and potential error, the students in this case described behaviors they employed to mitigate being vulnerable in front of peers, thereby sustaining a feeling of psychological safety when interacting. These mitigating behaviors included avoidance and taking time for consideration before replying.

So strong was the desire to not appear vulnerable that when confronted with the slightest possibility of appearing ignorant or incompetent in front of peers, several students admitted to simply avoiding the interaction altogether. Lindsey shared, "I like to figure out how I can just avoid the thing [the risk] altogether...I won't take any risks." Daisy agreed with that sentiment stating, "I play it safe, and I don't risk much...I'll hold back a little more, and I avoid it [answering a question] if possible and would only speak on it if it was like a direct question that we had to answer." However, if unable to avoid the interaction, the students resorted to using the extra time available due to the nature of an online class to prepare a question or response.

The extra time to consider the interaction helped students devise ways to decrease the vulnerability they experienced when risking an answer or a question in front of peers. Dr. Ellis noted that one of the benefits of online classes was that students "can have time to think about their answer and present it," thus decreasing the chance of appearing ignorant or incompetent to their peers. Moreover, Abigail's discussion post was written with thought and care, which was noted in a subsequent reply stating, "this is such a thoughtful and insightful reflection." In addition to providing more time for thoroughness, the asynchronous nature of the online format provided time for more research before asking or replying to a question thereby avoiding
appearing incompetent in front of peers. Abigail noted that she “can think through what I'm gonna say first and like do my research before I ask a question to be sure something hasn't already been answered.” Kayla agreed that when answering she goes “above and beyond in writing to explain where I'm coming from with like a lot of detail... to justify my point.” Similarly, the extra time for research was noted in Lucy’s discussion post as she provided citations for her reply to support her answer and decreased the chance of being in error. Even though this extra time decreased the feelings of vulnerability when risking a question or opinion or a potential error, some students reported it also led to overthinking.

Students desired the esteem of the instructor and their peers, leading some to overthink online interactions. Abigail also admitted that she “writes it out like what I’m gonna say five times before I submit it...I overthink everything I’m gonna say before I actually submit.” To confirm their thoughts, the students admitted to seeking the assistance of the instructor or peers by either directly asking or more often, modeling their response after someone else's response. Lindsey stated, “I may even read other people’s before I post my own if that’s an option.” Likewise, Kayla stated, “I read through other people’s to see like what kind of responses they were giving.” Overthinking led to feelings of doubt and vulnerability, which diminished the students’ feelings of psychological safety when risking. Overall, students struggled with mitigating the effects of vulnerability when taking a risk. While the mitigation technique of taking time to think and research before replying lessened how psychologically unsafe the students felt, these techniques did not wholly remove the feelings of unsafety; thus, to remain psychologically safe, the OT students would sometimes choose to avoid any conversations involving risk or potential error.
Summary of Taking Risks and Making Mistakes

To summarize the theme of being vulnerable, students in this case described a great deal of fear and anxiety surrounding online learner-learner interactions that required taking a risk or making a statement that could be in error. These learner-learner interactions placed a student in a vulnerable position which, for many, is the antithesis of the need to appear perfect in all interactions. The students described this vulnerability as a fear of being judged ignorant or incompetent. Additionally, the learning management system and the instructor created online learner-learner interactional spaces where aspects of the interaction are hidden from viewers. These hidden online spaces affected the demand for psychological safety during these interactions. As a result, students in this case utilized different mitigation techniques such as avoidance of risk and using the time inherent in online classes to prepare for the interaction.

While interactions involving risk and potential error placed students in a vulnerable position, they were not the only form of interaction that created a demand for psychological safety.

Uncomfortable Conversations as ‘Fear of Being Misunderstood’

The OT students described several instances of engaging in uncomfortable conversations, such as commenting on something controversial. Students operationalized these conversations as a fear of being misunderstood. (See Table 6) While this form of learner-learner interaction was always challenging, the students described how the heavy reliance on written communication with focused attention on the writer intensified it. Additionally, these interactions were often graded assignments, thus necessitating a conversation the student would rather not have in an online learning environment wrought with potential misunderstanding. During these conversations, the OT students discussed elements of the online learning environment that significantly influenced their sense of psychological safety. These elements included a lack of
social cues and the public and permanent nature of online discourse. In addition to these online elements, students described self-censoring behaviors used within this course to prevent misunderstandings and remain psychologically safe while discussing controversial topics.

Table 6

*Psychological Safety when having Uncomfortable Conversations: Fear of Being Misunderstood*

<table>
<thead>
<tr>
<th>Subtheme</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of Social Cues</td>
<td>Forms of communication that assist the spoken word including body language, tone of voice, and expression</td>
</tr>
<tr>
<td>Public/Permanence</td>
<td>Existing in open view and visible to all people for all time</td>
</tr>
<tr>
<td>Self-Censorship</td>
<td>“Intentionally and voluntarily withholding information from others in the absence of formal obstacles” (Bar-Tal, 2017)</td>
</tr>
</tbody>
</table>

**Lack of Social Cues**

During this online learning course, students used various types of technology to communicate with each other such as the learning management system, Google Docs, and text messages. As a result, the students frequently commented that they feared being misunderstood when conveying their thoughts due to the lack of social cues associated with primarily text-based communication. The lack of social cues thus challenged the OT students’ psychological safety during online conversations due to the lack of nonverbal cues, difficulty interpreting tone, and delays in discussion and feedback.

When engaging in uncomfortable conversations in a written format, the students bemoaned the loss of nonverbal cues such as facial expressions and gestures. They also complained of the loss of tone of voice, which conveyed the intention behind the words.
Nonverbal cues aided the student’s interpretation of how their opinion was received by peers. Elizabeth commented, “You don’t know...those typical social cues that you use when communicating so things could be interpreted incorrectly.” Interestingly, several students referenced the lack of nonverbal cues as being hidden “behind a screen.” For example, Abigail stated, “You don't really know what they're thinking behind a screen,” and Elizabeth stated, “You’re just in the online setting, you can’t really read a person because...you’re just reading a screen.” In addition to the lack of nonverbal cues, the OT students frequently attributed being misunderstood to the lack of tone during interactions. Elizabeth described this well, stating:

Whenever it’s like on the computer and just like typed out, you don’t know how they’re necessarily saying that. So, you interpret it in the worst way possible, and you’re just like, ‘oh my gosh, they think I’m stupid’ and ‘they’re mad’ or something like that.

Nicole agreed, stating, “I feel like in person you're able to show your intention a lot better. Um, you're able to kind of add kind of intent in your tone of voice... where online it's just what you write.” The students expressed that these missing communication elements made learner-learner interactions feel less psychologically safe, which was exacerbated by the communication delays.

Several students described how when sharing controversial thoughts and ideas online, they had to anxiously await knowledge of how these ideas would be received by their peers. For example, Lisa stated, “I just don't know how long I'd be waiting for the response or how quickly it would come or what type of response was gonna be.” Adding to that anxiety, students described an aspect of communication unique to online learning -the lack of closure as time worked differently in the asynchronous learning environment. Typical of most online learning discussion boards, the discussion boards for this case closed at the end of the week. Just as students began exploring different ideas, they posted their required two replies, and the module
closed, abruptly ending the discussion. Lindsey shared her frustration with the inability to follow up on the conversation and gain greater understanding. She stated, “(if) I don’t understand and I’m not able to ask questions to understand the person’s point of view…to some extent there’s like a wall being put up.” Additionally, some students were unsure if they had been correctly understood or interpreted by their peers. Lucy described this phenomenon as “you also lose the opportunity to clarify, you can’t really see if you’ve really made up with the situation.” The threat to psychological safety created by the learner-learner interactional delays caused the students to eschew entirely from stating their potentially controversial or alternative ideas out of fear of being misunderstood.

Public/Permanence

The student's perception of psychological safety was not only at risk by the lack of social cues and delays but also the public and permanent nature of online learning. The occupational therapy students in this case were continually reminded to carefully consider what they share in virtual spaces as it may reflect poorly in future professional endeavors. As a result, students were hyper-aware of the public nature of their comments when discussing a controversial topic online and how their peers may misunderstand that comment. Reflecting on the public nature, Kayla noted that she was “definitely thinking about how my response is gonna look to the fact that anyone can read it.” Elizabeth echoed this stating, “People can read that and butt in on the conversation and then also interpret it a different way.” Allison expressed that making a controversial comment “could get you in trouble or like your family in trouble.” Likewise, some students described how the online course “magnifies everyone looking at you” (Daisy & Allison), implying that conversations between peers were not private and opinions not quietly shared with like-minded people. Students also recounted how the instructor observed their
learner-learner interactions and how if something was written in error or misunderstood, “then that's tied to me” (Allison).

The public nature of an online post was worsened by the perceived permanent nature of online discussions, especially for potentially controversial topics. Elizabeth expressed this sentiment by stating:

*In fact, once it’s on there, it's on there, and I mean, it's online, so other people are gonna find it, other people are gonna see it, but people are more likely to forget something that you said in class, but online they can go back and read it again.*

Likewise, Kayla stated, “It's there for everyone to see for as long as they wanna see it,” and Lauren simply stated, “When it's online, it feels more permanent...it's there forever.” In summary, students felt that the public nature of the online written discourse exposed one to potential misunderstandings, and because of the permanent nature of the discourse, being misunderstood may not be resolved and could even get worse. As a result, students perceived uncomfortable, opinion-laden online conversations as psychologically unsafe and consequently used self-censorship to decrease the chances of misunderstanding.

