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THE INFLUENCE OF FORMAL MENTORING ON TEACHER BELIEFS OF K-12 CLASSROOM TECHNOLOGY USE DURING A GLOBAL PANDEMIC

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DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Education
at the University of Kentucky

By

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ABSTRACT OF DISSERTATION

THE INFLUENCE OF FORMAL MENTORING ON TEACHER BELIEFS OF K-12 CLASSROOM TECHNOLOGY USE DURING A GLOBAL PANDEMIC

This dissertation explores the influence and transfer of knowledge related to instructional technology that occurs in the formal teacher mentoring relationship of seven mentoring dyads in a suburban Missouri public school district. This multiple case study was performed during the COVID-19 pandemic during the 2020-2021 school year. The unit of analysis in this study was a mentoring dyad that consisted of an experienced mentor teacher and a novice teacher.

A multiple case study method was utilized. Individual interviews and two focus groups were conducted via the Zoom video conference platform to gather data to inform the research study. Thematic analysis of the interviews was utilized to examine each individual case of the mentoring dyad. A cross-case analysis was performed on the seven mentoring dyad cases to examine the nature of the influence of the mentoring relationship and the teaching knowledge related to technology education transferred during the formal mentoring program. Two focus group sessions provided additional information to reinforce and clarify themes developed in analyzing the individual cases in this study and aid in the multiple case study analysis.

The analysis revealed several aspects of the teacher mentoring relationship that influenced both mentor and mentee's instructional technology beliefs and usage. The findings revealed (a) the importance of creating a solid personal relationship between the mentor and mentee, (b) the need for improved teacher matching for optimal knowledge and resource transfer, (c) the importance of creating a solid foundation for new teachers, (d) the reciprocal nature of knowledge exchange in the relationship, and (e) the impact the pandemic had on mentoring. The mentoring relationship and the induction programs established in schools using mentoring are often not utilized to their full potential. These programs often miss a powerful opportunity to help create a stronger foundation of teaching skills and resources to strengthen their newest and most vulnerable teachers. A concerted effort is needed to create a teacher mentoring experience specifically designed to transfer knowledge and resources in this relationship.

KEYWORDS: teacher mentoring and induction, UTAUT, TPACK, technology, pandemic, multiple case study

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DEDICATION

This dissertation is dedicated to my first and most influential mentors in life: my parents, Joe and Becky Arbisi, and all of the other great people who have served as a mentor to me throughout my life. I owe all my successes to these wonderful people who guided me along the way. I would not be the person I am today or have experienced my successes without you.

“There is no such thing as I can’t. Only I can, I will, and I have.” - Joe Arbisi

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CHAPTER 1

INTRODUCTION

Technology, learning management systems, and associated blended learning concepts are becoming a critical part of the modern school classroom. The 2020 global pandemic related to the COVID-19 virus forced schools to adopt virtual and blended learning formats that accelerated the use of information technology within the classroom. The pandemic also influenced the way many teachers delivered instruction and changed the options available for students to participate in class. This pandemic also forced instructional institutions to propel themselves years into the future to provide a rigorous education to students. This unprecedented event in history also offered an excellent opportunity for educators and instructional institutions to explore, experiment, and expand instructional technology in classrooms worldwide. During this unprecedented experiment, many teachers and institutions lacked the skill and experience needed to provide students instruction effectively—making it evident that new ways are required to prepare new teachers and veteran teachers to provide technology-rich learning environments. The mentoring relationship between veteran and novice teachers could provide an effective means for them to learn from each other about classroom technology use.

Although new teachers are considered digital natives, many fail to understand how to use technology effectively in the classroom or leverage it to improve instructional practices (Lei, 2009; Raulston & Alexiou-Ray, 2018). The initial period in a teacher's career is critical in developing effective professional practices that retain them in the field (Stansbury & Zimmerman, 2000). Although mentoring programs can ease new teachers

into the profession, they can lead to stagnation in professional practice (Beck & Kosnik, 2000; Blackwell, 1989; Iowa, 2014; Lawson, 1992; Long, 1997). Further, mentors' recommendations can conflict with newer, technology-rich instructional approaches and thus can stifle innovative and creative methods used by beginning teachers. In a 2015 study on new teacher preparation, Webber (2019) indicated that many cooperating teachers working with student teachers were hesitant and resistant to supporting technology use in the classroom and instead encouraged traditional instructional methods.

Scholars conducting information system research reported how and why individuals adopt new information technologies (Vankatesch et al., 2003). For information technology to improve P-12 education, it must first be accepted and used effectively by teachers; however, many educational organizations do not focus on helping new teachers with classroom technology use. Further, administrators may even exclude new teachers during orientation events because they are perceived as digital natives and competent technology users. However, being technology savvy does not equate to being a competent technology user for instruction (Lei, 2009).

Research on individual acceptance and use of information technology is one of the most established and mature areas of information systems research (Venkatesh, Davis, & Morris, 2007). This finding has implications for the preparation and development of teachers. To use technology in ways congruent with current understandings of learning and teaching and technology use itself, teachers need to be familiar with an expanding variety of pedagogical techniques (Lei, 2009). Instructional leaders need to understand the best ways to spread these understandings (Stansbury & Zimmerman, 2000). Teacher mentors are leaders in schools: The mentoring relationship

thus provides a medium for new teachers to learn from veteran teachers and veteran teachers to reflect on their practice and explore new and innovative teaching practices.

Leadership in Teacher Mentoring

The impact of leadership on teacher mentoring and induction explicitly related to instructional technology knowledge transferred through the mentoring process is vital for understanding instructional leadership. French and Raven (1959) identified five different types of power available to influence others: (a) reward, (b) coercive, (c) legitimate, (d) expert, and (e) referent. Leadership in the context of mentoring novice teachers focuses primarily on the mentors' role and their personal power. A mentor's personal power derives from two sources. The first is through the *expert power* gained from a mentor's professional knowledge, skill, experience, and success. It is based on the idea that this person knows what he or she is doing. Veterans or senior staff with many years of experience often have expert power (French & Raven, 1959). The second source is *referent power* created through relationships based on admiration, respect, and trust. Referent power creates a desire for others to please, emulate, and associate with the individual that wields this power over another. Referent power is the most valuable and useful source of power because its influence stems from internal self-motivation (French & Raven, 1959). This influential power that an expert mentor teacher has over a novice teacher is the foundation of this mentoring leadership's impact on influencing a novice teacher's classroom technology use beliefs.

Teacher induction programs are inservice training programs completed during the first years of a teaching career and thus designed to provide additional supports to foster increased teaching knowledge attainment for new teachers. Huling-Austin (1990) defines

induction as “a transitional period in teacher education, between preservice preparation and continuing professional development, during which assistance may be provided and/or assessment may be applied to beginning teachers” (p. 3). Because all teacher induction programs intend to transform a teacher with no experience into a competent teacher (Schlechty, 1985), most teacher induction programs' cornerstone is teacher mentoring (Mena, 2017).

The definition of a *mentor* can be nuanced. The online Cambridge Dictionary (2019) defines a mentor as “an experienced and trusted person who gives another person advice and help, especially related to work or school, over a period of time” (Mentor, 2019). King (1986) defines a mentor as one who is a “teacher, coach, role model, opener of doors, and sponsor” (p. 1). Odell (1990) asserts, “A mentor, historically and traditionally defined, is an older, more experienced person who is committed to helping a younger, less experienced teacher in entering the profession” (p. 6). Odell further states that this individual is skilled in his or her craft, able to reflect upon their practice, and receptive to learning new information about the teaching process. Bott (2012) suggests mentoring is about the relationship between an experienced and inexperienced individual that can influence emotionally, cognitively, and professionally. The American Institute for Research (2015) describes the mentor relationship as “one in which one colleague supports the skill and knowledge development of another, providing guidance to that individual based on his or her own experiences and understanding of best practices” (p.4). As Clawson (1996) states, mentoring “includes teaching but goes beyond the mere transfer of knowledge and skill, to include technical, organizational and career/personal life issues” (p. 9). Gold (1999) states that the mentor's eight roles are role model,

motivator, advisor, guide, resource, listener, sponsor, and friend. While these definitions cover a wide gamut, they are all excellent illustrations of what a mentor is and what capacities a mentor serves. A mentor is a coach, guide, and support with vast experience in a field that improves the initial success and confidence of a mentee.

According to Wang and Odell (2002), three conceptual mentoring approaches are used in teacher induction programs. These approaches are the *knowledge transmission approach*, *theory-and-practice connection approach*, and the *collaborative inquiry approach*. In the knowledge transmission model, mentors are developed through workshops that enhance skills and knowledge about mentoring to be more effective in their practices. In the theory-practice connection approach, research-based knowledge and personal mentoring experience develop the mentor's abilities. In the collaborative inquiry approach, teacher educators work closely with mentors and novice teachers in contexts of teaching and mentored learning (Wang & Odell, 2002).

The blending of formal training with ongoing support and development is a potent professional development opportunity for experienced teachers to develop teacher leadership capacity (Carver & Fieman-Nemser, 2009). No matter the approach in developing mentors, the goal is to provide a knowledgeable teaching peer that can help induct a novice teacher into the profession by providing the perspective of an experienced teaching guide to improve new teacher competence, knowledge, and success (Howey, 1988).

On average, beginning teachers are less effective than more experienced teachers (Hanushek et al., 2005). Novice teachers who work with mentors expect them to provide guidance in professional growth, but more importantly, their mentors will know how to

guide them to do things correctly (Playko, 1990). One of the critical areas a mentor can influence a new teacher is the development of professional knowledge and practice. This idea of improving teacher practice aligns with the concept of mentoring as an apprenticeship process, where novice teachers are guided to develop professional knowledge by experienced teachers (Hobson and Malderez, 2013; Wang and Odell, 2007).

A model created by Mishra and Koehler (2006) divides teacher knowledge of practice into three overlapping knowledge domains of technology, pedagogy, and content, defined as TPACK. The TPACK model can be used to articulate instructional strategies and develop teacher knowledge. Additionally, the TPACK model has been used to develop many instruments for measuring knowledge of the three foundational knowledge domains and their blended domains. Educational research increasingly illustrates the need for studies to go beyond personal characteristics and delve more deeply into developing professional knowledge to understand better the nature of mentoring (Aspfors & Fransson, 2015, Garvey & Westlander, 2013). The three knowledge domains expressed in the TPACK model represent how teacher professional knowledge can be viewed individually or as a whole.

