EXPLORING MIDDLE SCHOOL TEACHER PERCEPTIONS OF VIRTUAL TEAMS AS A DELIVERY MECHANISM FOR PROFESSIONAL LEARNING

by

Shawna Jensen

A dissertation

submitted in partial fulfillment

of the requirements for the degree of

Doctor of Education in Educational Technology

Boise State University

August 2023

BOISE STATE UNIVERSITY GRADUATE COLLEGE

DEFENSE COMMITTEE AND FINAL READING APPROVALS

of the dissertation submitted by

Shawna Jensen

Dissertation Title: Exploring Middle School Teacher Perceptions of Virtual Teams as a Delivery Mechanism for Professional Learning

Date of Final Oral Examination: April 20, 2023

The following individuals read and discussed the dissertation submitted by student Shawna Jensen, and they evaluated the student's presentation and response to questions during the final oral examination. They found that the student passed the final oral examination.

Jesús Trespalacios, Ph.D.	Chair, Supervisory Committee
Charen Snelson, Ed.D.	Member, Supervisory Committee
Kerry Rice, Ph.D.	Member, Supervisory Committee

The final reading approval of the dissertation was granted by Jesús Trespalacios, Ph.D., Chair of the Supervisory Committee. The dissertation was approved by the Graduate College.

DEDICATION

I dedicate this work to all my family, friends, and colleagues who have supported me along the way. A special shout out to my husband, Clint, for surviving my crazy as I completed this chapter of my life, to my dad, for showing me what it means to aim for the stars, and to my fellow teachers for helping me find my purpose in this world.

ACKNOWLEDGMENTS

I would like to extend my gratitude to the participants of this study for taking the time to do interviews for this study. I would like to thank the committee members Dr. Chareen Snelson and Dr. Kerry Rice for providing guidance and feedback in this dissertation. I would also like to acknowledge all the professors at Boise State University for all their help and support during the path toward earning my Doctorate in Education. Most importantly, I would like to thank Dr. Jesús Trespalacios for believing in me and encouraging me throughout my journey at Boise State. His kind words and encouragement gave me the courage to apply and persevere through this program. Thank you for seeing in me, what I had yet to see myself.

ABSTRACT

Virtual teams are composed of members who work together, transcending time and space through communication technologies to meet shared goals. Many organizations currently use virtual teams to connect employees across the globe. Furthermore, the COVID-19 pandemic forced almost all organizations to shift their employees to hybrid and remote settings. As a result, many workers across the world found themselves shifting to virtual team models. In fact, during the pandemic, teachers found themselves working and learning through virtual teams in addition to teaching remotely. This study was designed to understand how teachers perceived virtual teams and teamwork as an effective modality for delivering professional learning. A basic qualitative study was conducted where seven middle school teachers were interviewed during a 6-to-8-week period in the fall of 2022. This study asked teachers to share firsthand experiences and perceptions of learning through virtual teams as relevant, collaborative, and future-focused.

This study's results indicate various perceived benefits and challenges when it came to using virtual teams to deliver professional learning. Participants reflected on their virtual teamwork within and across school buildings through semi-structured interviews. The findings of this study indicate strengths in flexibility and cross-school collaboration while working in virtual teams. The findings also suggest challenges around virtual team structures and community building while working in virtual teams.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ERT	Emergency Remote Teaching
AITSL	Australian Institute for Teaching and School Leadership
PLD	Professional Learning and Development
PLN	Professional Learning Networks
MTSS	Multitiered Support Systems

CHAPTER ONE: INTRODUCTION

COVID-19 lockdowns forced many organizations to operate remotely. During this time, employees turned their homes into virtual workspaces and had to rely on communication technologies to work and collaborate with their colleagues (Marshall et al., 2020). Furthermore, the pandemic resulted in schools transitioning into Emergency Remote Teaching (ERT). It made it necessary for teachers to work with their colleagues through virtual teams to support their students (Charteris et al., 2021). According to Hodges et al. (2020),

> … (ERT) is a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances. It involves the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses and that will return to that format once the crisis or emergency has abated (Hodges et al., 2020, para. 13).

The primary goal of ERT is not to "recreate a robust educational ecosystem" but instead to provide "temporary access" to instruction through online tools due to a crisis (Hodges et al., 2020, para. 13). The pandemic resulted in many schools shutting down in-person learning and shifting to ERT. This shift meant that teachers quickly adapted their current face-to-face or blended learning materials for ERT. Additionally, teachers moved from face-to-face collaboration with colleagues to virtual team models (Charteris et al., 2021).

Even though COVID-19 mandates have changed since the early stages of the pandemic, Peterson et al. (2020) acknowledged that ERT is likely to continue in the future, where schools and districts are parallel planning for providing more well-developed sustainable online learning practices. According to Cabeen (2021), this plan should also include how to support teachers with professional development and learning. Thus, with the pandemic still at large, educational leaders will need to continue evaluating strategies to deliver professional learning opportunities for teachers.

Charteris et al. (2021) acknowledged that teachers successfully shifted into virtual teams during the school response to the pandemic. Virtual teams are defined as members dispersed across time and space using communication technology to work toward a common purpose (Bell & Kozlowski, 2002; Gillam & Oppenheim, 2006; Handke et al., 2019; Lin et al., 2008; Snellman, 2014). Virtual teams are not a new concept. Many business organizations have been using virtual team models to support collaboration and productivity, especially those with globally distributed employees (Dulebohn and Hoch, 2017). Even though virtual teams are popular in the business disciplines, Charteris et al. (2021) explained that a virtual team approach is a practical base for establishing a professional learning community based on its relevant, collaborative, and future-focused potential. However, little research exists on virtual teams in schooling contexts (Charteris et al., 2021). The current literature on virtual teams in school contexts focuses on short-term projects and manufacturing scenarios instead of long-term sustainability and job-embedded relevance (Jensen, 2021). Additionally, most research on virtual teams in K12 or higher education settings occurs with undergraduate students majoring in

business disciplines (Jensen, 2021). Overall, there is a significant gap in virtual team research regarding virtual teams of educators.

Statement of the Problem

Current research on virtual teams exists across business organizations. This research includes effective design characteristics (Duarte & Snyder, 2006; Dulebohn & Hoch, 2017; Jarvenpaa & Leidner, 1998; Stevenson, 2017; Watkins, 2013) as well as critical components of virtual team models (Brahm & Kunze, 2012; Erez et al., 2013; Charteris et al., 2021; Gibson & Cohen, 2003; Kiffin-Peterson, 2004; Pangil & Chan, 2012; Marlowe et al., 2017; Wilson, 2007). While these studies help guide business leaders with models and research to inform their virtual teams, little is known about virtual teams in school contexts, especially regarding professional learning for teachers (Charteris et al., 2021; Purnell, 2012).

Even though Charteris et al. (2021) claim that virtual team research for educators is virtually non-existent, research on informal virtual teamwork and communities such as Professional Learning Networks (PLNs) exists. While there are some overlapping components of virtual teams and PLNs, PLNs differ from virtual teams as defined and used within this study. For example, both virtual teams and PLNs use communication technologies for communication and collaboration. However, virtual teams are formal and structured to support teams toward reaching common goals and purposes. These are often absent in PLNs and are considered an informal approach to team learning. As a result, virtual team research needs more attention on formal structures for virtual teams of educators.

Virtual teams and networks continue to grow in popularity. According to Lipnack and Stamps (2021), virtual teams and other digital networks dominate the 21st-century organization. However, the current literature does not reflect equally distributed information on virtual teams across varying disciplines (Jensen, 2021). As a result, many organizations outside the business sector have little to no information about how best to develop virtual team models for their unique contexts. Districts and schools are complex systems that require special attention as they include many adults that bring diverse perspectives and experiences to the workplace. Exploring teacher perceptions and experiences of virtual teams since the COVID-19 pandemic will provide valuable information for future virtual team models as professional learning vehicles for educators.

Purpose of the Study and Research Question

Virtual teams may provide a relevant mechanism for teachers to learn and engage in professional development. Research suggests that relevancy, collaboration, and future focus are effective characteristics of online professional development (AITSL, 2012; Charteris et al., 2021). This basic qualitative study aimed to explore how two groups of middle school teachers from a large, public urban school district perceive their virtual team professional learning experiences as relevant, collaborative, and future-focused. First, I sent an initial survey to teachers across two different middle schools within the district. This survey helped narrow the selected sample for additional interviews. To explore participant experiences, follow-up interviews were conducted with seven participants. Each participant engaged in three interviews using semi-structured questions. All interviews were recorded, transcribed, and stored using the Qualitative

Data Analysis Software (QDAS), NVivo. NVivo was used for coding analysis, interpretation, and data display. This study applied the following research question to guide data collection and analysis:

1. How did middle school teachers perceive professional learning through virtual teams as relevant, collaborative, and future-focused?

Significance of the Study

According to Luneburg and Irby (2007), it is essential for all researchers to "build a case for their study" (p. 117). Tracy (2010) explains that to build a case for qualitative research, the researcher should consider specific criteria to ensure an excellent qualitative study. One criterion for quality is choosing a worthy topic. According to Tracy, a worthy research topic is relevant, timely, significant, and interesting (p. 848). This study is relevant and timely because many educators shifted successfully to virtual team models since the COVID-19 pandemic (Charteris et al., 2021). Still, little research exists on virtual teams and virtual team models for educators (Charteris et al., 2021; Jensen, 2021). While several studies have focused on informal learning through digital communication and knowledge-sharing technologies, professional learning networks (PLNs) differ from virtual teams. PLNs primarily occur through social media sites and are often unstructured and informal opportunities for professional learning. The current literature on PLNs provides insight into participant experience of an informal learning environment. However, this research provides information better to understand structured and formal learning through virtual teams.

The significance of this study is paramount in that it addresses the current gap in the literature of gaining teacher perceptions on their experience with virtual teams as

vehicles for professional learning. By exploring teacher perceptions of this experience, educational leaders will gain insight into the impact of the virtual team models used for professional learning. The results of this study will be interesting to practitioners in education as it will contribute valuable insights into how virtual team models may be an effective method of professional learning for teachers. Practitioners in education can use this knowledge for further research and practical application of virtual team models.

Theoretical Framework

This study draws on the framework of the three core characteristics of professional learning and development (PLD) as found by The Australian Institute for Teaching and School Leadership (AITSL) (2012). The AITSL (2012) commissioned a study to explore innovative approaches to online PLD. This study involved an analysis of 97 studies and groups of studies where teacher PLD was linked to student outcomes. As a result of this analysis, the AITSL (2012) provides guidelines for what is considered effective online PLD. Overall, three main themes emerged from the study: relevancy, collaboration, and future-focused. Additionally, both Situated Learning Theory and Adult Learning Theory help explain the relationships between the participants and their learning within the context of this study.

Relevancy

Charteris et al. (2021) state that relevant PLD connects educators' goals, aspirations, and needs. Specifically, the framework outlined by the AITSL (2012) encourages professional learning for teachers that:

- supports teachers and leaders with understanding the immediate and long-term needs of their students

- challenges their current assumptions, and supports a solution-based approach to issues
- grounded in research and evidence-based practices
- aligns with professional, school, and system-wide mission, vision, and values
- apply principles of adult learning theory
- timely

Professional learning that is relevant based on the list mentioned above, will be more "engaging" and have "the greatest impact" on teaching and learning when it comes to addressing and adapting to challenges within their professional environment (AITSL, 2012, p. 4).

Collaboration

Collaborative PLD includes participant contribution to the design, facilitation, and evaluation of the pedagogical practices and their learning (Charteris et al., 2021). AITSL (2012) explains that for educator professional learning to integrate effective collaborative techniques, the learning experience should:

- include teacher involvement in decisions related to the design, content, and evaluation of the learning experience
- create a safe space for receiving feedback and observing others in action
- provide multiple models of support through coaching and mentoring
- integrate experts in the field of learning
- ensure connections amongst and between schools
- applies technology that elevates learning and collaboration

This list reveals intentionality when it comes to including collaboration in professional learning scenarios. It goes beyond bringing colleagues together to work on projects. Virtual teams harness the power of collaboration (Stevenson, 2017).

Future-focused

Finally, future-focused PLD allows teachers to evaluate their knowledge around theories that align with their actions (Charteris et al., 2021). Future-focused PLD includes learning experiences that support educator adaptability. For example, AITSL (2012) recommends that for professional learning to be future-focused, it should:

- focus on ways to adapt to challenges, both present and future
- provide practical strategies for adapting to a rapidly changing world
- immerse educators in research that challenges their beliefs and practice
- encourage innovative practices

Educational environments can be challenging and demanding as teachers attempt to meet the needs of a variety of diverse learners. The shift to ERT disrupted “normal” schooling routines for many students. As a result, students returning to school in-person, hybrid, or otherwise will bring additional layers of complex challenges to the classroom. Therefore, providing educators with future-focused PLD is incredibly important so that they have several strategies and tools for responding to these challenges as they present themselves.

Overall, the framework AITSL (2012) outlines practitioners with criteria used to evaluate current virtual teamwork that educators have engaged in due to the pandemic. More specifically, educators' recent virtual team experiences can be used to explore teacher perceptions of their relevance, collaborative components, and future-focused

alignment. It is important to note that Charteris et al. (2021) claim that these must all be in place to support educators' effective virtual team professional learning model. As a result, teacher feedback around these components will provide future practitioners with ways to replicate strengths and address gaps within current virtual team models.

AITSL's (2012) framework is a guide for developing the research question based on Situated Learning Theory and Adult Learning Theory (Andragogy). According to Lave and Wenger (1991), Situated Learning Theory emphasizes the importance of creating meaning through real-world activities and daily life. In other words, Situated Learning Theory encourages “learning environments that embed subject matter into the ongoing experiences of the learners” (Stein, 1998). This embedded subject matter is important to the learner’s knowledge acquisition as it allows for transferring learning from the learning experience to real-world practice (Stein, 1998). Additionally, Anderson et al. (1996) and Wilson (1993) explain that a Situated Learning experience has four key assumptions that should guide the development of learner activities. First, the learning should explicitly connect to the contexts in which the learner experiences. Second, knowledge acquisition is situational and transfers only to similar situations. Third, learning is a social process that includes thinking and interacting. Finally, learning is not separate from action. Based on this theory, the AITSL (2012) PLD framework is appropriate for exploring teacher perceptions of learning through virtual teams because relevance and future-focused PLD connects to Situated Learning Theory’s emphasis on grounding in learner real-world experiences. Furthermore, the collaborative focus of the AITSL (2012) PLD framework highlights the importance of learning as a social process.

Additionally, the AITSL (2012) PLD framework is a fitting guide based on Adult Learning Theory (andragogy). Knowles (1984) suggests that there are four principles to adult learning. First, adults should be involved in planning and evaluating their learning experiences. Second, the prior experiences of adult learners are essential to the instructional foundation of the learning experience. Third, adults learn best when the learning experience is directly relevant to their personal and professional lives. Finally, adult learning is problem-centered. Like Situated Learning Theory, Adult Learning Theory connects to the AITSL (2012) PLD framework because of the similarities to learning involving relevancy and future-focused learning experiences. For example, relevance includes learning experiences connected to participants' experiences and relevant needs. Also, future-focused learning is problem-centered learning. There is an emphasis on educators building up skills to respond and pivot to the future challenges they may encounter. Overall, both Situated Learning Theory and Adult Learning Theory provide the foundation for applying the AITSL (2012) PLD framework due to their connections to learning that is relevant, collaborative, and future-focused.

Limitations

The sample for this study included a small group of teachers from two schools within a district; therefore, the results of this study are not generalizable to the larger population. Additionally, outside variables would have impacted the teacher experiences and shared perceptions outside the realm of the virtual team experience. Finally, teachers were asked to reflect on their current and previous participation in virtual teamwork. As a result, teachers may not have been able to recall details as accurately or provide information or artifacts after the fact.

Delimitations

Determining delimitations in this study included gaining a more robust understanding of the virtual teamwork experienced by educators because of the COVID-19 pandemic. To better understand the teacher's experiences, I looked for potential subjects who worked on multiple virtual teams and conducted a variety of virtual teamwork.

A second delimitation was the use of only middle school educators as participants. Choosing middle school educators was due to not only the difference in educational models for elementary and middle school teachers. For example, elementary teachers often have the same students all day and teach multiple subjects. On the other hand, middle school teachers specialize in content and teach numerous groups of students over the course of a day. Therefore, the needs and experiences of virtual teams may differ between these two populations. Middle school teachers were also selected based on the need for a smaller sample size for the surveys per district recommendation.

Assumptions

This study includes the following assumptions: (a) the selected participants conveyed their experience accurately through their interviews, (b) the selected participants understood the components of the AITSL framework enough to provide examples based on their own experiences, (c) the data collected measured the participants' experience with virtual teams as it related to their professional learning, and (d) the interpretation of the data accurately reflects the perception and experiences of the participants.

Definition of Terms

There are terms used throughout the study that need clarification to support a shared understanding of the rest of these chapters. The following key terms are defined as they are frequently referenced in the literature.

Virtual Teams

Virtual teams can be defined as members dispersed across time and space using communication technology to work toward a common purpose (Bell & Kozlowski, 2002; Gillam & Oppenheim, 2006; Handke et al., 2019; Lin et al., 2008; Snellman 2014). Organizers specifically design virtual teams to facilitate progress toward achieving organizational goals.

Professional Learning Networks

Professional Learning Networks (PLNs) are educators who engage in collaborative learning with one another outside of their workday (Brown & Poortman, 2018). Moreover, many PLNs provide community members with informal learning opportunities through social media platforms such as Facebook and Twitter.

Online Professional Learning and Development

Professional learning and development refer to the learning experiences delivered to employees to support their continued success and growth within their roles. Organizers provide professional learning and development in person through presentations and workshops. Similarly, online professional learning and development refer to these same learning experiences through an online modality such as synchronous, asynchronous, or hybrid learning approaches.

Organization of the Dissertation

This dissertation is presented in five chapters. Chapter I includes the background of the study, a statement of the problem, the purpose of the study, the significance of the study, the definition of terms, the theoretical framework, research questions, limitations, delimitations, and assumptions of the study. Chapter II reviews the literature, including online professional learning modalities, professional learning networks, virtual team definitions, characteristics, and features, and ends with the current literature on virtual team research in education. Chapter III describes the methodology used for this research study. It includes the selection of participants, instrumentation, data collection, and data analysis procedures. Chapter IV presents the findings of this study and finally, Chapter V includes a discussion of the findings, limitations, and implications for future research.

CHAPTER TWO: LITERATURE REVIEW

This chapter presents the rationale for researching teacher perceptions and experiences of virtual teams and teamwork since the COVID-19 pandemic. Educational researchers have studied different modalities of online professional learning for several years. Additionally, business researchers have studied characteristics, effective features, and leadership among virtual teams across various business sectors. While neither of these groups of researchers has focused much on virtual teams as a method for delivering professional learning to employees, their findings provide insight into online learning and collaboration among team members. This study will build on this resource and bridge the gap between online professional learning for teachers and virtual teams as a mechanism for delivery.

As education practitioners continue to revise how digital communication technologies serve as platforms for working toward common goals, it is essential to consider how teachers have perceived the impact of virtual teams and teamwork on their professional learning. Thus, this study will elevate teachers' voices and allow them to share their perceptions of virtual teams and teamwork as relevant, collaborative, and future-focused.

The following literature review represents the literature pertinent to this research study, specifically online professional learning, virtual team characteristics and features, and virtual teams in education. Specifically, this chapter is organized into three major

sections: (a) online professional learning, (b) virtual teams, and (c) virtual teams in education.

Online Professional Learning

Professional learning is a common approach to teacher development across school districts. According to Johnson (2014), "professional development is the strategy schools and school districts use to ensure that educators continue to strengthen their practice throughout their career. The most effective professional development engages teams of teachers to focus on the needs of their students" (p. 1). Additionally, characteristics of professional development often include an emphasis on changing knowledge, skills, and practices (An, 2018). Although the purpose remains the same, professional learning can be delivered using various structures, including face-to-face and online components. A. This popularity may primarily be due to the flexibility online learning provides (Anthony, 2020). Adults taking part in online learning typically choose when and to complete assignments. As a result, this allows participants to learn during a time that best suits their needs and unique contexts.

Regardless of the approach, teachers report issues with current professional learning models, such as time constraints, misaligned content and context, and alternate agendas by administrators (Hanson, 2009). As a result, online learning received increased attention, potentially alleviating some of these barriers and providing more choices for teachers (Elliot, 2017). Currently, research focuses on effective design components of online learning experiences so that those designing the experiences can maximize instructional outcomes.

Research shows that practical professional learning experiences for teachers include content-focused learning, active participation, coherence, timeliness, collective participation, and considering the learners' context (Desimone, 2009; Yurtseven et al., 2020). Furthermore, State et al. (2019) shared that a core feature of effective professional development is acquiring and translating skills into practice. Therefore, it is important to plan time during professional learning experiences for participants to actively practice their skills from the session. However, when facilitators feel time pressure, they may leave out the practical application or suggest it after the learning. As a result, the lack of application may make professional learning irrelevant to the learner's context. Some research indicates that professional development for educators may feel "top-down," coming from the administration, with little power or control for teachers (Hanson, 2009). Regardless of the content, online professional learning happens through one of three modalities: synchronous, asynchronous, or hybrid.

Synchronous Learning

Online synchronous learning happens between learners and instructors in real time. For example, instructors may use some parts for synchronous learning, such as discussion or other forms of interaction (Finol, 2020). However, some research explores the impact of synchronous learning for teachers for online professional learning. For example, Francis and Jacobsen (2013) analyzed the effect of synchronous online discussions on math educators. Findings suggested that more straightforward mathematical tasks promoted the highest level and quality of interaction. Furthermore, Chen et al. (2009) explored the impact of synchronous learning on pre-service educators.

The survey results suggested that synchronous models could benefit this group of teachers, but these conditions depended on safety, environment, self-efficacy, and competency. While these studies provide a couple of examples exploring the impact of synchronous learning on teachers, they only focus on specific content or teaching experience. Additionally, both suggest considering components for the learning to be effective. These results give little to no insight into how teachers perceived the learning experience and whether they would have instead had the learning delivered in a different online delivery form.

Asynchronous Learning

Asynchronous learning happens at a time designated primarily by the learner. Examples of this kind of learning include recorded training sessions distributed to employees to watch and complete activities, instructional videos or slideshows sent to learners for viewing, and the use of discussion boards. A primary benefit of asynchronous learning is flexibility (Anthony, 2020). This approach to asynchronous online learning models allows instructors to provide learners with materials and use the resources to learn at their own pace and self-selected time. However, providing learning materials, regardless of their quality, is insufficient for supporting learning (Murphy & Coleman, 2004; Schaefer et al., 2019). Many studies have shown that learner interaction is essential in producing favorable learning outcomes (Bond, 2016; Castro, 2019; Schaefer et al., 2019). For instance, Murphy and Coleman (2004) shared a model for online asynchronous discussions that collaborate in asynchronous online learning. Therefore, those designing online professional learning experiences must consider maximizing participant collaboration.

Collaboration in asynchronous environments can happen in many forms, but it must be carefully designed and implemented in online learning environments. For this kind of interaction to show effective results, the collaboration must clarify a purposeful relationship between the learners and their work to achieve an outcome (Göktürk & Dikilitaş, 2020; Schrage, 1995). When the design of online learning environments considers this component, the social interactions with peers' support reflection and high learning processes (Schaefer et al., 2019). Furthermore, collaborative environments promote psychological well-being and social competence (Laal & Ghodsi, 2012). Overall, collaboration is an important component of asynchronous learning as it supports instructional outcomes and social well-being.

Hybrid Learning

Hybrid online professional learning combines both asynchronous and synchronous teaching methods. Current research shows many benefits to utilizing hybrid learning for teachers (Anthony, 2020; Belland et al., 2015; Matzat, 2013). For example, both Anthony (2020) and Belland et al. (2015) reported positive results with hybrid learning connected to instructional outcomes for participants. Furthermore, Matzat (2013) reported positive effects of hybrid learning for teachers related to increased engagement. Overall, current research on online professional learning provides implications for designing a successful virtual team experience for educators. For example, a virtual model must include content relevant to the learners' context. Additionally, the content should be focused and timely. Finally, participants should have many opportunities to collaborate and work toward a common goal or purpose. Many of these components are also crucial design components for effective virtual teams.

Overall, in-person and online professional learning can come in many forms for educators, including conferences, in-service training, online modules, professional learning communities, and coaching. Over the last year, school districts deployed professional learning opportunities through asynchronous, synchronous, and hybrid methods (Hartshorne et al., 2020). Furthermore, these delivery modalities exist in informal and formal professional learning settings. Growing more attention since the onset of social media platforms is a form of informal online professional learning, Professional Learning Networks.

Professional Learning Networks

Previously, practitioners in education reported being dissatisfied with teachers' professional development (Opfer & Pedder, 2011). There continues to be a gap between what is known to be effective and what teachers experience (Edge et al., 2015; Webster-Wright, 2009). As a result, educators continue to seek alternative avenues for professional learning. The rise of social media created new spaces for educators to collaborate and learn with and from each other (Krutka et al., 2016). As a result, several researchers discuss the promise of social media spaces as places where learning naturally occurs through participants (Sharp & Whaley, 2018; Sturm & Quaynor, 2020; Visser et al., 2014). Social media platforms, such as Facebook and Twitter, serve groups of people as collaborative spaces to share knowledge. In fact, “[s]ocial media and collaboration technologies are viewed as valuable tools for creating a new reality of collaborative learning” (Yang, 2014, p. 73). Yang (2014) explains the significance of these platforms for newer generations of learners who consider convenience as a priority for learning and collaboration.

These informal professional learning groups are called Professional Learning Networks (PLNs). A PLN is a group of people who use various communication and Web 2.0 technologies to share ideas (Krutka et al., 2016; Robinson et al., 2020; Trust et al., 2016). For educators, these teams may reflect similarities to Professional Learning Communities (PLCs), which often bring teachers together in person for professional development and collaboration (Brown et al., 2018). Also, researchers believe that a key component of PLCs does include a level of accountability (Hoaglund et al., 2014). That level of accountability or structure is something absent from PLNs. PLNs are increasingly popular, allowing learners to seek professional development to fit their specific needs (Visser et al., 2014; Sturm & Quaynor, 2020). They also "expand opportunities for engagement with digital peers who are more accessible across typical temporal, spatial, and institutional barriers" (Trust et al., 2018). Furthermore, teachers and administrators report that PLNs reduce isolation, promote autonomy, and provide inspiration (Flanigan, 2012). Overall, PLNs provide participants with opportunities for collaboration and rich conversations that include diverse perspectives.

First, PLNs often include informal learning instances with variations to provided structures (Oddone et al., 2019; Prenger et al., 2021). Prenger et al. (2021) conducted a recent study revealing that leadership, shared goals or outcomes, and collaboration impact learning outcomes in PLNs. Depending upon the PLN, these may or may not be present for the learners. Similarly, virtual team structures are strongly associated with team performance (Liu et al., 2008). Unlike PLNs, organizations often manage virtual teams that ensure team structures, procedures, and routines that contribute to favorable learning and performance outcomes.

Overall, a crossover exists between virtual teams and professional learning networks. PLNs, regardless of the digital platform, provide participants with mostly informal learning opportunities (Oddone et al., 2019; Robinson et al., 2020; Trust et al., 2018). However, virtual team models may be more fitting for formal organizations, such as education, as they can be managed within the organization and ensure the relevancy of the learning experience for participants. Even though differences exist amongst these virtual teams, the future application of digital networks continues to grow. In the end, the research on PLNs and the popularity of this informal approach to learning serve as additional information on how to best support educators with online professional learning opportunities. The next section shifts to exploring formal learning opportunities through virtual teams.