**Self-Censorship**

Students feared being misunderstood by their peers during uncomfortable conversations during their online learning experience. For example, Elizabeth stated:

*I don't want it to be taken the wrong way, and then it blows up into a bigger deal than I ever intended for it to be. Because I feel like when you're in person, you have more control over the conversation.*

As a result of this sentiment, they often resorted to self-censorship when interacting with their peers online, especially for challenging or controversial topics. This self-censorship took the
form of consideration and respect for others before interacting and using language modifications such as hedges and neutral language. Before placing their opinions in writing, most students took time to consider their peers’ points of view and how they may view their own reactions. Allison stated she liked to “think about both parties” and “consider everyone because everybody comes from a different place.” While Abigail explained that she tried “to see what I would say from different angles, from different viewpoints...just to be sure it wouldn't offend anyone.” Finally, Lucy was expansive on this topic stating, “We don’t have to agree on anything, but we’re gonna like respectfully hold space, um, for ideas. Not a right/wrong dichotomy” and “recognizing that ...there are other beliefs I think sets up an aspect of safety... open to considering how other people think, even if they're not open to changing how they think.” Respect for others' ideas helped protect the students if they voiced differing opinions, making the learner-learner interactions more psychologically safe online.

This consideration of multiple perspectives also led to feelings of hesitation to fully express oneself. This balancing resulted in the self-censoring of their statements and was often combined with language modifications to maintain a psychologically safe interactional space. Specifically, the OT students admitted modifying their language to prevent misunderstanding and to sound less harsh when stating their opinions during a difficult learner-learner conversation. They described the liberal use of hedges to sound less firm in their opinions. For example, “I'm not really sure about this but this is kind of what I think” (Daisy) and “I feel like this will be a good idea” (Abigail) and using “lots of question marks” (Lindsey). Additionally, they predominately used neutral language when stating an opinion, especially early in the online class when they were less sure of their peer’s reactions. To Allison, neutral language was words that “might accommodate all viewers.” While Abigail described it as “not really try(ing) to lean
either one way or another...just tread water...just to be sure you're not offending anyone else.” Similarly, Nicole stated, “It's just easier to stay pretty neutral and to just like kind of ride it out on the first one, and then if I feel more comfortable, I can do that [be more forthright with her thoughts] later on.” Additionally, they often avoided absolutes in their discussion board posts and tended to discuss the problems and successes of the community outing more objectively. By self-censoring through consideration of others' views and modifying their language, the students could engage in uncomfortable conversations during their learner-learner interactions but remain psychologically safe by appearing less sure or firm in their written opinions.

**Summary of having Uncomfortable Conversations**

In summary, students felt that participation in uncomfortable conversations, such as sharing thoughts on controversial topics, was fraught with potential misunderstanding. The students described how unique contextual aspects of online learning, such as the lack of social cues and the public and permanent nature of interactions, challenged their psychological safety when engaging in uncomfortable conversations. To counter this challenge to psychological safety, students leaned into their expectations of behavior and self-censorship to provide protection and prevent misunderstandings. However, uncomfortable conversations were not the only type of online interaction demanding psychological safety. Psychological safety was also needed when giving or receiving help.

**Giving and Receiving Help as ‘Need to Protect/Protection’**

The third construct was giving and receiving help, which was thematically described as needing to protect/protection. When discussing interactions involving giving and receiving help, the students typically reflected on providing feedback to peers on how they set up and ran a community group. The purpose of the feedback was to help students learn ways to improve their
performance before the next community group activity. Students commented that when providing this feedback, they were motivated to protect their relationship with their peers and not appear offensive. Giving and receiving help in the form of feedback was generally perceived as a more psychologically safe interaction due in part to the professional nature of the program. Additionally, students made great efforts to maintain psychological safety through overpraising and formulaic responses in all aspects of the feedback interaction. Despite these efforts, students were sensitive to the feedback from their peers, communicating varying methods for evaluating the quantity and quality of the feedback received in terms of safety and legitimacy. (Table 7).

**Table 7**

**Psychological Safety when Giving and Receiving Help: Need to Protect/Protection**

<table>
<thead>
<tr>
<th>Subtheme</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professionalism</td>
<td>Acting with accountability and integrity and “communicating with heart and mind” (Bulk et al., 2019, p. 75)</td>
</tr>
<tr>
<td>Overpraising and Formulaic Responses</td>
<td>Using positive politeness and planned responses</td>
</tr>
<tr>
<td>Evaluating Quantity and Quality of Feedback</td>
<td>Evaluation of the help given by a peer</td>
</tr>
</tbody>
</table>

**Professionalism**

As discussed in Chapters 1 and 2, a component of health professional education was to instill professionalism as a way of being and acting. Students in this study referred to professionalism often, but it was highlighted when discussing learner-learner interactions involving giving and receiving help. The researcher's journal visualized this subtheme as the “cloak of professionalism,” which Nicole described provided an “extra protective layer” of psychological safety and guidance on how to appear during online interactions. Many students noted that the professional culture of the program protected them from potentially personal
attacks when they received feedback from peers. Nicole described how when giving feedback, she knew “how to navigate conversation in a way that will come off as professional rather than just like, 'oh, you're wrong.'” Similarly, when receiving feedback, she had “a baseline of thinking it's a professional criticism rather than a personal insult.” Lucy concurred, stating she felt safer in the professional program because “People probably aren’t going to be rude because they know that wouldn’t fly within the culture of the program- it wouldn't be professional.” Professionalism provided expectations for the type of feedback which played a role in the psychological safety within the online learning environment.

Students were motivated to provide feedback out of professional responsibility and altruism. Specifically, students expressed a greater concern for the growth of their peers during their online learning experience. Kayla shared that she would provide feedback “if it’s something that I feel is gonna, if I don't say it, that they might not catch it, and it's something important they need to know.” Similarly, Nicole commented, “I felt like for our group and for my sanity and for their future career, it was better for them to know.” Some students also expressed a desire to help their peers despite the risk of initially hurting them. For example, Lauren stated that her feedback might “help them make connections or see something that maybe they hadn't thought about yet.” In many cases, the feedback was largely conceptual and content related, as opposed to feedback in other respects of the OT profession. While professionalism motivated these students to provide feedback, it also provided a way for students to interact while remaining psychologically safe.

Although feedback was an important part of the online experience, students noted that providing helpful feedback to peers was often challenging due to the need to balance providing a possible negative assessment against not sounding offensive. To mitigate this issue, the students
often relied on the formal language associated with professionalism to navigate this problematic situation. For example, Lauren stated:

[Professionalism is] part of what makes the discussion boards and responses a lot more... stuffy and ... formal feeling. Because typically, if we were truly ... discussing something, um, we would not have ... our three broken down paragraphs and here’s my evidence and here’s this and here’s that and here’s my like OT buzzwords that I'm gonna make sure that I... put in my feedback.

Similarly, Nicole described the formal language of professionalism as “get[ting] rid of all the exclamation points [and] get[ting] rid of the cheery atmosphere.” Interestingly, students also related correct grammar, punctuation, timeliness, and the use of medical terminology as part of their formal, professional written interaction. When asked what a professional peer to peer interaction looked like online, Lucy replied, “responses that are thorough but concise with formal, grammatically correct language, completed in a timely manner.” Formal language and heavy use of professional terminology were noted on the discussion board and in their feedback to others. Dr. Ellis agreed, “they're very formal on their discussion boards.” Unfortunately, the heavy reliance on formal, professional language made some students view the feedback as less than sincere. Allison bluntly stated, “The feedback doesn't seem genuine from my perspective.” So, while most students used formal language during feedback to maintain psychological safety during the interaction, it came at the cost of sincerity. Despite this, recipients relied on professionalism to protect them from unsafe feedback. The students also admitted to being very intentionally polite with their responses during learner-learner interactions.
Using Overpraise and Formulaic Responses

Students and the instructor reported being highly intentional in every aspect of the interaction involving giving and receiving help to keep from sounding offensive. The participants commented that they “choose my words more carefully” (Daisy), were “careful with what words you choose and thoughtful” (Allison), “try to not be too like picky or judgmental” (Kalya) and replied with a “more thought-out response” (Dr. Ellis). To make their interactions intentionally polite, they used literary devices such as overpraise and formulaic responses and carefully shaped their feedback to match known personality styles.

Dr. Ellis noted that a sign that a class truly felt psychologically safe was when the class was “willing to say the negative stuff.” However, these students did not appear “willing to say the negative stuff” (Dr. Ellis), as the most frequently reported way students used to soften the critique was through excessive praise. All students described using some form of overpraise when providing feedback to protect the recipient’s feelings in such a public forum void of nonverbal cues. Daisy mentioned saying “mostly positive things.” Elizabeth admitted to having to “put fluff around it” and “honestly never try(ing) to say anything negative,” and Lucy commented that she thought “there might be more words of praise” used online than in person.

Students reported several methods of praise with some more effective than others. For example, praise from a peer was perceived as more genuine when it addressed specific aspects of their performance or idea. However, it was less effective when only extra punctuation was used. Kayla describes how the “quietest, most reserved person is like super sweet and nice and like exclamation pointy in their comments, but in person, they’re just not like that at all.” The excessive use of exclamation points was viewed in numerous replies on the discussion board. The use of emphatic punctuation was relied upon so heavily and was so expected that it was
taken as a harsh criticism, despite its lack of formality, if it was not used. Many students admitted using “exclamation points instead of periods because periods come across as serious” (Lisa) during learner-learner interactions. In many instances, students used punctuation to encode their language, i.e., “exclamation point equals a smile” (Lisa), to close the emotional distance created by the lack of nonverbal cues. The extra praise and exclamations points helped soften the criticism and allowed the students to feel more psychologically safe during the learner-learner interaction. Unfortunately, the heavy use of praise and the way that praise was expressed created formulaic feedback.

Intention, when taken to an extreme, made some students feel that their feedback was formulaic. Students described this as “formal and scripted” or “generic” (Abigail) or as a “positive sandwich” (Lucy & Nicole). Allison described this formula best by saying:

_Basically, you pick a post, and then you just start your response, and it's like [mimicking typing] ‘Dear so and so, I love, I think,' you know, 'You did a great job with your post. I think I loved how you included'. And then you're like what did they include? [mimics scrolling] Oh, ok. Um, [resumes typing] 'I love how you included this’ [ends typing], and I've heard that so much that I guess it almost invalidates good comments whenever I read them._

Allison’s description of a formulaic reply was supported in the discussion board replies as many started with phrases such as “I really appreciate...” or “I love...” with an exclamation point, followed by a softly voiced opinion of that performance or idea, and ended in some form of encouragement.