Management and Leadership

The management and leadership concepts generated a foundational understanding among scholars and practitioners created during the industrial revolution. Those engaged in management were interested in efficiency, making profits, consistency, and control. During this period, leadership and management overlapped and became synonymous terms. As a result, leadership was eventually just considered proper management.

However, as time passed and society moved beyond the industrial age, organizational needs changed. The ideas related to leadership grew, changed, and evolved. Management and leadership diverged, becoming complementary disciplines. One of the early scholars of the two concepts, Rost (1991), developed the revolutionary idea of a paradigm shift of the new school of leadership. A significant portion of his work analyzed the various literature on leadership and management and created succinct and definitive definitions of leadership and management.

According to Rost (1991), management is "an authority relationship between at least one manager and one subordinate who coordinate their activities to produce and sell particular goods and/or services" (p. 145). This definition is concise and emphasizes four essential management elements: (a) an authority relationship, (b) the presence of a manager and subordinate, (c) coordinated activates to achieve a common goal, and (d) the production and selling of goods or services.

Conversely, Rost (1991) defines leadership as "an influence relationship among leaders and followers who intend real changes that reflect their mutual purposes" (p. 102). Rost meticulously developed this definition following years of study and examination of leadership and management theory. He believed there was too much ambiguity that was problematic. Each word in Rost's leadership definition in this postindustrial model was precisely chosen to deliver the exact intended message. His definition identifies four critical elements that must be present for a phenomenon to be considered leadership: (a) a relationship of influence, (b) a leader and follower, (c) shared intent on making real change, and (d) mutual purpose in actions among leaders and followers.

Before the publication of Rost's (1991) definition, leadership studies significantly focused on leadership traits, personality characteristics, goals, and management of organizations. Leadership studies have been more interested in content rather than the actual process of leadership. Rost contended that scholars and practitioners emphasized leadership's marginal aspects instead of the "essential nature of leadership as a relationship" (p. 5). As described previously, mentoring is about the relationship between an experienced and inexperienced individual that can influence emotionally, cognitively, and professionally (Bott, 2012). Additionally, based on Rost's elements in his definition shared previously for leadership, teacher mentoring is primarily a leadership relationship.

Leadership Frames

A significant component of an effective teacher induction program is the formal mentoring program (California, 2016; Rowley, 1999). In general, a mentoring program's general goal is to pair an experienced teacher and a novice teacher with the intent of the novice learning effective professional practices from the master teacher. Effective mentoring of novice teachers have been shown to have a positive effect on the retention of teachers, the quality of learning and teaching in the classroom, and the increased achievement of students (Hobson, Ashby, Malderez, & Tomlinson, 2009; Ingersoll & Strong, 2011; Pavia, Nissen, Hawkins, Monroe, & Filimon-Demeyen, 2003). A wide array of influences within this relationship can have multiple impacts on the mentee, including emotional support, cultural induction, and improved teaching practice (Villani, 2002).

Further, the improvement in teaching practice can be divided into the integrated categories of technology, pedagogy, and content knowledge (Harris, Mishra, & Koehler,

2009). Technology knowledge is one of the domains related to a teacher's professional practice that can be improved through this relationship. Additionally, as with any relationship, the mentoring relationship will have a degree of reciprocal effect on both parties involved. However, the primary focus is the mentor's relationship with the mentee. Thus, the mentor's leadership ability significantly impacts this relationship and significantly affects the successful transfer of knowledge from mentor to mentee and potentially from mentee to mentor.

School leaders spend much of their time evaluating and examining various aspects of their organizations. Several tools are available that leaders can employ to organize their thinking and strategically improve their organization. One of these tools is the framing and reframing process developed by Bolman and Deal (2017). This process allows practitioners to gain a systems view of an organization by examining issues from multiple frames (i.e., different perspectives) to increase insight into the scrutinized situation. These leadership perspectives can then be used to solve problems, interpret events, and even disregard matters safely. The frames influence what questions are asked, which information needs to be collected, how problems are defined, and what courses of action should be taken (Bolman & Deal, 2017). Bolman and Deal claim that the leadership-frames model is key to understanding leadership and influencing what leaders see and what they do. Additionally, Bolman and Deal (2017) suggest that reframing allows leaders to "know what [they] are up against and, ultimately, what [they] can do about it" (p. 12). The four frames—structural, human resource, political, symbolic—are viewpoints school leaders must employ to understand the complexity of mentoring and

induction for teachers. These frames are used to explore the strengths and weaknesses of mentoring concepts related to instructional technology.

Structural frame. The structural frame is based on classical ways of thinking about organizations and focuses on designing and implementing processes, structures, environments, and roles in an organization. The structural frame emphasizes specific goals, specialized roles, formal relationships, and coordination through authority, policies, and rules in the educational context. This frame is based on logic and the scientific management principles developed by Frederick Taylor and the bureaucratic principles of Max Weber (Bolman & Deal, 2017). The entire premise of this frame is to create mechanistic efficiencies and maximize production in organizations. Problems generally arise when the structure does not fit the situation.

Strengths. From the structural frame perspective, mentoring and induction programs provide structure for new teachers to become familiar with the organization and profession. Formal mentoring and induction programs define official roles, expectations, and goals for the mentoring pair and program outcomes (Kajs, 2002). These structural foundations set the tone for a successful relationship and provide a precise understanding of the process and outcomes. Additionally, the mentoring and induction process provides an ongoing process to ensure organizational continuity by providing a continuous drive to increase new teachers' competency and efficacy each year to improve school success. Meaningful mentoring and induction programs have a long-term impact on teacher quality and retention and help to ensure a school will have competent teachers each year (Kelley, 2004).

Weaknesses. Beyond the formal components of the mentor relationship and the induction program, understanding the structural frame as it relates to teaching is an essential perspective for new teachers to understand. However, the formal processes and repeated use of mentors could promote and reproduce conventional norms and practices (Hobson & Malderez, 2013). This frequent, systematic use of mentoring and what is considered good practice could stifle mentee knowledge development and more progressive teaching practices that may not be the norm in schools (Ying, 2009). New teachers could potentially be agents for change and renewal in school systems but could be stifled by the formal mentoring structure.

Human resource frame. The human resource frame deals with the human side of organizations as well as the interpersonal dynamics involved in organizations, thus fulfilling the needs of workers for better performance. This frame views people as the heart of any organization. In the educational context, the human resource frame is about social systems, individuals, and their needs and feelings. This frame views the school and classroom as a community and focuses on the relationships among teaching staff, teachers and students, and among the students themselves. Lunenburg and Ornstein (2000) suggest that the human resource frame's cornerstone is shared leadership, employee growth, and flexibility. This frame focuses on a work-family or team and encourages employees to feel they are appreciated contributors to the organization.

Strengths. From the human resource frame's perspective, some mentoring strengths lie in the relationship between the mentor and mentee. Varney (2012) describes mentoring as a relationship that involves supporting, motivating, and encouraging a mentee to reach their potential. Suggesting another perspective, Rodd (2013) compares

the mentoring relationship to that of a critical friend and suggests the relationship should be supportive and non-judgmental as well as based on trust, honesty, and mutual respect. Mentoring may also take the form of modeling, building a learning community, and encouraging "a culture of continual growth and professional responsibility" (Waniganayake et al., 2012, p. 100). Additionally, when mentors and new teachers work collaboratively, they both have the potential to gain knowledge from each other (Kadji, Zachariou, & Flogaitis, 2014). According to Holloway (2001), 96% of mentees and 98% of mentors believed they experienced professional and personal growth when they participated in mentoring activities. The mentoring concept is deeply set into the strengths of the human resource frame. It focuses on giving new teachers the ability to continue growing and performing their jobs well while also improving their confidence and job satisfaction.

Weaknesses. The weaknesses of mentoring related to the human resource frame also lie in the relationship between the mentor and mentee. The mentor and mentee relationship is critical to the mentoring processes' success (Kram, 1985; Long et al., 2012; Marable & Raimondi, 2007). Many factors play into successful formal and informal mentoring relationships, including personal characteristics (Turban & Lee, 2007). Personality traits deeply influence mentoring relationships and can have an impact when mentors are assigned in formal pairings. In mentoring relationships, informal pairings are often more productive than assigned pairing because of the self-selected pairing due to social attraction and shared interests (Ragins & Cotton, 1999). However, this might not be the case in formal mentoring programs because many mentors and mentees are paired based on the subject area, common planning times, location, and

mentor availability (California, 2016). Personality, beliefs, and other possible conflicts are often not considered, and a poor fit can lead to a bad mentoring relationship.

Political frame. The political frame is about managing power, influence, and conflict. This organizational view focuses on power building as well as the control of scarce resources. In this frame, conflict is not considered harmful but rather is a normal part of an organization and the process for prioritizing and distributing resources and power. The use of the political frame reveals conflicting goals, power arrangements, and negotiation opportunities. In the educational context, organizational members, departments, and other stakeholders all have conflicting needs, perspectives, and values. These groups contend for the organization's limited resources, and political considerations are how it is decided.

Strengths. From the perspective of the political frame, the strengths of mentoring lie in the supports a mentor, as an experienced teacher, can give to a mentee teacher. An experienced teacher has more influence in the organization, understands the power and resource structures available, and knows how to navigate its political environment. One of the roles of a mentor is to be a guide to the culture and the way things are done in the organization (American, 2015). In an educational organization, resources can be scarce, and a new teacher has little influence and power to obtain scarce resources. A mentor can serve as a champion for a mentee and can use her or his personal power to support the mentee's objectives and ideas to help gain access to needed resources.

Weaknesses. When examining mentoring via the political frame, a weakness in mentoring programs lies in scarce resources. Literature on mentoring reveals that the mentor and mentee's amount of time to work together is an essential factor in successful mentoring programs (California, 2016; Jones et al., 2014; Womack-Wynne et al., 2011).

Ingersoll and Strong (2011) found that participation in a teacher induction program with mentoring was consistently correlated with student achievement. The correlation was dependent on the extent and intensity of the particular program. However, opportunities for a mentor and mentee to meet can be scarce due to other obligations. Specific protected time (e.g., 1.25 to 2.5 hours a week) should be intentionally scheduled and used for prescribed purposes (California, 2016). This allocation of time needed for mentoring can be a source of conflict when that time is needed or desired for other uses. Additionally, mentors must be developed and trained for their role as a mentor. The California County Superintendents Educational Services Association (2016) suggests that mentors receive up to two weeks of initial mentoring training to prepare for their role as mentors. This allocation of time and fiscal resources can also be a potential conflict.