Virtual Teams

Virtual teams are widely used across business disciplines. Based on the current literature, virtual teams are commonly defined as team members dispersed across time and space using communication technologies to work toward a common goal or purpose (Bell & Kozlowski, 2002; Gillam & Oppenheim, 2006; Handke et al., 2019; Lin et al., 2008; Snellman, 2014). Businesses frequently use virtual teams, especially those with global employees (Dulebohn & Hoch, 2017). However, despite its popularity, very little has been written about virtual teams in the field of education (Charteris et al., 2021; Rolando et al., 2014).

Even though little research exists, some researchers see virtual teams as an opportunity to support professional development for educators (Charteris et al., 2021). Some even argue that virtual teams are the next stage of organizational evolution (Martin,

2021). Therefore, research should focus on how virtual teams and virtual team models best serve different organizations. The following section pulls from the current literature on virtual teams to provide definitions and typical characteristics of virtual teams. Finally, the section ends with an explanation of existing studies on virtual teams for educators.

Defining Virtual Teams

Virtual teams provide an opportunity for a flexible learning environment that still guides learners toward goals. Most of the interdisciplinary literature on virtual teams provides definitions that include members dispersed across time and space using communication technology to work toward a common purpose (Bell & Kozlowski, 2002; Gillam & Oppenheim, 2006; Handke et al., 2019; Lin et al., 2008; Snellman, 2014). For instance, according to Dulebohn and Hoch (2017), virtual teams include groups of people who are "geographically dispersed, have limited face-to-face contact, and work interdependently through the use of electronic communication media to achieve common goals" (p. 1). Another definition from Martin (2021) explains virtual teams as "teams with a common purpose that use technology to cross time zones, distance, and the boundaries of organizations" (p. 17). Practitioners in education may see similarities between these definitions and online communities of practice. However, Charteris et al. (2021) explain that a critical difference is that virtual teams are continuous, ongoing professional learning cohorts. A community of practice, online or in person, might exist as an isolated, informal professional learning event. Overall, slight variance exists between definitions of virtual teams across the literature.

Even though many researchers agree on a common definition of virtual teams, virtual teams' 'virtual' components can include different approaches. Many technologies are available in the workplace and used by teams to support organizational goals. However, Gibbs et al. (2019) made an important distinction about virtuality in that there is not an "on-and-off switch" instead, virtuality should be seen as a "continuum ranging from low to high" (p. 8). In this way, virtual teams could include several online learning modalities, such as asynchronous, synchronous, and hybrid approaches.

Design Features and Characteristics

Virtual team designs include various features and characteristics. According to Stevenson (2017), virtual teams harness the power of collaboration. Moreover, collaboration can happen over time and space (Dulebohn & Hoch, 2017). This collaboration is an important feature for schools as a virtual team model could connect educators in rural and urban areas, providing knowledge-sharing opportunities. (Charteris et al., 2021). There are also a variety of virtual team types. According to Duarte and Snyder (2006), there are seven basic types of virtual teams: networked, parallel, project, production, service, management, and action. Each of these types differs based on the group output or goal. Other researchers explain that it is best to consider their mode of interaction, context, and group (Jarvenpaa & Leidner, 1998).

Principles and practices guide many virtual teams. For example, Watkins (2013) shared ten guiding principles for virtual teams: in-person and virtual meetings, virtual "water coolers," and commitments to shared communication channels, tasks, and processes. Current research and writing show that while agreement exists on definitions of virtual teams, approaches to a successful implementation of virtual team models vary.

However, many authors emphasize the importance of successful interactions to help sustain a virtual team community (Charteris et al., 2021; Dulebohn & Hoch, 2017; Jarvenpaa & Leidner, 1998; Marlow et al., 2017; Watkins, 2013, Wilson, 2007).

Effective Virtual Teams

Some researchers have begun to explore the critical components of successful virtual teams. Overall, trust is crucial to the success of virtual teams (Brahm & Kunze, 2012; Erez et al., 2013; Kiffin-Peterson, 2004; Pangil & Chan, 2012). For example, Pangil and Chan (2012) explored the relationship between trust and virtual team effectiveness. They deployed a survey used within a cross-sectional study in Malaysia and found that three types of trust are significantly related to virtual team effectiveness. These three types of trust are personal-based, institutional-based, and cognitive-based trust. Personal-based trust connects to the trust that builds from mutual knowledge exchange. Next, institutional-based trust relates to accountability measures from the institution in that there will be rewards and punishments for not sharing knowledge. Finally, cognitive-based trust includes the type of trust that builds from the professional credibility of the team members (Pangil & Chan, 2012).

Next, Parke et al. (2017) explored how some face-to-face interactions impacted the performance of a virtual team model. They tested a virtual team model focused on the initial meeting approach and embedded team-building activities. The researchers set up an experiment that included 644 participants and 161 virtual team members. They found that virtual teams with an initial face-to-face meeting instead of completely virtual demonstrated increased knowledge sharing. However, in these cases, the structured team-

building exercises diminished knowledge sharing in some areas. In addition to trust, Parke et al. (2017) provided some additional insights into the benefits of an initial face-to-face meeting before virtual teamwork begins.

Finally, Gibson and Cohen (2003) shared five factors that support virtual team effectiveness: (a) supportive organizational structure, (b) task characteristics, (c) technology, (d) team member characteristics, and (e) team processes. Even though a few of these factors might not require in-depth levels of trust or collaboration, these factors' effectiveness depends upon strong organizational structures (Berry, 2011). To provide supportive organizational structures, practitioners facilitating virtual teams should develop norms and expectations around communication and collaboration, including accountability measures (Gibson & Cohen, 2003; Whitener et al., 1998). Additionally, Klein (2003) stress the importance of leadership in virtual teams. These leaders took the initiative by assigning tasks, coordinating efforts, and setting performance goals in virtual teams. Once again, the importance of trust between team members and their leader was paramount to the virtual team's success. The following and final section of this review builds on the current literature on virtual teams in general by focusing on virtual teams specifically in education.

Virtual Teams in Education

To best understand the current application of virtual teams in education, the following section discusses the findings of virtual team research in education related to participants, purpose, and virtual team tasks. This section shares the who, what, and why behind the research on virtual teams in education. Additionally, the section explains the types of projects and tasks virtual teams experienced across different studies. Since a

critical component of many virtual team definitions includes working toward a common goal or purpose (Bell & Kozlowski, 2002; Gillam & Oppenheim, 2006; Handke et al., 2019; Lin et al., 2008; Lilian, 2014), it is important to consider the deliverables of each group as they represent the common goal or purpose of the virtual teams within these studies.

Participants in Virtual Team Research

Although virtual teams and virtual team research has been around for decades, little of the current research focuses on virtual teams for educators (Charteris et al., 2021; Jensen, 2021). Most studies on virtual teams in education are biased toward undergraduate and graduate students pursuing business degrees (Jensen, 2021). The rationale for several studies conducted in business courses is connected to future work opportunities. In other words, several researchers justified the need for their research due to the potential future career path of the participants needing to function on a virtual team within the workplace.

For example, many researchers indicated that their participants would need to prepare to work in a business environment that utilized virtual teams and virtual teamwork (Bartel-Radic et al., 2015; Cleary et al., 2019; Dai et al., 2019; Fainee & Kline, 2013; Gonzalez-Perez et al., 2014; Meier et al., 2016). For instance, Bartel-Radic et al. (2015) highlight the complexity of business environments in that they often include multinational and multicultural teamwork through virtual teams. As a result, they suggest training and skills for business students since these are essential skills for participating in and managing virtual teams across business organizations.

Similarly, Dai et al. (2019) emphasized the same justification but added the importance of students understanding the value of virtual teamwork. Cleary et al. (2019) also stress the significance of participants valuing collaboration through virtual teamwork to work effectively in virtual teams, especially in interdisciplinary virtual teams. Overall, prior and current studies on virtual teams across education disciplines have focused on participants engaged in business courses. This reveals a gap in the existing literature regarding educators' presence and experience with virtual teams.

Purpose of Virtual Team Research

In addition to recent research on virtual teams focusing on students enrolled in higher education business courses, the purpose of several existing studies relates to participant experiences and their interactions within virtual teams. For example, participant experience frequently appeared in the literature on virtual teams in education by exploring participant perceptions through different methods. For instance, Sloan and Lewis (2001) used Likert-style surveys to gauge students' experience with the satisfaction of virtual teams. Additionally, Gonzalez-Perez et al. (2014) applied a mixed-methods approach using Likert-style surveys and conducting individual interviews with participants. Other researchers, such as Cleary et al. (2019), used qualitative analysis and coding on virtual team participant blogs and transcripts to interpret participant experiences.

While these studies reflect a purpose connected to participant experiences, others included exploring interactions within virtual teams. For instance, Cleary et al. (2019) and Martínez-Moreno et al. (2012) expressed concerns about understanding how challenges and conflict impacted students' strategies to progress toward goals.

Additionally, Yilmaz and Peña (2015) analyzed how negative communication and language influenced interpersonal and personal behavior. Other studies explored the interactions of virtual teams based on personal experiences and personality types (Meier et al., 2016; Olson & Kalinsk, 2017; Yilmaz & Peña, 2015). For example, Olson and Kalinsk (2017) used the Insights Discovery (ID) personality assessment to create homogeneous and heterogeneous groups for virtual teams. Their goal was to evaluate the impact of personality types on virtual team performance. In this study, the researchers randomly assigned participants to virtual teams. The researchers then assigned teams the title of Variable (heterogeneous groups) when at least 50% or more of the team has one ID personality type. The researchers also categorized teams as extroverted or introverted, thinking and feeling based on the ID results. Based on the results, the researchers found that extroverted teams outperformed introverted teams, and heterogeneous groups outperformed homogeneous groups.

Another study by Cogliser et al. (2013) applied Group Exchange Structures (Seibert et al., 2003) to explore the impact of different structure types on virtual team performance outcomes and overall satisfaction. They found that groups with generalized structures (high-quality exchange relationships and high information sharing and cooperation) did not experience higher performance levels or satisfaction than groups with balanced structures (low-quality exchange relationships and low trust and concern). However, groups with isolates (low quality and negative exchanges) experienced adverse effects on performance and satisfaction. These results suggest the importance of interactions that foster trust, cooperation, and information sharing in virtual teams. This conclusion aligns with findings from other general studies on virtual teams across

business organizations (Brahm & Kunze, 2012; Erez et al., 2013; Kiffin-Peterson, 2004; Pangil & Chan, 2012). The purpose of current literature on virtual teams in education is to indicate the importance of team members' personal experiences and personality types. Furthermore, these components tend to drive virtual team participants' interaction and satisfaction.

Virtual Team Outcomes

As with research purposes, similarities existed across virtual team literature related to the product and outcome of the virtual team experience. Studies included students working in groups on different projects through digital communication tools. However, the scope of the projects varied across studies. For example, Andrade (2019) used a team ePortfolio project with students during face-to-face and online sections. The researcher used a qualitative approach to measure student experiences in creating the ePortfolio and virtual teamwork. Each week, participants collaborated by adding an artifact that reflected a concept or topic for that week's study. Additionally, the researchers expected all students in face-to-face courses and those online working in virtual teams to set group norms and expectations around behaviors, including communication methods, meeting times, roles, tasks, deadlines, and consequences. Other studies conducted on virtual teams outside of education indicate that these norms and expectations are vital for virtual team success (Gibson & Cohen, 2003; Whitener et al., 1998).

Another example from the literature included a collaborative writing task using cloud technologies. Mehlenbacheret al. (2018) studied two online courses, run asynchronously, as students worked in groups of 3-4 using a Google Doc to write

collaboratively. Groups were required to write a report on globalization in the sciences. Both Andrade (2019) and Mehlenbacheret al. (2018) focused on providing written projects that groups could collaborate on asynchronously. While the virtual team participants in Andrade's (2019) study worked on a collaborative project throughout an entire course, the participants in Mehlenbacheret al. (2018) performed during a shorter period on one paper. In sum, researchers designed virtual team studies that allowed participants to work collaboratively on projects to achieve a goal; however, the length of these projects varied.

Next, Stoerger & Krieger (2016) collected data from participants who experienced a shift from a large lecture hall into virtual teams. The instructor's goal was to condense a 450-student class into a collaborative and active learning space through virtual team structures. As a result, the researchers created 30 virtual team groups to facilitate post-class work in online discussions, group projects, and papers. Participants used a variety of digital technologies, such as Twitter and Wikispaces, to engage in collaborative activities. Like Andrade (2019), Stoerger and Krieger's (2016) study involved virtual teams over a more extended period. However, this study differs from Andrade (2019) and Mehlenbacheret al. (2018). The virtual teams were not used for one specific project but rather as a delivery method to foster ongoing community and collaboration throughout different projects and tasks.

Other studies on virtual teams in education focused on participants working through simulations and activities that involved global collaboration. For instance, Faine and Kline (2013) wanted to explore international, multicultural teams in action. Therefore, their study carried out a realistic simulation by placing students into

international virtual teams where groups needed to use virtual technological developments to solve a new product development problem. Additionally, Meier et al. (2016) simulated a global virtual work environment by connecting students internationally to work on an auditing case. Both Faine and Kline's (2013) and Meier et al.'s (2016) studies focused on creating authentic virtual team experiences through simulations. On the other hand, Gonzalez-Perez et al. (2014) explored participants engaged in the Global Enterprise Experience (GEE). In this study, participants engaged in an international business competition where international virtual teams were required to work together on a six-page paper on a global business topic. Teams had approximately three weeks to complete the task. In summation, the virtual teamwork in the studies by Faine and Kline (2013), Meier et al. (2016), and Gonzalez-Perez et al. (2014) provided participants with opportunities to collaborate on real-world projects and tasks with international peers.

Overall, the literature on virtual teams in education revealed two project and task types for virtual teams. On the one hand, projects and tasks related to an assignment where the expectation for virtual teams was to collaborate and contribute to a final piece. On the other hand, virtual team members could work on an in-depth project or task over a more extended period that included various activities for the teams to complete together. In closing, the literature on virtual teams in education reveals patterns around participants' educational backgrounds, study purposes, and virtual tasks. The following section examines specific studies on virtual teams and educators.

Professional Learning through Virtual Teams

Charteris et al. (2021) argue that virtual teams are viable for delivering professional learning to educators. Although most research on virtual teams includes students participating in business courses, some researchers have already explored virtual teams for educators. For instance, two studies discuss how virtual teams might fit into a professional learning model for educators. First, Wilson (2007) applied an action research study with 24 preservice middle school teachers. Wilson (2007) explored the impact of a simulated interdisciplinary virtual team on the participant's development. Data collection included student artifacts, interviews, and researcher field notes. The study took place at a university during a required course for preservice teachers. Wilson (2007) created eight 3-person teams while intentionally ensuring interdisciplinary teams. Using three forms of data throughout the semester, Wilson (2007) documented their journey through reflective journals. Furthermore, participants also provided journal reflections and photographs. The researchers asked participants to reflect on their teaming experiences throughout the study. This study revealed that the participants-built community, developed skills to work more effectively on teams, and valued the teaming approach as an authentic experience.

In addition to these findings, Wilson's (2007) reflections serve as a guide to future virtual team models for educators. First, collaborative structures and practices can be taught and modeled for teams. For Wilson (2007), preservice teachers have minimal experience with collaboration and often approach their work together as more cooperative. Another exciting reflection came in the importance of compromise in problem-solving. Teams were given authentic tasks that required conflict resolution, problem-solving, and compromise. Even with initial reports of discomfort around

compromise, groups reported the discomfort as an asset to the group over time. However, perhaps the most fundamental component of virtual teaming was the time Wilson (2007) took on building community and team cohesiveness. While this work provides some general guidelines for creating effective virtual teams for educators, preservice teachers have very different experiences and needs than those who have had exposure to teaming efforts in schools.

Next, a study conducted by Chapman (2016) focused on teacher growth around curriculum implementation, ELA resources, enhanced learning management tools, and content or resource curation. They developed a Virtual English Faculty that met in person once a semester. The participants included educators from several rural and remote communities who work together via video conferencing tools and an online drive for resource sharing. They communicated and shared resources online to support pedagogical practices that increase student achievement and outcomes. While the author briefly discussed the purpose and activities of this group, they did not provide any empirical evidence of the impact of this model on their intended purpose and outcomes.

Chapter 2 Summary

Professional learning and development is a common way for educators to build on their skills and knowledge (Johnson, 2014). Before the COVID-19 pandemic, online learning became popular for adults (Sharp & Whaler, 2018). Furthermore, dissatisfaction with current modes of professional learning (Opfer & Pedder, 2011) led many teachers to explore alternative ways to engage in informal learning opportunities such as PLNs (Oddone et al., 2019; Prenger et al., 2021; Visser et al., 2014; Sturm & Quaynor, 2020). A PLN is a group of people who use various communication and Web 2.0 technologies to

share ideas (Krutka et al., 2016; Robinson et al., 2020; Trust et al., 2016). While PLNs continue to gain popularity, they are informal approaches to learning.

A formal approach to online professional learning is through virtual teams. Until recently, research on virtual teams existed primarily in the business disciplines (Jensen, 2021). Charteris et al. (2021) explain that teachers successfully shift to working through virtual teams due to the COVID-19 pandemic. Moreover, they believe that virtual teams can serve as a delivery platform for providing effective professional learning opportunities for teachers based on the professional learning framework supplied by AITSL (2012). However, little research exists exploring teacher perceptions and experience of working in virtual teams and its viability as a delivery method for delivering effective professional learning.

Furthermore, there continues to be a disconnect between what is known to be effective and what teachers experience (Edge et al., 2015; Webster-Wright, 2009). Therefore, by gaining a better understanding of teacher perceptions and experiences of virtual teams and teamwork, practitioners in education hoping to continue using and revising current virtual team models can use the results of this study to inform their future planning.

CHAPTER THREE: METHODOLOGY

This study aimed to understand the experiences of middle school educators relating to virtual teams as a mode of delivering professional learning. This study fills the research gap related to education and its representation in the literature on virtual team use. This study also builds on Charteris et al. (2020) 's work by including teacher voices around their experiences of virtual teams as a viable option for delivering professional learning to educators. This study used a basic qualitative design methodology to examine teachers' virtual team experiences (Merriam & Tisdell, 2016). According to Lunenburg and Irby (2007), qualitative research "emphasizes understanding by closely examining people's words, actions, and records, as opposed to a quantitative research approach that investigates such words, actions, and records at a mathematically significant level, thus quantifying the results of observations" (p. 89).

Aspers and Corte (2019) explained that qualitative research is an iterative process in which the researcher explores ways to make new distinctions among data and get closer to people and their contexts to deepen their understanding of the meaning of their data. While researchers continue to develop and refine definitions of qualitative research, Creswell and Poth (2018) described the field of qualitative inquiry as "ever-changing," and as a result, it becomes difficult to define (p. 7). However, they offer the latest definition of qualitative inquiry provided by the *SAGE Handbook of Qualitative Research*:

> Qualitative research is a situated activity that locates the observer in the world. Qualitative research consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the work into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret phenomena in terms of the meanings that people bring to them. (Denzin & Lincoln, p. 3)

A common thread throughout these definitions and explanations focuses on extracting and interpreting the meaning of qualitative data connected to participants in their natural settings. Therefore, the primary goal of this study was to explore participant experiences through the research question: How did middle school teachers perceive professional learning through virtual teams as relevant, collaborative, and future-focused? An explanation of the qualitative method for this study to answer the research question is presented in this chapter. This chapter is organized into four sections: (a) selection of participants, (b) instrumentations, (c) data collection, and (d) data analysis.

District Approval Process

I had to complete an Online Data and Research Request Form to gain permission to conduct research in the district. The form asks for information about the methodology of the proposed study. Furthermore, the survey asks for the researcher(s) to explain the district's immediate and tangible benefits of the research. From there, the responses are

sent to a review committee that meets every three months to review and approve any research requests.

After I submitted my form, I also sent additional supporting documents to the head of the review committee. These documents included the initial survey, the interview questions, IRB approval, my research proposal, and an accompanying video presentation. I received a response roughly 8 weeks later that my request had been denied based on teachers needing to focus on instruction and a lack of perceived benefit to the district. I connected with the head of the review committee via email and scheduled a meeting to discuss the committee's decision. During our discussion, I could discuss my study more thoroughly and explain the connection between the study results and the tangible benefits to the district. The committee's initial worries were surveying all secondary teachers, who are asked to complete surveys frequently. There was also some concern that the teachers may not want to participate or revisit the experiences of working on virtual teams.

After this conversation, a revised proposal was submitted to the committee using a smaller sample size, two schools. I obtained building-level support from the principal to allow their teachers to opt into this work and include the study information in their weekly newsletters. This request was approved within a couple of weeks of submitting it, and my study officially began on September 9th with email outreach to the teachers in both buildings.

Recruiting Initial Participants

Once both principals agreed to allow their teachers to participate, initial emails were sent to staff once a week over three weeks to encourage participation. The original timeline for the initial survey was for one week. However, after only gaining three

participants, other recruiting methods were applied outside the whole group email and school newsletter. In one middle school, I deployed a snowballing sample approach by enlisting the support of a participant to identify other potential subjects. I reached out to participants individually in the other middle school to gain more interest. I also extended the timeline from one week to three weeks to provide all teachers more time to choose to participate. All teachers agreeing to participate received and signed consent forms to participate in the study. Ultimately, this resulted in 22 survey responses out of the 74 total participants emailed about the research opportunity.

All initial survey participants were asked to provide information on their years of teaching experience in the district and the virtual teams they worked on during the pandemic. All participants had experience with both grade-level, content-level, and district-level teams. This included virtual teams of larger and smaller sizes. Some participants had experience leading some of these teams. The following displays relevant data on all participants who completed the initial survey before I conducted further analysis for interviewee selection. Participants were asked to reflect on their teaching experience, satisfaction with virtual teams, the degree to which virtual teams met their needs, the impact of virtual teamwork on their professional learning, and their openness to virtual teamwork in the future.

Participant Selection

The sample for this study included seven middle school teachers who work in one of two middle schools that are part of a large school district in Colorado. To plan for selecting and interviewing participants, I created a conceptual framework as a guide.

Miles et al. (2020) explain that qualitative studies often require “continual refocusing and redrawing of study parameters" and that a “conceptual framework and research questions can help set the foci and boundaries for sampling decisions” (p. 26). Figure 1 displays the initial conceptual framework for this qualitative study, highlighting two types of virtual teams that participants worked on, “District Teams" and “School Teams.” District teams included virtual teams where participants collaborated with their colleagues across school boundaries. School teams were those where virtual team participants collaborated with colleagues from their school site. The middle school teachers were purposefully selected to participate in the interviews for this study. The middle school teachers in this sample teach one or more grades between sixth and 8th grade.

Quantitative researchers typically work with small samples of people in their natural contexts (Miles et al., 2020). Furthermore, qualitative research includes extracting multiple perspectives and meanings from participants (Creswell & Poth, 2018). Therefore, before purposefully selecting a small sample size, all teachers within the school district for this study received an optional initial survey (Appendix A) to complete. This survey collected demographic information and allowed participants to share their experiences with virtual teams through four questions using a 5-point Likert scale. From the respondents, a criterion sample of seven participants were selected based on grade levels taught, years of teaching experience in the district, and their overall evaluation of virtual teams. The reasoning behind this approach was to ensure the inclusion of multiple perspectives in this research study, such as teachers with varying degrees of teaching experience in the district and positive, negative, and neutral evaluations of their experience working on virtual teams. For clarification, the phrase

"during the pandemic," used to reference the time period of virtual teamwork for these participants includes the initial closures that took place in March 2020 up to the work they are currently doing this 2022-2023 school year.

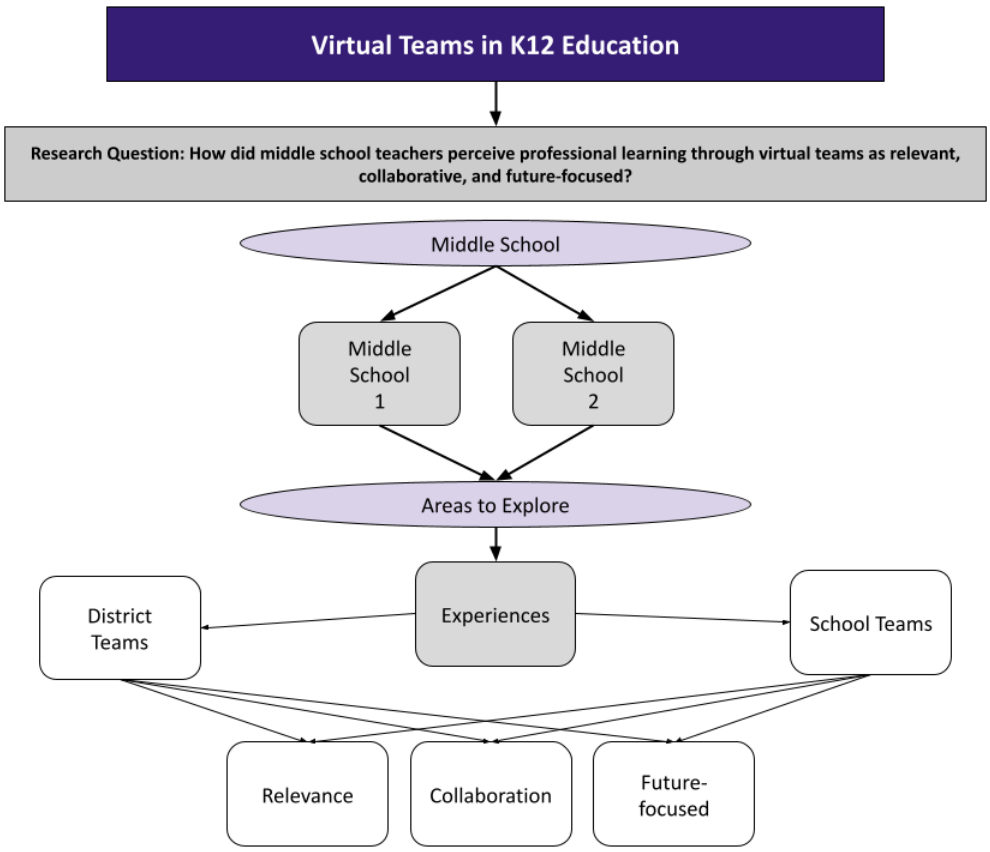


Figure 1 Virtual teams in K12 education conceptual framework.

Instrumentation

This study included using two instruments. The first instrument was an electronic survey (Appendix C). The survey allowed the participants to provide teaching background information and reflect on their experiences participating in district-level and school-level virtual teams. For example, the survey collected information on the grade levels taught and years of teaching experience in the district. Also, this survey collected

preliminary data on participant experience with virtual teams by asking participants to select the types of virtual teams they participated in, such as grade-level teams, district-level teams, and professional learning communities. Participants also had the opportunity to evaluate their satisfaction with virtual teams using a Likert scale.

Data from the initial survey was used to select participants with varying teaching experiences and satisfaction with virtual teams for three follow-up interviews. According to Creswell (2014), qualitative interviews include face-to-face, telephone, video, or focus group interviews. Selected participants engaged in three semi-structured interviews with open-ended questions intended to extract views and opinions from participants. This study applied Seidman's (2006) three-interview series methodology. According to Seidman (2006),

> The first interview established the context of the participants' experiences. The second allows participants to reconstruct the details of their experience within the context in which it occurs. And the third encourages the participants to reflect on the meaning their experience holds for them (p. 17).