In addition to these formulaic replies, students carefully shaped their feedback. To not hurt or offend a peer, many students discussed being intentional about how they shaped their
feedback based on knowledge of their peer’s personality. Nicole extensively described how she “grades her opinion” to match the receiver's personality. She described how she knew how to “converse with people based on their, the way that they react and their opinions.” As a result, she was blunter with some or more subtle with others when providing feedback. Likewise, but taken from the recipients' point of view, Lindsey expressed that “[we are] more willing to receive feedback because we know each other's strengths and weaknesses.” In conclusion, the OT students’ intentional acts led to a more psychologically safe space to give and receive help. However, it had the unfortunate effect of making this feedback less powerful and thought-provoking and was perceived as somewhat less valuable. Despite the culture of professionalism and the use of intention, many students found varying ways to evaluate the feedback they received.

**Evaluating the Quantity and Quality of Feedback**

Because of the methods used by students to couch their feedback, recipients of that feedback used contradictory signals and specific content to determine how the feedback would influence their psychological safety. Students evaluated the feedback in part on who was providing the feedback. For example, some students commented that feedback they received from their instructor felt less like judgment and more like her passing on her superior knowledge. Abigail explained, “It's easier hearing it [feedback] from a professor that has all of this knowledge about this topic versus a peer that's learning it the same point as you.” However, some students also valued receiving a high quantity of feedback. For instance, Kayla and Lindsey felt that not receiving a comment on their idea or performance indicated that they were in error and thus felt unsafe when risking on the next post. Lauren stated she felt discouraged if “one person’s post has like three or four comments on it and then your posts, it’s like no one
commented on yours” which made her wonder what about her idea was “not interesting or not worth responding to.” Lisa felt the same if she received a long comment on her performance or idea stating, “the length of the response matters” and “I wouldn’t feel as taken aback …[if] was brief and it was like, ‘oh you didn’t have a lot to fix, just maybe this thing.’” These descriptions suggest that, on the one hand, some students felt that feedback from only the instructor was the most valuable, while on the other, some students felt more valued if a large number of peers provided small suggestions for improvement.

Another contradiction expressed by students when evaluating feedback focused on the quality and forced nature of the feedback. Most students looked for quality in their feedback, which meant that their peers had similar thoughts or experiences or were “building off mine [idea]” (Kayla). Lucy commented that she appreciated “when someone expands on like a similar train of thought or even rebuts with a perspective that is like added to me.” However, the same students questioned the sincerity of those comments since the feedback was “forced” (Allison) as part of a graded assignment. Some felt that providing feedback to peers as part of the assignment provided more psychological safety since the feedback was required; thus, everyone would receive some form of feedback. Abigail stated, “I don’t take their responses as harshly online... because I know they’re required to respond, and they have to respond so many times.” Conversely, others felt it lessened psychological safety because they were required to be critical of their peers and, at times, had to search for things to comment on and hoped it did not appear “like I’m being super picky about the content or how correct it was” (Kayla). In both instances, students were concerned about “get [ting] your word count up” (Abigail) to ensure a good grade and possibly negating the positive effects of quality feedback. In conclusion, students were inconsistent in evaluating the value and psychological safety of the feedback they received from
peers. At times they were swayed by who provided the feedback; at other times, it was the quantity or quality of the feedback, while at others, it was the forced nature of that feedback.

**Summary of Giving and Receiving Help**

To conclude, OT students consistently felt that the culture of professionalism made them feel safer when giving or receiving feedback. Likewise, they consistently described using overpraise and formulaic responses to keep themselves psychologically safe and to promote psychological safety during learner-learner interactions. Because of these linguist modifications to protect their peers, the OT students struggled with evaluating the value and the validity of the feedback they received. Giving and receiving help was considered a challenging interaction, but the OT students developed patterns of behaviors and expectations to help them safely navigate this interaction with peers. Not all online learner-learner interactions were considered challenging. The interactions surrounding the next construct, inclusion, were typically more relaxed and positive.

**Influence on Inclusion as ‘Group Cohesion’**

While the previous forms of learner-learner interactions focused on the student’s perception of psychological safety from a more individualistic standpoint, discussions involving inclusion highlighted how students viewed their role as part of a group and how this influenced psychological safety within the online space. Reflection on psychological safety’s role in inclusion led students to consider the more positive aspects of psychological safety and the contextual elements that made it easier for them to participate in the previously mentioned difficult conversations. When discussing inclusion within online learning, students readily described feeling validated, valued, and accepted when interacting with peers and described the positive effect on their willingness to engage in more risky interactions. Group cohesion played a
vital role in the perception of psychological safety during interactions, and its development was attributed to the group’s familiarity and shared experiences. (Table 8)

Table 8

<table>
<thead>
<tr>
<th>Subtheme</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td>Friendliness or intimacy between people</td>
</tr>
<tr>
<td>Shared Experiences</td>
<td>A group of students experiencing similar activities</td>
</tr>
</tbody>
</table>

**Familiarity**

As previously described, this OT program utilized a cohort design that had students matriculate together through classes until the end of their didactic education. The students in this study were near the end of their didactic education and thus were well-known to one another and had strong group cohesion. They had positive relationships within the cohort, and as such, the community component was a major part of their online experience and learner-learner interactions. Data further suggested that students were loquacious about the positive effect of familiarity on their psychological safety during interactions. For example, Dr. Ellis pointed out, “If the group feels really comfortable with each other and they don’t feel like they’re gonna be put down…then it seems like they’re more willing to engage.” Student qualitative data also reinforced this perspective. For example, Abigail reflected, “I feel psychologically safe within my cohort because I know these people, and I know their intentions behind their comments,” and Lauren concurred, saying, “They're my friends, and I know that they're not gonna make fun of me if I do something wrong.” Furthermore, familiarity “helps get rid of the anxiety” (Lauren) when interacting with peers and allowed them to “feel more comfortable saying things” (Kayla).
Although familiarity strongly influenced how the OT students felt during group interactions, several students reported some surprising limitations. First, as a cohort, they had been exposed to the same content and experiences; thus, they expected to have the same knowledge. As a result, making an error may be forgiven by familiar peers, but it would also be more obvious. At the same time, challenging conversations appeared more difficult due to the friendly nature of the cohort. Kayla commented:

*I think more so here in this program where it's small, and it's with people that I know quite well and see every day where it kind of feels like the stakes are a little higher [that something she said could influence what they thought of her].*

Additionally, some students felt less inclined to be overly polite and were more honest in their interactions in previous classes where they were unknown to their classmates. Lucy explained, “these names were just names on screens... they’d have to go out of their way to know anything about me.” Daisy concurred stating, “I could kind of feel secure in that, that I wouldn't have to see them again.” Finally, because of their knowledge of each other’s personalities outside of the online class, some students felt their peers would know when their stated opinion did not ring true. Lucy stated, “I could be seen as disingenuous and not authentic because they do know me,” and her peers would “appraise this [comment] against the me they know outside of online....do they think...there’s a falseness here.” Consequently, while the students reflected that familiarity with peers made them feel like a cohesive group and more psychologically safe, they noted that occasionally familiarity made it more challenging to be cohesive and feel psychologically safe. Fortunately, during this class, this cohort's familiarity took the form of camaraderie facilitated by shared experiences.
Shared Experiences

As part of a large assignment for this class, students went in small groups of three-four into the community to lead a group on a set topic. Each group had a different setting, but the topic was the same. One of the assignments related to this project was a discussion board post asking them to reflect on the experience and discuss how they used OT theory to guide their decision-making. After posting their online reflection, students reported being excited to read and reply to each other's discussion. They were interested and eager to compare their reflections on the group experiences. Lauren mentioned, “It will be fun to get to read everyone’s responses to see like how it’s going and what they are thinking.” Kayla was also interested in the thoughts of her peers saying, “I wanted to go read what my group members said to see if we kinda like were thinking the same thing.” as they reflected on the experience. Likewise, Abigail stated, “It's interesting to see the people I was with-their viewpoint on our group as well as other people's experiences.” Having this challenging, shared experience as a group positively influenced students’ feelings of inclusion and psychological safety, and these feelings spilled over into their other online peer interactions. When students felt validated and valued within the group of peers, they reported feeling “encouraged to give more of my ideas” (Daisy), “more open to ask questions” (Nicole), “more willing to receive feedback” (Lindsey), more willing “to give my opinion...even if it was wrong” (Nicole) and would “say something out of the box” (Kayla). Likewise, Lauren explained that when she felt accepted by her peers, she was “a little bit more open to like putting a little more of my thoughts out there or elaborating on the question a little bit more.” Sharing this positive experience contributed to the OT class's cohesion which helped the students feel more included during other group interactions.

Summary of Influence on Inclusion
In summary, this case demonstrated how *group cohesion* caused the OT students to feel more included. A majority of students described how group cohesion was positively influenced by familiarity. However, a few students reported that familiarity sometimes negatively impacted how they felt and interacted within the group. Similarly, within this case, a shared positive experience significantly increased feelings of inclusion and aided in developing group cohesion. Most students reported feeling more psychologically safe due to inclusion and group cohesion, which increased their engagement during online peer interactions.