Symbolic frame. The symbolic frame is focused on empowerment and motivation through emotions, which presents an opposing perspective to the rationality prominent in the other three frames. The symbolic frame "depicts organizations as cultures, propelled by rituals, ceremonies, stories, heroes, history, and myths rather than by rules, policies, and managerial authority" (Bolman & Deal, 2017, p. 18). The symbolic frame is used to interpret and illuminate the meaning and beliefs that make symbols powerful. As an organizational view in education, this frame focuses on how people use meaning, belief, faith, and emotion to create a culture and invoke passion in schools. Symbolism and the related emotion it evokes is a potent motivator for people. The symbolic frame focuses on the soul of an organization, and at times meaning can matter more than the actual results when making decisions from this perspective.

Strengths. From the symbolic frame perspective, many of the mentoring strengths lie in the deeper reasoning for providing a mentoring program. As an experienced teacher, being asked to participate as a mentor would be a symbolic statement of their mastery and leadership as an experienced teacher in the organization. This kind of symbolic statement provides personal leadership power and provides the intangible reward of organizational status and empowerment (Haack, 2006). As a beginning teacher, a mentoring program proves the organization cares about the new teacher's success and invests resources into their development and success. Additionally, finishing a mentoring program is empowering for the beginning teacher as it provides a symbolic transition from a novice to a proven competent professional in the teaching field.

Weaknesses. In an organization with a mentoring program, a mentor could be perceived as an indifferent and uncaring individual, a babysitter, a spy for administration, or a hurdle to jump over for a mentee (Haack, 2006; Kozikoglu, 2018; Norman & Ganser, 2004). Any of these negative symbolic connotations can be perceived as a message that negatively influences the partnership's relationship and success. A negative perception is not the desired outcome of a mentoring relationship for the mentor or mentee because it can negatively impact the relationship. These connotations are generally the result of not meeting the mentee's needs because of a loss of focus on the mentoring program's goals and ideals (Womack-Wynne et al., 2011). Additionally, the pairing of a mentor and mentee relationship is critical. A failure in the cohesion of the pairing could be perceived as a symbolic indicator of a beginning teacher’s potential for success or failure in the field (Sudzina, 1994).

Unified Model of Effective Leader Practices

A unified framework that combines three existing leadership frameworks' ideas into one unified model was developed by Hitt and Tucker (2016). The frameworks were chosen because they all focus on the impact of leadership on student achievement and identify specific domains and dimensions contributing to this impact. The three frameworks used to construct the unified framework are (1) The Ontario Leadership Framework, (2) The Learning Center Leadership Framework, and (3) the Essential Supports Framework. Further, the unified framework created by Hitt and Tucker (2016) does not exclude any aspect of any of the foundational frameworks. Instead, it reworks and identifies some concepts to improve understanding by practitioners. Two domains of leadership practice within this model relate to the influence on instructional technology use through teacher mentoring and induction. The literature for these domains are reviewed below, and the particular methodological approaches used are examined

Building professional capacity. Building professional capacity is defined as developing the knowledge skills and dispositions of teachers for increased student achievement. An essential aspect of this domain is that the leader co-learns on development activities with teaching staff. Hitt and Tucker (2016) define seven dimensions about building professional capacity: (1) selecting the right fit; (2) providing individualized consideration; (3) building trusting relationships; (4) providing opportunities to learn for the whole faculty to include leaders; (5) supporting, buffering, and recognizing staff; (6) creating communities of practice; and (7) engendering responsibility for promoting learning. Each of these dimensions of building professional capacity can be a part of effective mentoring and induction programs.

One of the significant ideas within building professional capacity among teachers is the idea of everyone learning together within communities of practice, both expert and novice (Hitt & Tucker, 2016). Concerning mentoring, collaborative learning builds the collegial aspect of teaching, strengthens the mentor's knowledge, and lends credibility to the mentor's expert ability in a novice teacher's eyes. These aspects increase the personal power available for the mentor to guide the novice teacher and encourage the teacher to follow the mentor's lead (Freidkin, 1994). Reciprocally, the community of practice also challenges mentors to reflect on their practice and improve whatever aspects are appropriate.

The trust developed while engaged in the mentoring relationship is another dimension of building professional capacity. Tschannen-Moran (2009) performed a survey study that revealed that 57% of the variance in building teacher professional capacity is explained through trust issues. Hence, a greater amount of trust between mentor and mentee improves how a new teacher is willing to change and improve (Louis, 2007). Thus, building trust between the experienced teacher and the novice teacher is vital to developing a successful mentoring relationship among the many aspects of such relationships. Further, Hitt and Tucker (2016) assert that mentoring provides "an individualized development experience for both the mentor and the mentee" (p. 550), one of the dimensions of building professional capacity. Mentoring is an individualized learning opportunity customized to the novice teacher's needs (Gaines, 2020) and an essential component of beginning teachers' professional development.

Providing opportunities to learn is another dimension of building professional capacity (Hitt & Tucker, 2016). According to Wayne and colleagues (2008), teacher

professional development improves teachers' professional practice and learning outcomes for students. However, these scholars also note that it is difficult to pinpoint what aspects of professional development influence these improvements. One aspect noted by Wayne and colleagues was the difficulty of effectively comparing professional development delivery modes due to the numerous more practical variables that can be different in the delivery. Some of these include the program content, location, number of participants, use of multiple trainers, and professional development content. The problem with numerous uncontrollable variables is similar to the variability in developing a mentoring relationship and how mentoring has been proven effective (Hobson et al., 2009; Ingersoll & Strong, 2011; Pavia et al., 2003). However, some studies supported the ideas of intensive, sustained, job-embedded professional development within a teacher's content area that considers active learning, coherence, and collective participation to best practices (Garet et al., 2001). The transfer of knowledge in a mentoring relationship can be through the instructional coaching that may occur in this relationship. Many of the practices discussed align with the characteristics of mentoring and coaching best practices. The four dimensions of building professional capacity within leadership were examined and found to be related to mentoring and induction for this study.

Creating supportive organization for learning. Creating a supportive organization for learning focuses on creating a work environment for people to be their best. This domain centers on building good relationships and empowering people as valuable and involved organizational members to better themselves and the organization. According to Hitt and Tucker (2016), seven dimensions define how to create a supportive organization for learning: (1) acquiring and allocating materials and resources for mission

and vision, (2) considering context to maximize organizational functioning, (3) building collaborative processes for decision making, (4) sharing and distributing leadership, (5) tending to and building on diversity, (6) strengthening and optimizing school culture, and (7) maintaining ambitious and high expectations and standards. The seven dimensions help create an environment of support and growth and ultimately create a more effective instructional program. Many of these dimensions of creating a supportive organization for learning are aspects of mentoring and induction programs for teachers.

The first three dimensions in this domain that relate to the mentoring relationship are (a) building collaborative processes for decision making, (b) sharing and distributing leadership, and (c) strengthening and optimizing school culture. All three dimensions are accomplished by empowering experienced and beginning teachers in the mentoring experience to become more collaborative and create a learning community. These dimensions are reflected in how the process of mentoring inducts a beginning teacher into the learning community as a peer with a voice in the organization's operation. Cochran-Smith and Lytle (2009) expressed the importance of professional learning communities focused on teacher inquiry, encouraging members to ask questions, admit uncertainties, and embrace continuous learning as integral components of a mentoring program. The democratic nature of inquiry groups can empower novice and veteran teachers to think critically in their classrooms, make data-informed decisions, and provide input to the learning community for decisions (Cochran-Smith, 2012). Further, professional learning communities that create positive, supportive environments evidence openness, transparency, efficacy, trust, and conflict resolution (Hitt & Tucker, 2016). The creation

and support of professional learning communities are reinforced through effective mentoring.

The final dimension of creating a supportive organization related to the mentoring relationship is maintaining ambitious, high-performance expectations and standards. Hitt and Tucker (2016) suggest that teachers' formative and summative assessment of their progress to reach performance goals is critical in maintaining high-performance standards. One common practice in mentoring is regular observation and feedback for improvement for the beginning teacher by the mentor (American, 2015). This aspect of the relationship supports new teachers' achievement of the organization's performance standards and goals while providing positive support to improve. The four dimensions examined in the domain of creating a supportive organization for learning align with characteristics of mentoring and induction practices that will be the focus of the research study.

Methodological Approaches to Similar Studies

Many approaches were utilized in examining several studies related to building professional capacity and creating a supportive organization for learning. However, in the further examination, there appeared to be four common approaches to methodology. The first methodology found was the action research approach, with the researcher actively participating in a change or intervention while studying the situation. Given the nature of the research on building the professional capacity of teachers, this makes sense. A significant number of researchers in this field are practitioners involved in the study's context.

Another approach commonly found was an experimental design with one group of teachers receiving a particular professional development, while another group received a different type of professional development or no support. This method appears to be very practical when looking at traditional professional development and easily grouping teachers. A third standard method found in the studies I examined used surveying as the methodological approach. Surveys appeared to be used in more extensive studies, were more opinion-based, and looked to explain larger populations.

The final method that is commonly used is the case study method. In this method, researchers look at unique situations, individuals, sites, or programs and study these unique analysis units to gain more insight and examine possible aspects for larger, more detailed studies. The case study method is the chosen method for this research study on the influences of mentoring on technology use.

Purpose of the Study

The purpose of this study is to examine the poorly understood influences a mentoring relationship has on teacher instructional technology beliefs. Thus, this study examines the relationship between teacher mentors and their mentees and its impact on classroom technology use of both members in the pairing. This examination incorporates concepts of Technology Acceptance Theory and the Technological Pedagogical Content Knowledge framework (TPACK) as the lens to examine the mentoring relationship.

Research Questions

The primary question driving this study is: *How does the teacher mentoring relationship influence mentor and mentee teacher beliefs on classroom technology use?* A secondary question was developed because of the study being conducted during the

global COVID-19 pandemic: *In what ways has the global pandemic influenced teacher technology adoption through formal mentoring programs?*

Four guiding questions assist the researcher in answering the overarching research questions:

1. What are the characteristics of the mentor-mentee pair that produce a high-functioning relationship for knowledge transfer?
2. What practices of the mentor-mentee pair hinder the development of a high-functioning relationship for knowledge transfer?
3. What practices and experiences encourage the transfer of technology knowledge between the mentor and mentee?
4. When is the most effective time for providing early career teachers with mentoring in the use of instructional technology?