The interview questions for each of the three interviews in this study followed the descriptions provided by Seidman (2006). The first round of interview questions focused on establishing participants' educational experiences and participation in virtual teams before and after the COVID-19 pandemic (Appendix D). For example, the first question of the first-round interview was, "Tell me about your educational background; how did you come into teaching?*"* This question was designed to support participants in "reconstructing" their background and how they came to where they are as teachers (Seidman, 2006, p. 17). The shift to asking "how" instead of "why" helps participants

construct a narrative that will paint a more robust depiction of their experience over time. Additionally, I used the first interview to establish an understanding of participants' perceptions of professional learning by asking, "How would you describe professional learning?" Overall, reconstructing a focused history was the goal of the first interview.

The second round of interview questions asked participants to explore the details of their experiences with working on virtual teams (Appendix E). For instance, questions from this interview include “What current virtual team and teamwork do you engage in at the school level?” and “What is your role in these virtual teams and teamwork?” For participants to construct details about their lived experiences, these questions ask participants to reflect on their relationship with virtual teams and teamwork. The goal of the second interview was to capture the details of the participant's experience.

Finally, the third round of interview questions encouraged participants to think about how their virtual team experiences contributed to their professional learning (Appendix F). This final interview included questions such as “Reflecting on the last three years working through virtual teams in some capacity, how would you describe the collaboration that took place? What about the relevance of the learning experience through virtual teams?” These questions asked participants to think about these experiences connected to the larger picture of professional learning. The final interview aimed to get participants to reflect and make meaning of their experiences of virtual teams and teamwork. Overall, the initial survey provided information that informed participant selection, and the three-interview series gave multiple opportunities for participants to build on their experiences. To establish trustworthiness (credibility) in this

qualitative research, “member checks” were used to allow participants the opportunity to determine the accuracy of the transcribed interviews (Bloomberg & Volpe, 2016).

Data Collection

As a best practice reporting qualitative research methodology, the researcher should provide a substantial description of the Qualitative Data Analysis Software (QDAS) (Jackson et al., 2018). QDAS has evolved to offer qualitative researchers a robust system for collecting, managing, analyzing, and reporting qualitative data (Jackson et al., 2018; Wolski, 2018). For this study, I used NVivo to manage and organize data, analyze data for initial and secondary coding cycles, conduct queries to dig deeper into the data and produce graphical displays. Data collection was an ongoing process throughout this study. NVivo is a comprehensive QDAS platform that allows researchers to manage and revise their qualitative research projects.

I used an initial survey (Appendix C) to collect data on teacher background experiences, including years of teaching experience in the district and the types of teams they experienced. Additionally, the initial survey allowed participants to evaluate their experiences working on virtual teams. Based on the criteria, I analyzed the data to purposefully select seven teachers for three open-ended interviews during a four-week period in the fall of 2022. The interviews ranged from 15-30 minutes and took place via Zoom. The three-part interview process was selected as the source of data collection as it helps construct the participants’ perceptions through sharing their voices, experiences, and opinions (Seidman, 2006).

The data analysis process began with the initial survey. From the participants' responses, I purposefully selected those for follow-up interviews that provided the best range of years of teaching, teaming experience, grade levels taught, and overall evaluations of virtual team experiences. Further data analysis took place after each interview as the audio-visual files from Zoom were used to revise interview transcripts. For accuracy and revisions, these transcribed interviews were sent to each participant before their next interview. Ultimately, no revisions were requested, and the transcribed files were uploaded into NVivo for coding cycles and additional analysis.

The primary data source for this study's results was three semi-structured interviews for each of the seven selected participants. Following the analysis and participant selection process, a semi-structured format was used to conduct three interviews with each participant. Seidman (2006) recommends the three-interview approach as it helps the researcher develop a deeper understanding of the participants and their context. Additionally, this approach allows the researcher and participant to build relationships throughout the interviews. Finally, this kind of in-depth interviewing provides the researcher with an opportunity to understand “the lived experience of other people and the meaning they make of that experience” (p. 9).

All interview questions were prepared and emailed to each teacher before every interview. Some follow-up questions were asked for clarification and further details. The interviews were designed specifically to support participants in reconstructing their experiences of virtual teams. For instance, the first interview focused on establishing the participants' experiences in education and with virtual teams. The second interview required participants to explore more details about those experiences, and the third and

final interview asked participants to make connections between their experiences of virtual teams and professional learning. After each interview, transcripts were spot checked, revised, and sent to participants for approval. The transcripts were then uploaded into NVivo for initial analysis and first-cycle coding, including Concept and In Vivo Coding based on the work and descriptions provided by Miles et al. (2020). This helped inform the following interviews where questions needed adjustments based on the themes or clarification of ideas.

Prior to the first interview, participants received information about the study, including the purpose and expectations for participation. This included IRB requirements such as study goals, participant rights, confidentiality and data safety plans, and consent forms for participation. All interviews were conducted using a password-protected Zoom meeting. Meeting information was sent via Google Calendar and email, along with the relevant interview questions. Transcripts were downloaded from Zoom and were uploaded into NVivo using participant pseudonyms. These items were all stored on a password-protected computer.

The first interviews took place from mid to late October 2022. The first interview (Appendix D) aimed to understand the participant's prior experiences and collect relevant background information. The interview questions included asking participants to share how they came into teaching and their experiences with educational teams and any virtual teams outside of the district. Also, participants explored the meaning of professional development and what that learning looked like over the last few years since the beginning of the pandemic in March 2022. After the first interview, I watched the video recording of the interview alongside the transcript and fixed errors. The transcripts were

emailed to the participant for review, and it was during this time, they received the second interview questions.

The second interview took place one-to-two weeks after the first interview concluded for all participants. The purpose of the second interview (Appendix E) was to help participants construct details about their experiences working in virtual teams since March 2022. During this interview, participants were asked to reflect on details about virtual teams, such as their ease of use, benefits, challenges, structure, and role. After the second interview, I watched the video recording of the interview alongside the transcript and fixed errors. The transcripts were emailed to the participant for review, and it was during this time they received the final interview questions.

The third and final interview took place one to two weeks after the second interview concluded participants. The purpose of this interview (Appendix F) was to connect the participants' virtual team experiences and their professional learning because of participating in them. The final interview focused on drawing connections between the participants' virtual team experiences and the framework of the three core characteristics of professional learning and development (PLD) as found by The Australian Institute for Teaching and School Leadership (AITSL) (2012), relevancy, collaboration, and future-focused. Also, participants were asked to reflect on their experiences and provide advice for strengthening the three core characteristics of educators working across virtual team spaces. Upon completing the final interview, participants received a $75 Amazon gift card and were also sent the final transcript for interview three. I discussed the next steps of data analysis and mentioned that I would contact participants for any follow-up questions as I began to write up the results for the analysis.

In closing, the data collection process for this study included an initial survey and then followed the three-part interview structure (Siedman, 2006). The purpose of the initial survey was to collect data for a larger sample size to a purposeful sample for specific criteria. From the purposeful sampling, seven teachers engaged in three interviews over four to six weeks. The interviews were designed specifically to support participants in constructing their experiences of working in virtual teams and then bridging connections and drawing meaning from those experiences as they related to their professional learning. Interviews were recorded and transcribed using Zoom and were imported into NVivo. All participants received copies of transcripts after each interview and were allowed to suggest revisions or omissions. Data was uploaded in NVivo file folders between interviews and reviewed for follow-up and clarifying questions. Data analysis began during the participant interview windows, but once all interviews were imported into NVivo, I could complete both the first and second coding cycles.

Data Analysis

Qualitative research is iterative (Creswell & Poth, 2018; Miles et al., 2020). As a result, the data analysis for this study began as soon as data was collected from participant interviews. After collecting data from the participant interviews, the interview recordings were downloaded into video and audio transcripts. Interviews were transcribed initially using Zoom transcripts and spot-checked by the researcher for accuracy. This process allowed me to become more intimate with the data (Evers, 2011). Interviews were labeled one, two, or three, and transcripts were nested under individual file folders in NVivo with participant pseudonyms. Classification sheets were

only used with the initial survey data to help identify varied teaching experiences across participants. This study did not collect other demographics, such as age, race, or gender.

To begin the data analysis process, I completed the first coding cycle using NVivo. Codes help provide "symbolic meaning" to the data collected from a study (Miles et al., 2020, p. 63). Saldaña (2016) divides coding into two major stages: First Cycle and Second Cycle. I used In Vivo and Concept Coding to complete the first coding cycle. As one of the most well-known qualitative coding methods, In Vivo coding refers to a process that uses:

> words or short phrases from the participant's own language in the data record as codes. It may include folk or indigenous terms of a particular culture, subculture, or microculture to suggest the existence of the group's cultural categories (e.g., in a hospital, you may hear unique terms such as "code blue," "sharps," and "scripts"). Phrases used repeatedly by participants are good leads; they often point to regularities or patterns in the setting. (Miles et al., 2020, p. 64)

Miles et al. (2020) describe In Vivo coding as an appropriate method for "virtually all qualitative studies" and particularly studies that "prioritize and honor participant voice" (p. 65). Similarly, Concept Coding assigns

> meso- or macro levels of meaning to data or to data analytic work in progress (e.g., a series of codes or categories). A concept is a word or short phrase that symbolizes a suggested meaning broader than a single item or action—a "bigger picture" beyond the tangible and apparent. A concept suggests an idea rather than an object or observable behavior. (Miles et al., 2020, p. 66)

Concept Codes are typically applied to longer sections of the participant's voice to extract the bigger picture. Overall, the initial coding cycle provides the researcher with a basis for further analysis and interpretation.

After the initial coding took place, I engaged in the Second Cycle of coding. According to Saldaña (2016), the Second Cycle coding integrates the initial codes into cohesive chunks representing patterns. Patterns "are inferential or explanatory codes that identify a 'bigger picture' configuration" (Miles et al., 2020, p. 79). Furthermore, patterns often consist of the following four: categories or themes, causes or explanations, relationships among people, and concepts or theoretical constructs (Miles et al., p. 80). I deployed visual techniques such as developing visual maps and matrices to move from codes to patterns. The parent ideas included connections to the core components of the AITSL Framework for PLD (2012). Second, a matrix display helped organize codes based on relevancy, collaboration, and future-focused (Appendix I). According to Miles et al. (2020), matrices and other tabular data displays "organize the vast array of condensed material into an at-a-glance format for reflection, verification, conclusion drawing, and other analytic acts" (p. 83).

Overall, the data analysis process began after the first round of interviews. Interview transcripts were revised and downloaded from Zoom and then sent to participants for review. From there, transcripts were uploaded to NVivo to undergo First Cycle Coding. I used a mix of In Vivo and Concept Coding to identify words and phrases that supported the research question. I began by using In Vivo coding to extract the exact language of the participants from the interviews. Given that this study focused on teacher perceptions and experiences, In Vivo coding was appropriate since it helps researchers

"prioritize and honor participant voice" (Miles et al., 2020, p. 65). Concept Coding was deployed to create bigger categories and to attach some of the In Vivo codes to broader ideas. Concept Codes are typically applied to longer sections of the participant's voice to extract the bigger picture and suggest an idea rather than an object or behavior (Miles et al., 2020). The more that I coded, the easier it became to identify themes and ideas and consider their connections. This led to a review of my codes after the First Cycle of coding. During the review, I moved and revised top-level codes where I saw connections to ideas or codes that fell under larger parent ideas. From there, I relied on the relevancy, collaboration, and future-focused descriptions from AITSL (2012) to connect the data and these core concepts as parent nodes.

Ethical Considerations

Creswell and Poth (2018) share that ethical issues may arise at any point during a study, and therefore, ethical considerations were made throughout the life of this study. Since participant interviews took place over Zoom, following proper research procedures for data collection and protecting participants' anonymity was important. Institutional Review Board (IRB) approval was sought and received to ensure the appropriate permissions were in place to approach the chosen district for this study. Next, the district received information about this proposed research study, including IRB documents and the perceived benefits of this study to the district. From there, permission had to be granted at the buildings where this study was to take place. Only then could prospective participants be approached about the study.

Once approval was received from the district, it was important to collect informed consent from all participants taking part in this study. Consent forms informed

participants of their rights and any potential risks involved with the study. Participants also received information about the study, including the purpose, research question, and methodological approach. Before each interview, participants received interview questions, and after each interview, they received transcripts. Participants were informed that they might choose not to answer certain questions and that they could request omissions from the transcripts. The purpose of this was to build trust and transparency between myself and the participants (Creswell & Poth, 2018; Tracy & Hinrichs, 2017).

With qualitative research, it is even more important to ensure all viewpoints are presented in a way that limits potential bias (Creswell & Poth, 2018). Ensuring that all viewpoints are presented builds the trustworthiness and credibility of the research (Tracy & Hinrichs, 2017). Therefore, I included participants in the data collection process by providing them with transcripts after each interview to ensure their accuracy. During interviews, I also clarified concepts from previous questions to ensure that their perspectives were captured accurately. Once the study was completed, the results were shared with the participants for them to ensure their credibility and accuracy.

Throughout the entire study, I engaged in reflective writing through annotations and memos. This kind of reflective writing helped to organize my thoughts and feelings about the data so that I could be more aware of any potential bias taking root in the analysis (Birks et al., 2008). Memo writing also helped me remember specific details about codes that I created, specifically what I thought when I created them. This ensured the alignment of the coded data with the nodes. These took place in NVivo and were used during the coding of each participant interview.

Finally, confidentiality and anonymity were paramount in protecting participant rights (Miles et al., 2020). I ensured that measures were put in place to protect the identities of all participants. This included keeping all data on a password-protected computer and saving participant files under pseudonyms. All efforts were made to include only data relevant to answering the research question and avoid any potential identifiers in participant stories. This included removing names, phrases, or ideas that would reveal information about the participant or the school they worked at.

Chapter Three Summary

This basic qualitative research study explored the experiences of middle school educators as it relates to virtual teams as a mode of delivering professional learning. This study fills the research gap related to education and its representation in the literature on virtual team use. The researcher used the QADAS, NVivo, to collect, manage, analyze, and interpret data to achieve the research objectives. Participants were selected through purposeful sampling and engaged in a series of three interviews over 11 weeks. Data was collected in the form of video interviews, where the interviews will be uploaded into NVivo with their transcriptions for spot-checking and analysis. Data analysis and interpretation included first and second cycle rounds of coding. Every precaution was taken to ensure the protection and privacy of all participants in this study.

CHAPTER FOUR: RESULTS AND IMPLICATIONS

This study aimed to understand the experiences of middle school educators as it relates to virtual teams as a mode of delivering professional learning. To examine teachers' virtual team experiences, this study followed a basic qualitative design methodology. After an initial survey of 74 middle school teachers, 22 survey responses were collected, and seven teachers were purposefully selected and interviewed three times over the course of a four-week period during a fall semester. Their responses were analyzed to answer the following research question:

1. How did middle school teachers perceive professional learning through virtual teams as relevant, collaborative, and future-focused?

This study fills the research gap related to education and its lack of representation in the literature on virtual team use. While much research in PLNs, and informal learning networks, there is a need to look at prolonged virtual team experiences specifically for K12 educators. Additionally, the results of this study build on the work of Charteris et al. (2020), who suggest virtual teams as a natural evolution for professional learning modalities for teachers. This includes teacher voices around their experiences of virtual teams as a viable option for delivering professional learning to educators. The following section describes the background information of the district research approval process, the participants in the study, the data collection process, and the data analysis procedures.

Interview Participants

Interview participants for this study were selected using purposeful sampling to ensure they met the parameters for this study. This included varied teaching experiences in the district and evaluations of virtual teams. For example, eight participants have ten or more years of teaching experience, eight have five to ten years of experience, five have two to four years of experience, and one is completing their first year of teaching (Figure 2). Based on the initial survey data, eleven participants shared they "enjoyed" virtual teamwork, five disagreed with this statement, and six remained neutral against this statement (Figure 3). Next, twelve participants agreed, and one participant strongly agreed that virtual teams "met their needs." On the other hand, four participants disagreed with this statement, one participant strongly disagreed with this statement, and four remained neutral (Figure 4).

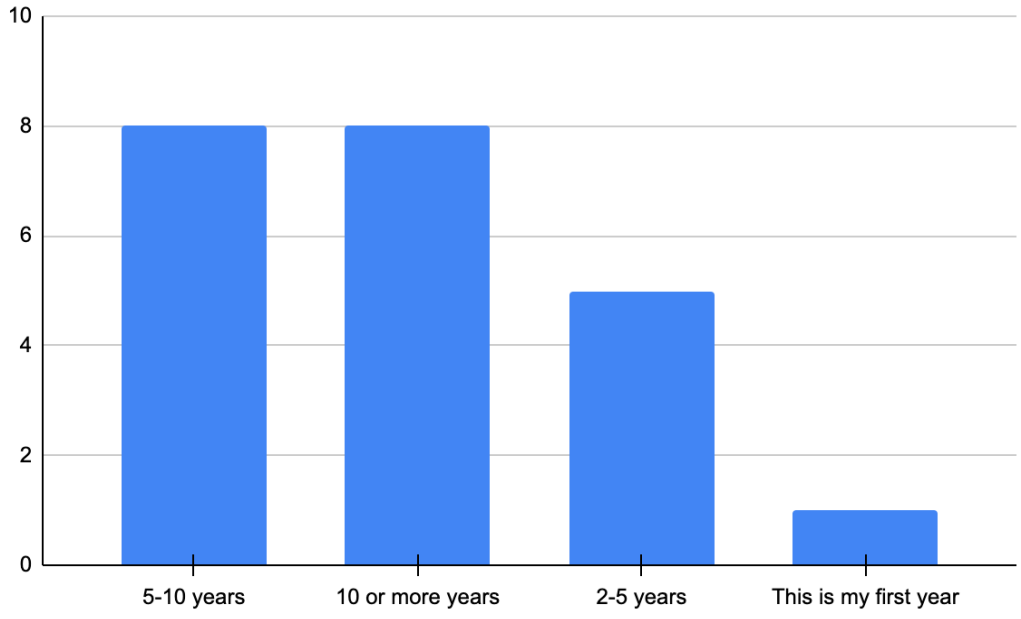


Figure 2 **Initial survey participant teaching experience.**

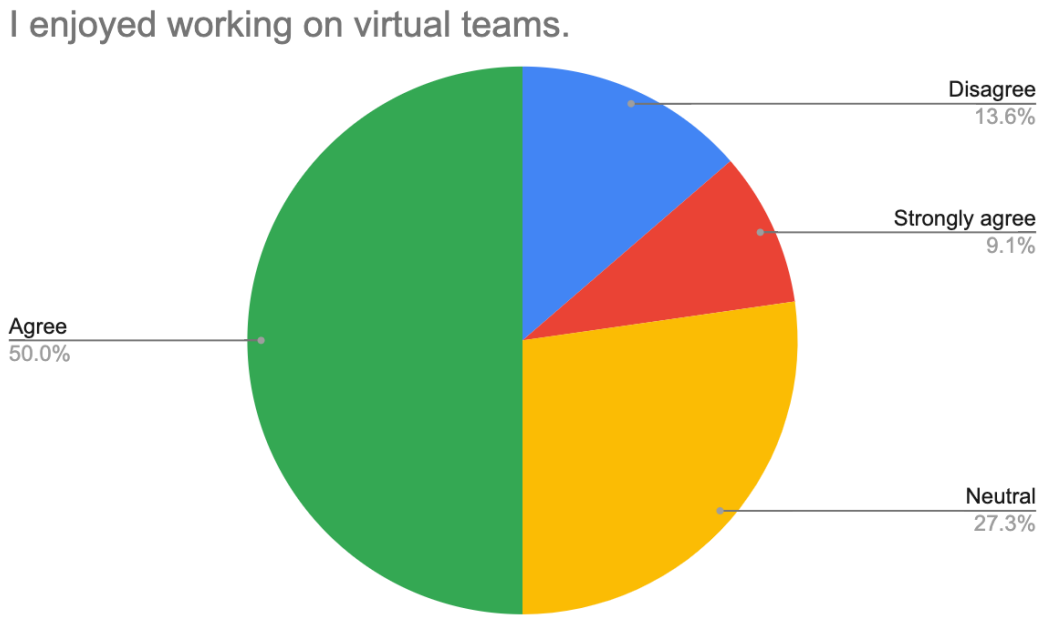


Figure 3 **Participants rate the satisfaction of virtual teams**

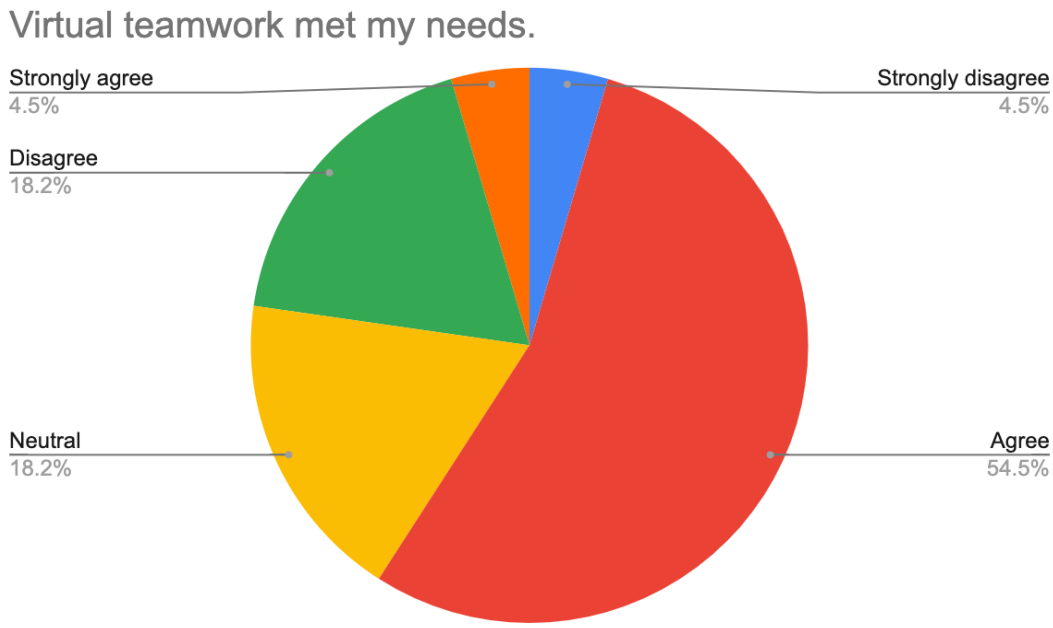


Figure 4 **Participants evaluate virtual teams based on needs met**

Regarding professional learning, nine participants agreed, and three strongly agreed that virtual teams were an effective way to engage in professional learning. However, six participants disagreed, three strongly disagreed with this view, and four remained neutral (Figure 4). Finally, ten participants agreed, and four strongly agreed that they would like to engage in virtual teams and teamwork in "some capacity," while only three disagreed with this statement, and five remained neutral (Figure 5). Only two participants from the initial survey requested they not be contacted for a follow-up interview.

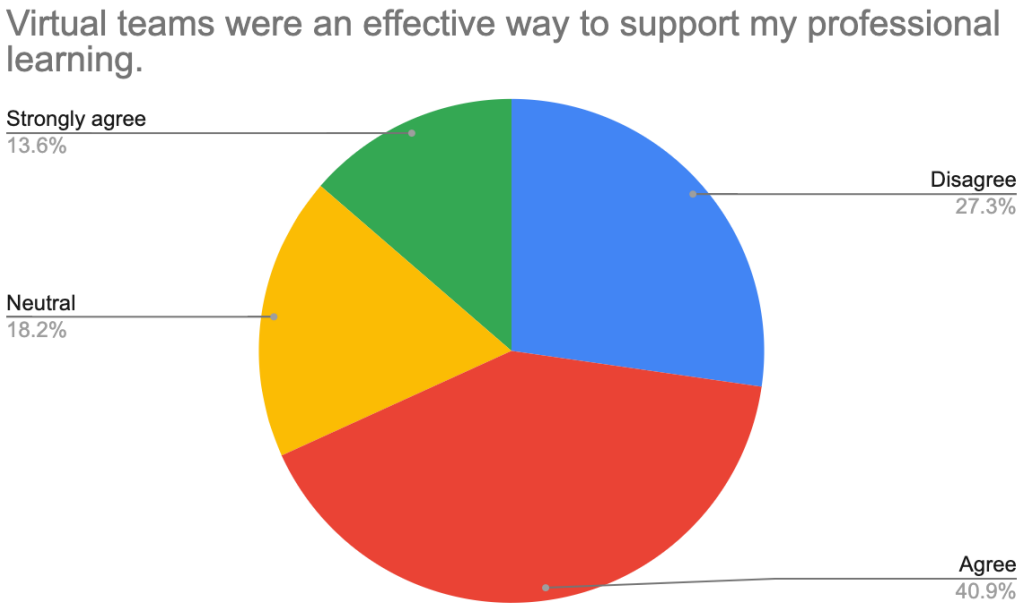


Figure 5 **Participants connect virtual teams to professional learning**

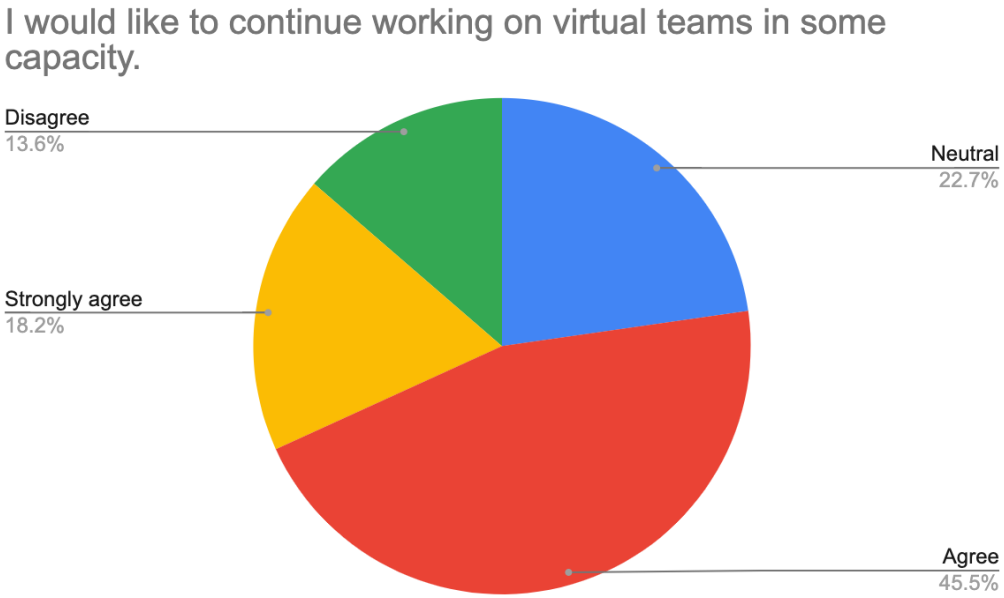


Figure 6 Participants reflect on the future virtual team use

Table 1 shows detailed information about each participant selected for the interviews for this study. This includes relevant background information, experience with virtual teams and teamwork, and additional information important to understanding their context. For clarification, the phrase “during the pandemic,” used to reference the timeframe of virtual teamwork for these participants, includes the initial closures that took place in March 2020 up to the work they are currently doing this 2022-2023 school year.