**Conclusion**

This study examined the influence of psychological safety on healthcare professionals' learner-learner interactions during an online learning class. This study examined an occupational therapy class occurring at the end of the didactic portion of the program. The case consisted of ten students from this cohort class and their instructor. The data collected from interviews and various documents were analyzed and sorted into themes based on four types of interactions requiring psychological safety. Four themes emerged that were primarily related to each type of interaction. The first of these themes was *being vulnerable*. When students in this OT class engaged in interactions involving risk or a potential error, they greatly needed psychological safety due to their underlying need to be seen as perfect. The discussions with hidden components, such as anonymous posting and hidden response posts, affected how vulnerable students felt, thus affecting how they judged the psychological safety of the interactional space. If students felt it was less safe, they took actions to mitigate the risk of *being vulnerable*. The next theme, *fear of being misunderstood*, was primarily associated with more difficult conversations, such as stating an opinion. During this form of conversation, students felt their psychological safety was more at risk due to aspects unique to the online learning environment,
such as the lack of social cues and the public and permanent nature of their interactions. To protect their psychological safety, students used self-censoring behaviors during learner-leaner interactions. Next, students described how psychological safety influenced their interactions when giving and receiving help. This type of interaction was characterized by the theme need to protect/protection. The students in this case were fond of their classmates and, as a result, were motivated to ensure there were no misunderstandings. To this end, they counted on their professional behaviors and the use of overpraise and formulaic responses to soften the feedback. While these behaviors did improve the psychological safety of the interaction, they had the unfortunate side effect of causing the students to search for other ways to evaluate the sincerity of the feedback. The fourth and final construct looked at psychological safety's influence on the students' feelings of inclusion. The hallmark of this construct was the theme of group cohesion, as the students tended to reflect on what made them feel included in the group. The students in this case reflected that familiarity and having the shared experience of the community activity made them feel more psychologically safe during the interactions.

This case demonstrated how psychological safety created feelings of security, comfort, and acceptance during interactions. Additionally, the case demonstrated several behaviors the participants used to protect the psychological safety of the interactional space. Finally, the case highlighted several contextual qualities specific to online learning and health professional education, which influenced how students perceived the psychological safety of the learner-leaner interaction. This case's results are similar to the literature's description of the feelings and behaviors associated with psychological safety; however, the contextual influence of online learning and health professional education offers new information to the theory of psychological safety.
CHAPTER FIVE: DISCUSSION AND CONCLUSIONS

Introduction

As healthcare professional schools move to more online learning, the curriculum must continue teaching critical thinking skills and professionalism. However, students' participation in learning behaviors and knowledge sharing needed to encourage the development of those skills is lacking in online learning (Cheng & Tsai, 2012; Holley & Oliver, 2010; Kang & Min, 2019). The purpose of this study was to explore psychological safety's influence on learner-learner interactions associated with learning behaviors during an online health professional education class. As discussed in Chapter 2, psychological safety has been traditionally studied in work environments where the consequences of risk are different from the educational setting (Edmondson, 1999, 2016; Edmondson & Mogelof, 2006; Kahn, 1990; Newman et al., 2017). Psychological safety is only beginning to be explored in health professional education, where the research has primarily focused on simulation training (Huffman et al., 2020; Johnson et al., 2020; Kang & Min, 2019; Purdy et al., 2022) and clinical education (Thyness et al., 2022; Tsuei et al., 2019). However, the studies have yet to fully explore this phenomenon within an online setting or using qualitative approaches. As a result, little is known about how psychological safety is described, the behaviors associated with psychological safety, or the contextual elements which affect psychological safety in online health professional education. To address this knowledge gap, this study used a qualitative single case study to study the issue of psychological safety using the following central issue and subquestions:

Central Research Question:

How, if at all, does psychological safety influence healthcare professional students’ learner-learner interactions during an online learning course?
Subquestions:

1. How, if at all, does psychological safety contribute to healthcare professional students’ decision to *take risks and make mistakes* during learner-learner interactions in an online learning course?

2. How, if at all, does psychological safety contribute to healthcare professional students’ decision to engage in *uncomfortable conversations* during learner-learner interactions in an online learning course?

3. How, if at all, does psychological safety contribute to healthcare professional students’ decision to *give or receive help* during learner-learner interactions in an online learning course?

4. How, if at all, does psychological safety influence healthcare professional students’ perception of *inclusion* during learner-learner interactions in an online learning course?

The case included an online occupational therapy class at a southern United States university. A purposeful sample of ten occupational therapy students and the online class instructor were interviewed, and documents, including policies from the university, course syllabus, and discussion board posts, were used to explore psychological safety in healthcare professional online learning. The following chapter summarizes the results of each subquestion and how these results relate to the literature on the topic. Next, this chapter explores the implications of this research and suggests ways to improve psychological safety in online learning. This chapter concludes with a discussion of the study's limitations and recommendations for future studies.
Discussion of Findings

This study answered four subquestions that culminated in a description of the influence of psychological safety on learner-learner interactions during an online learning class. Each subquestion discussed contextual and behavioral elements related to each area of psychological safety and how these findings were situated in the literature.

**Subquestion 1: How, if at all, does psychological safety contribute to healthcare professional students’ decision to take risks and make mistakes during learner-learner interactions in an online learning course?**

Based on the data, the psychological safety construct of taking risks and making mistakes was operationalized as 'being vulnerable' within the online learning class. Findings suggest the OT students in this study struggled with being vulnerable during online learner-learner interactions due to a more (a) perfectionistic personality style. Psychological safety during learner-learner interactions was further influenced by online spaces within the learning management system that allowed students to keep aspects of the (b) interaction hidden from viewers. As a result, students took actions such as avoidance and using the extra time inherent in online classes to (c) mitigate the risk of appearing vulnerable, thereby maintaining or improving their perception of psychological safety during learner-learner interaction.

*Perfectionism* was a common theme trait found in this study’s OT students and aligned with prior research on occupational therapists (Wagner & Causey-Upton, 2017). This data extended the prior finding by contextualizing perfectionism within the online learning environment as learners interacted with peers. Consistent with other research (Huffman et al., 2020; Kang & Min, 2019; McLeod & Gupta, 2023; Tsuei et al., 2019), the OT students expressed this perfectionism as a desire not to be judged ignorant or incompetent during learner-
learner interactions, which greatly influenced the perception of psychological safety. Although traditionally contextualized within the organizational workplace literature, the fear of negative evaluation in the current case study was consistent with Edmonson’s (2003) description of psychological safety as a desire not to appear “ignorant, incompetent, negative, or disruptive” (p. 3). The metaperceptive quality of psychological safety was reflected in the perfectionist’s fear that their peers would perceive them as ignorant or incompetent when engaging in risk or making a mistake and is consistent with Edmondson’s (2019) description of “whether others will give you the benefit of the doubt” (p.17). The metaperceptive interpretation of perfectionism and psychological safety demonstrates how these are interrelated constructs. The personality trait of perfectionism influenced how students predicted their questions and mistakes would be perceived, thus affecting their perception of psychological safety when being vulnerable. Furthermore, acceptance into a health professional education program is highly competitive. For example, only 23% of students that apply to occupational therapy programs are accepted (American Occupational Therapy Association, 2022). As a result, students in these programs have a habit of high performance and perfectionist tendencies. Unlike research discussed in Chapter 2 (Said & Rabi, 2021) this habit was not expressed by the OT students as competition but instead the OT student described comparing their performance and accuracy to their peer’s performance and accuracy; therefore, perfectionism appeared to be seen as a need to appear competent rather than focused on outdoing performance of their peers. Adding to this need for perfectionism is the knowledge that making an error in future work could have significant detrimental effects (Molloy & Bearman, 2019; Siad & Rabi, 2021). Consequently, Molloy and Bearman (2019) discuss how learning from failure and inevitable errors requires vulnerability. Edmondson (2004) noted in her work in healthcare organizations that similar organizational and
cultural barriers exist when attempting to learn from failure. Edmondson (2004) suggested that psychological safety was required to create a learning environment that embraced learning from errors. Additionally, education literature (Kang & Min, 2019; Turner et al., 2023) on simulation training endorsed the need to establish a psychologically safe space for students to work through and learn from failure. In this study, however, despite the psychological safety created by familiarity and class design, the students still expressed a reluctance to appear vulnerable due to the need to appear perfect. This tension between a drive to be perfect but still admitting and learning from mistakes caused some of the protective behaviors noted during learner-learner interactions in this study, such as avoidance, overthinking, and self-censorship.

Another contextual element influencing the perception of vulnerability was the student's ability to *hide in online spaces* by keeping parts of the interaction from peers when interacting within the learning management system. The data suggested that the student's ability to post questions anonymously had the greatest impact on the psychological safety construct of 'being vulnerable' (the original construct of taking risks). This finding was supported in the educational literature (Jong et al., 2013; McLeod & Gupta, 2023; Panadero & Alqassab, 2019; Roberts & Rajah-Kanagasabai, 2013) as a way for the OT students to express thoughts and ask questions without exposing vulnerability. While anonymity allows learners to express themselves to a greater degree in online learner-learner interactions, professionalism has a degree of accountability among peers, such as admitting mistakes and knowledge deficits and then boldly taking steps to correct this situation (Bulk et al., 2019; Edmondson, 2004). This accountability would be lost in an anonymous learning environment (see professionalism in subquestion three). So while anonymity may help overcome some of the trepidation about certain online discussions,
it would take away the chance for students to practice acknowledging their limitations and fallibility in front of peers, which may impact professional development.

Another aspect of being vulnerable (original construct of taking risks) included the actions the OT students took to mitigate risks, such as avoiding interactions and taking extra time when interacting to decrease the risk of appearing vulnerable and increase their psychological safety. The mitigating behaviors the students described are common online learning behaviors (Ertmer & Koehler, 2018; Wut & Xu, 2021); however, these behaviors had different, more emotional, motivations when examined through the lens of psychological safety. For example, Saqr et al. (2018) noted increased interactions between peers when the topic was knowledge beyond the presented learning material and the peer’s initial contributions. In contrast, this study found that when the student's knowledge was too greatly challenged, they felt it risked them appearing ignorant. Instead of interacting more, they chose to avoid the interactions. Additionally, the literature discussed how online education provided time for consideration and research (Dost et al., 2020; Ertmer & Koehler, 2018) from a cognitive perspective, but in this study, this mitigation factor was motivated by a desire not to appear ignorant or incompetent as much as to be accurate and thorough. While learning proponents have highlighted the temporal aspect as a benefit regarding convenience and reflection (Dost et al., 2020; Ertmer & Koehler, 2018), the study suggested that the extra time could also lead to overthinking in this population and increase anxiety with learning.