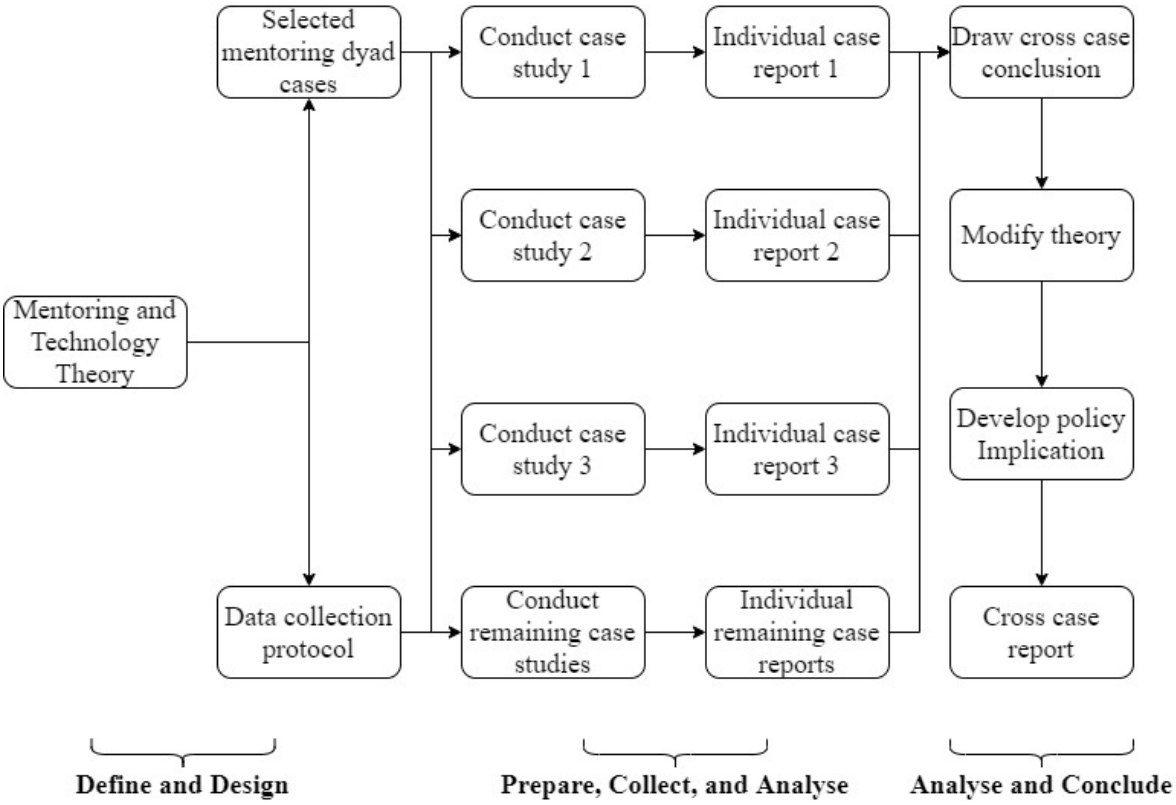
Methodology

An explanatory multiple-case study design identifies and explains relationships found within the data (Creswell, 2007; Stake, 1995; Miles & Huberman, 1994; Yin, 2014). Examination of mentor and mentee pairings are the individual cases this study uses for analysis. In the first phase, the influence of mentoring within dyad pairs (i.e., each mentor-mentee couple) is explored to identify and explain the influence of the mentoring relationship within each case. This exploration was accomplished through the analysis of semi-structured interviews with study participants. Additional focus groups were conducted at the conclusion of the study to gather clarifying information on the interview data for the qualitative study.

The second phase of the study consists of a multiple case analysis using individual and focus group interviews that examines the identified pairings across cases to explain further the observed influences. A constant comparative method utilizing a codebook was used to analyze the qualitative data and develop themes in each case and across the cases. The diagram in Figure 1.1 displays the research design used.

Figure 1.1

Multiple-Case Study Procedure



Note. Adapted from Yin (2014, p. 60).

The Context for the Study

This study was conducted in a suburban school district serving approximately 5,000 students in Grades P-12 in western Missouri. This district was selected as the research site because it has implemented and sustained a one-to-one laptop program for

the past eight years and has made instructional technology an essential focus of learning and teaching. The school district employs approximately 300 certified teaching staff members. Missouri requires all school districts to implement a two-year teacher induction program that includes mentoring from a highly qualified, experienced teacher. The national average of teachers in their first year is 5%.

The study participants are closely aligned to the estimated national average and include 26 dyad pairs. From the K-12 school district, there are 16 first-year teachers and ten second-year teachers, and these teachers were paired with 26 distinct mentor teachers. The participating mentor teachers must have at least five years of teaching experience and be identified by district leaders as a model teacher with exemplary teaching practices and relationship-building skills.

Summary

The first chapter of this dissertation included the leadership aspects of mentoring, the purpose and significance of the study, the problem to be addressed, the research questions guiding the study, and a brief explanation of the research methods used in the study. Chapter 2 provides a review of the literature on teacher mentoring and induction, the professional teacher lifecycle, technology acceptance models, and the Technological Pedagogical Content Knowledge framework. Chapter 3 outlines the procedures and methods used for data collection and analysis. Chapter 4 presents the findings of the individual data collection. Chapter 5 presents the findings of the focus group interviews and multiple case study analyses. Chapter 6 provides key findings and implications to the educational leadership field and discusses further research recommendations for study.

CHAPTER 2

LITERATURE REVIEW

Key concepts related to the influences of mentoring on teacher classroom instructional technology use are reviewed in this chapter. The chapter is organized to introduce key concepts to provide a more thorough understanding of the study, to exhibit the connections of these concepts, and explain the significant focus. It begins with a general description, examination, and in-depth review of the four significant literature areas related to this study: (a) mentoring, (b) teacher lifecycle, (c) TPACK, and (d) technology acceptance theory. Additionally, this chapter includes a synthesis of related concepts that provides an overall conceptual framework for this study. This review closes by identifying the gap in the literature related to the understanding of how technology knowledge and beliefs are transferred through the mentoring relationship.

This literature review identifies the key concepts related to mentoring and induction and explores how these concepts relate to the mentoring influence on teacher classroom instructional technology use. The literature search was conducted over 12 months, with most of the search occurring in the latter six months after the topic of study was more thoroughly established. The literature search strategy began by using a general search of each vital topic online to gain a basic understanding and discover the significant theories and researchers. After gaining this basic understanding, a search was conducted using Google Scholar and the University of Kentucky research databases of EBSCOhost, ERIC, Gale, Sage, and ProQuest. While reviewing the initial literature found, the reference lists for additional valuable resources and authors were examined. The

literature collected was surveyed and organized to develop this literature review on novice teacher induction and the mentoring relationship.

Mentoring

The definition of a mentor can be nuanced. The online Cambridge Dictionary (2019) defines a mentor as "an experienced and trusted person who gives another person advice and help, especially related to work or school, over a period of time" (Mentor, 2019). According to King (1986), a mentor is one who is a "teacher, coach, role model, opener of doors, and sponsor" (p. 1). Odell (1990) states that a mentor, "historically and traditionally defined, is an older, more experienced person who is committed to helping a younger, less experienced teacher in entering the profession" (p. 6). Odell further states that this individual is skilled in his or her craft, able to reflect upon their practice, and is receptive to learning new information about the teaching process.

Using a different framework, Bott (2012) suggests mentoring is about the relationship between an experienced and inexperienced individual that can influence emotionally, cognitively, and professionally. The American Institute for Research (2015) describes the mentor relationship as "one in which one colleague supports the skill and knowledge development of another, providing guidance to that individual based on his or her own experiences and understanding of best practices" (p. 4). According to Clawson (1996), mentoring "includes teaching but goes beyond the mere transfer of knowledge and skill, to include technical, organizational and career/personal life issues" (p. 9). Gold (1999) noted that the eight roles of the mentor are *role model*, *motivator*, *advisor*, *guide*, *resource*, *listener*, *sponso*r, and *friend*.

While these definitions cover a wide gamut, they are all excellent illustrations of what a mentor is and the capacities a mentor serves. For this study, a mentor is defined as a coach, guide, and support with vast experience in a field that serves to improve the initial success and confidence of a mentee.

Historical Foundations of Mentoring

The term *mentor* and the idea of a mentor originate from the poem *The Odyssey*. Odysseus left his son Telemachus in the care of Mentor while he was away fighting the Trojan War. He charged Mentor with the responsibility of the boy's education and the shaping of his character, values, and beliefs. Mentor guided this child from an unknowing youth to a competent adult in many ways. Eventually, the name Mentor became the descriptive term mentor as a reference to a person who serves in this manner.

During the Middle Ages, many skilled trades' knowledge was maintained through generations by legacies of skills passed from master to apprentice (Nefstead & Nefstead, 2005). These pairings were the standard method for transferring knowledge for many professional trades for hundreds of years. Though not formally termed mentoring, the relationships were similar pairings of an experienced craftsman with a person of less experience to induct the novice into the craft and share knowledge and wisdom acquired through the master's experiences.

In 1978, Daniel Levinson led a group of social scientists to study a man's life phases. He published a book on this study, *The Seasons of a Man's Life*, one of the first publications examining the mentoring relationship. According to Barondess (1995), the mentoring relationship emerged in these studies as an essential relationship in early

adulthood. The mentor served as a teacher, sponsor, advisor, and model in helping the protégé adapt to the professional and social world.

Modern Mentoring

Just as Mentor guided Telemacus, many organizations use a mentoring relationship to initiate new employees. The idea of mentoring beginning teachers in modern times began in the 1980s as a strategy for professional development by creating a relationship that fulfills relational needs for new teachers. In Missouri, numerous mentoring programs were founded in 1988 because of the mandated beginning teacher development program related to the Excellence in Education Act passed in Missouri in 1985 (Bliss & Honeyman, 1986). In 1985, the Commonwealth of Kentucky directed schools to induct new professionals into teaching via teacher induction and mentoring programs (Brennan et al., 1999). In 2016, 29 states in the United States required support for new teachers through teacher induction programs and mentoring (Goldrick, 2016).

Purpose of Mentoring

Mentoring is a significant professional development for new teachers, and it impacts teacher retention, affects instructional practices, and contributes to student achievement (Achinstein & Davis, 2014). When teachers begin their careers, they concentrate on the basic requirements demanded of them and the simple act of surviving in the profession. As they become more comfortable with teaching demands, they turn their focus on how to teach more effectively. With teacher mentoring, beginning teachers can start their careers addressing the *what* and the *how* of effective teaching. They rely on veterans to share best teaching practices and institutional knowledge accumulated from their mentor's career. In addition to contributing to new teachers' sense of efficacy and

professional growth, the peer relationship decreases new teachers' feelings of isolation and helps them navigate organizational intricacies (Wechsler et al., 2010).