Table 1 Background Information of Participants

Participant Pseudonyms	Grade Levels Taught	Teaching Experience	Virtual Team Experience
Peyton (Participant 1)	6th Grade	5 Years	Grade Level Teams, Professional Learning Communities, District Level (cross-building), Leading a Virtual Team
Bailey (Participant 2)	7th Grade	6 Years	Grade Level Teams, Professional Learning Communities, District Level (cross-building), Leading a Virtual Team
Hadley (Participant 3)	7th Grade	4 Years	Grade Level Teams, Professional Learning Communities, District Level (cross-building)
Mackenzie (Participant 4)	8th Grade	18 Years	Grade Level Teams, Professional Learning Communities, District Level (cross-building), Leading a Virtual Team
Ryder (Participant 5)	8th Grade	13 Years	Grade Level Teams, Professional Learning Communities, District Level (cross-building), Leading a Virtual Team
Morgan (Participant 6)	6th and 7th Grade	12 Years	Grade Level Teams, Professional Learning Communities, District Level (cross-building)
Hayden (Participant 7)	6th, 7th, and 8th Grade	3 Years	Grade Level Teams, Professional Learning Communities, District Level (cross-building)

Peyton

Peyton has worked as a middle school educator for 5 years. They have been at the same school since they began their teaching career. During the pandemic, they had experience working on virtual teams at the school and district levels. They also have experience leading a school-level virtual team since the beginning of the pandemic.

They participated in weekly virtual grade-level teams at the school level that shared the same students. During this time, they would plan for and facilitate how best to support their group of students with various needs. The primary purposes of these teams, whether virtual or in-person, centered around implementing Multi-tiered Systems of Support (MTSS), best described as integrating teaching practices and interventions that best support student academics and behavior, collaborating on parent communication, and planning student celebrations. Additionally, these meetings were also used to deliver important information from administrative leaders. Additionally, at the school level, Peyton met weekly with other content partners in Professional Learning Communities (PLCs). The purpose of these meetings was to align content and plan for common assessments vertically.

At the district level, Peyton worked with teachers across the district at different school sites for Data-Driven Instruction (DDI) practices. The purpose of these meetings was to collaborate and align assessments and instruction across school buildings. They also worked with a smaller group of teachers across the district, collaborating on evaluating new curricular materials for their content. Their overall evaluation of their experiences with virtual teams was positive and can be seen in detail in Table 2. They

choose not to offer any additional information outside of the Likert-style questions on their experiences with virtual teams.

Table 2 Peyton's initial survey responses

Initial Survey Question	**Participant Response**
I enjoyed working on virtual teams.	Agree
Virtual teamwork met my needs.	Agree
Virtual teams were an effective way to support my professional learning.	Strongly Agree
I would like to continue working on virtual teams in some capacity.	Strongly Agree
(Optional) Is there anything else you would like to explain or elaborate on regarding your experiences with virtual teams?	No Response

Bailey

Bailey has worked as a middle school educator for 6 years. They have worked at two different schools in the same district during their teaching career. During the pandemic, they had experience working on virtual teams at both the school and district level. They also have experience leading a school-level virtual team since the beginning of the pandemic.

At one school, they participated in weekly virtual grade-level teams that shared the same students. During this time, they were mostly a participant. The primary purposes of these teams, whether virtual or in-person, centered around implementing MTSS, collaborating on parent communication, and planning student celebrations. At their other

school, these meetings existed but less frequently, happening every 1-2 months. Additionally, at the school level, Bailey met weekly with other content partners in PLCs. The purpose of these meetings was to align content and plan for common assessments vertically. At one school, they led a PLC virtually and acted as a participant at their most recent school.

At the district level, Bailey worked with teachers across the district at different school sites for Data-Driven Instruction (DDI) practices. The purpose of these meetings was to collaborate and align assessments and instruction across school buildings. They have prior experience working in virtual teams through graduate schoolwork. Their overall evaluation of their experiences with virtual teams was negative; however, they have not ruled out the possibility of exploring the use of virtual teams in the future. Their results can be seen in detail in Table 3. They choose not to offer any additional information outside of the Likert-style questions on their experiences with virtual teams.

Table 3 Bailey's initial survey responses

Initial Survey Question	**Participant Response**
I enjoyed working on virtual teams.	Disagree
Virtual teamwork met my needs.	Strongly Disagree
Virtual teams were an effective way to support my professional learning.	Disagree
I would like to continue working on virtual teams in some capacity.	Neutral

Initial Survey Question	**Participant Response**
(Optional) Is there anything else you would like to explain or elaborate on regarding your experiences with virtual teams?	No Response

Hadley

Hadley has worked as a middle school educator for 4 years. They have worked at two different schools in the same district during their teaching career. They transitioned to a new school during the pandemic, and they had experience working on virtual teams at both the school and district level at both schools.

At one school, they participated in weekly virtual grade-level teams that shared the same students. During this time, they were mostly a participant. The primary purposes of these teams, whether virtual or in-person, centered around implementing MTSS, collaborating on parent communication, and planning student celebrations. At their other school, these meetings existed but less frequently, happening every 1-2 months. Additionally, at the school level, Hadley met weekly with other content partners in PLCs. The purpose of these meetings was to align content and plan for common assessments vertically. They took on an informal leadership role at their most recent school, helping implement a new curriculum during virtual teams and teamwork.

At the district level, Hadley worked with teachers across the district at different school sites for DDI. The purpose of these meetings was to collaborate and align assessments and instruction across school buildings. They have prior experience working in virtual teams through some outside educational organizations. Their overall evaluation of their experiences with virtual teams was neutral. However, they left some additional

information that indicates that they would have responded differently for different virtual teams as they perceived some as effective for knowledge sharing. Their results can be seen in detail in Table 4.

Table 4 Hadley's initial survey responses

Initial Survey Question	**Participant Response**
I enjoyed working on virtual teams.	Neutral
Virtual teamwork met my needs.	Neutral
Virtual teams were an effective way to support my professional learning.	Neutral
I would like to continue working on virtual teams in some capacity.	Agree
(Optional) Is there anything else you would like to explain or elaborate on regarding your experiences with virtual teams?	My answers are 'Neutral' because virtual if we were just talking about virtual teams at my school, I would say they were very helpful and collaborative (strongly agree), but when we think about virtual teams across the district, many times they were not supportive as it was too many people on a meeting or in a team. Having a successful virtual team across schools in the district can be very supportive as it gives teachers an easy way to collaborate and gain new ideas and knowledge.

Mackenzie

Mackenzie has worked as an educator for 18 years. They have experience working in both school districts and charter networks. They have extensive experience working on different teams across their schools and districts. During the pandemic, they

had experience working on virtual teams at both the school and district level and leading a school team virtually.

They participated in weekly virtual grade-level teams at the school level that shared the same students. During this time, they would plan for and facilitate how to best support their group of students with various needs. The primary purposes of these teams, whether virtual or in-person, centered around implementing MTSS, collaborating on parent communication, and planning student celebrations. Additionally, at the school level, Mackenzie met weekly with other content partners in PLCs. The purpose of these meetings was to align content and plan for common assessments vertically.

At the district level, Mackenzie worked with teachers across the district at different school sites for DDI. The purpose of these meetings was to collaborate and align assessments and instruction across school buildings. While they did not have prior experience working with virtual teams, they relied heavily on family members who have experience with virtual work to help them lead their teams during the pandemic. Their overall evaluation of their experiences with virtual teams was neutral. However, they left some additional information that indicates that they feel like the context in which educators found themselves working in virtual teams, a pandemic, had contributed to their overall evaluation of their experience with virtual teams. Their results can be seen in detail in Table 5.

Table 5 Mackenzie's initial survey responses

Initial Survey Question	**Participant Response**
I enjoyed working on virtual teams.	Neutral

Initial Survey Question	**Participant Response**
Virtual teamwork met my needs.	Disagree
Virtual teams were an effective way to support my professional learning.	Neutral
I would like to continue working on virtual teams in some capacity.	Neutral
(Optional) Is there anything else you would like to explain or elaborate on regarding your experiences with virtual teams?	The only other thing I would add is that my experience with virtual teams has a lot to do with schools being completely surprised by Covid and trying to quickly adjust. Many people in my life work in fully virtual jobs, and they develop a culture and expectations that make sense in their organization. That was never really done in schools during Covid. There are better ways to run virtual work than what I experienced!

Ryder

Ryder has worked as a secondary educator for 13 years. They have experience in both school district and charter school environments. During the pandemic, they had experience working on virtual teams at both the school and district levels and as a virtual team leader. They participated in weekly virtual grade-level teams at the school level that shared the same students. During this time, they would collaborate on best supporting their group of students with various needs. The primary purposes of these teams, whether virtual or in-person, centered around implementing MTSS, collaborating on parent communication, and planning student celebrations. These meetings were also used to deliver important information from administrative leaders. Additionally, at the school

level, Ryder met weekly with other content partners in PLCs. The purpose of these meetings was to align content and plan for common assessments vertically.

At the district level, Ryder worked with teachers across the district at different school sites for DDI. The purpose of these meetings was to collaborate and align assessments and instruction across school buildings. They also worked virtually with teachers across the district in teacher association meetings. Ryder opted into summer learning options where teachers collaborated and learned virtually through Google Classroom. Their overall evaluation of their experiences with virtual teams was positive. In the initial survey, they provided additional insights into their evaluations by sharing the importance of relationships in virtual teams and taking time to build effective teams and teamwork. Their results can be seen in detail in Table 6.

Table 6 Ryder's initial survey responses

Initial Survey Question	Participant Response
I enjoyed working on virtual teams.	Strongly Agree
Virtual teamwork met my needs.	Agree
Virtual teams were an effective way to support my professional learning.	Agree
I would like to continue working on virtual teams in some capacity.	Agree
(Optional) Is there anything else you would like to explain or elaborate on regarding your experiences with virtual teams?	Teams that had strong connections/relationships had more effective meetings. Virtual meetings got easier and smoother with time and experience.

Morgan

Morgan has worked as a middle school educator for 12 years. They have worked at two schools in the same district during their teaching career and have charter school experience. They transitioned to a new school during the pandemic into a new content role, and they had experience working on virtual teams at both the school and district level at both schools.

At both schools, they participated primarily in grade-level teams that shared the same students. During this time, they were mostly a participant. The primary purposes of these teams, whether virtual or in-person, centered around implementing MTSS, collaborating on parent communication, and planning student celebrations. Additionally, at the school level, Morgan met weekly with content partners in a PLC as a support role and led the team during the pandemic. The purpose of these meetings was to align content and plan for common assessments vertically.

At the district level, Morgan worked with teachers across the district at different school sites for DDI. The purpose of these meetings was to collaborate and align assessments and instruction across school buildings. They could also collaborate across school buildings to get more content-level support for their role. Since then, they have continued to seek leadership positions at the district level with some of the virtual collaborative elements of virtual teams. Their overall evaluation of their experiences with virtual teams was mixed. However, they left some additional information that indicates that they experienced different feelings on different virtual teams based on what was happening in them. Their results can be seen in detail in Table 7.

Table 7 Morgan's initial survey responses

Initial Survey Question	Participant Response
I enjoyed working on virtual teams.	Neutral
Virtual teamwork met my needs.	Agree
Virtual teams were an effective way to support my professional learning.	Agree
I would like to continue working on virtual teams in some capacity.	Neutral
(Optional) Is there anything else you would like to explain or elaborate on regarding your experiences with virtual teams?	It would depend on what was happening in the virtual teams if I felt it was helpful or successful. Sometimes they were, and other times they were not.

Hayden

Hayden has worked as a middle school educator for 3 years. They have been at the same school for those three years. During the pandemic, they had experience working on virtual teams at both the school and district levels, teaching more than three different contents before settling into new content when coming back to teaching fully in person for the 2022-2023 school year. They also have several years of prior professional experience both inside and outside of education, working with virtual teams in large organizations.

They participated in weekly virtual grade-level teams at the school level that shared the same students. During this time, they would plan for and facilitate how to best support their group of students with various needs. The primary purposes of these teams,

whether virtual or in-person, centered around implementing Multi-tiered Systems of Support (MTSS), which included integrating teaching practices and interventions that best support student academics and behavior, collaborating on parent communication, and planning student celebrations. These meetings were also used as a means to deliver important information from administrative leaders. Additionally, at the school level, Hayden met weekly with other content partners in Professional Learning Communities (PLCs). The purpose of these meetings was to align content and plan for common assessments vertically.

At the district level, Hayden worked with teachers across the district at different school sites for Data-Driven Instruction (DDI) practices. The purpose of these meetings was to collaborate and align assessments and instruction across school buildings. Their overall evaluation of their experiences with virtual teams was positive and can be seen in detail in Table 8. They choose not to offer any additional information outside of the Likert-style questions on their experiences with virtual teams.

Table 8 Hayden's initial survey responses

Initial Survey Question	**Participant Response**
I enjoyed working on virtual teams.	Agree
Virtual teamwork met my needs.	Agree
Virtual teams were an effective way to support my professional learning.	Agree
I would like to continue working on virtual teams in some capacity.	Strongly Agree

Initial Survey Question	Participant Response
(Optional) Is there anything else you would like to explain or elaborate on regarding your experiences with virtual teams?	No Response

Coding Process Explanation

During the coding process, I noticed that the data could bridge multiple existing codes. As a result, the Second Cycle of coding included using visual techniques to explore relationships between ideas. First, a hierarchy chart tree map was created in NVivo to be able to start from the broader codes and zoom in to the smaller codes to explore further how they contributed to the larger parent node. The tree map is a diagram that displays data as nested rectangles of varying sizes. The sizes of the rectangles represent the amount of coding for each node present within the highest parent node. Larger areas display at the top left of the chart; smaller rectangles display toward the bottom right. An example of this chart can be seen in Figure 6. This tool was used as I coded to help identify larger parent nodes for groups of ideas until I ended up with the three core concepts from the Australian Institute for Teaching and School Leadership (AITSL) (2012) framework. To explore the core components more in-depth, table matrices were used to identify patterns to develop themes amongst participants. According to Miles et al. (2020), “a matrix (used interchangeably with table) is essentially the “intersection” of two lists, set up as rows and columns” (p. 105). Patterns were ideas that emerged from the data multiple times across most participants, and themes reflected a synthesis of the patterns. Appendix G highlights participant

descriptions of professional learning, and Appendix H includes participants' high-level organization of themes. Both informed the results of the teacher perceptions in Figure 7. However, as I worked through this data, I needed to find a way to connect these pieces to the larger idea of supporting professional learning.

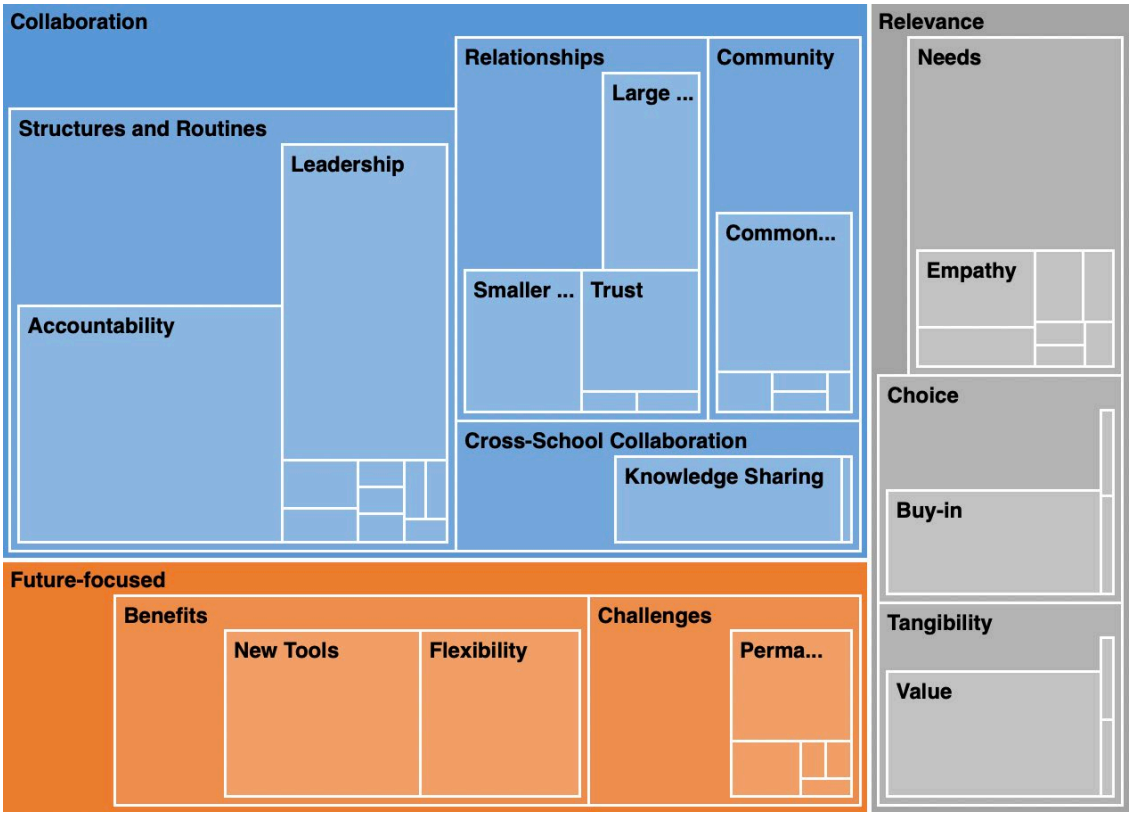


Figure 7 Hierarchy chart tree map generated through NVivo

A visual organizer was used to explore common themes among participants. The matrix helped me better understand the commonalities between participant experiences (Figure 8). This organizer helped me consider commonalities among teachers, most teachers, and some teachers. The results from this analysis also provided me with more information about potential relationships between the AITSL's (2012) core components, relevancy, collaboration, and future-focused. Tables 9, 10, and 11 display all participants

and a word or short phrase that captures both a perceived benefit and a challenge under each core component. The benefits are connected to the positive experiences of virtual teamwork as it relates to the core component in the header. The challenges connected to virtual teamwork did not support participant learning for one reason or another.

Upon conclusion of data organization and initial coding, visual displays were used to create connections and establish relationships between and amongst the core components of the AITSL Framework for PLD (2020). A visual display was created using a whiteboard and sticky notes. The draft of this can be seen in Figure 8 and will be explored further in the findings section of this paper. The purpose of this display was to highlight the patterns and themes that emerged from the data into a cohesive visual representation that also described the relationship amongst and between these characteristics as it relates to professional learning. This included using different colored sticky sticks for the core characteristics and organizing them along relationship lines. Additionally, the themes from the original data helped identify the most critical theme for each characteristic to create a visual formula for when professional learning on virtual teams benefited the participants most.

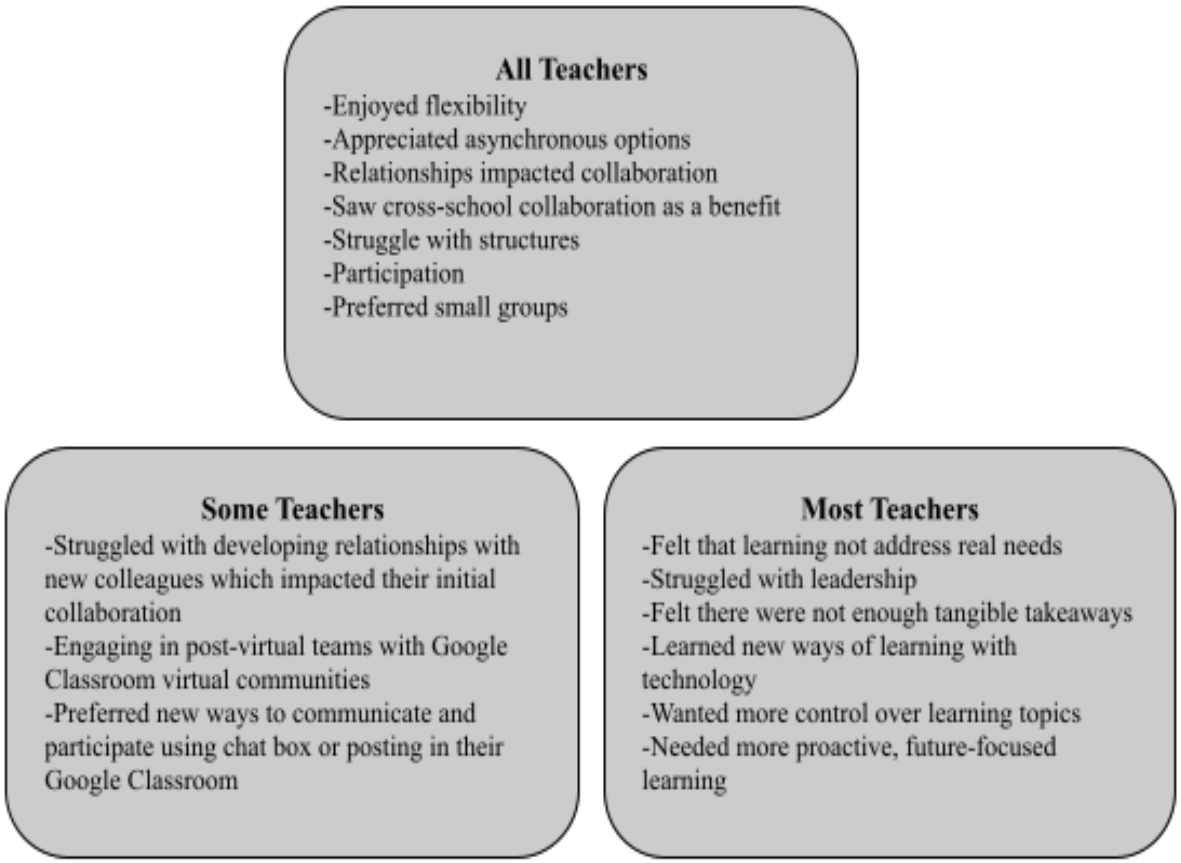


Figure 8 **Visual representation of findings for participants.**

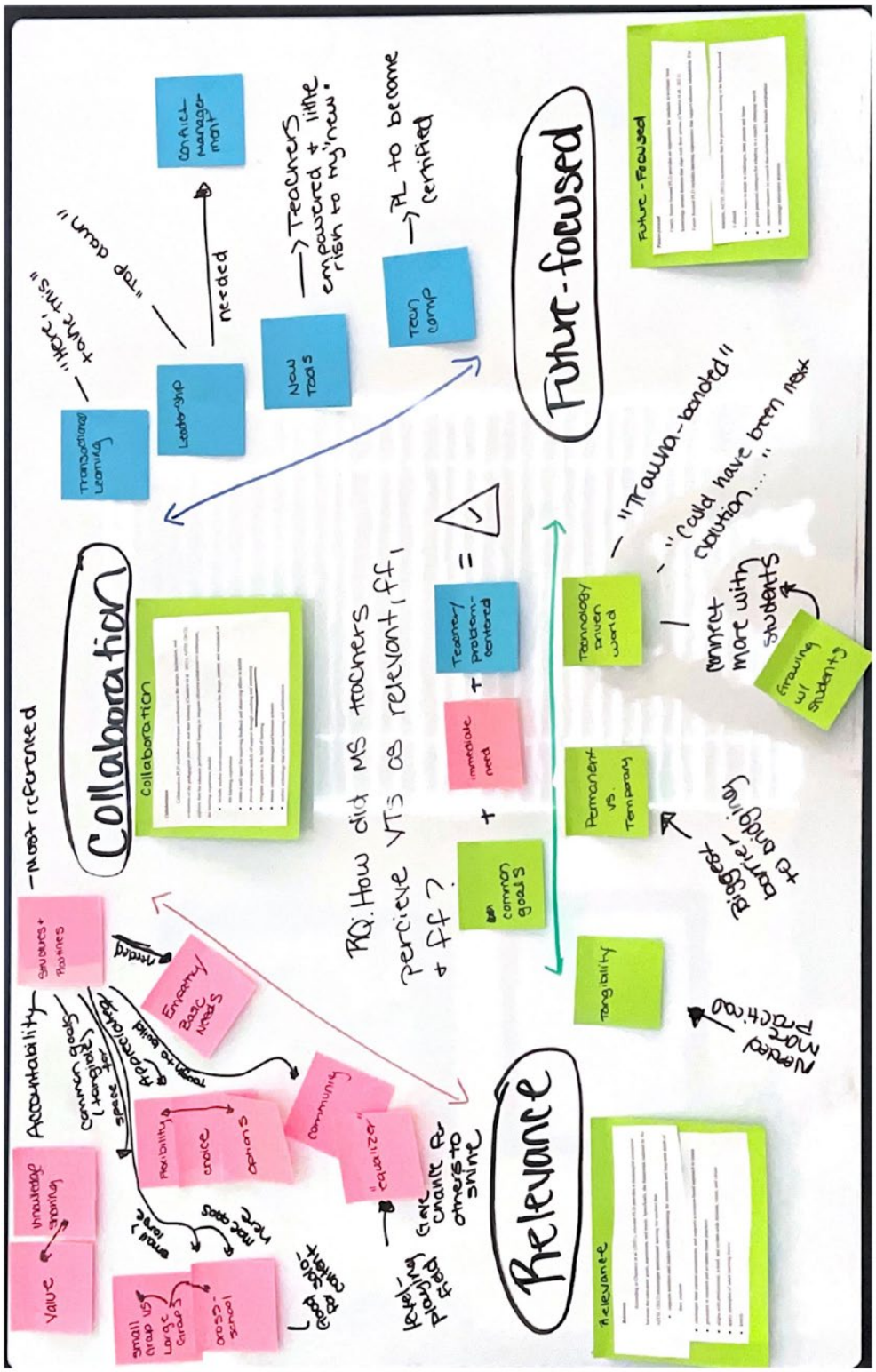


Figure 9 Visual representation of themes and patterns relating to the core components of the AITSL framework for PLD.

Overall, the data for this study were coded and analyzed through multiple means. The first round of coding used In Vivo Coding to focus direct words and phrases from participants, and Concept Coding for big ideas based on the research question. Both coding approaches took place during and after each interview. To further analyze the data, the second coding cycle included reviewing the data and reorganizing codes to fit underneath the core components of the AITSL Framework for PLD (2020). The second cycle of coding took place after all interviews were complete. During the final stage of analysis, visualization techniques in the form of hierarchical tree maps, matrices, and concept maps were used to understand patterns across participant experiences and relationships between and amongst big ideas from the data.

Findings

In this section, the research findings are discussed. This section is divided into four parts to fully address the research question:

1. How did middle school teachers perceive professional learning through virtual teams as relevant, collaborative, and future-focused?

To explore the answer to this question, the first section discusses the goals of professional learning as described by the participants. The next three parts of this section describe findings that relate to the three core components of the AITSL Framework for PLD (2020) relevancy, collaboration, and future-focused. Table 9 below displays the codes that are related to relevancy, Table 10 displays codes related to collaboration, and Table 11 shows codes connected to future-focused. All tables provide codes, descriptions, and participant quotes from all interview rounds. Later, in Chapter 5, I bring the three components together to discuss the relationship between them and participants'

experiences relating to professional learning.