**Subquestion 2** How, if at all, does psychological safety contribute to healthcare professional students’ decision to engage in uncomfortable conversations during learner-learner interactions in an online learning course?
The OT students in this study conceptualized the uncomfortable conversations construct as a *fear of being misunderstood* as it related to online learner-learner interactions. When discussing uncomfortable conversations, the students focused on how the context of online learning created barriers to their psychological safety and modified their subsequent behaviors. These barriers included the (a) *lack of social cues* and the (b) *public and permanent nature of interactions*. Furthermore, students in this study (c) *practiced self-censorship* to protect the psychological safety of learner-learner interactions in the online learning space.

The OT students described how common elements missing in online learning interactions, such as *social cues*, affected their perception of psychological safety during interactions with peers where there was a chance of being misunderstood. Nonverbal communication accounts for over half of communication during interaction and provides emphasis and importance to the spoken word (Blanch-Hartigan et al., 2018; Peper et al., 2021). During text base communications, this form of communication is lost, causing students to work harder to decode the meaning and intention of the words (Wut & Xu, 2021). The OT students in this study described how despite being familiar with each other, the lack of social cues remained a persistent issue, especially as they tried to read the conviction behind their peers' statements. As a result, the students appeared to be more hesitant to engage in online learner-learner interactions where there was a potential for misunderstanding. This finding was consistent with education literature describing the lack of social cues as a limitation to online learning (Khalil et al., 2020; Rogers et al., 2011; Plummer et al., 2021; Wut & Xu, 2021). However, this study suggests that one reason a lack of social cues limits online learning is that it threatens the student’s psychological safety as the students work to not be misunderstood. Additionally, the problem with the lack of social cues was not just approval or disagreement with an idea but was
exacerbated by the lack of immediate responses. Related findings by Dost et al. (2020) suggested that delays in response contributed to students feeling not “well prepared for my profession.” The communication delays took away the student's ability to think and respond rapidly in a manner consistent with the medical environment. This research study together with Dost et al. (2020), suggests that the interactional delays students encounter in the online learning environment could negatively impact health professional students' emotions and professional development.

An additional theme of fear of being misunderstood (uncomfortable conversation construct) focused on the public and permanent nature of online learning as a barrier to psychological safety. This theme has not been explored as it relates to psychological safety. Instead, related literature underscored this type of online security and privacy as critical to engagement during online learning, but it typically referred to students' discomfort with having their home environments exposed (Plummer et al., 2021), concerns with protecting identity (Roberts & Rajah-Kanagasabai, 2013), or concern that the recorded classes would be accessible to the public (Wut & Xu, 2021). This study described how the public and permanent nature of learner-learner interactions limited their expression of opinions and potentially their understanding of controversial topics.

When students had to discuss their opinions, this study found that self-censorship was a typical behavioral response to threats to psychological safety related to fear of being misunderstood (uncomfortable conversation construct). Education and organizational science literature (Bar-Tal, 2017; Clark, 2020; Detert & Edmondson, 2011) discussed self-censorship as a typical behavioral response to threats to psychological safety. In this study, self-censorship is related to not only a desire not to be misunderstood but also a sense of belonging within a community. Indeed, Bar-Tal (2017) discussed self-censorship’s role in how one self-identified in
a group and how the group identified itself. Additionally, Bar-Tal (2017) mentioned that “individuals assess what the cost and rewards may be for oneself, the ingroup, the outgroup, the system, or the idea” when faced with the decision to share an opinion. This case suggests that in addition to accessing the cost and rewards of an interaction to determine the amount of self-censorship required, students also assess the impact that uncomfortable conversation may have on their chances of being misunderstood and on the feelings of inclusion. The case described how self-censorship appeared differently in online learning because of primarily text-based communications. In this study, self-censorship included using the extra time online communications afforded to consider all sides and using hedges and neutral language to soften the tone while stating an opinion. The finding related to self-censorship is problematic as it may constrain the expression of diverse points of view, thus restricting transformative learning (Damianakis et al., 2019).

Subquestion 3 How, if at all, does psychological safety contribute to healthcare professional students’ decision to give or receive help during learner-learner interactions in an online learning course?

In this case, the psychological safety construct, giving and receiving help, elicited a desire not to appear negative and was operationalized as a need to protect/protection within the online learning class. This theme highlighted the case’s contextual qualities of health professional education by first describing the relationship between (a) professionalism and psychological safety. Next, students described using (b) overpraise and formulaic responses to protect peers' emotional well-being and sustain psychological safety when providing feedback. Unfortunately, the heavy use of overpraise and formulaic responses resulted in alternative
methods for (c) evaluating the quality and quantity of the feedback received from peers during online interactions.

The need to protect/protection (the original construct of giving and receiving help) emphasized the qualities of professionalism and non-maleficence common to healthcare professionals. Research in the workplace literature focusing on psychological safety (Edmondson & Mogelof, 2006; Frazier et al., 2017) found that an openness personality type was primarily associated with psychological safety. Within the healthcare profession, conscientiousness and agreeableness were the most prevalent personality traits (Lewis & Caldwell, 2020; McCombie et al., 2015). In line with this literature, many OT students in this case study exemplified conscientiousness and agreeableness with a strong desire to help and protect their own and their peers' psychological safety during learner-learner interactions. To this end, they fell back on their professionalism training when giving feedback during this online class. Professionalism during feedback was an important aspect of prior literature related to psychological safety in other settings. In workplace contexts, Edmondson (2003; 2004) studied psychological safety in healthcare organizations with an eye toward the accountability aspect of professionalism. However, with respect to protecting/protection, other aspects of professionalism, such as integrity, altruism, and communicating with “heart and mind” (Bulk et al., 2019), have not been directly studied with psychological safety. This study provided an opportunity to examine how psychological safety was influenced by a professional atmosphere by demonstrating how OT students used professionalism to protect their peers’ self-esteem and confidence while still providing honest feedback. At the same time, it promoted the use of formal, guarded language during learner-learner interactions. As it relates to protect/protection (giving and receiving help construct), the OT student's desire to protect their peers and the need to maintain the interaction’s
psychological safety had its drawbacks, including linguistic modifiers such as *overpraising and formulaic responses* that reduced the value and validity of the feedback. Prior studies in education have described similar ineffective strategies students use when engaging in peer feedback (Yu, 2021) and discussed the use of intensifiers to bridge the emotional gap when interacting online (Pratama, 2019; Schallert et al., 2009). However, this study showed how these language modifiers were used to maintain the psychological safety of the learner-learner interaction. In this sense, it was a form of self-preservation, not simply politeness. The findings related to *overpraise and formulaic responses* added to the literature on psychological safety and signaled the student’s attempt to maintain a psychologically safe space when there are few guidelines on acceptable behaviors.

**Subquestion 4 How, if at all, does psychological safety influence healthcare professional students’ perception of inclusion during learner-learner interactions in an online learning course?**

The prior subquestions viewed psychological safety as an individual-level phenomenon, but this subquestion drew attention to the group-level effect of psychological safety. The OT students reflected on learning as a cohort and how this influenced their feelings of inclusion. As a result, the theme of *group cohesion* operationalized the perception of inclusion during online learning. The students discussed how (a) *familiarity* and participating in (b) *shared experiences* strengthened their feelings of inclusion and made it easier for them to feel psychologically safe when participating in learner-learner interactions.

The OT students in this study described feeling included primarily due to a cohort model creating *familiarity* among peers. Consistently, McLeod and Gutpa (2023) found that when medical students were placed in small groups for most of their training, these students “felt more
comfortable participating in online sessions when they were in these familiar long-term groups (p. 5). Consistent with education literature (Durand et al., 2022; Ito et al., 2021; Mauldin et al., 2022, McLeod & Gupta, 2023; Tsuei et al., 2019), as the OT cohort’s familiarity increased, and their knowledge grew together so did their feelings of psychological safety. While this study concurred with education and workplace literature (Catyanadika & Rajasekera, 2021; Edmondson & Lei, 2014; Zhang et al., 2010) that the construct of inclusion in the group was supportive of learning behaviors, it also pointed out how familiarity limited these behaviors. For example, the cohort model suggested a baseline of prior knowledge. This expectation caused the students to fear appearing ignorant when asking questions. Additionally, this high degree of familiarity made the students more sensitive about how their peers would perceive their comments when providing feedback, which led to more overpraise and formulaic responses. These negative aspects of familiarity hint at what Edmondson and Lei (2014) described when discussing the boundary effects of psychological safety in work groups finding that “the effects of psychological safety become less pronounced over time as people become too comfortable with each other…” (p. 39). Finally, this study discussed how a shared experience influenced OT students’ feelings of group cohesion (construct of inclusion). In this case, the OT students were divided into small groups and were asked to apply their new knowledge by completing an activity in the community. This activity allowed the students to interact outside of class towards a common goal and reflect on the experience in the online learning management system. Literature on psychological safety in the work environment and management education (Perrmann-Graham et al., 2022; Wheeler et al., 2020) pointed to the importance of team-building activities to support inclusivity and a collaborative atmosphere. Within online learning, an
alternative approach would be creating the opportunity for a shared experience, as seen in this case study.

Implications

Theoretical Implications

This study described how psychological safety was essential to promoting learning behaviors during learner-learner interactions. However, this study's most significant contribution was its description of the many contextual elements and behaviors that influenced the development and maintenance of psychological safety and the theoretical and practical impact those elements and behaviors may have on other aspects of learning and online learning design. This section first discusses the theoretical implications of this study, followed by specific suggestions to help instructors achieve more psychologically safe learner-learner interactions.

To begin, the students in this study discussed how behaviors such as risk mitigation, self-censorship, overpraise, formulaic responses, and heavy reliance on professionalism were used to maintain or improve the psychological safety of learner-learner interactions. The use of these behaviors questions whether there is such a thing as too psychologically safe. For example, is a safe interactional space so prioritized that tough questions cannot be asked or controversial topics fully discussed? Arao and Clemens (2013) found that students tended to “conflate safety with comfort” (p. 135), which was consistent with this study. Unfortunately, learning is often uncomfortable, especially within a constructivist understanding of knowledge construction, which requires discomfort as current knowledge is challenged (Ertmer & Newby, 2013; Gayle et al., 2013).