Teacher retention is often cited as the primary reason school districts or states implement a teacher induction and mentoring program. The teacher shortage in the United States is a confounding problem (Goldrick, 2016; Little, 1990). It continues to grow, with new-teacher departures from schools and the profession being a significant contributor to the problem. The highest teacher attrition rates come within the first two years of teaching, during the survival period (Huberman, 1989). This problem is even more pronounced in low-income and rural school districts. Although most professions exhibit the highest turnover in the beginning stages of careers, comparatively, the level of new teacher turnover is unusually high across the nation (Ingersoll, Merrill, & May 2016). This current high turnover level comes with negative consequences for districts, schools, and students, mainly because it is estimated that teacher attrition nationally can cost over 7 billion dollars annually (Muller, Dodd, & Fiala, 2014).

Additionally, teacher turnover is a source of school instability that creates management challenges and adverse effects on student performance (Ronfeldt, Loeb, & Wyckoff, 2013). The State of Texas's Beginning Teacher Induction and Mentoring program has a specific purpose: to increase retention among all beginning teachers (Beginning Teacher Induction, 2017). Research has shown a positive impact mentoring programs have on teacher retention (Ingersoll and Kralik, 2004).

On average, beginning teachers are less effective than more experienced teachers (Hanushek et al., 2005). Teaching is a profession in which much is learned on the job during the initial induction phase. High-quality induction programs can increase new

teacher professional growth and enable teachers to be effective more quickly. Mentorship promises potential benefits in the areas of new teacher induction, teacher career enhancement, teacher professional development, and improved student outcomes (Little, 1990). Both Little (1990) and Goldrick (2016), scholars who focus on teacher development and practice, suggest that mentoring programs are a critical strategy to effectively increase new teacher retention and combat the growing shortage of skilled teachers in education.

Quality of instruction has been identified by numerous experts as the most important factor within a school to impact student achievement. Finding high-quality teachers, developing high-quality teachers, and retaining high-quality teachers are the keys to high-quality instruction (Hanushek & Rivkin, 2007; Hattie, 2003; Wayne & Youngs, 2003; Wong, 2004). Novice teachers have indicated a mentor's support as one of the most critical factors to their success and achievement of these key motives during the teacher induction phase of the teacher life cycle (Behrstock-Sherratt et al., 2014). Through interaction within this positive working relationship, novice teachers are encouraged to identify and achieve their personal and professional goals. When novice teachers work with their mentors, they expect them to know not only how to guide them in the profession, but more importantly, how to guide them to do things correctly (Playko, 1990). The mentor's job is to help guide the novice from novice practitioner to professional educator. Although there are many benefits to this relationship, mentor selection is one of the critical aspects of a mentoring program's success.

Teacher Professional Lifecycle

This study is based on the conceptual approaches of the research on the professional teacher lifecycle (Huberman, 1993; Fessler and Christensen, 1992; Leithwood, 1992; and Steffy, 2000). For example, Huberman (1989) describes his professional teacher lifecycle model with three main phases of teachers' practice (i.e., novice, mid-career, late-career) and five basic stages.

The five stages are (a) beginning teacher, (b) stabilization, (c) diversification, (e) serenity, and (f) disengagement. Although the five stages vary by individual, they roughly fall within specific years of experience. The first stage is that of a novice teacher. This stage generally includes teachers with less than three years of experience, and the general concept in this stage is the struggle to survive and establish themselves as professionals. The second stage is composed of teachers with four to six years of experience. It is the stabilization period in which the teacher has become established and decided that the teaching career is for them; their practices can typically be defined as routines. The third stage is described as the pedagogic tinkering stage, which generally occurs among teachers with 7 to 18 years of experience. During the tinkering stage, veteran teachers tend to experiment, grow, and share with others. The fourth stage is the serenity stage, which generally happens among teachers with 19 to 30 years of experience. Teachers in this stage tend to mentor others but also start to reject innovation. The final stage occurs near retirement and affects teachers with more than 30 years of experience. Although most of these teachers may still have some of the previous stage traits, many have entered a mentally retired stage and start to focus on life beyond the profession (Huberman, 1989).

Several other scholars have described teaching lifecycles (Fessler & Christensen, 1992; Leithwood, 1992; Steffy, 2000). They generally are very similar to Huberman's (1993) description but have a slightly different breakdown of the different stages, created by adding or consolidating stages.

Mentors

Mentoring is defined as a relationship between an experienced and inexperienced individual that can influence emotionally, cognitively, and professionally (Bott, 2012). In examining this relationship, there are two general approaches used: formal and informal. *Formal mentoring* is a structured program created by an organization with the expressed intent of inducting new employees into the organization and profession to improve employee effectiveness quickly. Improvement is accomplished by pairing a beginner with an expert for an established induction period. Conversely, *informal mentoring* is a naturally occurring relationship between two people with little structure for their interactions or discussions. This relationship is created by mutual choice where a lesser experienced person gains insight, knowledge, wisdom, guidance, and support from a more experienced person. Scholars generally believe informal mentoring is the more effective type of mentoring because the source of the relationship is kindred thinking and mutual commitment (Sosik et al., 2005). However, naturally occurring mentoring relationships can be slow to develop independently and may never develop for many novices. Hence, the need exists to create formal mentoring programs that attempt to expedite this relationship's creation.

The mentor's commitment and the choice of the right mentor for a mentee are two of the most critical parts of the mentoring relationship (Moir, 2009). Assuming this role

can benefit mentors because it can improve their professional practice and build their leadership skills. Being a mentor allows one to reflect on one's professional practice, improve understanding of teaching, and adopt progressive teaching practices (Moir, 2009). Choosing good mentors, however, can be challenging. A great mentor's essential characteristics include positive aspects related to attitude and character as well as professional competence, experience, and interpersonal skills. Through decades of research on mentoring and induction, standard criteria and traits for successful mentors have been established.

Many states have developed specific policies that establish mentor qualifications and generally address experience levels, interpersonal skills, and teaching skills. However, other characteristics have been proven to improve the effectiveness of mentoring, as well. For example, Rowley (1999) developed six essential characteristics of good mentors. These include a commitment to the role of mentoring, acceptance of the beginning teacher, skill at providing instructional support, effectiveness in different interpersonal contexts, a model of a continuous learner, and being a communicator of hope and optimism. Additionally, Beaudette and Nolan (2013) support Rowley's (1999) proposed traits and add other essential factors to consider for success, such as teaching the same grade or subject area, classrooms near one another, and availability to meet regularly. A study by Huling and Resta (2007) reinforces the previously mentioned qualities by suggesting many of the same qualities as critical considerations in mentor selections.

The study of the traits and characteristics of mentors and induction programs has been the focus of a vast amount of studies examining effectiveness. Interestingly,

educational research increasingly illustrates the need for studies to go beyond characteristics and delve more deeply into developing professional knowledge to understand better the nature of mentoring (Aspfors & Fransson, 2015; Garvey & Westlander, 2013).

New Teacher Needs

Most people entering the teaching profession are not adequately prepared for the daily challenges of managing a classroom. "Whatever you learned in college probably did not include the day-to-day mechanics with which we all contend" (Delisle, 2004, p. 31). If the transition into the field is not handled appropriately during the early months of a new teacher's experience, it can lead to an unfortunate trend for our schools and the teaching profession. Ingersol and Smith (2004) found a 40% attrition rate among new teachers who received no induction or mentoring at the start of their careers; however, this number was reduced to 18% when novice teachers received induction supports. Another study conducted by Jorissen (2002) revealed that teachers in their first and second years of teaching leave the profession at a rate of 15% a year and 10% by the third year. Additionally, Jorissen projected that 40-50% would leave the profession during the first seven years of a teacher's career. Understanding and improving the reasons behind this turnover within the teaching profession during this phase is essential.

Although the struggles that new teachers experience can vary based on a teacher's specific situation, Gordon and Maxey (2000) suggest they generally fall into the following six environmental categories: (a) difficult work assignment, (b) unclear expectation, (c) inadequate resources, (d) isolation, (e) role conflict, and (f) reality shock. This first struggle is how new teachers are often burdened with the least desirable and

more difficult teaching assignments. Lower-level courses, more challenging students, and undesirable assignments are often the positions left for new teachers. In contrast, experienced teachers avoid these conditions and assert claims on the upper level and less contentious courses (O'Brien, 2013). Personnel in other professions generally work the opposite, with more experienced staff members assuming more challenging roles as they gain experience.

The second struggle among novice teachers is unclear expectations. Research conducted by Kurtz (1983) revealed that first-year teachers' most common complaint among those leaving the profession was vague expectations. These vague expectations are often in the form of the many formal and informal rules in schools. These organizational and cultural rules are often difficult for someone new to the organization to navigate because they are not explicit. Additionally, the pull of administrators' different expectations, teaching peers, difficult students, and challenging parents can confuse and frustrate new teachers when attempting to prioritize needs and navigate their initial work professionally (Niebrand, Horn, & Holmes, 1992; Corley, 1998).

The third struggle novice teachers face is inadequate resources: Many first-year teachers often find their classrooms without instructional resources. Lack of resources is attributed to previous teachers removing their resources as they leave and the raiding of resources by other teachers that often happens when a teacher leaves (Gratch, 1998; Glickman, 1984). Thus, this practice leaves the new teacher, entering with little to no resources, in a position of not having the necessary resources to teach creatively or effectively. Tragically, new teachers typically have the greatest need for support

materials. Lack of needed resources can lead to frustration for the new teacher, but more importantly, it also impacts the students.

The fourth struggle a beginning teacher may experience comes in various forms of isolation that can occur. Isolation can be both social and professional, as well as inflicted upon them or self-inflicted. Tragically, many experienced teachers do not offer new teachers assistance, even when they see them struggling. Some veteran teachers see this as a rite of passage that all must suffer through alone at the start of a career, while others may believe they are overstepping their role or simply do not have the time or resources to help another colleague (Houston & Felder, 1982; Ryan, 1974). Additionally, new teachers can contribute to their isolation by not reaching out to others with more experience for fear of demonstrating failure or incompetence. Finding help can be critical for the success of the new teacher and their students (Beaudette & Nolan, 2013)

The fifth struggle, role conflict, occurs on a more personal level for the beginning teacher. It concerns young adults working in a professional setting for the first time and being responsible for establishing themselves as working colleagues and dealing with the related responsibilities for the first time. The combination of starting one's individual life and entering the teaching profession at the same time can be overwhelming for some young adults. Learning to find a work-life balance is essential for new teachers, and an imbalance can lead to burnout and a teacher leaving the profession early in their career (Latifoglu, 2016).