Table 9 Coding Descriptions for Relevancy

Code	Coding Description	Coded Quotes
Choice	The significance of choice and how it impacted the relevancy of their learning in virtual teams.	"...if it wasn't relevant it wasn't a good experience. I don't know we weren't given a lot of choices then, with what needed to happen" (Mackenzie) "The asynchronous learning … I liked it because then you could choose different professional developments that the district was offering, and you could do them at your own pace, and you could decide what you wanted to do and not do, and that made some professional development so much more relevant to me" (Morgan)
Needs	The kinds of needs those participants had during their virtual team experiences, how they were or were not met, and how it impacted relevancy.	"Not having to worry about travel time. That was wonderful. I really really liked that and it saves a lot of time. It's so much time. Everyone has their coffee. Everyone has their snacks. No one needs to worry about water bottles. So like a lot of those human needs are obviously taken care of…" (Peyton) "Ya, and the main problem with that learning experience... I'm thinking like also like my takeaways from it, my bigger picture is like we were trying to fit it as if they're in a classroom. And you know that's just not... That's not how it is. That's not how people work from home" (Ryder)
Tangibility	The importance of practical strategies they could walk away with	"Professional learning. To be honest, I really have no idea. We had it. We had professional learning, but, like I said, it was really

Code	Coding Description	Coded Quotes
	and how the lack of tangible resources impacted relevancy.	disconnected, and it felt like it was… 'here's a shoe figure out how it fits for you with your language learners…' But it wasn't like those tangible strategies and there was no follow through" (Bailey) "There wasn't a lot of like physical or tangible participation, … sometimes I'll put something in the chat. A lot of it was like, just verbally discuss, or just shout out, or just share out. You know I felt like there wasn't, you know, in some Pds that are more in person like you have a graphic organizer to fill out or you have this to fill out...And then the virtual ones... A lot of that went away" (Morgan)

Table 10 Coding Descriptions for Collaboration

Code	Coding Description	Coded Quotes
Community	The impact of common goals, relationships, and professionalism on community and collaboration.	"It was easier to get feedback from more people, and you could, I think everyone was benefiting just by easily being able to share things and gaining that knowledge for some of us" (Hadley) "I think, with content there was collaboration. But I think that collaboration comes more naturally when you're working with people who are doing the same. Right? You're doing the same thing. It's gonna come naturally. Same goals" (Ryder)
Cross-school Collaboration	The impact of virtual teams connecting participants across school	"I think that that was a huge benefit to just being able to stay connected to people across multiple buildings. And

Code	Coding Description	Coded Quotes
	buildings and the impact on collaboration.	that's really, in my opinion, the biggest area where I could see the potential for virtual teams going forward because we don't always have to drive across town to like a different building, we could actually conceivably have structures where we could meet up a lot more often um for specific purposes if we employed virtual" (Mackenzie) "Oh, my God, I love talking to so many different people I loved hearing every idea. I really appreciated working especially like with my [content] teacher partners [across the district]" (Peyton)
Relationships	The importance of relationships, how relationships differed across smaller and larger groups, and the impact of relationships on collaboration.	"I didn't really think I learned a lot in the bigger groups like we talked about the big district meetings or even all staff meetings. Unless I was working with like one or two people that I knew would also collaborate with me. Then I feel like those were really useful" (Bailey) "Virtual, it's not the same, but I'm a new teacher, and so it was resourceful for sure. And those meetings are the most helpful for me because I get people's ears as a new teacher, and it's hard to do that. So yeah, you trap them in a room online. They can't go anywhere they have to. They have to talk to me" (Hayden)
Structures and Routines	The roles that accountability, communication, leadership, and norms	"Virtual teams aren't always awesome, and it takes a lot of work for them to be good" (Bailey)

Code	Coding Description	Coded Quotes
	played in curbing collaboration.	"...it didn't really feel like a place to voice a disagreement because we were just kinda all flying by the seat of our pants, and I don't think that there was much opportunity for teacher's voice or for collaboration…" (Ryder) "…there's definitely different skill set being a virtual leader" (Peyton)

Table 11 Coding Descriptions for Future-focused

Code	Coding Description	Coded Quotes
Flexibility	How virtual teams allowed for flexibility and new ways of doing.	"I think it also forced us to learn. Learn to teach in a different way, but also to learn in a different way" (Bailey) "I guess it was useful in terms of it was like it provided some flexibility. I was able, like, if I had a question, I was able to quickly jump online with like either another [content] teacher, another [grade-level] teacher and get those answered versus like sometimes in the chaoticness of the in-person school days, you like can't even find time to send an email to ask a question" (Hadley)
New Tools	The technological skills teachers gained during this time and continue to use.	"I think some of the things I learned the most were just like tech things and how to put things together in a digital platform that I didn't really know, and some of it was my teammate and myself like learning together…" (Ryder) "I wouldn't highly rate the experience, but at the same time, as an educator, I learned so

Code	Coding Description	Coded Quotes
		much more. You know how I've been saying previously about like the different technological possibilities" (Morgan)
Permanent vs. Temporary	The challenge of investing in learning that addresses the temporary context vs. the permanent context.	"Now we're like, okay, everything's good. Let's just cut it off completely. Well down the road, if something happens again, all of this next generation won't know what to do. We'll have the experience, and it'll be a mess again" (Hayden) "…how much of it do you think would have been different if it was just our next step in technology to be virtual, or because of the pandemic and everything else around it affecting that virtual space, too" (Morgan)
Teacher and Problem-centered	The need for building more teacher capacity around problem-solving for immediate and future contexts.	"And I think, you know, when you ask people, when you give them the problem and you start there then you're already setting up this environment of modeling like… 'It's you guys that get to tell us how,' and 'what's the best way to do this?'" (Mackenzie)

Defining Professional Learning

As defined in terms of this study, professional learning and development refer to the learning experiences delivered to employees to support their continued success and growth within their roles. During the first interview, participants reflected on how they would describe professional learning. Continued education, deliverables, and choice were the themes that emerged from the data analysis. Highlights from this question can be viewed in Appendix G.

Theme 1: Continued Education

First, participants echoed the definition outlined in this study. For example, Mackenzie referred to professional learning as the "ongoing education" of any given person relating to their work. Additionally, Hayden explained that the idea of professional learning is "the ability to understand that you're a lifetime learner and that you're going to grow." Hayden continued by stating, "we're never going to know everything. So it's just the understanding that you need to keep going." Additionally, professional learning was perceived as an event that takes place consistently. Bailey shared that they "have professional learning once a week." The participants in this study define professional learning as an ongoing education related to one's work, where the individuals embrace the fact that they are lifetime learners who continuously grow and develop. They view professional learning as a consistent event, taking place regularly.

Theme 2: Deliverables

Participants also highlighted the importance of walking away with practical, tangible strategies. Peyton explained that something tangible might include a "scaffold or a document or a protocol" that can be used in the classroom. Peyton also shared that "professional learning for teachers just builds a teacher's capacity, whether that means to provide a further understanding of a concept or to help them build things to utilize in their classroom" Furthermore, these strategies should have a high impact. Hadley stated that professional learning should focus on what will have the "most impact immediately." Participants emphasized the significance of obtaining practical, effective strategies from professional learning. They illustrated this by pointing out that these strategies can be tangible, such as a scaffold, document, or protocol, that can be applied in the classroom.

Additionally, they highlighted that professional learning aims to enhance a teacher's capacity and provide them with a deeper understanding of concepts that can be *immediately utilized* in their teaching. Furthermore, they emphasized the need for professional learning to focus on strategies with the highest impact.

Theme 3: Choice

Finally, participants discussed the role of choice in professional learning by sharing that some professional learning is required, and others include choice. For instance, Morgan reflected on this by sharing that

> Professional learning can either be an opportunity or it can be a requirement to learn about different teaching strategies or professional needs… I guess that it can be an opportunity where you choose to learn something that you feel might help your teacher's learning continue, or maybe some gaps that you might have found to be filled, or it can be a required thing that you know everyone has to learn that's just a part of their daily job.

Additionally, Ryder shared that "the professional learnings that I've found to be really successful have been ones that I knew I needed, ones I took on my own." The participants discussed the role of choice in professional learning, highlighting that it can be both required and voluntary. Morgan explained that professional learning could be a chance to fill gaps in knowledge or a requirement to meet job standards. Ryder also shared that the most successful professional learning experiences for them were ones they took on their own initiative. Overall, participants described professional learning through definitions, descriptions, and stories. The results indicate an alignment not only to the terms for professional learning defined in this study but also to the three core components

of the AITSL Framework for PLD (2020), as discussed in the following four parts of this section.

Relevancy in Virtual Teams

Relevant PLD provides a meaningful connection between the educators' goals, aspirations, and needs (Charteris et al., 2021). Specifically, the AITSL (2012) describes relevancy in relation to professional learning in that it:

- supports teachers and leaders with understanding the immediate and long-term needs of their students
- challenges their current assumptions, and supports a solution-based approach to issues
- is grounded in research and evidence-based practices
- aligns with professional, school, and system-wide mission, vision, and values
- applies principles of adult learning theory
- is timely

In line with these explanations, themes, and ideas from concept codes were organized under ‘relevancy’ as a top, parent-code. Underneath ‘relevancy,’ three overarching themes emerged: (a) choice, (b) needs, and (c) tangibility (See Table 9).

Theme 1: Choice

The concept of choice emerged as a recurrent theme during participant interviews, being discussed concerning both content and collaboration. To explain, three participants out of seven felt choice in *what* they could learn and *how* they could engage in that learning while working in virtual teams. On the other hand, two participants out of seven did not believe choice existed much during this time, making it difficult to feel it aligned

with their or their students' immediate needs and impacted their motivation to participate.

Participants in the study emphasized the importance of choice in their virtual learning experiences, specifically regarding flexibility in group collaboration and the ability to choose their own professional development opportunities. Hadley recalled their most effective learning experiences: they could go into Google Meets breakout rooms and work with others or stay in the main virtual room and work with everyone. Hadley specifically mentioned that it was supportive to "pick how we worked together" and that in other sessions, they could "split up to whatever groups we wanted to work with, and we were given that freedom." Participants also discussed the power of choice in asynchronous professional learning. Morgan shared

> I liked it because then you could choose different professional developments that the district was offering, and you could do them at your own pace, and you could decide what you wanted to do and not do, and that made some professional development so much more relevant to me.

The asynchronous learning opportunities provided by the district were mentioned multiple times by multiple participants, all echoing the sentiments of Hadley and Morgan. When discussing the benefits of choice in virtual team collaboration, they discussed less about choice in content and more about choice as it relates to the flexibility of learning. Overall, data from the interviews highlighted the significance of choice as a factor that enhances participants' virtual learning experiences, and it was clear that the ability to select how they learn and with whom they learn leads to a more engaging and effective education experience.

However, two out of seven participants identified the element of choice as a challenge for their professional development during this time. Bailey reflected on their difficulties by sharing that “people have to be invested in what they're doing to want to collaborate” and that during this time, some of the learning felt “very inauthentic” and “forced.” Mackenzie shared similar reflections, “If it wasn't relevant, it wasn't a good… I don't know that we were given a lot of choices then, with what needed to happen” when describing one of the virtual teams they led. The ideas connected to choose also included discussion around how choice creates buy-in and that buy-in leads to more engagement. Participants that had experience working in virtual teams in other areas, such as post-graduate work, recognized the importance of their decision to seek that learning experience and its impact on their engagement. For instance, Bailey shared

> …everyone was excited to be there because you're getting your masters in something you were passionate about, so it made it easier to want to listen… I don't really actually know what the difference really was other than I was excited to be there, and I wasn't forced to just sit at my computer for not only an hour-long meeting but then eight hours of a school day. So I think that probably made it a lot easier.

In the end, many participants saw choice as a positive aspect of virtual learning, but a few identified it as a challenge. Specifically, they reflected that choice creates buy-in and that buy-in leads to more engagement. The participants stated that lack of choice and relevance in their learning experience made it difficult for them to stay engaged; however, they had positive experiences with choice and relevance across other virtual team experiences. Building on the participants' reflections on the role of choice in their

virtual learning experiences, the next theme delves deeper into the specific long-term and immediate needs expressed by the participants regarding virtual learning environments and support.

Theme 2: Needs

A key component of relevancy is ensuring that professional learning supports immediate and long-term needs. Based on the interview data, six out of seven participants experienced challenges with unmet needs. However, most participants recognized the complexity of the needs presented due to the pandemic. Mackenzie discussed their experience with their leadership team and recognized they

> were trying to figure out what they could do to pull the staff together and provide a focus … but they were also not instructing in that virtual environment. I think there was a massive disconnect between what was needed and what they were emphasizing.

Mackenzie further explained that even after coming back to in-person learning full time, their leadership acknowledged "there was not a lot of space for teams to be deciding what was most useful or beneficial to them." Another revelation by Ryder as they reflected on this time was that "we were trying to fit it as if they're in a classroom. And you know that's just not... That's not how it is. That's not how people work from home." Like Mackenzie, Ryder felt a disconnect between professional learning needs and what was happening.

> We're the ones who are in the class, and we're the ones who are in that virtual setting like we knew what our struggles were, and I don't feel like we had a

> genuine space, safe space to sit and collaborate and try to come up with solutions to what we were seeing.

Additionally, three of seven participants struggled with inconsistent norms across virtual teams that did not align with their immediate needs. In particular, Hadley recalled an instance where they felt "called out" for not having their camera on during a meeting and thinking about teachers working from home.

> What's their expectation? Yes, they should be engaged. But they're also playing teacher to their kids, and the dog is gonna bark and wine and wants to go outside… like just general expectations, which was challenging because it changed from meeting to meeting, and if they didn't specify it…sometimes you got called out, and you're like well, sorry I didn't know, or sorry I had to take care of someone in my apartment. My fire alarm went off one time, and I got called out. Sorry, I am outside my building, just holding my laptop.

Mackenzie also recalled a similar situation. They participated in a session where the leader reiterated a norm around having cameras on attendees. Mackenzie struggled "because [their] kids were at home, and having small kids, the way she [the leader] was trying to maintain connection during those meetings was she wanted everybody to have their cameras on, and I had to have a conversation with her on the side." Mackenzie continued by sharing the discomfort of describing what was happening at home to the other session participants and that it was not something they felt they should have to do. Even though Hadley and Mackenzie referenced these norms as challenging, they also recognized that this challenge was primarily due to the pandemic.

Differentiation was another need shared by participants. However, Peyton, who led and participated in virtual teams, felt that virtual teams during this "made it a little bit more difficult to differentiate for your audience" since there were so many different teachers' needs during this time. They felt like many of the professional learning opportunities that

> ended up coming out weren't necessarily relevant for me, because the way that I work and the way that I process is…let me mess around with a program for a minute, let me try and make something, then let me look at it through a student view, and I'm good. I don't need hours of training on how to utilize a new online resource or a new tool.

On the other hand, most participants recognized and discussed that there were many technological needs of teachers that drove the creation of more entry-level professional learning around technology integration. However, Morgan found that some of the professional learning options, provided by the district but run by a different company, were helpful when teachers could become certified educators around a particular educational technology tool like Kami or Peardeck.

Ultimately, interview data revealed participants' challenges with unmet needs during their virtual teamwork. The participants shared their experiences with unaligned norms, inconsistent expectations, and a disconnect between their immediate needs and the professional learning opportunities provided. Additionally, the participants noted the challenges of differentiation in a virtual setting and the need for more relevant professional learning opportunities that address the unique needs of teachers during this time.

Theme 3: Tangibility

A final theme that emerged from a couple of the participant interviews was the idea of tangibility. For example, four of the seven participants discussed the lack of tangible strategies and materials during virtual teamwork as a barrier to feeling that the sessions were relevant to their needs. When reflecting on learning during this time, Bailey shared that they felt there "was no real tangible way of how to fix it," referring to solutions for perceived needs. Moreover, Morgan shared that some of the deliverables were missing from learning experiences. For example, they shared that instructional strategies like graphic organizers or other ways to capture learning lacked presence in professional learning in virtual teamwork. But rather, participant expectations in terms of showcasing learning looked more like "just verbally discuss, or shout out, or just share out."

Another challenge connected to tangibility is connected more to the practical application of learning for different needs. For example, Peyton discusses working in some of the larger district teams

> So I'd say, you know, in a room of sixty participants, I wouldn't find it as useful because it was a lot of 'me' questions or tech questions, or you know, 'how does this cater to my specific classroom.' So I'd say that's kind of where it fell short. In those really big teams. Many people took it in like, 'well, how does this work for me?' And that takes up the majority of the time, which then ultimately doesn't help the greater good of the team that's working together.

For Peyton, some of the learning in larger groups made it difficult to understand the tangible connection to any overarching team goals. In conclusion, tangibility emerged

as a common theme among participants in their reflections on virtual teamwork, with many expressing the need for more concrete strategies and materials to make the sessions relevant to their needs. Furthermore, the lack of tangible deliverables and the focus on individual needs in larger group settings were identified as challenges that hindered the effectiveness of the virtual teamwork sessions and hindered the overall goal of the team.

Collaboration in Virtual Teams

Collaborative PLD includes participant contribution to the design, facilitation, and evaluation of the pedagogical practices and their learning (Charteris et al., 2021). AITSL (2012) explains that for educator professional learning to integrate effective collaborative techniques, the learning experience should:

- include teacher involvement in decisions related to the design, content, and evaluation of the learning experience
- create a safe space for receiving feedback and observing others in action
- provide multiple models of support through coaching and mentoring
- integrate experts in the field of learning
- ensure connections amongst and between schools
- applies technology that elevates learning and collaboration

Based on these explanations, themes, and ideas from concept codes were organized under ‘collaboration’ as a top, parent-code. Underneath ‘collaboration,’ four overarching themes emerged from the most highlighted coded core component: (a) community, (b) cross-school collaboration, (c) relationships, and (d) structures and routines (See Table 10).

Theme 1: Community

The theme of community emerged as it impacted participant collaboration. Participants expressed varied experiences and perceptions of the community in virtual teams. First, six of seven participants shared that the groups working toward common, relevant goals were effective. Although, participant data showed this was most effective in smaller teams. Bailey explained that teams that were "all doing the same thing" felt more beneficial. Peyton also recognized that teams functioned well when "everyone understood the purpose" of the work and were "grounded in that common goal." For example, Mackenzie recalled some of their grade level meetings as being the most effective, where participants came together to "develop [their] own process" and that "people were engaged" because it "felt like exactly what they needed to be doing."

Both Hadley and Ryder found that their content community came together during virtual teamwork to ensure a successful curriculum implementation. Hadley shared that in these teams, people came together to learn new tools and a new platform and discuss how to make the most out of their new curriculum for teachers and students. Hadley also reflected on why this team had so much success together by stating that "everyone [was] on this level playing field" and that "everyone [was] new to 'this.'" They saw this as an example where their team was "all learning this together."

Similarly, Hayden shared that they had a "mostly positive experience" regarding the community in virtual teams "because it showed how, when it all hit the fan, how everybody came together." Hayden further explained that everybody was in "the same boat" and experiencing "the same struggles" and that it helps people feel like they "were probably not alone." Moreover, Mackenzie discussed that participants created the kind of

community they needed during professional learning sessions when participants were put into smaller breakout groups. They explained that during the breakout groups, they just "talked about what we needed to talk about," even if their discussions were not on topic with the intended work of that session.

Building a community was another challenge that impacted some participants' collaboration. Morgan and Hadley started at new schools during the pandemic and worked with new colleagues for the first time virtually. This presented a few challenges, but both participants considered this transition awkward. Specifically, Morgan shared that they found building community in virtual teams "awkward" and challenging. Hadley shared similar sentiments about figuring out how to get to know people in this setting for the first time. Both participants recalled community builders at the start of almost all virtual teamwork and professional development sessions. Still, they did not feel it was enough if participants didn't seek additional ways to insert themselves into virtual communities.

In conclusion, the theme of community emerged as a key factor impacting participant collaboration in virtual teams. Participants expressed varied experiences and perceptions of community, with many finding that groups that worked toward common, relevant goals were effective, particularly in smaller teams. However, building a sense of community was also identified as a challenge, especially for those new to their teams and working virtually with colleagues for the first time. Despite the challenges, participants emphasized the importance of community in virtual teamwork and the need for additional ways to insert themselves into virtual communities.

Theme 2: Cross-school Collaboration

Almost all participants, six out of seven, discussed having a positive experience with cross-school collaboration. Even though some of this teamwork started in a much larger group, many participants were put into breakout rooms with other like-content participants. From there, Hadley explained they felt as though, in these sessions, there was an increase in knowledge sharing. They attributed this to everyone experiencing a learning curve with a new curriculum.

> Because we were in a new curriculum, also in a new setting, and we had to jump in and learn all this together, so we are more willing to work across schools than when we're in person and when we're in our buildings every single day, and it was easier to meet someone online be like, 'Hey? I liked what you said…can you share that resource?'

Additionally, Mackenzie, Hayden, and Morgan found cross-school collaboration through virtual teams particularly effective, given their unique contexts. Mackenzie and Morgan do not have partners in their buildings who teach the same grade level and content as they do. Therefore, the virtual model worked effectively for them as it allowed them to connect with their colleagues across school buildings who had a common purpose and common goals. Mackenzie stated that for those teachers without teaching partners in their buildings, "it was really nice to be able to connect across [school] buildings" and that "sometimes just putting people in a room together has useful impacts." Hayden appreciated seeing other teachers' final projects and plans, which inspired them in their classrooms. Also, Morgan shared that the virtual community established during this time still exists as a Google Classroom where participants share their ideas and resources with each other.

> I can see, and I can meet with other people in my same role…we created a Google classroom for sharing resources to Google drive um sharing resources, and we created a Google chat where we could just reach out and ask each other questions throughout the day or into the week. Sometimes we met for just a quick Google meet to be like, 'Hey? I need help with this. Let's brainstorm.' So the virtual meeting led to a stronger virtual community outside of that meeting which was really effective.

Peyton reflected that the virtual approach to learning across schools also helped them connect more with people they wouldn't usually meet. They shared that it "helped, not knowing the people" on the teams all the time and "helped people all over the district that maybe you'd talk to one or twice." Morgan and Hadley shared similar thinking, and they both recognized that virtual teamwork pushed them to work with people they might not have the confidence to go up to and work with in person. Hadley shared that in person, it is easy to sit with "who you know."

Theme 3: Relationships

While cross-school collaboration helped participants collaborate across school sites, four participants recognized the role relationships, specifically trusting relationships, played in their willingness and comfort with collaborating. For example, Bailey stated that what made collaboration effective was "trusting the people you're working with and knowing them." For them, they realized that the relationship piece of virtual teamwork "would take more time than in person" but that it is important for there to be a "safe space" to get to know "the people on the other side of the screen." Additionally, as Morgan transitioned into a new role and a new school during this time,

they felt like within these virtual teams, “emotions were kind of gone,” and they felt “like an outsider, on the ledge, not really knowing what to do or where to be.”

Next, almost all participants struggled with relationships in larger group settings and found it easier to navigate smaller groups. For Ryder, smaller groups allowed for fostering “strong relationships” and felt that their overall experience with collaboration was impacted mostly by “the relationship [they] had with the teachers [they were] working with.” Similarly, Peyton recognized that the “smaller setting” helped “build those relationships that a lot of [them] were missing when [they] weren’t about to be out and about.” Furthermore, for Hayden, the smaller virtual teams gave them a “platform” for being able to “express what [their] doing” rather than being in front of a larger group where they may not be as comfortable sharing or being able to participate and get the support they need or want.

Theme 4: Structures and Routines

For six out of seven participants, the structures and routines applied during virtual teamwork presented many challenges. Challenges included accountability, communication, norms, and leadership approaches. For Bailey, the motivation to collaborate was challenging when they felt there would be no follow-through or accountability. They shared that “no one was really coming to check” on the application of their learning or that they would “learn things in isolation.” Morgan and Peyton both recalled that a challenge was that there may have been too much freedom around accountability, that many people chose not to participate at times, and that “finding intrinsic motivation” was difficult.

Hayden and Ryder both discussed challenges with communication efforts during this time. Hayden compared the difference to following up with teammates in person and that it is “easier to catch someone in person” by “walking over their room” to ask a quick question or clarification. They did not find that as easy during virtual teamwork, specifically in asynchronous settings. Ryder also recalled during a virtual team meeting that they felt left out of some communication when the facilitators felt they had communicated very well.

Mackenzie, Ryder, and Peyton all felt virtual teamwork required different norms, structure, and leadership. Mackenzie recalled leading a team, encountering conflict, and feeling unsure how to handle it in a virtual setting best. They found themselves wondering, “Is this an email? Is this what…?” Mackenzie recognized that their first reflex with online pieces was “just to email” but learned that “entirely different norms were needed” for these virtual spaces. Ryder also recognized the challenge of conflict management when discussing their experience “...it didn't really feel like a place to voice a disagreement because we were just kinda all flying by the seat of our pants, and I don't think that there was much opportunity for teacher's voice or collaboration…” Ryder also expressed challenges with “bucking at a system that just wasn’t working.” They expressed on a few occasions that learning during this time reflected more of the in-person norms and expectations over “how people work from home.”

Those participants in leadership roles experienced challenges in making some of the work for the teams they were leading more collaborative. Bailey, Mackenzie, and Ryder all shared the sentiment that the support for planning for their teamwork was “top-down” and felt more like “checking boxes” than engaging in collaborative learning or

problem-solving. Peyton stated that being "a virtual leader requires a totally different skill set." On the other hand, Hadley found an opportunity for informal leadership during this time by supporting their content team. Due to their experience and motivation to use technology, they made videos and other resources to help their team.

Future-focused Virtual Teams

Future-focused PLD provides an opportunity for teachers to evaluate their knowledge around theories that align with their actions (Charteris et al., 2021). Future-focused PLD includes learning experiences that support educator adaptability. For example, AITSL (2012) recommends that for professional learning to be future-focused, it should:

- focus on ways to adapt to challenges, both present and future
- provide practical strategies for adapting to a rapidly changing world
- immerse educators in research that challenges their beliefs and practice
- encourage innovative practices

From these details, themes, and ideas from concept codes were organized under 'future-focused' as a top, parent-code. Underneath 'future-focused,' four overarching themes emerged: (a) flexibility, (b) new tools, (c) temporary vs. permanent, and (d) teacher and problem-centric learning (See Table 11).

Theme 1: Flexibility

All seven participants discussed the benefits of flexibility that virtual teamwork provides. This included flexible learning as well as communication. Bailey shared, "I think it also forced us to learn to teach in a different way, but also learn to learn in a different way." They went on to share how beneficial this was to understand the student experience at this time as well. In line with Bailey's experience, Peyton discussed the

new modalities for professional learning, provided flexibility in how they learn, and that it “opens doors for a lot of parents that are educators” who can “access things later in the day.”

Participants frequently discussed the benefits of flexible communication through virtual teams. Hadley recalled that they “would be able to jump on the phone if the kids were like doing an independent thing” or “jump on a virtual meeting” for “quick responses” and “quick troubleshooting with others.” This contrasts with regular “school days you can't even find time to send an email to ask a question.” Ryder had a similar experience in that they could check in more frequently at the end of each lesson and share how the lesson went and whether they wanted to adjust. It left Ryder feeling “like the collaboration was actually stronger when it was fully remote.” Finally, Morgan found that it was “easier to participate and share out…for people who weren't as ready to verbally share out…it was easier to just type in the chat box, and it was easier to keep your camera off so that you wouldn't feel uncomfortable talking.”

Theme 2: New Tools

Another benefit frequently discussed by participants was the new technologies and skills they learned through virtual teamwork. Morgan reflected on how their virtual teamwork impacted their practice.

> I learned so much more… like the different technological possibilities and then also navigating that virtual space, you know, learning how to do things through technology that I might not have done before, or learning how to create or manage a Google Meet or a breakout room.

Ryder revealed that they were “never shy of technology” but rather adopted the mentality that “if it's not broken, don't fix it.” They explained that this time “pushed” them more to use “more technology.” Additionally, Bailey shared that “it was easier to both be on the same document and be looking at the same stuff in the sense of sharing your screen, making sure everybody has stuff pulled up, versus everyone filing through in person, trying to be on the right document.”

Theme 3: Temporary vs. Permanent

While participants perceived benefits connected to flexibility and technological innovations, they frequently expressed concern with how quickly everyone was trying to “go back to normal.” Hadley felt that some of their teammates struggled to engage as much as they could because the mentality was to “do what they had to do” until “[they would] eventually be back in person. Hayden expressed concerns about this thinking as well, “now we're like, okay, everything's good. Let's just cut [virtual collaboration] off completely. Hybrid and remote should pretty much be perpetual, for any environment.” Similarly, Peyton “didn't feel as though it was long-term” when discussing professional learning. They continued to say that it “felt as though it was the Band-Aid patch for how we are going to work through this until we get to go back to how we taught before.” Morgan mentioned on several occasions that they often reflect on how virtual teams would be different had it not been for the pandemic forcing the teachers to shift to them. They continued by wondering if this would have “just [been] our next step in technology to be virtual.” Ryder also sees how these models could benefit teachers and that “there's kind of a missed opportunity right now.”