Moreover, Edmondson (2019) pointed out that “psychological safety is not about being nice” (p.14) and further stated, “psychological safety is about candor and willingness to engage
in productive conflict so as to learn from different points of view” (p.15). This understanding of psychological safety questions how instructors design a space that invites conflict and different points of view but assures feelings of nonjudgement and understanding. One way to overcome this issue is through the role of the instructor as they set the tone of the class. For example, Gayle et al. (2013) studied difficult conversations and critical thinking from the student’s perspective based on Baxter Magolda’s (2000) four strategies for holistic learning. This study recommended that the instructor be open to and motivate difficult conversations, have the students utilize real-world applications or examples and encourage reflective thinking (which could be done by having opinions and ideas cited from literature), have peers work in small groups, and show support and scaffold students as they move into deeper levels of analysis.

Next, the OT students were enthusiastic about the benefits of familiarity from the cohort model as it contributed significantly to their overall feelings of inclusion and psychological safety. The cohort model has been frequently used in health professional education as it created a community of learners (Mauldin et al., 2022; Opacich, 2019). The OT students interacted within this community inside and outside of class, creating more opportunities for collaboration and engendering feelings of support during difficult learning experiences. Additionally, this study and literature (Opacich, 2019) agreed that a cohort model allowed students to understand their peers’ strengths and weaknesses, resulting in the ability to give more honest feedback. A cohort model also provided an environment where trust and psychological safety could build over time.

Despite the student's endorsement of the cohort model, the OT students also appreciated a certain amount of anonymity, especially when asking questions. Roberts and Rajah-Kanagasabai (2013) suggested that “enabling anonymous postings on discussion boards may increase student engagement through providing a psychologically safe teaching environment that reduces the
impact of self-consciousness and fear of negative evaluation” (p.621). Additionally, Panadero and Alqassab (2019) found that anonymity encouraged students to provide more critical feedback during peer reviews. Providing anonymous feedback may decrease the amount of overpraise students use, and the students may find the critical feedback more valid and valuable. Beyond just constructive criticism, according to Jong et al. (2013), anonymity made students more willing to share an innovative idea and come to a less biased consensus when working in groups. That said, this must be balanced with issues of student accountability for a post. As a result, consideration should be given to the rationale behind providing anonymity for the interaction and if anonymity is best suited for that topic or interaction. Furthermore, anonymous interactions would require more careful monitoring by the instructor to ensure appropriate interactions (Freeman & Bamford, 2004; Hew et al., 2010).

Nolan and Roberts (2021) noted that troubling conditions and topics would arise during a health professional's career, and health professional education provides a safe space to discuss and ease exposure to those conditions and topics. This is noteworthy because the current case study suggested that the students guarded their learner-learner interactions to ensure psychological safety due to aspects of the virtual environment, such as a lack of social cues and the public and permanent nature of learner-learner interactions. Suppose the learners are hesitant to discuss important issues online. In that case, one might question how students discuss the myriad of sensitive topics related to healthcare when engaging in an online class, such as sexuality, mental health, or the social determinants of health. One solution would be to have those sensitive conversations during in-person classes utilizing a hybrid educational model strongly endorsed by many studying medical education (Dost et al., 2020; Mu et al., 2014; Plummer et al., 2021; Stoehr et al., 2021). However, this may not always be possible for fully
online programs or for students who use online to overcome issues of physical distance. Another way to consider this issue would be to embrace these guarded conversations and encourage them as a way to practice professionalism and diplomacy in preparation for future difficult conversations or when reporting poor practices (Edmondson, 2004; Guinea et al., 2018; Siad & Rabi, 2021). Also, the formal and diplomatic language surrounding the culture of professionalism would allow the conversations to occur while providing an element of safety.

Finally, this case described how the temporal aspect of online interactions affected the students' psychological safety and touched on how these delays impacted higher-order learning, which is important for OT expertise development. Because of the previously described lack of closure, students were unable to have their new knowledge challenged or validated, especially if a new idea was shared. Additionally, when interacting with peers during an asynchronous online class, students experienced a delay in response to their initial posts. This delay did not allow for the rapid back-and-forth interaction that occurs when students negotiate the meaning behind new ideas and work to map this new information into their old knowledge (Dost et al., 2020). As a result, this delay in response may impact their critical thinking skills and learning. This is noteworthy in light of prior literature (Ertmer & Koehler, 2018) that suggested online interactions are more substantive and reflective due to the extra time online affords to formulate and articulate an idea or response. Although online learning is often discussed as a positive component in terms of alternative ways of time, the findings suggest that the temporal aspect may have a negative impact on psychological safety.

Implications for Practice

This case discussed aspects of the online learning environment that hampered or improved students' psychological safety during learner-learner interactions. Based on this
information, the following describes practical suggestions for improving the psychological safety of the interactional space.

First, the need for a strong instructor presence cannot be understated. As previously stated, the students and literature (Edmondson, 2019; Kolbe et al., 2020) discussed how the instructor sets the tone of the class by inviting questions and describing rules of engagement. These rules may be better acknowledged if placed in a more prominent position, such as part of an embedded video describing the assignments and class expectations. Additionally, Molloy and Bearman (2019) and Huffman et al. (2020) suggested that the instructor model vulnerability by admitting errors and potential misunderstandings. Furthermore, to allay anxiety, Martin and Bolliger (2018) suggested rapidly responding to questions and providing timely feedback. They also suggested that the instructors scaffold the interactions by providing explicit directions for the discussion prompt and replies. For example, “name one thing...,” “share one experience that describes,” “discuss how this knowledge could improve your practice,” or “share an experience that demonstrates this...”. In addition to explicit directions, rubrics or a written description of expectations for the initial interaction and replies, such as citing literature requirements and the level of formality, would decrease students' apprehension about correctness before engaging in the discussion and may provide more critical and valuable replies.

Next, the OT students noted several issues surrounding the design of the discussion board and its effect on their psychological safety. For some, a discussion board is students' first introduction to each other. Because psychological safety builds with familiarity, Martin and Bolliger (2018) and Tatiana et al. (2022) suggested some form of an introduction or icebreaker. This icebreaker should have specific instructions on what to include, and the instructor could
post first to provide a model for the interaction and a way for the students to know the instructor better and set the tone of psychological safety.

Several issues surrounding discussion boards could be solved with simple design decisions. Discussion boards typically rely heavily on text-based communications, which lack social cues and tone. To solve this issue, the instructor could have discussions posted in video format either through the learning management system or an external application. Additionally, depending on the class size, students may not get the number of replies they desire because there are too many posts to read. Stone et al. (2017) suggested placing students in smaller groups of six-eight for discussions or having some discussions open to the whole class and others closed to only a small group. Next, while the hidden response posts had mixed reviews in this study regarding its psychological safety, it still provided a way for students to voice their ideas without influence from others. The psychologically unsafe part of the hidden response post could be overcome with a model answer or explicit instructions for content. Next, anonymity could be achieved by using an avatar or a pixilated image if a video was uploaded. Finally, some of the loss of tone could be overcome using emojis. Danesi (2017) found that emojis provided tone and positivity to interactions. Likewise, Bießwenger and Pappert (2019) found that emojis softened tone or boosted politeness.

Lastly, psychological safety could be impacted by the synchronous or asynchronous nature of the course. The issue of synchronicity touched on many aspects of psychological safety in online learning previously discussed, such as the delay in feedback, anonymity, and the impact of the lack of social cues. However, one additional suggestion would be to place students in small learning groups with their own private discussion channels during synchronous discussions to encourage engagement in more controversial or challenging discussions. Uijl et al. (2017)
found that interactions in small private online groups increased student participation in synchronous discussion groups and noted that the conversation consisted of one student explaining the content to another. However, it should be noted that in their study, the students had been in these groups for an extended time, suggesting that a level of familiarity, similar to this study’s cohort, was needed for the discussion to be truly productive.

**Limitations and Future Studies**

While the study contextualized aspects of psychological safety in an online learning context, there are opportunities to build on this study given its methodology. One limitation of this study was the homogeneity of the sample population of this case. The demographics reflected that school's typical OT class and the OT profession in general, but a future study with a more diverse sample might highlight other influential features of psychological safety not explored in this study. Likewise, this case consisted of one cohort of occupational therapy students, which may not represent other health professional programs or programs not using a cohort model. As a result, future studies are recommended to explore psychological safety during online learner-learner interactions in other health professions such as nursing, physical therapy, speech therapy, or more transient continuing education groups or in curriculums not using the cohort model. This information would provide a broader theoretical understanding of psychological safety in online learning.

Another issue relates to the type of data presented in the current study, which was qualitative in nature. Therefore, a future study could look at psychological safety utilizing quantitative methods such as a survey using repeated measures. Hung et al. (2021) utilized a repeated measures methodology to study how the phenomenon of self-efficacy changed after repeated exposure to simulation scenarios, and Bye et al. (2020) used repeated measures to track
changes in students' social capital and its related effects on their well-being. Similarly, psychological safety may change over time or have boundaries as students repeatedly interact over the course of a class. For example, it may be that learners experience less psychological safety early in the semester but experience a change in perception as the interactions increase and the content changes. A repeated measure approach would provide important information about how to support students at different times during the semester and how that may affect their learner-learner interactions.

A further limitation of this study was that this case was an asynchronous online class and explored only learner-learner interactions. Previous studies have examined psychological safety during simulation activities (Jowsey et al., 2020; Kang & Min, 2019; Purdy et al., 2022) and the effects of psychological safety on knowledge sharing in online classes (Catyanakika & Rajasekera, 2021), but research has not examined the online learning environment in more detail. Future studies could probe more deeply into psychological safety's influence on other aspects of the online learning environment, such as discussion boards, group projects, or synchronous classes. For example, design-based research could examine different ways to design learner-learner interactions aside from the traditional methods found in most learning management systems. According to McKenny and Reeves (2013), design-based research starts with a problem of practice and ends with results that expand theoretical knowledge and provide practical applications. Results from a study of this type could provide evidenced-based methods for improving feedback, decreasing the delay in feedback, and addressing the lack of closure in interactions found in this study to affect psychological safety.
Conclusion

This qualitative, single case study explored the influence of psychological safety during online learning learner-learner interactions. The themes of this study described the feelings that occurred during interactions associated with learning behaviors that required psychological safety: being vulnerable, fear of being misunderstood, need to protect/protection, and group cohesion.