The final struggle is the shock caused when a new teacher's idea of teaching does not match the reality of her or his new position. Veenman (1984) defines *reality shock* as "the collapse of the missionary ideals formed during teacher training by the harsh and

rude reality of classroom life" (p. 143). The reality shock results from the realization a novice teacher has that their teacher preparation program does not cover every difficulty or hurdle they may face in the profession or the entire reality of what they may have to handle. According to Gordon and Maxey (2000), "The discrepancy between the beginning teacher's vision of teaching and the real world of teaching can cause serious disillusionment" (p. 2). The reality shock has the potential to magnify the difficulty of the other five environment struggles the beginning teacher may face by reducing the teacher's ability to cope (Gordon & Maxey, 2000).

Gordon and Maxey (2000) examined seven studies on the specific problems and needs of beginning teachers and identified 12 potential needs for beginning teachers: (1) managing the classroom; (2) acquiring information; (3) obtaining instructional resources; (4) planning, organizing, and managing instruction other responsibilities; (5) evaluating student progress; (6) motivating students; (7) using effective teaching methods; (8) dealing with individual student needs and problems; (9) communicating with colleagues; (10) communicating with parents; (11) adjusting to the teaching environment and role, and (12) receiving emotional support. Many of these needs overlap with the environmental struggles discussed previously. The foundations of the strategies used in many mentoring and induction programs are based on addressing beginning teachers' needs.

Mentoring Supports and Activities

Successful transitions into the teaching profession and the skilled support of an experienced mentor are reported as critical components in teachers' early success (Brindley et al., 2000). Within these two facets of a beginning teacher's inaugural

experience are several supports that educational organizations can provide to improve the teacher's success. According to Grossman (2012), mentors need specific training and program support to provide mentees with the additional support needed for success. Numerous research studies have shown common themes new teachers need support for and what should be provided by the mentor teachers. For example, Algozzine and colleagues (2007) completed a study that examined 19 common activities and 15 common methods of assistance in teacher mentoring and induction programs. This study found the top five most effective induction supports as (1) formal evaluations or observations, (2) assignment in licensure area, (3) school-specific orientation, (4) formal evaluation or observations by a mentor, and (5) informal evaluations or observations by a mentor. The researchers also identified the top five induction assistance activities for supporting new teachers: (1) understanding of school policies and rules; (2) locating appropriate materials, supplies, and equipment; (3) incorporating state standards and performance objectives; (4) planning for instruction; and (5) effective use of diverse teaching methods (Algozzine et al., 2007). With these needed activities and supports in mind, mentoring and induction programs should be designed around the participants' needs to be successful.

Missouri Mentoring and Induction

Because this study examines a mentoring and induction program in a Missouri school district, understanding the Missouri mentoring program requirements is also essential. Mentoring in Missouri became a formal requirement for all public schools in the state, starting with the Mentor Standards added to the Code of State Regulations in 2008 (Missouri, 2019). The State of Missouri Department of Education created the

Beginning Teacher Assistance Program (BTAP) requirements, a two-year mentoring and induction program required for all novice educators in Missouri as part of their teacher certification requirements. The BTAP teacher induction program requires schools to provide overviews of four specific educational-related topics and participation in a two-year mentoring program and individual growth plans for each new teacher. The topics include classroom environment overview, student engagement and motivation, professional communication, and education law (Missouri, 2019).

Mentoring Standards in Missouri

The State of Missouri developed mentoring standards required for this program and designed to provide a baseline common objective to ensure that the induction process's mentoring component is useful and valuable to a novice teacher. The mentoring standards in Missouri require seven key components. The first component is an introduction to the cultural environment of the district, school, and community. The second component establishes a process for review and evaluation of the mentoring program's overall effectiveness. The third component is an individualized two-year growth plan for beginning educators that aligns with the school district's goals and needs and provides observations and structured professional development opportunities. The fourth component establishes mentor selection and support criteria with minimum experience, knowledge, and personal skills requirements. The fifth component establishes the requirement for mentor training and support that provides the mentor with the necessary training and resources for success. The sixth component is a complete list of responsibilities for the mentor, mentee, and school administrators. The seventh component establishes recommendations for observations and the minimum time

requirements for master educator observations (Missouri, 2019). These standards provide a foundation for school-based programs that generally align with best practices.

Missouri Mentoring and Induction Success

In examining the success of the current Missouri BTAP program, a search for literature from 2008 to the present was performed to locate studies that evaluated the Missouri BTAP program in its current form. The databases used were ERIC, Academic search complete, Google Scholar, and ProQuest. In these searches, the keywords of *Missouri*, *BTAP*, *evaluation*, *teacher*, *mentoring*, *effective*, *success*, and *quality* were used in different combinations to locate related literature. The resulting literature discovered through this search was very sparse. Although no peer-reviewed journal articles related directly to evaluating the Missouri mentoring program's success were found, three dissertations that evaluated the Missouri BTAP program to some degree were located and examined during the search. The three dissertations' findings were generally positive about the state program, the requirements, and the program's effectiveness; however, all three scholars mentioned inconsistencies in the implementation and management as a negative aspect (Boyer, 2017; Ciolek, 2017, St. Pierre, 2008).

The difficulty of having a single evaluation of the Missouri BTAP program as a whole could be attributed to the variability allowed in creating the programs in educational organizations. The Missouri Department of Elementary and Secondary Education defines only the minimum requirements for the BTAP program and the associated mentoring practices. The requirements discussed previously are established in the literature as acceptable practices in mentoring and induction programs (California, 2016; Ingersoll & Strong, 2011; The New Teacher Center, 2016). Additionally, many

organizations go beyond the minimal requirements in their implementation of the program. These actions discouraged any need to research the program and its iterations across the state as a whole. Additionally, in the studies examined, the researchers mentioned the difficulty in getting district participation because of the time taken from the mentors and mentees (Ciolek, 2017).

The New Teacher Center (2016), a national non-profit organization dedicated to improving student learning, developed a report on teacher induction across the nation. Missouri's teacher induction policies were reviewed, and several areas of strength were highlighted regarding current requirements and recommendations for teacher mentoring. Notably, Missouri requires teachers to receive induction support for the first two years in the profession in the form of a teacher-driven mentor program. The state's Department of Elementary and Secondary Education has also developed formal program standards in Missouri. Additionally, the state criteria include a minimum requirement of experience in the profession to be eligible to mentor new teachers and minimal time and observation requirements for mentoring with a policy that protects mentors from additional duties (New Teacher Center, 2016). The report lists two areas of needed improvement: dedicated state funding for mentoring programs and more program accountability (New Teacher Center, 2016).

Mentor Knowledge of Practice

On average, beginning teachers are less effective than more experienced teachers (Hanushek et al., 2005). Novice teachers work with a mentor expecting that the mentor will know how to guide them in the profession, but more importantly, they will know how to guide them to do things correctly (Playko, 1990). One of the critical areas in

which a mentor can influence a new teacher is the teacher's professional knowledge of teaching practices. Improving teacher practice aligns with the idea of mentoring as an apprenticeship process, where novice teachers are guided to develop professional knowledge by experienced teachers (Hobson & Malderez, 2013; Wang & Odell, 2007). Mishra and Koehler (2006) created a model that divides teacher knowledge of practice into three overlapping knowledge domains of technology, pedagogy, and content knowledge (TPACK). The TPACK model can be used to articulate instructional strategies and develop teacher knowledge.

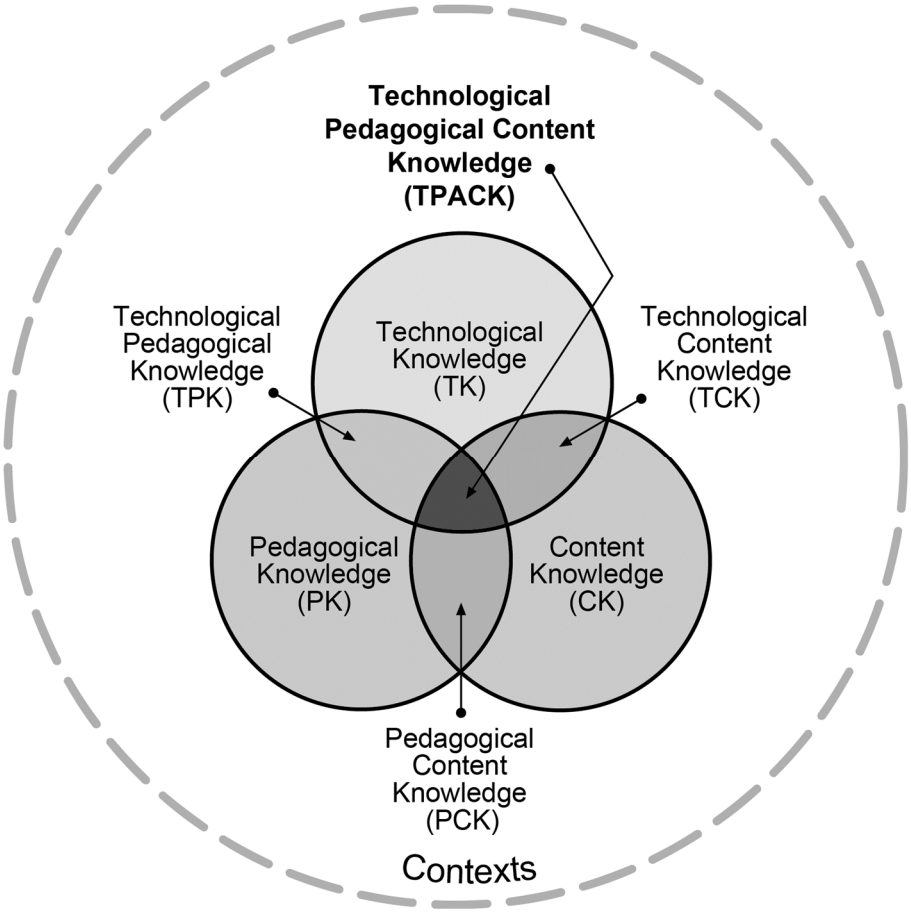
TPACK

Technology has the potential to change the learning and teaching process fundamentally. However, researchers have shown that most instructional technology uses by teachers are very limited in scope, variety, and depth, with most uses being aids to efficiency and not transformational learning tools (McCormick & Scrimshaw, 2001). Researchers better understand improving classroom technology use by studying the kinds of knowledge teachers need for effective instruction. For example, Shulman (1986) developed the idea that teachers need knowledge in two specific knowledge domains to be competent: pedagogy and content knowledge. This idea became the pedagogical content knowledge (PCK) model, a model of "the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction" (Shulman, 1986, p. 8). The primary idea of PCK is the need for a teacher to know effective instructional techniques and strategies and a deep understanding of the

content being taught, which together lead to effective instructional methods to deliver the specific content.