Theme 4: Teacher-centered learning

A final challenge that emerged from the data was the lack of teacher-centered learning. By teacher-centered learning, I mean learning that occurs when teachers identify a specific problem or need in their practice and seek out opportunities for professional development to address it. Mackenzie, who led a virtual team, felt that this was a missed opportunity during virtual team collaboration. When reflecting on how to make virtual teams and learning in these spaces more future-focused, Mackenzie encouraged more teacher-driven approaches because "when you ask people… when you give them the problem, and you start there, then you're already setting up this environment and sort of modeling it." Ryder also struggled with feeling like they had control over some of their learning and the challenges they faced. Ryder's recommendation for a more future-focused approach was around incorporating more teacher voices. They shared, "we're the ones who are in the class, and we're the ones who are in that we're in that virtual setting like we knew what our struggles were, and I don't feel like we had a genuinely safe space to sit and collaborate and try to come up with solutions to what we were seeing." For Bailey, they felt "it was just kind of like on your own to figure out if it's working."

Summary of Chapter 4

The purpose of this study was to understand the experiences of middle school educators as it relates to virtual teams as a mode of delivering professional learning. To examine teachers' virtual team experiences, this study followed a basic qualitative design methodology. After an initial survey of 74 middle school teachers, seven teachers were purposefully selected and interviewed three times over the course of a four to six period

during the fall semester of 2022. The data were analyzed using multiple coding procedures, data organization methods, and visualization techniques between each interview and upon the conclusion of the study. This process helped to reveal themes that helped answer the research question.

This study's results revealed several themes connected to AITSL's Framework for PLD (2012). First, all participants perceived professional learning as ongoing education that includes choice and practical strategies for their role. Regarding relevancy, teachers had mixed experiences with choice and challenging experiences with meeting their needs and walking away with tangible ideas and strategies. Some participants saw choice as a strength in how they could participate in learning, while others did not feel like they had a choice in what they learned. Most teachers struggled with walking away from their teamwork, feeling like the results met their needs or provide something for them to capture their learning or use in the classroom.

Next, all teachers perceived the opportunities for cross-school connections as collaborative. Additionally, they cited that the smaller groups and breakout rooms supported stronger relationship building, improving their perceptions of collaboration. On the other hand, most participants struggled with building community and inconsistent and unrelatable structures and norms. Some participants reflected that virtual teams take time to build and that building community in these spaces felt more difficult than in person. This impacted their participation and comfort. Additionally, most participants felt challenged by some of the norms and structures used during their sessions as they recognized that virtual spaces need different norms than in-person and different learning models.

Finally, all participants perceived learning as future-focused by the flexibility of learning and the new tools they adopted. However, they perceived challenges with future-focused learning due to the lack of teacher or problem-centric learning and the overall perception that everything was temporary. First, all participants appreciated new ways of learning and communicating that they learned across different teams. This included the application of new tools for different purposes. One perceived challenge with future-focused learning was that teachers wanted more opportunities to discuss the problems that they experienced and develop solutions for them. Finally, most participants struggled with some of the learning during this time, acting more as a place-holder for when things "got back to normal."

CHAPTER FIVE: SUMMARY, DISCUSSION, AND CONCLUSIONS

The preceding chapter reports the presentation and analysis of participants' interview data. Chapter five consists of a summary of the study, a discussion of the findings where the results of this study are described in greater detail by connecting them to the existing literature on virtual teams and the Australian Institute for Teaching and School Leadership (AITSL) Framework for professional learning and development (PLD) (2012), implications for practice, recommendations for future research, and final conclusions. The latter sections aim to expand upon teacher experiences of virtual teams and their potential to be a future delivery mechanism for professional learning and teamwork.

Summary of Study

This study aimed to understand teachers' experiences and perceptions regarding professional learning in virtual teams. Specifically, this study explored teacher experiences of virtual teams and professional learning as relevant, collaborative, and future-focused. This study followed a basic qualitative design in which seven middle school teachers were interviewed three times over a 6–8-week period in the fall of 2022 after being purposefully selected from an initial survey. Their responses were recorded, transcribed, and analyzed.

Participants in this study were purposefully selected from initial survey data. Across two middle schools, 74 teachers received emails about voluntary participation in this study. From this email, 22 consented to participate and completed the initial survey.

From the initial survey, 20 participants responded that they would be open to follow-up interviews. I used criteria to purposefully select seven participants for follow-up interviews. Participants were selected based on getting a wide range of educational backgrounds and overall virtual team evaluations. This study included one research question:

1. How did middle school teachers perceive professional learning through virtual teams as relevant, collaborative, and future-focused?

To answer this question, interview data were collected and transcribed through Zoom. Data were then imported into NVivo for coding and analysis.

Discussion of Findings

In this section, the study's findings are discussed and connected to the existing literature. This is done by beginning with participant descriptions of professional learning. Next, the research question was broken down into three components outlined by the AITSL Framework for PLD. Finally, the framework components are brought together to discuss the relationships between them as discovered during the analysis process.

Professional Learning

Participants in the study described professional learning as the ongoing education that is necessary for continued success and growth in their roles. They emphasized the importance of professional learning in that it provides practical, tangible strategies that can be used in the classroom and greatly impact their practice and students. Lastly, participants discussed the role of choice in professional learning, with some being required and others being optional. The participants' explanations of professional learning support what is already found in the literature.

For example, Johnson (2014) describes professional learning as a strategy that helps educators “strengthen their practice throughout their career” (p. 1). Similarly, Quinn et al. (2019) refers to professional learning as ‘personal and professional growth with continuous and relevant reflection and review” (p. 408). Professional learning is seen as a key strategy for educators to enhance their professional development and growth over time. Like participants in this study, both Johnson (2014) and Quinn et al. (2019) highlight the importance of ongoing learning and continuous reflection and review to achieve this growth. These definitions emphasize the ongoing nature of professional learning and its potential to positively impact an educator's career. In addition to providing an opportunity for continuous growth, the current literature on professional learning emphasizes the importance of providing learners with practical skills.

Participants frequently referenced that professional learning should include practical strategies that meet current and immediate needs. Like the participants, An (2018) and State et al. (2019) explain that professional learning should include an emphasis on changing knowledge and skills that can be easily transferred to practice. Similarly, Reeves and Pedulla (2013) describe high-quality professional learning as “practical, concrete, and readily usable” (p. 62). The participants expressed the idea that professional learning should be focused on providing practical strategies that can be immediately applied in the workplace. This view aligns with the findings of previous research studies by An (2018), State et al. (2019), and Reeves and Pedulla (2013). While these studies emphasize the importance of practical, concrete, and usable knowledge and skills in professional learning, participants frequently cited the element of choice in describing professional learning.

Finally, participants shared that professional learning includes both learnings that teachers may seek themselves or be a requirement based on their role. Participants also discussed choice about choosing topics that connect with their needs. Based on the current literature, choice plays an integral role in effective professional learning (AITSL, 2012) but is often cited as a barrier or challenge by teachers who find current approaches to professional learning ineffective (Elliot, 2017). Choice, in general, is a critical component of Adult Learning Theory as it empowers them to claim responsibility for their own education, leading to more motivation and engagement (Knowles, 1978). Furthermore, as outlined by the AITSL (2012) Framework for PLD, providing choice can support teachers in connecting the relevance of their learning to their contexts. The participants highlight that professional learning can involve both self-selected and mandatory learning, as well as the choice to focus on topics that are relevant to their needs. The AITSL (2012) Framework for PLD also stresses the importance of choice in connecting professional learning to the context of teachers. The convergence of participants' views with the literature supports the idea that choice plays a significant role in professional learning and is crucial in empowering individuals, increasing motivation and engagement, and making the learning experience relevant to their needs.

In conclusion, this study provides insight into participants' perceptions regarding professional learning. The participants emphasized the importance of professional learning to acquire practical strategies and skills that can be immediately applied in their workplace. They also discussed the role of choice in professional learning, highlighting that it can include both self-selected and mandatory learning and the choice to focus on topics relevant to their needs. These participant perceptions align with the findings of

previous research studies, which emphasize the importance of practical, concrete, and usable knowledge and skills in professional learning. The current literature also highlights the role of choice in effective professional learning, as it empowers individuals and increases motivation and engagement. These findings support the idea that professional learning is an ongoing process that is crucial for personal and professional growth and that choice plays a significant role in making professional learning relevant, empowering, and motivating.

The participant responses connected with some of the current literature on professional learning, one component of the AITSL (2012) Framework for PLD was left out, collaboration. Even though Quinn et al. (2013) share that teachers can collaborate through online forums, blogs, chat spaces, or synchronous spaces like Skype, Zoom, or Google Meets, the participants in this study did not reference collaboration when describing professional learning. Furthermore, the AITSL (2012) provides examples of effective collaboration for their framework as coaching, mentoring, formal and informal observations, and consideration of feedback practices. However, these were also not mentioned by the participants in this study.

Relevant: Choice, Needs, and Tangibility

Firstly, choice plays a key role in Adult Learning Theory (Knowles, 1978). Giving adults choices in the learning process allows them to take ownership of their learning, increasing their motivation and engagement (Elliot, 2017). They are more likely to commit to and follow through with learning when they have a sense of autonomy and can see the relevance of what they are learning to their lives and careers. The theme of choice emerged as a recurrent theme during participant interviews, being discussed

regarding content and collaboration. Many participants felt that choice in what they could learn and how they could engage in that learning while working in virtual teams was essential for their motivation and engagement. They found the ability to select how they learn and with whom they learn leads to a more engaging and effective educational experience. Participant experiences and perceptions align with a critical component of Adult Learning Theory, highlighting the significance of self-directed learning as adults grow older and seek more independence. Furthermore, participant perceptions align with relevancy as Charteris et al. (2020) provides an example of supporting relevancy in virtual teams, "purposeful interaction can take place between virtual team peers through zoom meetings, discussion forums, and blogs" (p. 6).

On the other hand, some participants did not believe choice existed much during this time, making it difficult to feel it aligned with their or their students' immediate needs and impacted their motivation to participate. This is supported in the literature as professional learning and development with relevance has the greatest impact on practice when it helps educators "address and adapt the challenges they face" (AITSL, 2012, p. 4). The literature emphasizes the importance of professional learning, meeting the just-in-time needs of the learners (AITSL, 2012; An, 2018; Charteris et al., 2020; Johnson, 2014). Furthermore, relevancy is a key reason for piqued interest in PLNs as they allow learners to seek professional development to fit their specific needs when they need it (Visser et al., 2014; Sturm & Quaynor, 2020).

The power of choice in asynchronous professional learning opportunities was also highlighted by many of the participants. However, a few participants identified the element of choice as a challenge for their professional development during this time,

specifically when it came to feeling invested in the learning experience, relevance, and engagement. Finally, some participants struggled with thinking there were practical, applicable strategies for both individuals and the groups. The lack of practical strategies is supported in the literature as it is a critical component of effective professional learning and development (AITSL, 2012; An, 2018; Charteris et al., 2021). Overall, the data from the interviews highlighted the significance of choice as a factor that enhances participants' virtual learning experiences.

Secondly, a key component of relevancy is ensuring that professional learning supports immediate and long-term needs (AITSL, 2012). Even though most participants recognized the complexity of the needs presented due to the pandemic, they still felt that their professional learning through virtual teams misaligned with their needs. This is likely a result of decisions made when designing virtual team experiences for teachers. Participants frequently referenced challenges with structures, routines, and leadership. According to the current literature, these components are critical for deploying effective virtual teams (Berry, 2011; Duarte & Snyder, 2006; Gibson & Cohen, 2003; Klein, 2003; Whitener et al., 1998). For example, the literature suggests that there are different virtual team types (Duarte & Snyder, 2006) and supportive characteristics (Gibson & Cohen, 2003). This includes designing different structures for different virtual team purposes. Furthermore, Klein (2003) explain the importance of leaders taking the initiative by assigning tasks, coordinating efforts, and setting up performance goals in virtual teams. These leadership behaviors allow leaders to ensure there is alignment between purpose and deliverables, accountability for participants, effective communication, engagement, and relevant support.

One area related to participant needs that received positive feedback was how virtual teamwork allowed teachers to meet some of their basic needs. For example, participants frequently mentioned the ability to be able to use the restroom, grab water or a snack, and turn their cameras off when they needed a minute to dissociate. According to the participants, this is not a luxury they experience in their daily lives when teaching in person. The current literature on virtual teams and even PLNs consistently reference flexibility as a key benefit of their models (Anthony, 2020; Charteris et al., 2021; Dulebohn & Hoch, 2017; Trust et al., 2016). However, the literature does not specifically address flexibility in meeting social-emotional needs, as referenced by participants. This is likely due to the nature of the work regarding being a classroom teacher. Teachers must perform in front of their audience all day with little breaks in between and a lack of coverage to be able to take care of some of the basic needs they mentioned they could take care of during virtual teamwork.

In addition, to choice and needs, the results revealed the importance of tangible strategies in order for teachers to find virtual learning relevant. This aligns with Reeves and Pedulla (2013), who observe, high-quality PLD is “practical, concrete, and readily usable” (p. 62). Furthermore, effective learning for teachers should easily support transferring new ideas and skills to their classroom setting (Herbert et a, 2016). Participants reflected that during virtual teamwork, they felt there was a lack of tangible strategies or takeaways from their learning that met their immediate needs. In addition to strategies, one participant cited that using graphic organizers or other learning tools was not present, resulting in challenges with taking away ideas from virtual learning spaces. As a result, there was a disconnect between what teachers were taking away from their

virtual teamwork and how it might impact student learning and enhance their teaching effectiveness.

In closing, Adult Learning Theory stresses that adults require choice in their learning process to take ownership and increase their motivation and engagement in the learning process. As noted in the study, the theme of choice emerged as essential, and participants agreed that the ability to select how they learn and with whom they learn leads to a more engaging and effective educational experience in virtual teams. However, the lack of practical strategies to support individual and group learning in virtual teams emerged as a challenge for some participants, affecting their investment in the learning experience as relevant and engaging. This highlights the significance of ensuring that professional learning through virtual teams supports immediate and long-term needs, the use of tangible strategies, and the importance of leaders in deploying effective virtual teams. Although virtual teamwork allowed teachers to meet some of their basic needs, the literature does not specifically address flexibility in meeting social-emotional needs, indicating a gap that needs to be addressed. Overall, it is crucial to design virtual learning experiences that promote choice, flexibility, and practical, transferable strategies to enhance the participants' virtual learning experiences as relevant.

Collaborative: Community, Relationships, Cross-school teams, and Structures

The theme of community emerged as one of the key factors impacting participant collaboration in virtual teams. Participants expressed varied experiences and perceptions of community, with many finding that groups that worked toward common, relevant goals were effective, particularly in smaller teams. However, building a sense of community was also identified as a challenge, especially for those new to their teams and

working virtually with colleagues for the first time. Despite the challenges, participants emphasized the importance of community in virtual teamwork and the need for additional ways to insert themselves into virtual communities. Current research on virtual teams emphasizes the importance of successful interactions to help sustain a virtual team community (Charteris et al., 2021; Dulebohn & Hoch, 2017; Jarvenpaa & Leidner, 1998; Marlow et al., 2017; Watkins, 2013, Wilson, 2007).

Building a sense of community in virtual teams can be challenging since team members are often physically distant and may not have the same opportunities for social interactions as they would in a face-to-face setting. For example, participants shared that it felt difficult to get to know new colleagues in this setting, particularly those participants starting at new schools. However, interactions that occur in a virtual setting can still play an important role in community building. The community can significantly impact collaboration in virtual teams as it. Virtual team members are more likely to collaborate effectively when they feel a sense of community as it helps build trust (Eissa et al., 2012; Siau & Wang et al., 2018). Additionally, according to a study by Turel and Serenko (2012), the sense of community among virtual team members positively affects their collaboration, which is facilitated through communication, trust, and coordination. When team members feel connected to each other and share a common purpose, they are more likely to communicate more effectively and collaborate more efficiently. This idea was echoed by participants as they shared the effectiveness of working with colleagues who taught common subjects. Moreover, a positive community can foster a culture of trust and openness, which leads to greater participation and engagement. Challenges with

community building in virtual teams also revealed the importance of relationships in virtual team collaboration.

Many participants viewed relationships as crucial to their motivation and comfortability with collaborating. Relationship building was referenced as much easier in smaller group settings. The current literature on virtual teams echoes the importance of relationships and the challenge of building trusting relationships in a virtual space (Brahm & Kunze, 2012; Erez et al., 2013; Kiffin-Peterson, 2004; Pangil & Chan, 2012). Participants' perceptions of relationships and their impact on collaboration align closely with personal-based trust, where trust builds over the mutual exchange of knowledge and the professional credibility of the team members (Pangil & Chan, 2012). However, before that could happen, participants struggled with the cognitive-based trust which builds from the professional credibility of the team members (Pangil & Chan, 2012). The challenge of building trusting relationships in a virtual space is well-documented in the existing literature (Brahm & Kunze, 2012, Erez et al., 2013; Kiffin-Peterson, 2004; Pangil & Chan, 2012). The results of this study suggest that personal-based trust is a key component of building strong relationships and collaboration but that cognitive-based trust, rooted in professional credibility, must also be established.

Another theme that emerged was cross-school collaboration. Almost all participants discussed having a positive experience with connecting with teachers across the district. They felt that there was an increase in knowledge sharing in these sessions and that they had the chance to work with people they would not usually get to collaborate with in person. This is a key benefit of virtual teams in general because they allow for crossing barriers such as time and geography (Bell & Kozlowski, 2002;

Dulebohn & Hoch, 2017; Gillam & Oppenheim, 2006; Handke et al., 2019; Lin et al., 2008; Snellman, 2014). Furthermore, Charteris et al. (2021) specifically call out that a key benefit of virtual teams for teachers is connecting teachers who would otherwise not meet.

The theme of cross-school collaboration aligns with the literature on the benefits of virtual teams, particularly in education. Virtual teams can be particularly advantageous for educators, as they can help overcome the isolation often experienced by teachers, especially those in remote or rural areas (Charteris et al., 2021). The increased knowledge sharing and opportunity to work with colleagues from different schools and districts can also foster a sense of community, leading to enhanced trust and collaboration (Eissa et al., 2012; Siau & Wang et al., 2018). The literature suggests that virtual teams can facilitate the creation of new, diverse networks and communities that are unlikely in in-person settings (Gillam & Oppenheim, 2006; Handke et al., 2019). Overall, the positive experiences reported by participants in cross-school collaborations align with the broader benefits of virtual teams.

Finally, leadership approaches made it challenging for virtual team leaders to facilitate collaborative learning environments with top-down directives for their teams and unrelatable structures and routines. The challenge that the leadership approaches created is supported in the literature when looking at both Adult Learning Theory and AITSL's Framework for PLD (2012). The theory and framework both stress the importance of learners being active members of the planning, design, and delivery of the learning experience. Participants' perceptions of structures and routines also connect to the literature on the importance of team processes in virtual teams (Berry, 2011; Gibson

& Cohen, 2003). Supportive structures begin with norms and expectations around communication and collaboration, including accountability measures (Gibson & Cohen, 2003; Whitener et al., 1998). Some virtual team leaders were found to deploy top-down directives that made it challenging for their teams to engage in collaborative learning. This approach lacks connection to the literature, emphasizing the importance of involving learners in developing learning processes (AITSL, 2012; Forsyth, 2008). Participants' perceptions of unrelatable structures and routines align with the literature on the significance of team processes in virtual teams (Berry, 2011; Duarte & Snyder, 2006; Gibson & Cohen, 2003; Klein, 2003; Whitener et al., 1998). Supportive structures should be established to promote collaboration, starting with clear norms and expectations around communication and collaboration, including accountability measures. These findings accentuate the importance of effective leadership and support team processes in promoting collaborative learning in virtual teams.

In closing, this study identified several factors that impact collaboration in virtual teams, including community building, relationship building, cross-school collaboration, and leadership approaches. Participants emphasized the importance of community and establishing personal-based trust to encourage collaboration. Cross-school collaboration was viewed positively, enhancing trust and knowledge sharing across the district. Leadership approaches, particularly top-down directives, and unrelatable structures, posed a challenge to virtual team collaboration. To foster successful collaboration in virtual teams, it is crucial to establish a culture of trust and openness, encourage relationship building, and create supportive structures and routines. Virtual teams can benefit educators, as they allow for crossing barriers such as time and geography,

providing opportunities for teachers to connect with colleagues they might not meet in person. The study contributes to the existing literature on virtual teams and provides insights for educators and leaders to facilitate collaborative learning environments in virtual settings.

Future-focused: Flexibility, New Tools, Permanence vs. Temporary, Teacher-centric

The participants discussed the benefits of virtual teamwork, including flexibility in learning and communication. They found that this allowed for a deeper understanding of the student experience and provided new modalities for professional learning. As previously discussed, flexibility is often cited as a key benefit of virtual collaboration and teamwork (Anthony, 2020; Charteris et al., 2021; Dulebohn & Hoch, 2017; Trust et al., 2016). The flexibility of learning through virtual teams provided teachers with models for new ways of delivering and participating in learning through virtual teamwork. This aligns with the AITSL Framework for PLD (2012) as it relates to future-focused learning. For example, a description of future-focused learning includes exposing "teachers to new and emerging practices and the theories that underlie them" (p. 5). Based on the data from this study, participants were able to connect the new ways of learning through virtual teams and spaces to new ways of teaching and learning. Moreover, embracing these new ways of teaching and learning allowed the participants to learn more about the latest technology tools and platforms to support student learning.

Participants discussed the benefits of the new technologies and the skills they learned through virtual teamwork. For example, the interview data revealed that teachers appreciated using and experiencing new presentations and collaborative tools. They discussed other Web 2.0 tools that aided in improving productivity and efficiency. This

aligns with future-focused learning in that it promotes innovation in teacher practice and supports adapting to a "rapidly changing and hyper-connected world" (AITSL, 2012, p. 5). In fact, several studies on virtual teams in education specifically focus on virtual teamwork through virtual collaborative tasks (Andrade, 2019; Mehlenbacher et al., 2018; Stoerger & Krieger, 2016). Additionally, participants in this study could conceive of a future that included virtual teamwork and collaboration through a hybrid approach. Charteris et al. (2021) specifically mention that a potential strategy for ensuring future-focused PLD is by using blended or purely virtual approaches "can maximize the use of evolving and new technologies" (p. 6). Participants perceived using new technologies through virtual team collaboration as beneficial in improving productivity and efficiency, fostering innovation, and preparing for a rapidly changing world. As this study and several other studies have demonstrated, virtual teamwork and collaborative tasks have the potential to impact teaching practices. By using a blended or purely virtual approach, teachers can maximize the use of evolving and new technologies and better support the diverse needs of their students. The insights gained from this study highlight the importance of ongoing professional development in technology integration and virtual collaboration and the need to create a culture of continuous learning that supports educators in adapting to new challenges and opportunities.

Even though the interview data revealed connections to future-focused learning, participants expressed concerns about the rush to return to in-person learning and the lack of teacher-centric learning. Some participants believed that hybrid and remote learning should be permanent and wondered if the shift to virtual teams would have occurred sooner if it had not been for the pandemic. As a result, action learning and moving

practices forward impeded participants' perceptions of future-focused learning. The AITSL Framework for PLD (2012) recommends a few different approaches for facilitating future-focused learning, including addressing the day-to-day needs of participants but also exploring new realities. This was a struggle for participants as they perceived their learning experiences as 'getting by' until they returned to 'normal.' According to the AITSL Framework for PLD (2012), future-focused learning should also equip teachers to deal with future and current challenges. This is an unexplored area in the current literature as educators grapple with post-pandemic education and its impacts on students and teachers. The assumption that 'returning to normal' would include the same challenges as pre-pandemic education made it difficult for educators to perceive their learning during the pandemic as relevant to future challenges.

Furthermore, participants felt that another difficulty with preparing and responding to current and future challenges was the lack of teachers' voices in virtual teamwork and collaboration during the pandemic. Current literature suggests that when teachers have a voice in their professional learning, they are more invested and more likely to apply the learning (Borko et al., 2008; Desimone, 2009; Garet et al., 2001; Hirsh & Hord, 2010). Furthermore, Charteris et al. (2021) perceive teacher voice in planning virtual teams for professional learning as a critical component for success as well. Having choice over content and approaches for collaborative inquiry and exploration also helps the experience feel more relevant to teachers in addition to future-focused. The limited studies on virtual teams in educational contexts focus mostly on undergraduate students, and even within these studies, participant voice in designing their virtual team experience is lacking (Jensen, 2021). While limited studies have explored virtual teams in

educational contexts, future research could investigate ways to design virtual team experiences that center around the needs and challenges voiced by teachers, including developing structures, norms, and accountability measurements for virtual teammates.

Relevant, Collaborative, and Future-focused Virtual Teams

There were many connections among the core components of AITSL's Framework for PLD (2012). After coding and organizing themes into Relevancy, Collaborative, or Future-focused, the additional visual analysis revealed relationships between these components (Figure 8). Through analysis, I found the key component for success was collaboration. For example, when the virtual learning experiences felt relevant and future-focused, collaboration was perceived as easy and even invited. However, where these learning experiences lacked either, especially relevancy, collaboration was negatively impacted and perceived as ineffective. Therefore, from participant interview data, it was clear that relevance and future-focused learning heavily impacted participants' motivation to collaborate in virtual teams. This is critical as the work by Charteris et al. (2021), and the AITSL (2012) suggest the importance of collaboration in professional learning. Charteris et al. (2021) and Stevenson (2017) allude to the idea that virtual teams can potentially harness more collaboration than in-person teams. Similarly, other research suggests that collaboration often bridges the gap between theory and practice (Opfer & Pedder, 2011; Rondfeldt et al., 2015), and Hattie (2012) found that teacher collaboration has a significant impact on student achievement.

Moreover, there were many overlapping ideas between the components of the AITSL Framework for PLD (2012). For example, relevance and collaboration were connected by ideas like building community, cross-school collaboration, empathy, basic

needs, value, and flexibility. In essence, participants felt that their motivation to participate and collaborate was often dependent upon these factors, making their experience more relevant and meaningful. Similarly, there was a bridge between relevancy and future-focused. Most participants struggled with learning being future-focused because much of it lacked relevancy as it related to applicable strategies and common goals, leaning into the impact of this learning for the future and how this time would change students. Finally, collaboration and future-focused were connected in that collaboration was impacted by the perceived lack of future-focused learning. Overall, when triangulating the core components of the AITSL Framework for PLD, participants viewed virtual teams as an effective modality for delivering professional learning when it included working toward common goals (collaboration), served an immediate need (relevance), and was problem-centered (future-focused).

Overall, the findings from the study align with the AITSL Framework for PLD (2012). The study found that collaboration was key to participants' perceived effectiveness of professional learning through virtual teams. This is consistent with the literature on the importance of collaboration in professional learning for educators (AITSL, 2012; Charteris et al., 2021; Hattie, 2012; Opfer & Pedder, 2011; Rondfeldt et al., 2015). Furthermore, the results of this study also revealed that relevance and future-focused learning heavily impacted participants' motivation to collaborate in virtual teams. Also, the results of this study identified several overlapping ideas between the components of the AITSL Framework for PLD (2012), such as building community, cross-school collaboration, empathy, basic needs, value, and flexibility. Additionally, this study found that these factors were critical in making virtual professional learning

experiences more relevant and meaningful. Finally, this study found a connection between collaboration and future-focused learning, with collaboration being impacted by the perceived lack of future-focused learning. The interconnectedness of the framework components is less clear in the literature from Charteris et al. (2021) and the AITSL Framework for PLD (2012). For instance, this framework compartmentalizes the core components of professional learning rather than how they might intersect or the impact of their relationships on professional learning. Therefore, it is important for future studies to explore the connections between the components in order for future educators to prioritize and plan for the most impactful components of effective professional learning as it relates to this framework.