This study described how the larger contextual elements of health professional education and online learning influenced the perception of psychological safety. The context of health professional education brought forth the themes of perfectionism, professionalism, and familiarity into the discussion of psychological safety. These elements were mainly consistent with current education and organizational science literature on psychological safety. However, this study’s online learning context broadened the understanding of psychological safety. The subthemes of hiding in online spaces, self-censorship, and shared experiences were consistent with the education literature on psychological safety, but these elements presented differently when examined in the context of online learning. Additionally, this study found that contextual features of online learning, such as the lack of social cues, the delay in feedback, and the public and permanent nature of interactions, impacted the psychological safety of learner-learner interactions in interesting ways and added to the understanding of psychological safety in the online learning context. Likewise, the behaviors the students explicated, such as using extra time, overpraise, formulaic responses, and evaluating the quality and quantity of feedback signaled to instructors the students’ attempts to promote or sustain the psychological safety of the interactional space. Ultimately, “psychological safety is not about being nice” or “lowering
performance standards” (Edmondson, 2019, p. 14 & 16). Instead, in learner-learner interactions in online learning, it was about knowing “the intentions behind their comments” (Abigail).

To conclude, this study contributes to the body of knowledge related to the construct of psychological safety as it appears in health professional education. Additionally, this study offers a deeper understanding of the student’s online learning behaviors and suggests actions to improve engagement in learner-learner interactions.
References


Appendix A

IRB Approvals

Institutional Review Board
Division of Research and Innovation
Office of Research Compliance
University of Memphis
315 Admin Bldg
Memphis, TN 38152-3370

December 8, 2022

PI Name: Janna Knickerbocker
Co-Investigators:
Advisor and/or Co-PI: Andrew Tawfik
Submission Type: Initial
Title: THE PSYCHOLOGICAL SAFETY OF HEALTHCARE PROFESSIONAL STUDENTS IN AN ONLINE LEARNING ENVIRONMENT
IRB ID: #PRO-FY2023-124

Expedited Approval: December 8, 2022

The University of Memphis Institutional Review Board, FWA00006815, has reviewed your submission in accordance with all applicable statuses and regulations as well as ethical principles.

Approval of this project is given with the following obligations:

1. When the project is finished a completion submission is required
2. Any changes to the approved protocol requires board approval prior to implementation
3. When necessary submit an incident/adverse events for board review
4. Human subjects training is required every 2 years and is to be kept current at citiprogram.org.

For additional questions or concerns please contact us at irb@memphis.edu or 901.678.3270

Thank you,
James P. Whelan, Ph.D.
Institutional Review Board Chair
The University of Memphis.
Appendix B

Psychological Safety Participate Information Form

This study explores the influence of psychological safety on interactions with your peers during an online course. Psychological safety is defined as what you think the consequences would be of taking a risk (such as asking a question, sharing an opinion, or giving feedback) when interacting with peers in an online class. Participation in this study would involve one interview taking about sixty minutes, a follow-up interview taking about 30 minutes, and one 30-minute group meeting. All interviews will occur at your convenience during the first half of the semester. If you are interested in participating, please complete the form below. Information on this form will be held in confidence, not shared with your instructor, and stored in a secure location until the end of the study.

If you have any questions about the study, I can be reached at jfknckrb@memphis.edu.

Thank you for your time,

Janna Knickerbocker, OT/L BCPR

1. What is your gender identity?
   - Male
   - Female
   - Trans Male/Trans Man
   - Trans Female/Trans Women
   - Genderqueer/Gender Nonconforming
   - Prefer not to share

2. What is your age?
   - 18-22
   - 23-27
   - 28-32
   - 33-37
   - 38-42
   - Over 42
   - Prefer not to share

3. How do you identify your race/ethnicity (select all that apply)
   - Asian
   - Black
   - Hispanic or Latin
4. When will your current degree be completed?
   - Less than 6 months
   - 6 months- 1 year
   - 1 year – 2 years
   - More than 2 years

5. How many online courses have you taken in college up to this point?
   - 1 - 3
   - 4 – 6
   - 7 – 9
   - More than 10

6. Considering classes you have taken in college, can you think of a time when you felt comfortable or uncomfortable sharing an opinion or an idea with peers or giving a peer feedback in an online class?
   - Yes
   - No
   - Maybe

7. Please share your contact information to secure a time for participation in the study if you are selected.

   Name: ___________________________
   Email address: ______________________
   Phone number: ______________________

Thank you
Appendix C

Participant Interview Protocol

Time of Interview: ________________________________
Date: ___________________________________________
Interviewee Pseudonym: ___________________________

Lead Question 1. Tell me about your educational journey so far.

Follow up question:
A. What was your Bachelor’s degree in?
B. Where does this class fall in your educational journey?

Lead Question 2. How have online classes have fit into that journey?

Follow up questions:
A. What made you decide to take an online class?
B. In general, what do you think of online classes?
C. How many online questions have you taken in college up to this point?

Lead Question 3. Thinking about this online class, tell me about a time when you felt like you took a risk (such as asking a question, answering a question, or volunteering information).

Follow up questions:
A. How did you feel or what did you think before taking that risk?
B. Some people would say that before taking a risk Or asking a question or answering a question, that they worry that their classmates or instructor will think they are ignorant or in some way offensive. What would you tell them?
C. How did the online nature of the course factor into your feeling or thinking that it was ok to take that risk?
D. How did the outcome effect how you felt the next time you had to risk or ask a question or answer a question?

Lead Question 4. Give me an example of when you were asked to comment on something that was controversial in this online class.

Follow up questions:
A. What were you thinking or feeling before commenting?
B. How did you think your comment would be perceived by your peers or instructor?
C. What influenced your decision to comment?

Lead Question 5. Thinking about this online class, tell me about a time when you shared an opinion, idea, or information and it was incorrect, or you thought it might be incorrect.

Follow up questions:
A. What do you think your peers or instructor were thinking?
B. How did this affect your interactions?
C. Is there anything about the online nature of the course that made this occurrence better or worse?

Lead Question 6. Tell me about a time when you had to ask for help or give feedback (such as during peer review) during this online class.

Follow up questions
A. How did you think it would be received and what made you think that?
B. What were you thinking or feeling before you gave that feedback?
C. What hesitations did you have about providing that feedback?
D. Reflecting on the outcome, how did the outcome influence the next time you were asked to give feedback
E. How was providing that feedback online different from what you would normally do if it is different?

**Lead question 7. During this class, tell me about a time when you felt accepted.**

Follow up questions

A. What is it about your peers, the instructor, or the online environment that made you feel that way?

B. How did that experience affect your future action?

**Lead question 8. Tell me about a time when you felt rejected during this online class.**

Follow up questions

A. What is it about your peers, the instructor, or the online environment that made you feel that way?

B. How did that experience affect your future actions?

**Lead question 9. Tell me about a time when you felt that your opinion was valued.**

Follow up questions

A. What is it about peers, the instructor, the online environment that made you feel that way?

B. How did that experience affect your future actions?

**Lead question 10. What things do you do make your classmates feel comfortable and safe interacting with you during this online course?**

Follow up question

A. If you were looking for guidance on acceptable online behaviors or types of discourse, where would you look?

B. Have you ever looked at the course syllabus or university policy for this?
C. What do you use or how did you learn these behaviors?

_Leading question 11_

*How would you describe the difference between interacting with peers in a regular online class like in undergrad and interacting with peers in this cohort class?*
Second Reflective Interview and Member check Protocol

Date: _______________________

Lead question: After looking over the document I sent, did it make sense?

A. Was it accurate and succinctly represent your answers?

B. Did I leave anything out?

Lead question: Thinking back over the interview is there anything you would like to add or clarify?

Lead question: When participating in this class, how could you tell that it was safe or not safe to risk?

Lead question: Now that you have participated more fully in a discussion board, how did you think others would respond to your post or replies?

A. What made you feel that way?

B. Will it change the way to post or respond on the next discussion board?

Lead question: Anything I need clarified
Instructor Interview Protocol

Time of Interview: ____________________________

Date: ____________________________

Interviewee Pseudonym: ____________________________

Lead Question 1. How many online classes have you taught?

Follow up questions

A. What, if any, special training have you received in online instruction?

Lead Question 2. In general, what do you think of online classes?

Follow up questions

A. How do you see them fitting into the curriculum

Lead Question 3. How would you describe your role in an online class?

Follow up questions

A. What tasks do you perform as an online class instructor?

Lead Question 4. Please tell me how you encourage problem-solving in this online class.

Lead Question 5. Tell me how you encourage collaboration and exchanging of feedback.

Lead Question 6. What strategies do you use to encourage students to answer a question or ask questions?

Follow up questions

A. How are these strategies different from what you do in a face-to-face class

Lead Question 7. In your opinion, why do you think students hesitate when voicing an opinion, sharing an idea, or commenting on controversial topics?

Follow up questions
A. In what ways, if any, do you think this hesitation is affected by the class being online versus face to face?


Lead Question 8. What are your signs that the class feels comfortable interacting in the online class?

Lead Question 9. What do you do to ensure that your students feel psychologically safe in this online class?

Lead Question 10. How would you describe this cohort compared to others in the past?