Figure 2.1

TPACK Framework



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The idea of Shulman's PCK was extended by Mirsha and Koehler (2006) to additionally consider an instructor's knowledge of technology and how it can influence effective teaching in the modern classroom. A teacher's combined understanding and experience was termed the technology, pedagogy, and content knowledge framework, or the TPACK framework. TPACK is the interaction of the three guiding knowledge domains that help decide how to teach, what to teach, when to teach, and how technology

can help accomplish these tasks. TPACK "involves asking how technology can support and expand effective learning and teaching within the discipline, while simultaneously adjusting to the changes in content and pedagogy that technology by its very nature brings about" (Swenson, Rozema, Young, McGrail, & Whitin, 2005, p. 222). Figure 2.1 depicts the idea of TPACK and the interactions each knowledge domain has with each other in this framework. Each of these knowledge domains and hybrid knowledge domains is explained in further detail.

Pedagogical Knowledge

Pedagogical knowledge (PK) is an educator's deep understanding of the practices, processes, and learning and teaching methods. PK includes understanding the reasons behind education and instructional practices, assessment and evaluation, and student learning (Koehler & Mishra, 2006). Pedagogical knowledge is defined as "the application of pedagogical strategies not specific to instructional technology like scaffolding, motivating students, and checking for understanding" (Angeli & Valanides, 2005, p. 294). It is the ability, skill set, and knowledge to teach others.

Content Knowledge

Content knowledge (CK) is understanding a specific field, subject, or topics such as math, language arts, art, or chemistry. Koehler and colleagues (2013) define CK as "knowledge about the subject matter being learned or taught" (p. 14), whereas Shulman (1986) describes CK as "the amount and organization of knowledge per se in the mind of the teacher" (p. 9). Thus, CK is understanding the history, theories, frameworks, ideas, and content development in a specific subject area. Further, Shulman (1986) suggests that established practices and approaches in developing the content ideas, how it is related,

and why it is worth knowing should be included in this domain. In most instruction settings, the CK is the subject matter knowledge that a teacher is responsible for teaching.

Technology Knowledge

Technology knowledge (TK) is challenging to define as knowledge in this domain because it continuously changes rapidly, especially compared to the two other primary TPACK model domains (Koehler et al., 2013). Some scholars would consider understanding technologies such as computers, the Internet, and digital video as technology knowledge. Previously, rudimentary technology like chalkboards, typewriters, overhead projectors, and books could have fallen into this knowledge domain (Koehler & Mishra, 2006). Alternately, Angeli and Valanides (2005) define knowledge of instructional technology as "knowledge of the hardware and ability to troubleshoot it when technical issues arise" (p. 294), while Koehler and colleagues (2013) suggest the TK domain as being closely related to the fluency of information technology (FITness) framework. This framework suggests that *FITness* goes beyond simple technology literacy. There must be a broad understanding of the application of technology in work and life and how it can be used to adapt, assist, or impede in actions towards goals (National, 1999). TK is the understanding of using a dynamic and evolving set of tools or technologies to accomplish desired tasks.

Pedagogical Content Knowledge

Pedagogical content knowledge (PCK) is the intersection of pedagogical knowledge and content knowledge, which means different things to scholars. For example, Koehler and Mishra (2006) propose that it is knowledge of pedagogy that is applied to a specific subject area or the understanding and experience of teaching certain

content. Knowledge of developed instructional methods to teach specific content, experience knowing the challenges different content can present, and understanding a learner's possible preconceived notions and misconceptions regarding a specific content area fall into this idea domain. Alternately, Shulman (1986) describes PCK as “an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction” (p. 8).

Expertise in PCK involves more than problem-solving skills and knowledge of the subject (Bransford, Brown, & Cocking, 2000). There must also be a superior understanding of how the content relates to a student’s existing knowledge. Expert teachers differ from novice teachers because of their experience. Through diverse experiences, the teacher attains a deeper level of understanding and ability to use this understanding to create an appropriate learning experience for increased student learning. Further, Kennedy (1999) claims that teaching is a craft, not a science. Thus the "formal, propositional knowledge that is developed and taught in education programs do not, and cannot, contribute to the dynamic, situated, and idiosyncratic practices of teaching" (p. 41). A simplistic definition of PCK is the educator’s ability to teach specific material content.

Technological Pedagogical Knowledge

Technological pedagogical knowledge (TPK) is the intersection of technology knowledge and pedagogical knowledge. It is an understanding of how to use technology, in general, to teach effectively. It is critical to understand how learning and teaching transform when technology is used (Harris, Koehler, & Mishra, 2007). TPK includes

understanding how technology can support instructional goals and objectives (Koehler & Mishra, 2006, p. 4). Cox (2008) suggests that this knowledge includes understanding how online teaching is conducted and how learning management systems are used to facilitate a course. Further, Koehler and Mishra (2008) propose that creative flexibility in using technology-based learning tools and the ability to redefine how they are used in different applications is an essential part of TPK. Expert practitioners should "look beyond the immediate technology and 'reconfigure it' for their own pedagogical purposes" (Koehler & Mishra, 2008, p. 17). TPK is a general understanding of how technology can be used with instruction that requires flexible and creative thinking to improve student learning effectively.

Technological Content Knowledge

Technological content knowledge (TCK) is the intersection of technology knowledge and content knowledge. It is the "understanding of the manner in which technology and content influence and constrain one another" (Koehler et al., 2013, p. 16). Another perspective of TCK is described as "knowledge of how subject matter is transformed by the application of particular technology" (Koehler & Mishra, 2006, p. 4). Technology is tied to content ideas at times. One example is how computers have changed physics, mathematics, and statistical analysis through the sheer power computers provide for calculations and the ability to create simulations (Koehler et al., 2013). TCK also includes understanding how specific technologies are more appropriate to teach particular subject matters and content. The understanding of the appropriate technology is generally gained through teaching experience and experience and knowledge in the

content field. TCK is the knowledge of how technology and content are linked within the related subject area knowledge.

Technological Pedagogical Content Knowledge

Technological Pedagogical Content Knowledge (TPACK) is the knowledge at the intersection of the combined understanding of technology, pedagogy, and content knowledge and beyond any individual knowledge domain. Koehler and colleagues (2013) describe TPACK as “the basis of effective teaching with technology, requiring an understanding of the representation of concepts using technologies” and “pedagogical techniques that use technologies in constructive ways to teach content” (p. 16). TPACK is the understanding that begins with instructional thinking united with understanding about a content area and then combined with the knowledge of how technology can be used to support the instructional goals (Neiss et al., 2007). Koehler and Mishra (2006) claim that TPACK is "an understanding that emerges from an interaction of content, pedagogy, and technology knowledge" (p. 17), while Margerum-Leyes and Marx (2004) assert that TPACK is "knowledge of appropriate instructional strategies specific to the implementation of technology-enhanced learning activities" (p. 433). Expert teachers with a high level of TPACK are those with vast knowledge of the three domains of technology, pedagogy, and content that can flexibly integrate these domains to develop combined solutions for effective learning and teaching.

Universal Theory of Acceptance and Use of Technology

A goal of modern education is to prepare students for life in a digital world, and thus, this goal requires the appropriate use of technology in the classroom. The use of technology in the classroom depends significantly on how much a teacher accepts it as an

instructional tool and learning opportunity. One way to examine the teacher's acceptance of technology is using the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). UTAUT can be applied to how teachers accept and use a given technology and how that technology can be applied to teachers' use of instructional technologies. The foundation of this theory is the Technology Acceptance Model (TAM) (Davis, 1989). This model specifies casual relationships among external variables, beliefs, and actual usage behavior (Hubona & Kennick, 1996). Teacher technology acceptance can have an impact on successful student technology use. Various iterations of the TAM improve upon the original by combining with other models or adding additional considerations to the originating model. The most recent and advanced model is UTAUT (Venkatesh et al., 2003).

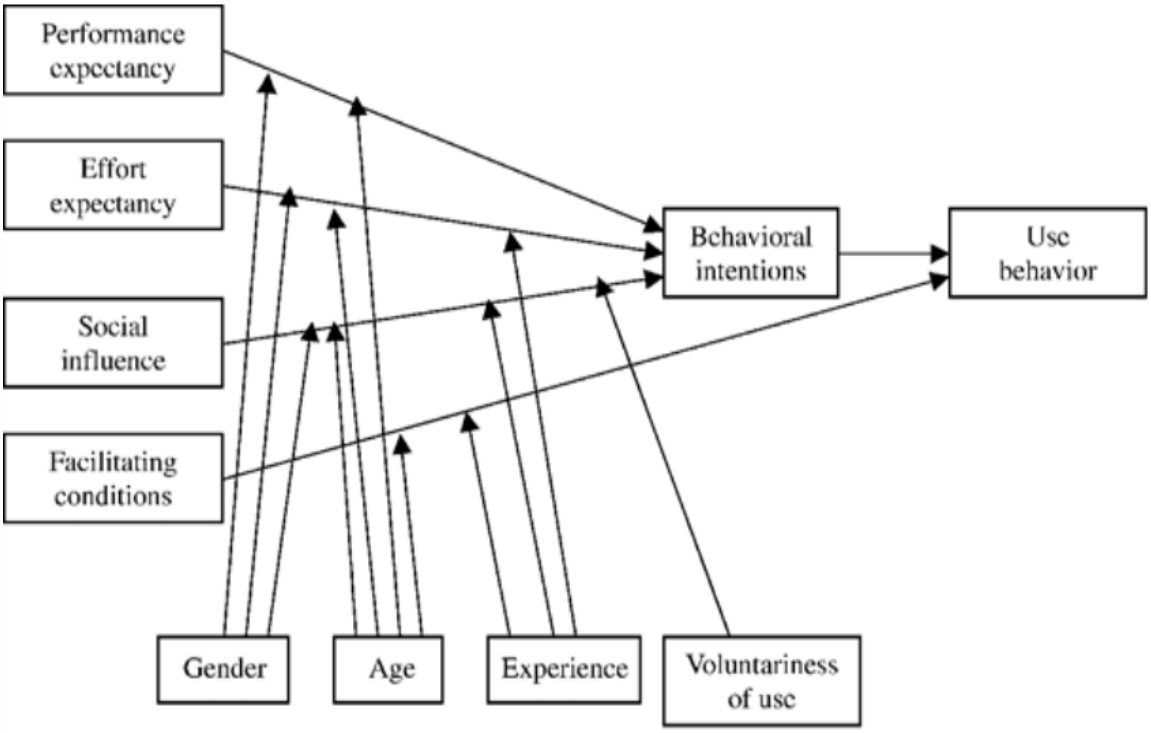
Beliefs about the intention to perform a behavior originate through various sources, such as education, prior cultural and social experiences, and personality (Fishbein & Ajzen, 2011). These collective beliefs are the deciding factor on whether an individual intends to perform a particular behavior or not. The foundational idea of UTAUT is how several factors can be combined to predict an individual's acceptance of technology and therefore use of technology based on their beliefs (Venkatesh et al., 2003).