In closing, this study's analysis of AITSL's Framework for PLD (2012) revealed the critical role of collaboration in participants' perception of the effectiveness of virtual teams as a delivery mechanism for professional learning. This study also found that relevance and future-focused learning heavily impacted participants' motivation to collaborate in virtual teams. The overlapping ideas between the framework components, such as building community, empathy, and flexibility, were identified as critical factors in making professional learning through virtual team experiences more meaningful and relevant. The findings also emphasize the importance of exploring the interconnectedness of the components of professional learning frameworks for educators to prioritize and plan for the most impactful components of effective professional learning through virtual teams. Overall, this study's results suggest that virtual teams can effectively deliver professional learning when they are problem-centered, serve an immediate need, and work toward common goals.

Implications for Practice

The COVID-19 pandemic impacted work-life as we used to know it. As a society, we are still exploring the immediate and long-term effects of the pandemic. This includes the impact on education. During the pandemic, teachers successfully shifted into virtual teams (Charteris et al., 2021). Before this, virtual teams were primarily reserved for regional and global companies, with employees dispersed by time and space (Jensen, 2021). However, the pandemic created an opportunity for exploring virtual teams across other disciplines. Charteris et al. (2021) draw on the AITSL's Framework for PLD (2012) to provide structure and rationale for how virtual teams could effectively continue to support professional learning for teachers. The findings of this study synthesize the connections between the current literature on virtual teams and effective professional learning with the perceptions of teachers who experience virtual teamwork and collaboration due to the pandemic. This section describes the implications of the findings of this study.

This study accounts for where and how teachers perceived virtual team learning as effective according to AITSL's Framework for PLD (2012) and where it fell short of meeting the core components. First, perceived challenges of relevancy related to choice, needs, and tangible strategies. School and district leaders could start by providing choices around how team members collaborate virtually. For example, providing options for either live virtual sessions or asynchronous modules and communication. Next, including surveys or other methods of capturing teacher needs before meetings will ensure that leaders have the immediate needs of their teachers in mind when planning virtual

teamwork. Additionally, virtual spaces such as live chat and video communication tools can be a space to address teachers' needs just in time. Finally, district and building leaders can include a deliverable in each session. Making participants aware of what they are learning and how they can use it in their classrooms immediately could help alleviate some of the challenges participants felt with missing out on tangible strategies from virtual teamwork sessions.

Next, according to the data from this study, collaboration often suffered due to the lack of structures and routines implemented during virtual teamwork. The findings could provide district and building leaders with insight into providing more effective virtual collaboration for their teachers. For example, on some level, all participants mentioned that they felt differences between virtual and traditional face-to-face learning. In fact, two participants specifically described that virtual teams were trying to be run as if they were in person, which made it difficult to collaborate. Therefore, district and building leaders should consider how to adapt and modify existing practices to best cater to a virtual environment. For instance, they may need to find alternative methods for facilitating group discussions or provide teachers with additional support or options for completing collaborative tasks and learning. Additionally, two participants specifically referenced that there are completely different norms needed in virtual teams and that virtual leadership looked different from in-person as well. As a result, district and building leaders should seek and offer training and support to implement effective virtual teams and teamwork. Providing training and support teachers with communication technologies and research-based strategies for virtual collaboration in hopes of overcoming any initial barriers to virtual teamwork and ensuring that everyone can participate fully. This could

also include team building, accountability, technology, conflict-management, and training to work specifically with virtual teammates.

Also, participants struggled with collaboration due to a lack of trust and community among team members. To foster a sense of community among their virtual teams, district and building leaders could encourage social interaction and collaboration by providing opportunities for teachers to connect with one another in meaningful ways, like through virtual group discussions, online games, or other social activities. They could also encourage their virtual spaces' physical and virtual decoration by adding images, videos, or other forms of personal expression. Finally, district and building leaders could dedicate time to shared virtual experiences such as virtual conferences, online field trips, or other shared projects.

Even though there were perceived challenges with collaboration across virtual teams, several participants found value in the opportunity to connect with teachers across school buildings through virtual collaboration. For example, teachers felt that they could connect more with people across schools than they normally would in person when they would likely just sit next to and work with people they already know. As a result, district and school leaders could deploy virtual teams across school buildings to get more out of cross-school collaboration. Also, the findings of this study suggest that participants feel like there is a place for virtual teams in their current contexts, especially for those teachers who lack in-building support. This connects with the ideas shared by Charteris et al. (2021) that virtual teams have the power to connect teachers across time and space who otherwise would be unlikely to meet. Here, there is an opportunity to create virtual

team structures that bring together teachers across buildings to share knowledge and collaborate toward common goals.

Similarly, many participants felt that asynchronous communities built through Google Classroom were effective as they carried on beyond their required time. This could be a place where district leaders build structured communities that act like PLNs, combining the best of both worlds. This study, alongside the work of Charteris et al. (2021), could provide the foundation for building and testing virtual teams that connect educators across buildings and provide more flexibility to their teachers. Additionally, the findings of this study show that teachers have a wealth of knowledge and experience from their time working with one another in virtual spaces. Participants in this study revealed that working through the interviews helped them reflect more on this time and how they can see a future where virtual teams play a vital role in collaboration. Future researchers and district and building leaders could build on this study and continue to explore teachers' perceptions and experiences with virtual teams to understand better and inform a more cohesive virtual team model through surveys and interviews of their teachers. This could reveal additional opportunities for implementing virtual teamwork based on the teacher's voice.

Finally, participants perceived strengths in the flexibility and new learning that came along with virtual teams but struggled with problem-solving and planning for the future. Since many participants found value in some of the asynchronous spaces created during the pandemic, district and school leaders could begin offering more virtual teamwork opportunities through asynchronous methods that provide the flexibility the adult learners need. These opportunities could include new learnings connected to

technology integration or edtech certifications that teachers found valuable during the pandemic. The primary challenge around problem-solving, especially for the future, connected most to learning that was perceived as more of a 'band aid' until returning to 'normal.' However, the results of this study indicate that participants feel like the experiences during the pandemic have changed the educational landscape for the long haul and would like to see more opportunities for flexible learning opportunities provided during the pandemic. Therefore, district leaders might consider creating a virtual team of teachers across school buildings to design and implement professional learning experiences connected to both current and future challenges.

In conclusion, there have been several studies of virtual teams for various business organizations. However, very little research exists on how virtual teams might serve as a delivery mechanism for professional learning for teachers (Charteris et al., 2021; Jensen, 2021). Most of the research on virtual teaching communities exists in informal settings such as PLNs (Krutka et al., 2016; Sharp & Whaley, 2018; Sturm & Quaynor, 2020; Visser et al., 2014). This study adds to the body of research on virtual teams, specifically regarding educators. Thus, filling the current gap and building on the work of Charteris et al. (2021) and the AITSL (2012). This is significant because it includes teachers' first-hand experiences relating to virtual teams, but it could also lead to future studies and models for virtual teams of teachers. Overall, district and building leaders can apply the results of this study to address the areas of growth for relevant, collaborative, and future-focused learning in virtual teams and build on the success of virtual teams as references by the participants. The findings provide valuable insights for district and building leaders on effectively designing and implementing virtual

collaboration for teachers, including using structured communities and asynchronous communication. This study also highlights the potential for virtual teams to connect educators across buildings and provide more flexibility in their professional development. Furthermore, it suggests that teachers have a wealth of knowledge and experience from working in virtual teams, and future research should continue to explore their perceptions and experiences to inform a more cohesive virtual team model. Overall, this study provides a foundation for building and testing virtual teams that support professional learning for teachers.

Limitations

This study adds to the research related to virtual teams and contributes to the gap in the literature on virtual team use for K12 teachers. Specifically, the results of this study build on the work of Charteris et al. (2021) and their claim that virtual teams could be an effective modality for delivering professional learning to K12 teachers. Even though this study contributes to the literature on virtual teams and how they might be used to support professional learning for K12 teachers, there are limitations to be considered. This section describes these limitations.

First, the size and scope of the study were small and confined to only two schools in one district in Colorado. Furthermore, this study only included middle school teachers, primarily teaching core content and elective classes, thus not including support staff such as paraprofessionals or special education teachers. As a result, the different teaching contexts and virtual teaming among these groups may highlight different experiences than those selected to participate in this study.

Next, almost all participants expressed comfortability using technology for different purposes. In fact, a couple of the participants recognized that their age played a role in their experiences with virtual teams as they discussed growing up with and utilizing technology throughout their learning environments. Therefore, those with less experience using technology, especially for collaboration and learning, may express a different experience with professional learning through virtual teams.

Another limitation of this study was the design of the interviews, as the participant self-reported their experiences. Because the study relies on participants' subjective experiences and perceptions, their individual biases or perspectives may influence their responses. Even though the interview questions were designed to help participants reconstruct their experiences during this time, the participants shared that there is a lot of traumas built up from the work they have done over the last few years, and at times, it was difficult to recall some of the learning they experienced. Additionally, even though the research design included measures to improve the trustworthiness of the data, I coded and analyzed the data alone. Teachers had the opportunity to review and request revisions, but none were made. Therefore, my biases may also affect the data analysis process, and my interpretation of the data may not align with other interpretations of the same data.

This study was designed to collect data from teachers on their experiences with virtual teams as they related to their professional learning. This study was limited to a small sample of teachers within a single district. Applying these findings to another area or group of teachers may yield different results. I did not attempt to specifically search for additional participants with limited technological experiences to explore their

perceptions which could also yield different results. Also, the results of this study depend upon the participants' memory and reflection on their past experiences. This includes experiences during a traumatic time, which made it challenging to recall certain details. Finally, I was the only researcher coding and analyzing data which limited the analysis to my perspective and could be interpreted differently by others.

Recommendations for Further Research

This study aimed to explore teacher experiences and perceptions of virtual teams as a vehicle for delivering professional learning. Data was collected through participant interviews to answer the research question. Interview data were analyzed, and patterns emerged from the data that supported the research questions. While this study provides some possible answers to the research question, this study had limitations. This section describes the recommendations for research to expand on the findings and design of this study.

First, the scope of this study was limited to a small sample size in one district. Given the limited number of participants, further research could attempt to duplicate this study with a larger sample across multiple districts. Furthermore, the sample only included middle school teachers teaching electives and core content areas. Future research could explore elementary and high school teachers to expand the scope. Additionally, this study did not include many educators outside of those with their own classroom, such as support staff in schools and districts who often work across classrooms and even school buildings. Future research could explore their experiences, especially given the positive results of cross-school collaboration from this study.

Next, teachers were forced into virtual teams by circumstance. All participants reflected on the heightened emotions and experiences impacting some of their work during this time. Therefore, additional research could be conducted with educators working in virtual teams in some capacity at the current moment. Or, the results of this study, combined with the suggestions of Charteris et al. (2021), could be used to inform and test a model on teachers in the current climate to reflect a more accurate understanding of virtual teamwork outside of a pandemic. This approach might provide a little more validity and produce artifacts or empirical data to support additional findings.

Finally, the participants in this study were comfortable using technology. Therefore, those with less experience using technology to collaborate and learn were left out of the findings. It is important to note that participants' comfort level with technology may have influenced their perceptions and experiences with virtual teams. Future studies should consider this factor and explore how it impacts the effectiveness of professional learning in virtual teams. It would be valuable to research how to support teachers who may not have the same level of comfort and experience with technology to succeed in virtual teams. New studies could focus on the experiences and perceptions of those who perceive themselves as less “tech-savvy.”

In conclusion, this section offers several recommendations for future research to be conducted on professional learning in virtual teams for teachers. The data collected through participant interviews provided valuable insights, but this study also had limitations. Recommendations for future research include expanding the sample size and scope to include more educators across different levels and roles, conducting research in the current climate to reflect a more accurate understanding of virtual teamwork,

developing, and testing a virtual team model, and exploring the experiences and perceptions of educators who may not have the same level of comfort and experience with technology. By addressing these limitations, future research can build upon the findings of this study and inform the design of effective virtual teams for professional learning for teachers.

Chapter 5 Summary

This study aimed to explore middle school teachers' perceptions of virtual teams and a delivery mechanism for professional learning and development. This study followed a basic qualitative research design. Participants included seven purposefully selected teachers from two middle schools in a large school district in Colorado. Each participant was interviewed three times throughout six to eight weeks in the fall of 2022. Their responses were recorded via Zoom; transcripts were the primary source of collected, organized, and analyzed data. Findings connected to the research question were discussed by connecting themes, core components of effective PLD, and current literature on virtual teams.

This study has several implications for future research on virtual teams for educators and fills the gap in K12 teachers’ experience in virtual teams. It also builds on the work of current researchers exploring effective virtual team models for teachers. District and building leaders can benefit from the results of this study. District and building leaders can use the information in this study to conduct their own research on virtual team experiences across their district and use the information to inform future models of virtual collaborations. Similarly, District leaders can use this information to

benefit teachers in buildings with less planning support by connecting them to other colleagues across the district.

This study took place within a single district with a small sample size. Therefore, this study's small scope provides limitations for future research. This study did not explore elementary or high school teachers' perceptions of virtual teams. Additionally, the participants only included core content and elective teachers, leaving out support staff who work across buildings or classrooms. Furthermore, all participants expressed comfortability with technology leaving out those with less experience using technology for learning experiences. These teachers may perceive virtual teams as vehicles for professional learning. Finally, the data included only self-reported information from a challenging context. Thus, more research is needed outside of the pandemic years.

The limitations of this study lead to recommendations for future research. First, expanding the scope of this study to include a larger, more diverse sample size would provide more insight into the general population of teachers and their perceptions of virtual teams. Additionally, developing and testing virtual team models could lead to more concrete data about the effectiveness of virtual teams as a delivery method for professional learning. Finally, new studies should explore virtual teams outside of pandemic years to separate the context from the findings.

REFERENCES

An, Y. (2018). The effects of an online professional development course on teachers' perceptions, attitudes, self-efficacy, and behavioral intentions regarding digital game-based learning. *Educational Technology Research and Development*, *66*(6), 1505–1527. https://doi.org/10.1007/s11423-018-9620-z

Anderson, J. R., Reder, L. M., & Simon, H. A. (1996). Situated learning and education. *Educational Researcher*, *25*(4), 5-11.

Andrade, M. S. (2019). ePortfolios and online earning: Applying concepts of organizational behavior. *International Journal of E-Learning & Distance Education*, *34*(1), 1–20. http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1227689&site=ehost-live

Anthony, D. (2020, October 1). *Asynchronous learning or live lessons? Which one works better for me?* EdSurge News. https://www.edsurge.com/news/2020-10-01-asynchronous-learning-or-live-lessons-which-one-works-better-for-me.

Aspers, P., & Ugo, C., (2019). What is "qualitative" in qualitative research? *Qualitative Sociology, 42* (2), 139–160.

Australian Institute for Teaching and School Leadership (AITSL). (2012). The Australian charter for the professional learning of teachers and school leaders: A shared responsibility and commitment. *Education Services Australia.* https://www.aitsl.edu.au/tools-resources/resource/australian-charter-for-the-professional-learning-of-teachers-and-school-leaders

Bartel-Radic, A., Moos, J. C., & Long, S. K. (2015). Cross-cultural management learning through innovative pedagogy: An exploratory study of globally distributed student teams. *Decision Sciences Journal of Innovative Education*, *13*(4), 539–562. https://doi.org/10.1111/dsji.12076

Bell, B. S., & Kozlowski, S. W. J. (2002). A typology of virtual teams: Implications for effective leadership. *Group & Organization Management*, 27, 14–49.

Belland, B. R., Burdo, R., & Gu, J. (2015). A blended professional development program to help a teacher learn to provide one-to-one scaffolding. *Journal of Science Teacher Education*, *26*, 263-289.

Berry, G. R. (2011). Enhancing effectiveness on virtual teams: Understanding why traditional team skills are insufficient. *The Journal of Business Communication*, *48*(2), 186-206.

Birks, M., Chapman, Y., & Francis, K. (2008). Memo writing in qualitative research: Probing data and processes. *Journal of Research in Nursing*, *13*(1), 68–75. https://doi.org/10.1177/1744987107081254

Bloomberg, L. D., & Volpe, M. (2016). *Completing your qualitative dissertation* (3rd ed.). Sage.

Bond, V. (2016). Using online professional learning communities to encourage dialogue in University/College mathematics. *International Journal for Technology in Mathematics Education*, *23*(2), 87–92. https://doi.org/10.1564/tme_v23.2.04

Borko, H., Jacobs, J., Eiteljorg, E., & Pittman, M. E. (2008). Video as a tool for fostering productive discussions in mathematics professional development. *Teaching and Teacher Education*, *24*(2), 417-436.

Brahm, T., & Kunze, F. (2012). The role of trust climate in virtual teams. *Journal of Managerial Psychology*.

Brown, C. and Poortman, C. (Eds.) (2018). *Networks for learning: Effective collaboration for teacher, school and system improvement*. Routledge.

Cabeen, J. (2021, April 9). *Professional development that's relevant now*. Edutopia.

Castro, L. F. (2019). Social presence in an online professional conference. *TechTrends*, *63*(4), 408–419. https://doi.org/10.1007/s11528-019-00382-6

Chapman, S. (2016). The virtual English faculty. *Metaphor*, (2), 6.

Charteris, J., Berman, J., & Page, A. (2021). Virtual team professional learning and development for practitioners in education. *Professional Development in Education*, 1–13. https://doi.org/10.1080/19415257.2021.1879215

Chen, Y., Chen, N. S., & Tsai, C. C. (2009). The use of online synchronous discussion for web-based professional development for teachers. *Computers & Education*, *53*(4), 1155-1166.

Cleary, Y., Slattery, D. M., Flammia, M., & Minacori, P. (2019). Developing strategies for success in a cross-disciplinary global virtual team project: Collaboration among student writers and translators. *Journal of Technical Writing & Communication*, *49*(3), 309–337. http://10.0.4.153/0047281618775908

Cogliser, C. C., Gardner, W., Trank, C. Q., Gavin, M., Halbesleben, J., & Seers, A. (2013). Not all group exchange structures are created equal: Effects of forms and levels of exchange on work Outcomes in virtual teams. *Journal of Leadership & Organizational Studies*, *20*(2), 242–251. http://10.0.4.153/1548051812472370

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. SAGE Publications, Inc.

Creswell, J.E., & Poth, C.N. (2018). *Qualitative inquiry & research design: Choosing among five approaches.* SAGE.

Dai, Y., Lu, S., & Liu, A. (2019). Student pathways to understanding the global virtual teams: An ethnographic study. *Interactive Learning Environments*, *27*(1), 3–14. http://10.0.4.56/10494820.2018.1448286

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher*, *38*(3), 181–199.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2011). *The Sage handbook of qualitative research*. Sage.

Duarte, D. L., & Snyder, N. T. (2006). *Mastering virtual teams: Strategies, tools, and techniques that succeed*. John Wiley & Sons.

Dulebohn, J. H., & Hoch, J. E. (2017). Virtual teams in organizations. *Human Resource Management Review*, *27*(4), 569–574. https://doi.org/10.1016/j.hrmr.2016.12.004

Eissa, G., Fox, C., Webster, B. D., & Kim, J. (2012). A framework for leader effectiveness in virtual teams. *Journal of Leadership, Accountability and Ethics*, *9*(2), 11-22.

Elliott, J. C. (2017). The evolution From traditional to online professional development: A review. *Journal of Digital Learning in Teacher Education*, *33*(3), 114–125. https://doi.org/10.1080/21532974.2017.1305304

Erez, M., Lisak, A., Harush, R., Glikson, E., Nouri, R., & Shokef, E. (2013). Going global: Developing management students' cultural intelligence and global identity in culturally diverse virtual teams. *Academy of Management Learning & Education*, *12*(3), 330-355.

Evers, J. C. (2011). From the past into the future. How technological developments change our ways of data collection, transcription and analysis. *FORUM: Qualitative Social Research*, *12*(1), 1–31. https://doi.org/10.17169/fqs-12.1.1636

Fainee, N., & Kline, M. (2013). The dynamics of multicultural NPD teams in virtual environments. *International Journal of Technology & Design Education*, *23*(2), 273–288. http://10.0.3.239/s10798-011-9178-0

Flanigan, R. L. (2012). Professional learning networks taking off. *Education Digest: Essential Readings Condensed for Quick Review*, *77*(7), 42-45.

Finol, M. O. (2020, March 26). *Asynchronous vs. synchronous learning: A quick overview*. https://www.brynmawr.edu/blendedlearning/asynchronous-vs-synchronous-learning-quick-overview.

Forsyth, L. (2008). *A learning ecology framework for collective, e-mediated teacher development in primary science and technology* (Doctoral dissertation).

Francis, K. & Jacobsen, M. (2013). Synchronous online collaborative professional development for elementary mathematics teachers. *International Review of Research in Open and Distributed Learning*, *14*(3), 319–343. https://doi.org/10.19173/irrodl.v14i3.1460

Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, *38*(4), 915-945.

Gibson, C. B., & Cohen, S. G. (2003). *Virtual teams that work: Creating conditions for virtual team effectiveness*. John Wiley & Sons.

Gibbs, J. L., Kim, H., & Boyraz, M. (2017). Virtual teams. *The international encyclopedia of organizational communication*, 1-14.

Gillam, C., & Oppenheim, C. (2006). Review article: Reviewing the impact of virtual teams in the information age. *Journal of Information Science*, *32*(2), 160–175. https://doi.org/10.1177/0165551506062328

Göktürk Sağlam, A. L., & Dikilitaş, K. (2020). Evaluating an online professional learning community as a context for professional development in classroom-based research. *Tesl-Ej*, *24*(3).

Gonzalez-Perez, M. A., Velez-Calle, A., Cathro, V., Caprar, D. V, & Taras, V. (2014). Virtual teams and international business teaching and learning: The case of the global enterprise experience (GEE). *Journal of Teaching in International Business*, *25*(3), 200–213. http://10.0.4.56/08975930.2014.925738

Handke, L., et al., 2019. Teams, time, and technology: variations of media use over project phases. *Small Group Research*, 50 (2), 266–305. https://doi.org/10.1177/1046496418824151

Hanson, J. (2009). Displaced but not replaced: The impact of e-learning on academic identities in higher education. *Teaching in Higher Education*, *14*(5), 553-564.

Hartshorne, R., Baumgartner, E., Kaplan-Rakowski, R., Mouza, C., and Ferdig, R. E. (2020). Special issue editorial: Preservice and inservice professional development during the COVID-19 pandemic. *J. Technol. Teach. Educ.* 28, 137–147.

Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning*. Routledge.

Hoaglund, A., Birkenfeld, K., & Box, J. (2014). Professional learning communities: Creating a foundation for collaboration skills in pre-service teachers. *Education*, *134*(4), 521-528.

Herbert, S., Campbell, C., & Loong, E. (2016). Online professional learning for rural teachers of mathematics and science. *Australasian journal of educational technology*, *32*(2).

Hirsh, S., & Hord, S. M. (2010). Building hope, giving affirmation: Learning communities that address social justice issues bring equity to the classroom. *The Learning Professional, 31*(4), 10.

Hodges, C., Moore, S., Bond, A., Trust, T., & Lockee, B. (2020, March 20). *The difference between emergency remote teaching and online learning*. EDUCAUSE Review.

Jackson, K., Paulus, T., & Woolf, N.H. (2018). The walking dead genealogy: Unsubstantiated criticisms of qualitative data analysis software (QDAS) and the failure to put them to rest. *The Qualitative Report, 23*(13), 74-91. https://doi.org/10.46743/2160-3715/2018.3096

Jarvenpaa, S. L., & Leidner, D. E. (1998). Communication and trust in global virtual teams. *Journal of Computer-mediated Communication*, *3*(4).

Jensen, S. (2021). *Virtual teams in formal education: A scoping review*. [Submitted for publication].

Johnson, W. W. (2014). Why professional development matters. *Journal of Contemporary Criminal Justice*. *30*(4). 360-361.

Kiffin-Petersen, S. (2004). Trust: A neglected variable in team effectiveness research. *Journal of Management and Organization*, *10*(1), 38.

Klein, J. A., Kleinhanns, A., Gibson, C. B., & Cohen, S. G. (2003). Closing the time gap in virtual teams. *Virtual teams that work: Creating conditions for virtual team effectiveness*, 381-399.

Knowles, M. (1984). *The adult learner: A neglected species*. Gulf Publishing.

Krutka, D. G., Carpenter, J. P., & Trust, T. (2016). Elements of engagement: A model of teacher interactions via professional learning networks. *Journal of Digital Learning in Teacher Education*, *32*(4), 150-158.

Laal, M., & Ghodsi, S. M. (2012). Benefits of collaborative learning. *Social and Behavioral Sciences, 31*, 486- 490. http://doi.org/10.1016/j.sbspro.2011.12.091

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press.

Lilian, S. C. (2014). Virtual teams: Opportunities and challenges for e-leaders. *Procedia-Social and Behavioral Sciences*, *110*, 1251-1261.

Lin, C., Standing, C., & Liu, Y. C. (2008). A model to develop effective virtual teams. *Decision Support Systems*, *45*(4), 1031–1045. https://doi.org/10.1016/j.dss.2008.04.002

Lipnack, J., & Stamps, J. (2021). Virtual teams. *Operational Excellence*, 14-19. https://doi.org/10.4324/9781003045250-12

Liu, X., Magjuka, R. J., & Lee, S. H. (2008). An examination of the relationship among structure, trust, and conflict management styles in virtual teams. *Performance improvement quarterly*, *21*(1), 77-93.

Lunenburg, F. C., & Irby, B. J. (2007). *Writing a successful thesis or dissertation: Tips and strategies for students in the social and behavioral sciences*. SAGE Publications.

Marlow, S. L., Lacerenza, C. N., & Salas, E. (2017). Communication in virtual teams: A conceptual framework and research agenda. *Human Resource Management Review*, *27*(4), 575-589.

Marshall, D. T., Shannon, D. M., & Love, S. M. (2020). How teachers experienced the COVID-19 transition to remote instruction. *Phi Delta Kappan*, *102*(3), 46-50.

Martin, J. W. (2021). Virtual Teams. *Operational Excellence*, 387–402. https://doi.org/10.4324/9781003045250-12

Martínez-Moreno, E., Zornoza, A., González-Navarro, P., & Thompson, L. F. (2012). Investigating face-to-face and virtual teamwork over time: When does early task conflict trigger relationship conflict? *Group Dynamics*, *16*(3), 159–171. https://doi.org/10.1037/a0029569

Matzat, U. (2013). Do blended virtual learning communities enhance teachers' professional development more than purely virtual ones? A large scale empirical comparison. *Computers & Education*, *60*(1), 40-51.

Meier, H. H., Smith, D. D., & Porter, T. H. (2016). Global virtual teams for accounting millennials. *Journal of Research in Business Education*, *58*(1), 48–60. https://acces.bibl.ulaval.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=buh&AN=122574906&lang=fr&site=ehost-live

Mehlenbacher, B., Kelly, A. R., Kampe, C., & Autry, M. K. (2018). Instructional design for online learning environments and the problem of collaboration in the cloud. *Journal of Technical Writing & Communication*, *48*(2), 199–221. http://10.0.4.153/0047281616679112

Miles, M. B., Huberman, A. M., & Saldaña, J. (2020). *Qualitative data analysis: A methods sourcebook*. Sage publications.

Murphy, E., & Coleman, E. (2004). Graduate students' experiences of challenges in online asynchronous discussions. *Canadian Journal of Learning and Technology/La revue canadienne de l'apprentissage et de la technologie*, *30*(2).