Lead Question 11. What is your main objective of this class?
### Appendix D

#### Interview Protocol Alignment

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<tr>
<td>4. It is safe to take a risk on this team</td>
<td>1. How, if at all, does psychological safety contribute to healthcare professional students’ decision to take risks and make mistakes during learner-learner interactions in an online learning course?</td>
<td>3. Thinking about this online class, tell me about a time when you felt like you took a risk (such as asking a question, answering a question, or volunteering information).</td>
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<tr>
<td>1. If you make a mistake on this team, it is often held against you</td>
<td>1. How, if at all, does psychological safety contribute to healthcare professional students’ decision to take risks and make mistakes during learner-learner interactions in an online learning course?</td>
<td>5. Thinking about this online class, tell me about a time when you shared an opinion or idea, and it was incorrect, or you thought it might be incorrect.</td>
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<td>2. Members of this team are able to bring up problems and tough issues.</td>
<td>2. How, if at all, does psychological safety contribute to healthcare professional students’ decision to engage in uncomfortable conversations during learner-learner interactions in an online learning course?</td>
<td>4. Give me an example of a time when you were asked to comment on something that was controversial in this online class.</td>
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<td>5. It is difficult to ask other members of this team for help.</td>
<td>3. How, if at all, does psychological safety contribute to healthcare professional students’ decision to give or receive help during learner-learner interactions in an online learning course?</td>
<td>6. Tell me about a time when you had to ask for help or give feedback (such as a peer review) during this online class.</td>
</tr>
<tr>
<td>6. No one on this team would deliberately act in a way that undermines my efforts.</td>
<td>3. How, if at all, does psychological safety contribute to healthcare professional students’ decision to give or receive help during learner-learner interactions in an online learning course?</td>
<td>6. Tell me about a time when you had to ask for help or give feedback during this online class.</td>
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<td><strong>3.</strong> People on this team sometimes reject others for being different</td>
<td><strong>4.</strong> How, if at all, does psychological safety influence healthcare professional students’ perception of <em>inclusion</em> during learner-learner interactions in an online learning course?</td>
<td></td>
</tr>
<tr>
<td><strong>7.</strong> Tell me about a time when you felt accepted during this class.</td>
<td><strong>8.</strong> Tell me about a time when you felt rejected during this online class.</td>
<td></td>
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<tr>
<td><strong>9.</strong> Tell me about a time when you felt that your opinion was valued.</td>
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Appendix E

Sample Discussion Board Post and Reply

LAUREN

The submissions for this assignment are posts in the assignment's discussion. Below are the
discussion posts for LAUREN, or you can view the full discussion.

from MOB Discussion Board #1
Feb 3, 2023 10:04AM

LAUREN

For our Matter of Balance group, my group is at the aXX apartments inXX. Because this is an
apartment complex for older adults and people with disabilities, the members of our group
already know and are comfortable with each other. This will help our group to already have a
base comfort level to speak and share freely with each other, so we will just need to introduce
ourselves to become a part of their group. We planned to introduce ourselves and take time to
talk with the members to get to know them better, and allow them to ask us questions. On our
first day, this went well! We were able to ask our members to introduce themselves, and they
shared some of their stories with us. We then also answered their questions to reciprocate the
willingness to share.

In the physical environment, it is best practice for therapeutic groups to be able to sit together as
one group and for the leaders to sit with the members as part of the group. To accomplish this,
our group has decided to place the chairs in the room into a U shape, so all members are in a
semi-circle. We can extend the circle with our chairs to be with them, however, we will have to
be at the front of the circle to be able to write on the dry erase board and use the TV to show the
videos as needed.

I was a little worried about how the group would flow with a more structured program and
wording that needs to be read out loud from the manual. I think that one way to help this would
be by encouraging discussion as the manual says, but also using our active listening and
motivational interviewing skills to dive deeper into discussion. The manual provides basic
questions to discuss, but I think that we can make it even more therapeutic by using these skills
to reflect the worries or fears we are hearing and help guide the members to problem-solve those
worries. This will help to empower members to problem solve and try to move away from a
model where we are telling them all the answers. We can also make sure to process and do a
therapy set to help solidify learning and summarize what we did at each session.

I think that it would be fun to make some of the more didactic portions more interactive as some
of the long reading passages can be hard. Some thoughts that come to mind are possibly making
small handouts of the flip chart goals or major themes to watch out for, and the members could
hold up the theme they think matches the passage that we just read. This could be more
interactive and possibly spark some discussion as we go to talk through why we think that theme
matches. I am definitely open to any ideas from others on what you think may be fun and
helpful!
Lauren’s Reply to Lucy

I love your willingness to be flexible to meet the needs of your group, XX! It sounds like you guys have put intentional thought into setting up your physical space as well as your group's dynamic to be the most therapeutic that it can be. I think allowing discussion to organically occur and allowing for flexibility in time limits is a really important part of allowing the group to grow. I completely agree with you that adding in time for questions as well as pauses for thinking are a valuable part of a group. However, I know that having those long pauses can feel really uncomfortable and hard not to fill in the space as a leader! I know that I tend to struggle with that, so that's a really great reminder for myself as I look forward to my own groups.

I also like your point to making sure that our energy and enthusiasm for the group is still evident even if we are reading from scripted material. I remember talking about the concept of “energy matching” in group when learning about the IRM, but I feel like it can also be applied in this case. If we don't bring a fun energy to the group overall, the group will eventually match that level of energy as well. I think how we present ourselves and the material is a really important part of making the program successful.
Appendix F

Sample of Research Journal

Couch feedback in praise “more flowery”, more words to make up for the lack on nonverbal (Lucy 39:54) “Light” (Abigail)

Role of perfectionism Causes hesitation
  - Not having wrong answers seen by everyone
  - Afraid that she missed something in the reading
  - Not having started project seen as procrastinating
  - Fear of seeming like you don’t understand something
  - My classmates will know that I am wrong or think I’ve missed something
  - Everyone can see it, scared of being wrong (Elizabeth 651 and Lauren)
  - 93% of OT’s are perfectionistic and 40% score within the mod -severe anxiety level (check that stat)

Feedback
  - Not using absolutes
  - Positive sandwich (Abigail 2425 and another one)
  - More formal and scripted?
  - Online influence Source of feedback is less knowledgeable (peers) than instructor
  - Feedback requirement versus volunteer Don’t engage
  - Role of interest
  - Not a master of the subject

Professionalism
  - Adds to safety because they aren’t’ going to be rude because that is not the culture of the program and these actions would be seen by instructors and peers
  - More attentive in writing- formal, grammar, medical terminology, professional language, direct
  - Pressure to be ‘well spoken”(Lucy 57:27)
  - Promotes honest criticism see Nicole quote 44:47

Instructor has role in tone setting and culture setting
  - How much does feeling valued come from the instructor’s comments
  - Instructor giving feedback on board makes students more guarded

Risk
  - Delay in feedback not able to ask follow up questions to gain understanding(may not really belong here See Lindsey 11:56 “wall put up” nonverbal
  - Need more feelings?
  - Implies you don’t know something Scary “You don’t want them to know what you do know and what you do not know” Abigail 10:46
  - More of a risk taker because have the time to formulate a question and make sure it has not already been covered Abigail 13:03
Permanence (Elizabeth 1416)
Think I’m stupid permanence imposter syndrome, avoidance Don’t want name attached to question
Mistake
“gotcha moment” What does this mean?
Fear of failure due to delay
We all have the same knowledge
Bigger consequence because peers and instructor can see it and it has more of their focus and is more permanent

Students will mimic the online behaviors they see their peers doing unless told otherwise by the instructor

Look up asking questions in education for their wording of this not wanting others to know what you don’t know

Controversial
Tends to reflect on DB posts Do I need to talk about somewhere the type of interactions as it relates to these questions? It may add to the description of the case to know that the context for this was mainly a DB post versus synchronous class
Lisa 1259 use of positive sandwich
Don’t engage Elizabeth and Lisa and unless required
Elizabeth 2053 Mentions no social cues, and other people can participate and increases the chances of being misunderstood losing control of the conversation and its intention, immediacy
May be misunderstood due to no tone of voice don’t know personalists of audience so soften language but cohort makes this easier to navigate

Cautious
Role of personality?
Suggestions versus statements or soft language such as These are just my thoughts or I feel like this will be a good idea to soften the differing opinion
Appendix G

Sample of Codebook

Apprehensive- anxious or fearful that something bad or unpleasant will happen

Self Conscious- Undue awareness of one’s appearance or actions
   Allison 191 I guess because I don't want to be like considered trying unnecessarily hard or, um, like showing off. Like I never want it to look like to the teacher that I'm like trying to get their opinion of me to be good because I'm engaged

Cautious- careful to avoid potential problems reserved, guarded holding back
   Kayla 120 I feel like being guarded feels necessary

Nervous- agitated, uneasy, anxious
   Lucy 127 sense of like, uneasiness
   324 heart pounding
   Nicole 131 anxiety kind of creeps in

Fear of negative evaluation- distress over negative evaluations by others

Judged Incompetent- inability to do something successfully; unskilled, lacking in expected degree of ability (imposter syndrome)
   Lindsey 324-326 they are all, they all think it and they all know it And this [mistake] is just further proof of that [I am behind] they see that and they're like, yeah, she don't know what she's doing

Judged Ignorant- lacking in knowledge or awareness about a particular thing
   Nicole 121 like maybe I'll just say this one really dumb thing and like everyone will think I'm stupid

Gotcha moment- An unexpected usually disconcerting challenge, revelation or catch
   Lucy 315-319 in that moment it feels like kind of like a gotcha this person doesn't know what they're talking about

Misunderstood- incorrectly interpreting the words or actions of others

Misunderstood-
   Elizabeth 241 but I would be scared that they would interpret it in the wrong way, as in maybe I'm just like coming at them or the topic because it is a difference of opinion

Judged Offensive- causing someone to feel deeply hurt or upset
   Lindsey 266-67 It's just very blunt and open and I don't really care about your feelings. That's how I'm afraid it's perceived

Supported- give approval, comfort, encouragement
Secure
Kayla 169 sense of security

Comfortable
Daisy2 123 feel more comfortable going into it and I'll be more eager also to interact with my peers

Validated- Found correct, founded in truth
Nicole212 like I feel validated when it's a good response

Respected- showing deference, due regard for the feelings, wishes, rights or traditions of others
Lucy2 68 Recognizing that our …there are other beliefs I think sets up an aspect of safety…open to considering how other people think, even if they’re not open to changing how they think
Appendix H

Sample of Thematic Analysis