Oddone, K., Hughes, H., & Lupton, M. (2019). Teachers as connected professionals: A model to support professional learning through personal learning networks. *International Review of Research in Open and Distributed Learning*, *20*(3).

Olson, J., & Kalinski, R. (2017). Making student teams work. *Quarterly Review of Distance Education*, *18*(4), 1–22. http://libproxy.boisestate.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=129691035&site=ehost-live

Opfer, V. D., & Pedder, D. (2011). Conceptualizing teacher professional learning. *Review of educational research*, *81*(3), 376-407.

Pangil, F., & Chan, J. M. (2014). The mediating effect of knowledge sharing on the relationship between trust and virtual team effectiveness. *Journal of Knowledge Management*, *18*(1), 92–106. https://doi.org/10.1108/JKM-09-2013-0341

Parke, K., Marsden, N., & Connolly, C. (2017). Lay theories regarding computer-mediated communication in remote collaboration. *Open Praxis*, *9*(1), 17-30.

Peterson, L., Scharber, C., Thuesen, A., & Baskin, K. (2020). A rapid response to COVID-19: One district's pivot from technology integration to distance learning. *Information and Learning Sciences*.

Prenger, R., Poortman, C. L., & Handelzalts, A. (2021). Professional learning networks: From teacher learning to school improvement?. *Journal of educational change*, *22*(1), 13-52.

Purnell, C. P. (2012). *Exploring teachers' perceptions of professional development in virtual learning teams*. Florida Atlantic University.

Quinn, F., Charteris, J., Adlington, R., Rizk, N., Fletcher, P., Reyes, V., & Parkes, M. (2019). Developing, situating and evaluating effective online professional learning and development: A review of some theoretical and policy frameworks. *The Australian Educational Researcher*, 46, 405-424.

Reeves, T. D. & Pedulla, J., (2013). Bolstering the impact of online professional development for teachers. *The Journal of Educational Research & Policy Studies*, 1, 50–66.

Robinson, H., Kilgore, W., & Bozkurt, A. (2020). Learning communities: Theory and practice of leveraging social media for learning. In *Managing and Designing Online Courses in Ubiquitous Learning Environments* (pp. 72-91). IGI Global.

Rolando, L., et al., 2014. Learning with their peers: Using a virtual learning community to improve an in-service biology teacher education program in brazil. *Teaching and Teacher Education*, 44, 44–55. https://doi.org/10.1016/j.tate.2014.07.010

Ronfeldt, M., Farmer, S. O., McQueen, K., & Grissom, J. A. (2015). Teacher collaboration in instructional teams and student achievement. *American Educational Research Journal*, *52*(3), 475-514.

Saldaña, J. (2016). *The coding manual for qualitative researchers*. Sage.

Siau, K., & Wang, W. (2018). Building trust in artificial intelligence, machine learning, and robotics. *Cutter Business Technology Journal*, I(2), 47-53.

Schaefer, T., Rahn, J., Kopp, T., Fabian, C. M., & Brown, A. (2019). Fostering online learning at the workplace: A scheme to identify and analyse collaboration processes in asynchronous discussions. *British Journal of Educational Technology*, *50*(3), 1354–1367. https://doi-org.libproxy.boisestate.edu/10.1111/bjet.12617

Schrage, M. (1995). *No more teams! Mastering the dynamics of creative collaboration*. Doubleday.

Seibert, S. E., Sparrowe, R. T., & Liden, R. C. (2003). A group exchange structure approach to leadership in groups. In C. L. Pierce & J. A. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (173-192). SAGE.

Seidman, I. (2006). *Interviewing as qualitative research: A guide for researchers in education and the social sciences*. Teachers College Press.

Sharp, L. A., & Whaley, B. (2018). Wikis as online collaborative learning experiences: "A different kind of brainstorming." *Adult Learning*, *29*(3), 83–93. https://doi-org.libproxy.boisestate.edu/10.1177/1045159518761095

Sloan, T., & Lewis, D. (2011). Vertical integration: Results from a cross-course student collaboration. *Journal of Education for Business*, *86*(6), 339–345. http://10.0.4.56/08832323.2010.536273

Snellman, L., (2014). Virtual teams: Opportunities and challenges for e-leaders. Social and Behavioral Sciences, 110, 1251–1261. https://doi.org/10.1016/j.sbspro.2013.12.97

State, T. M., Simonsen, B., Hirn, R. G., & Wills, H. (2019). Bridging the research-to-practice gap through effective professional development for teachers working with students with emotional and behavioral disorders. *Behavioral Disorders*, *44*(2), 107–116. https://doi-org.libproxy.boisestate.edu/10.1177/0198742918816447

Stein, D. (1998). *Situated learning in adult education*. ERIC Clearinghouse on Adult, Career, and Vocational Education.

Stevenson, H., (2017). Harnessing the power of collaboration: Time for collective learning to speak back against corrosive competition. *Professional Development in Education*, 43 (3), 315–317. https://doi.org/10.1080/ 19415257.2017.1318597

Stoerger, S., & Krieger, D. (2016). Transforming a large-lecture course into an active, engaging, and collaborative learning environment. *Education for Information*, *32*(1), 11–26. http://10.0.12.161/EFI-150967

Sturm, E. & Quaynor, L. A. (2020) Window, mirror, and wall: How educators use Twitter for professional learning. *Research in Social Sciences and Technology*, *5*(1), 22-44.

Tracy, S. J. (2010). Qualitative quality: Eight "big-tent" criteria for excellent qualitative research. *Qualitative inquiry*, *16*(10), 837-851.

Tracy, S. J., & Hinrichs, M. M. (2017). Big tent criteria for qualitative quality. *The International Encyclopedia of Communication Research Methods*, 1–10. https://doi.org/10.1002/9781118901731.iecrm0016

Trust, T., Carpenter, J. P., & Krutka, D. G. (2018). Leading by learning: Exploring the professional learning networks of instructional leaders. *Educational Media International*, *55*(2), 137–152.

Turel, O., & Serenko, A. (2012). The benefits and dangers of enjoyment with social networking websites. *European Journal of Information Systems*, *21*, 512-528.

Visser, R. D., Evering, L. C., & Barrett, D. E. (2014). #TwitterforTeachers: The implications of Twitter as a self-directed professional development tool for K–12 Teachers. *Journal of Research on Technology in Education*, *46*(4), 396–413.

Watkins, M. D. (2013, June 27). *Making virtual teams work: Ten basic principles*. Harvard Business Review. https://hbr.org/2013/06/making-virtual-teams-work-ten.

Webster-Wright, A. (2009). Reframing professional development through understanding authentic professional learning. *Review of educational research*, *79*(2), 702-739.

Whitener, E. M., Brodt, S. E., Korsgaard, M. A., & Werner, J. M. (1998). Managers as initiators of trust: An exchange relationship framework for understanding managerial trustworthy behavior. *Academy of Management Review*, *23*(3), 513-530.

Wilson, A. L. (1993). The promise of situated cognition. *New directions for adult and continuing education*, *1993*(57), 71-79.

Wilson, J. L., (2007). Virtual teaming: Placing preservice middle level teachers on interdisciplinary teams. R*esearch in Middle Level Education*, *31*(3), 1–15. https://doi.org/10.1080/19404476.2007.11462046

Wolski, U. (2018). The history of the development and propagation of QDA software. *The Qualitative Report, 23*(13), 6-20. https://doi.org/10.46743/2160-3715/2018.2984

Yang, Y. (2014). Convenience matters: A qualitative study on the impact of use of social media and collaboration technologies on learning experience and performance in higher education. *Education for Information*, *31*(1/2), 73–98.

Yilmaz, G., & Peña, J. (2015). How do interpersonal behaviors and social categories affect language use?: The case of virtual teams. *Communication Quarterly*, *63*(4), 427–443. http://10.0.4.56/01463373.2015.1058285

Yurtseven Avci, Z., O'Dwyer, L. M., & Lawson, J. (2020). Designing effective professional development for technology integration in schools. *Journal of Computer Assisted Learning*, *36*(2), 160–177.

APPENDIX A

Consent Form

INFORMED CONSENT

Study Title: Exploring Secondary Teacher Perceptions of Virtual Teams as a Delivery Mechanism for Professional Learning

Principal Investigator/Faculty Advisor: Dr. Jesús Trespalacios

Co-Principal Investigator/Doctoral Candidate: Shawna Jensen

You are invited to participate in a research study. This consent form will provide you with the information you will need to understand why this study is being done and why you are being invited to participate. It will also describe what will be expected of you as a participant, as well as any known risks, inconveniences, or discomforts that you may have while participating. We encourage you to ask questions at any time. If you decide to participate, you will be asked to sign this form and it will be a record of your agreement to participate. You will be given a copy of this form to keep.

PURPOSE AND BACKGROUND

The purpose of this research is to explore middle school teacher perceptions of virtual teams as relevant, collaborative, and future-focused. You are being asked to participate because you are a secondary teacher who has experienced working in virtual teams as a result of the COVID-19 pandemic. A **virtual team** is defined by research as

members dispersed across time and space using digital communication technology to work toward a common purpose. In other words, a virtual team is a formal collaborative team, working within a shared organization, to achieve common goals and outcomes.

PROCEDURES

If you agree to be in this study, you will participate in the following:

- Survey
- Selected participants will participate in three 30-minute interviews over the course of 6-8 weeks.

We will set up all three times for a virtual meeting using Zoom, a web-conferencing software. After each interview, transcripts will be sent to you for review and amendments will be made upon request. Additionally, no real names or identities will be used in labeling documents or meetings. The interview will be audio recorded and the investigators will take written notes as well. However, you do have the option of keeping your camera off for the interview.

____ *Initial to indicate your permission to be audio recorded during the interview.*

RISKS

The survey will include a section requesting demographic information. Due to the make-up of the district's population, the combined answers to these questions may make an individual person identifiable. We will make every effort to maintain confidentiality. However, if you are uncomfortable answering any of the questions, you may leave them blank.

Some of the survey and interview questions might make you feel uncomfortable or upset. You will receive all questions ahead of time so you can plan for any questions that you would like to decline. You are always free to decline any question, take a break, or to stop your participation at any time. Should you feel discomfort after participating and you are a Boise State University student, you may contact the University Health Services (UHS) for counseling services at (208) 426-1459. They are located on campus in the Norco Building, 1529 Belmont Street, Boise ID, 83706. If you are not a Boise State University student, please contact your own health care provider or call the Idaho Care Line, 2-1-1 (a free statewide community information and referral service).

BENEFITS

There will be compensation for those who agree to participate in the form of an Amazon gift card. Furthermore, this is an opportunity to share your voice around the experiences which will help researchers and educators make more informed decisions for the future.

EXTENT OF CONFIDENTIALITY

Reasonable efforts will be made to keep the personal information in our research records private and confidential. Any identifiable information obtained in connection with this study will remain confidential and will be disclosed only with your permission or as required by law. The members of the research team, and the Boise State University Office of Research Compliance (ORC) may access the data. The ORC monitors research studies to protect the rights and welfare of research participants.

The audiotapes from the interview will be transcribed without any information that would identify you. The tapes will then be erased. Your name will not be used in any written reports or publications which result from this research. Data will be kept for at least 3 years (per federal regulations) after the study is complete and then destroyed.

PAYMENT/COMPENSATION

You will be compensated for your participation in this research study with a $75 Amazon gift card after completing the third and final interview. Everyone who completes the initial survey will be entered to win a $50 Amazon gift card, regardless of their willingness to participate in follow-up interviews.

PARTICIPATION IS VOLUNTARY

Your decision to participate in this research study is entirely voluntary. You may withdraw from this research study at any time without penalty of any kind or loss of benefits to which you are otherwise entitled.

QUESTIONS

If you have any questions or concerns about your participation in this study, you may contact the Principal Investigator, Dr. Jesús Trespalacios: 208-426-7105, jesustrespalacios@boisestate.edu or Shawna Jensen: 720-468-2694, shawnajensen529@u.boisestate.edu

This study has been reviewed and approved by the Boise State University IRB (IRB). If you have questions about your rights as a research participant, you may contact the IRB, which is concerned with the protection of volunteers in research projects. You

may reach the board through the Office of Research Compliance by calling (208) 426-5401 or emailing humansubjects@boisestate.edu.

DOCUMENTATION OF CONSENT

I have read this form and the descriptions of this research study. I have been informed of the risks and benefits involved and all of my questions have been answered to my satisfaction. Furthermore, I have been assured that any future questions I may have will also be answered by a member of the research team. I understand I can withdraw at any time. I voluntarily agree to take part in this research study.

Printed	**Signature**	Date
Name of Study Participant	of Study Participant	

Signature of Person Obtaining Consent Date

APPENDIX B

Initial Email

Greetings, Teachers at X!

Read the email below or click here to hear me read it to you and provide a little more context.

My name is Shawna Jensen, and I am a former X. I am also a doctoral student working toward a degree in educational technology. My research involves exploring secondary teacher perceptions and experiences of working in virtual teams as a result of the COVID-19 pandemic. I am emailing in hopes of securing participation in my research study. **Everyone who completes the initial survey will be entered to win a $50 Amazon gift card. From there, all participants selected for follow-up interviews will receive a $75 Amazon gift card upon completion of interviews**.

Study Background and Purpose

The last few years in education have been a roller coaster ride. In March 2020, X teachers' lives changed drastically. As a result of the COVID-19 pandemic, teachers experienced a shift from face-to-face learning to remote and then, eventually, to hybrid teaching environments. Since this shift, X educators have found themselves working in and across both district-level and building-level virtual teams. The purpose of this study is to explore teacher experiences of virtual teams and virtual teamwork that has taken place over digital communication and knowledge-sharing technologies in hopes of providing educational leaders with information that could better inform virtual team communication and work across schools and the district.

Study Participation

Participation in this study includes an initial survey (sent to participants who sign the consent form and email it back to me), and then 5 to 8 teachers will be purposefully selected to participate in three 20-30 minutes virtual interviews over the course of 6-8 weeks. There are no foreseeable risks in participating in this study. Participation is completely voluntary, and your answers will be anonymous. All data will be stored and presented in the final dissertation under pseudonyms. Additionally, all participant interview data will be stored in a password-protected computer and folder. Furthermore, there are no consequences to you if you elect not to participate. The decision whether or not to participate does not have any relationship to your standing in the district or otherwise.

If you are interested in participating in this research, please complete the attached consent form and email it back to me. Once I receive your consent form, you will receive a reply with the survey link. If you have any questions, please do not hesitate to contact me (shawnajensen529@u.boisestate.edu) or Dr. Jesús Trespalacios, my dissertation committee chair (jesustrespalacios@boisestate.edu).

I look forward to hearing from you!

APPENDIX C

Initial Survey

Name

What is the best email to contact you?

(Optional) Phone

1. What grades do you teach? Select all that apply:

- 6
- 7
- 8

2. How many years have you been teaching in the district?

- This is my first year
- 2-5 years
- 5-10 years
- 10 or more year

3. Virtual teams are teams that use digital communication technologies to work together to achieve common goals. What types of virtual teams have you taken part in since the shift to remote learning in 2020? Select all that apply:

- Grade Level Teams (PBIS, MTSS, RtI)
- Professional Learning Communities (content)
- District Level (across school sites)
- Other:_____

4. Based on your experience in the teams that you selected in the previous question, please evaluate the following statements:

a. I enjoyed working on virtual teams.

Strongly Disagree Disagree Neutral Agree Strongly Agree

b. Virtual teamwork met my needs.

Strongly Disagree Disagree Neutral Agree Strongly Agree

c. Virtual teams were an effective way to support my professional learning.

Strongly Disagree Disagree Neutral Agree Strongly Agree

d. I would like to continue working on virtual teams.

Strongly Disagree Disagree Neutral Agree Strongly Agree

5. Would you be open to being contacted by the researcher to receive a $75 Amazon gift card for a set of follow-up interview questions? Your total time commitment would be 3 separate virtual interviews over the course of 6-8 weeks (Mid September-End of October). Each interview will last no longer than 30 minutes.

Yes/No

6. (OPTIONAL) Is there anything else you would like to explain or elaborate on as it relates to your experiences with virtual teams?

APPENDIX D

Interview Questions Round 1

1. Tell me about your educational background, how did you come into teaching?
2. Tell me about your background and experience teaching in this district, what have you taught, and for how long?
3. What have teams been like that you have worked on within the school? The district?
4. How would you describe professional learning?
5. What have been your experiences working on teams since the beginning of the COVID-19 pandemic during the spring of 2020?
6. What have been your experiences with professional learning since the beginning of the COVID-19 pandemic during the spring of 2020?
7. Tell me about any virtual teams you worked on before the pandemic, what are they and what were/are they like?
8. How has your experience working in virtual teams impacted your professional practice?

APPENDIX E

Interview Questions Round 2

1. What current virtual teams and teamwork do you engage in at the school level?
2. What about the district level?
3. What typically happens in these? Walk me through an example of one.
4. What is your role in these virtual teams and teamwork?
5. How easy is it to participate in virtual teams and teamwork?
6. How useful is it to participate in virtual teams and teamwork?
7. What are the benefits of virtual teams and teamwork?
8. What are the challenges of virtual teams and teamwork?
9. Provide an example of a time when virtual teamwork was effective? What do you think made it effective?

APPENDIX F

Interview Questions Round 3

1. Reflecting on the last 3 years working in virtual teams, how would you describe the collaboration that took place?
2. What about the relevance of the learning experience through virtual teams?
3. What about the learning experience as future-focused? In other words, how did the learning experience through virtual teams support your ability to be proactive in problem-solving for the future?
4. How would you evaluate your experience working within and learning during your participation in virtual teams and teamwork? Why?
5. Which virtual team learning experience was the most effective and why?
6. What about least effective? Why?
7. How would you make learning through virtual teams more relevant?
8. What about being more collaborative?
9. What about future-focused?
10. Is there anything else you would like to share about your experience learning and participating in virtual teams and teamwork?

APPENDIX G

Participant Descriptions of Professional Learning

Table G.1 Cross-table Analysis of Participant Perceptions

Participant	Describing Professional Learning
Peyton (Participant 1)	"Professional learning for teachers just builds a teacher's capacity, whether that means to provide further understanding of a concept, or to help them build things to utilize in their classroom, whether that be a scaffold or a document or a protocol." "The goal, I say that loosely um is for you to walk away with something you can use in your classroom tangible"
Bailey (Participant 2)	Working toward common goals (interpreted from story) Follow through and accountability (interpreted from story)
Hadley (Participant 3)	"Professional learning should be geared towards what is going to make the most impact immediately." "…support each other with different research…"
Mackenzie (Participant 4)	"I would define it as like the ongoing education that we receive, a lot of it is required. Some of it is optional."
Ryder (Participant 5)	"I think professional learning is … it can be what you make of it." "the professional learnings that I've found to be really successful have been ones that I knew I needed like ones I took on my own" "…look and reflect on practice…"
Morgan	"Professional learning can either be an opportunity or it can be a requirement to learn about different teaching strategies or professional

(Participant 6)	needs… I guess that it can be an opportunity where you choose to learn something that you feel like might help your teacher learning continue, or maybe some gaps that you might have found to be filled, or it can be a required thing that you know everyone has to learn that's just a part of their daily job.”
Hayden (Participant 7)	“…the ability to understand the your lifetime learner that you're going to grow. That needs to happen, and it shouldn't stop, and that's it like we're all adults. We're all professionals. We don't. We're never going to know everything. So it's It's just the understanding that you need to keep going.”

APPENDIX H

Cross-table Analysis of Participant Perceptions

Table H.1 Cross-table Analysis of Participant Perceptions

	Relevancy		Collaboration		Future-focused	
	Benefits	Challenges	Benefits	Challenges	Benefits	Challenges
Peyton (Participant 1)	Technology-driven world,	Choice, Tangible resources and strategies	Cross-building collaboration	Large meetings, professionalism	New tools and skills	Practical strategies for adapting
Bailey (Participant 2)	Technology-driven world, New ways of learning	Tangible resources and strategies	X	Large meetings, participation	New tools and skills	Leader development
Hadley (Participant 3)	Choice	Tangible resources and strategies, immediate needs	Knowledge sharing, community	Relationship building, expectations	New tools and skills	Temporary vs. Permanence
Mackenzie (Participant 4)	X	Teacher-centered learning, immediate needs	Cross-building collaboration	Norms, conflict management	X	Leader development
Ryder (Participant 5)	Choice	Lack of choice and voice, buy-in	Cross-building collaboration	Large Meetings	New tools and skills	

	Relevancy		Collaboration		Future-focused	
	Benefits	Challenges	Benefits	Challenges	Benefits	Challenges
Morgan (Participant 6)	Choice, Technology-driven world, New ways of learning	Tangible resources and strategies	Cross-building collaboration	Relationship building, accountability	New tools, certifications	Temporary vs. Permanence
Hayden (Participant 7)	Technology-driven world	Redundancy	Cross-building collaboration	Relationships, redundancy, time	New tools and skills	Temporary vs. Permanence

APPENDIX I

District Conditions of Approval

Research Study Name: Play Equity: An evaluation of the Playworks 'Relay' Program in Colorado: Megan Stellino

Conditions of Approval

1. The voluntary nature of the study is made clear to all potential participants. *Final approval for the study is contingent on the principals', teachers', students', and parents' agreement to participate.*

2. All rules in the district's research manual are followed including maintaining the anonymity of the district, the schools, and the study participants.

3. If your request involves the release of data, you agree to limit the use of said data to the terms specified in your application. The data will not be released to any third party and you agree not to copy, reproduce, disseminate, transmit, license, sublicense, assign, lease, or release the data to any other party. All data should be maintained in a secure fashion with access being restricted to the persons identified in the research application to prevent unauthorized use of the data. Following the use of the data for the prescribed reasons, the data should be destroyed.

4. This letter does not reflect a commitment on behalf of Aurora Public Schools towards the requestor. At any point, the approval status involving the release of data or access to students/staff for research may be withdrawn. A violation of any of the conditions within this letter and/or deceptive practices by the researcher will lead to immediate termination of all research privileges. Furthermore, the release of future data and/or research privileges may be indefinitely terminated.

5. A report of the findings is made available to the Department of Accountability & Research at the conclusion of the study.

6. This letter is returned by US mail or via email prior to initiating your study with the requestor acknowledging agreement with the terms described above by signature.

Please contact John Lyons at jdlyons@aurorak12.org if you have any questions.

Please return this letter with the following statement verified by signature:

I, SHAWNA JENSEN, agree to abide by the conditions described in this document and will carry out my research practices in accordance with those conditions. I assume complete responsibility for the described study and will work according to best-practices when working with Aurora Public Schools data and/or conducting scientific inquiry within the Aurora Public Schools district.

Signature of Requestor

Please send via email or US mail to:

Department of Accountability and Research
15701 East First Avenue, ESC 1, Suite 210
Aurora, Colorado 80011
Attn: John Lyons

APPENDIX J

IRB Approval

BOISE STATE UNIVERSITY
RESEARCH AND ECONOMIC DEVELOPMENT
Research Compliance

Date: May 16, 2022

To: Jesus Trespalacios cc: Shawna Jensen

From: Social & Behavioral Insitutional Review Board (SB-IRB)
c/o Office of Research Compliance (ORC)

Subject: SB-IRB Notification of Approval - Original - 101-SB22-067
Exploring Secondary Teacher Perceptions of Virtual Teams as a Delivery Mechanism for Professional Learning

The Boise State University IRB has approved your protocol submission. Your protocol is in compliance with this institution's Federal Wide Assurance (#0000097) and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46).

Protocol Number:	**101-SB22-067**	Received:	4/20/2022	Review:	Expedited
Expires:	**5/15/2023**	Approved:	5/16/2022	Category:	6

Your approved protocol is effective until 5/15/2023. To remain open, your protocol must be renewed on an annual basis and cannot be renewed beyond 5/15/2025. For the activities to continue beyond 5/15/2025, a new protocol application must be submitted.

ORC will notify you of the protocol's upcoming expiration roughly 30 days prior to 5/15/2023. You, as the PI, have the primary responsibility to ensure any forms are submitted in a timely manner for the approved activities to continue. If the protocol is not renewed before 5/15/2023, the protocol will be closed. If you wish to continue the activities after the protocol is closed, you must submit a new protocol application for SB-IRB review and approval.

You must notify the SB-IRB of any changes to your approved protocol and the committee must review and approve these changes prior to their commencement. You should also notify the committee if your activities are complete or discontinued.

Current forms are available on the ORC website at http://goo.gl/D2FYTV

Please direct any questions or concerns to ORC at 426-5401 or humansubjects@boisestate.edu.

Thank you and good luck with your research.

1910 University Drive Boise, Idaho 83725-1139
Phone (208) 426-5401 orc@boisestate.edu

APPENDIX K

CITI Certifications

CITI PROGRAM

Completion Date 11-Apr-2022
Expiration Date 10-Apr-2025
Record ID 44472879

This is to certify that:

Shawna Jensen

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

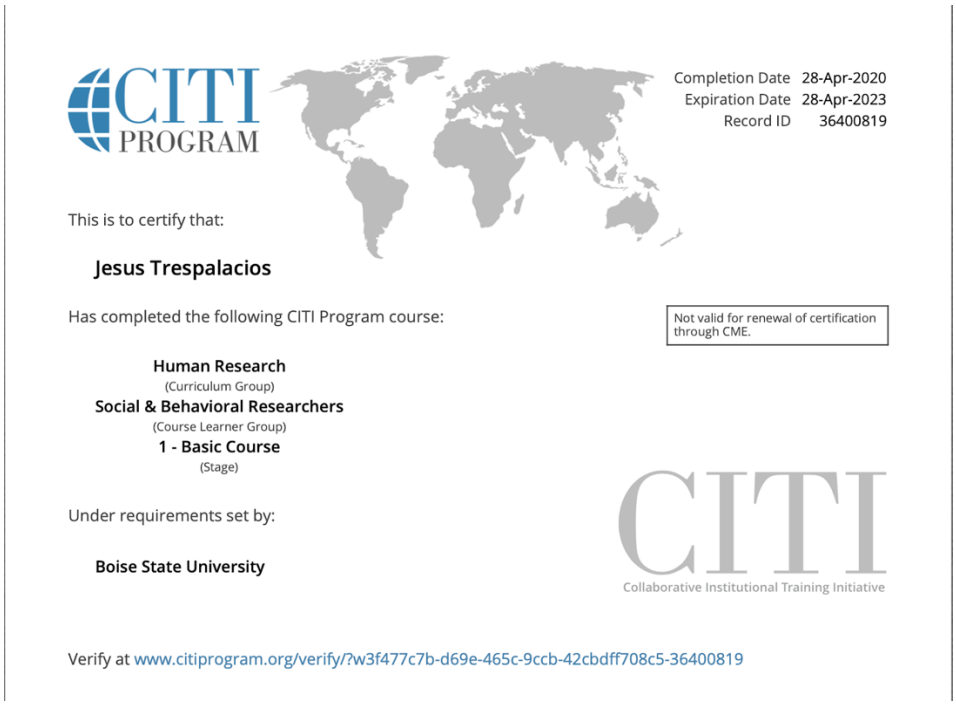
Human Research
(Curriculum Group)
Social & Behavioral Researchers
(Course Learner Group)
2 - Refresher Course
(Stage)

Under requirements set by:

Boise State University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wf0e375cd-8ac6-4074-8587-a0de94051af6-44472879



CITI PROGRAM

Completion Date 28-Apr-2020
Expiration Date 28-Apr-2023
Record ID 36400819

This is to certify that:

Jesus Trespalacios

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Human Research
(Curriculum Group)
Social & Behavioral Researchers
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Boise State University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w3f477c7b-d69e-465c-9ccb-42cbdff708c5-36400819