The UTAUT model was developed by Venkatesh and colleagues (2003) and is based on social cognitive theory and the combination of eight technology acceptance models. It has been depicted in Figure 2.2. According to Venkatesh et al. (2003), the goal of integrating these models was to combine the most critical factors that lead to behavioral intention as the key-dependent variables. The foundational models for

UTAUT are the Theory of Reasoned Action (TRA), The Theory of Planned Behavior (TPB), The Technology Acceptance Model (TAM), The Motivational Model (MM), The Combinational Theory of Technology Acceptance Model and the Theory of Planned Behavior (C-TAM-TPB), The Model of PC Utilization (MPCU), The Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). By combining these theories, the UTAUT model has been proven to outperform all of the foundational theories it was built upon (Vankatesh et al., 2003).

Figure 2.2

UTAUT Diagram



Note. Adapted from Vankatesh et al. (2003).

The UTAUT model has several factors that contribute to the acceptance and use of a technology system. These constructs are performance expectancy, effort expectancy, social factors, and facilitating conditions. The first three concepts of performance

expectancy, effort expectancy, and social factors directly affect behavioral intention. Behavioral intention, along with facilitating conditions, results in actual use. Additionally, gender, age, experience, and voluntariness of use are moderating variables that indirectly influence the four main concepts. The behavioral intentions formed by its three inputs and the facilitating conditions are the critical factors in the acceptance of technology use. At different stages in the teacher lifecycle, these influences can change or become more powerful. Additionally, age and experience will play a significant factor in behaviors, beliefs, and uses (Vankatesh et al., 2003).

UTAUT Foundations

This section of the literature review briefly describes each foundational theory used to develop the UTAUT model. It also identifies the contributing ideas from each that were combined to form the UTAUT model. This section provides a deeper understanding of the UTAUT model's parts that converge as a comprehensive theory to predict user acceptance of technology.

Technology Acceptance Model (TAM). In 1989, Davis introduced his technology acceptance model used to determine the behavioral intention of using technology and attitudes related to technology. TAM is based on TRA's foundational ideas but removes the attitude construct and instead uses the constructs of perceived usefulness and ease of use. It has been used to predict the technology used in many fields, including educational fields (Teo, 2011). This model suggests that for someone to adopt a technology, the determining factor was their intention to use it, which was also influenced by their attitude regarding that specific technological innovation. The way a given technology was perceived as easy to use or valuable was influenced by a person’s

attitude towards using it (Davis, 1989). TAM is a commonly used model in the instructional technology field, and it has played an integral part in the development of the UTAUT framework. It is the basis for the foundational idea of UTAUT (Venkatesh et al., 2003).

Theory of Reasoned Action (TRA). Many instructional technology theories and behavioral intention models trace their origins to Fishbein and Ajzen's (1974) theory of reasoned action (TRA). This theory was developed to understand human behavior in different situations. The primary assumption of this theory is that humans have intelligence, and for that reason, they make intelligent decisions based on the information available (Yuen & Ma, 2008). The TRA suggests that behavioral intention to act builds from the attitude about that behavior and social influences. The behavioral intention to act leads directly to actual behavior (Fishbein & Ajzen, 1974). Attitude in this model is the positive or negative judgment of behavior. The subjective norm is the perceived social influence that may pressure the individual to perform a specific behavior (Ajzen, 1991). Technology adoption and use can be considered with the theory of reasoned action. Technology users base their decisions on the two critical aspects of attitude towards behavior and subjective norms. UTAUT uses attitude concerning technology use as one of the foundational concepts.

Theory of Planned Behavior (TPB). The Theory of Planned Behavior builds on and is an extension of the TRA. TPB adds the idea of perceived behavioral control to the TRA model (Venkatesh et al., 2003). Perceived behavioral control is the perceived ease or difficulty of performing a behavior (Ajzen, 1991). Behavioral control parallels the concept of self-efficacy from Bandura's (2012) social cognitive theory. The TPB states

that intention toward behavior, subjective norms, and perceived behavioral control shape an individual's behavioral intentions and behaviors. Nearly all theoretical constructs and models related to behavior prediction have been built upon the foundations established by TPB and TRA (Sadaf, Newby, & Ertmer, 2016). UTAUT incorporates the three main factors of the TPB model that impact behavioral intentions.

Motivational Model (MM). The Motivational Model was developed to understand better the factors that influenced the acceptance and usage of computers in the workplace (Davis, Bagozzi, & Warshaw 1989). The MM model uses extrinsic and intrinsic motivation as the two key contributing factors in predicting behavioral intention and action. A large body of research supports the use of motivation as a factor in psychology (Venkatesh et al., 2003). Davis and colleagues (1992) explained intrinsic motivation to be driven by an individual's satisfaction, attraction, and pleasure in carrying out a particular activity. Additionally, extrinsic motivation is the drive to carry out a given activity with the idea that it will result in rewards such as increased pay or promotion. MM theory suggests that intrinsic and extrinsic motivation create influences on intentions and actual performance of an activity. In the UTAUT model, performance expectancy is driven by extrinsic motivation, while intrinsic motivation is a lesser influencer in the model.

Combined Technology Acceptance Model and the Theory of Planned Behavior (C-TAM -TPB). The C- TAM-TPB model is another theory that is used as a foundation of the UTAUT model. This theory was developed by Taylor and Todd (1995) as a way to evaluate the predictive power of combining both TPB and TAM. This model combines the TAM and TPB models and the significant constructs of attitude toward

behavior, subjective norms, perceived behavioral control, behavioral intention, and actual behavior adapted from the TRA and TPB models. The remaining constructs of perceived usefulness and ease of use were adapted from TAM. These models are often combined to evaluate both models' variables and determine the most powerful constructs in a study (Taylor & Todd, 1995). Because this model is built off two other models included in the development, this model contributes a number of the constructs to UTAUT.

Model of PC Utilization (MPCU). MPCU was developed by Thompson, Higgins, and Howell (1991) as an alternative to the TRA and TPB models. The primary purpose of MPCU was to predict computer use in an organization based on personal and organizational factors (Thompson et al., 1991). This model focuses on actual use more than behavioral intention (Venkatesh et al., 2003). Six primary constructs are used in the MPCU model to determine computer usage. These constructs are social factors, complexity, affect towards use, job fit, long-term consequences, and facilitating conditions. The MPCU model has been successful in predicting computer usage based on these constructs (Thompson et al., 1991). From this model, two of the core constructs of the UTAUT model, social influence and facilitating conditions, were taken from MPCU.

Innovation Diffusion Theory (IDT). The diffusion of innovation model was developed by Everett Rogers, a sociologist who wrote the book *Diffusion of Innovation* (Brancheau & Wetherbe, 1990). Rogers (2003) suggests diffusion innovation as a process to explore how new ideas are adopted in a social system over time among its members. This theory also explains the rate at which new ideas are spread through a society (Sevcik, 2004). According to Oliveira and Martins (2011), the innovation diffusion theory is the most used in evaluating technologies because it produces many practical

outcomes applicable to the study of technology evaluation, its acceptance, and realization in organizations. Oliveira and Martins (2011) also noted multiple reasons that assist or prevent technology acceptance in this theory. These reasons include the uniqueness of the technology and the adopters, how the adopters learn about the technology, and whether it is persuasive enough. Researchers from various disciplines have used the model and have found it beneficial in explaining the process of innovation adoption (Drape, Westfall-Rudd, Doak, Guthrie, & Mykerezi, 2013; Peres, Muller & Mahajan, 2010). Therefore, Roger's (2003) theory was developed in a broad-based framework of innovations of all kinds, not only for disciplines like technology and education.

The IDT model was built into the UTAUT model (Venkatesh et al., 2003). The IDT model centered on gauging the opinions of the adopters of innovations. The model validated by Moore and Benbasat (1991) had seven constructs, five of which originated from IDT. These constructs consisted of relative advantage, ease of use, image, visibility, compatibility, results demonstrability, and voluntariness of use. Several studies validated the IDT model's predictive ability, including Venkatesh et al. (2003), who chose the IDT set of variables to develop the UTAUT model.

Social Cognitive Theory (SCT). The SCT model, first developed by Bandura (1986) in the 1960s and linked to social psychology, was later integrated into the framework of computer use by Campeau and Higgins (1995). These researchers studied the association between computer self-efficacy and the environment to influence information technology usage. The main determinants of this model are personal, behavioral, and environmental. Their main research objective was to examine how an individual's beliefs influenced their capabilities and confidence to use computers. An

idea termed computer self-efficacy. People with high levels of self-efficacy establish challenging goals for themselves, are confident in their ability to recover from failures, and generally have lower stress levels (Bandura, 2012).

Compeau and Higgins (1995) created three critical dimensions in the context of computer self-efficacy: magnitude, strength, and generalizability. The magnitude of computer self-efficacy describes the level of computer capability. An individual with a high level of computer self-efficacy should be able to mitigate more challenging tasks using computers than those with a lower level of computer self-efficacy. The strength of computer self-efficacy refers to the power of conviction towards the belief of the individual's computer use or the level of confidence an individual has regarding their ability to perform various computer-related tasks. The generalizability of computer self-efficacy is the degree to which an individual is comfortable with broad computer-related tasks. Individuals with high computer self-efficacy generalizability are expected to be more flexible in using various technology and more comfortable with a broad range of technology than those with lower computer self-efficacy generalizability (Compeau and Higgins, 1995). Performance expectations and self-efficacy are taken from this model and are built into the UTAUT model (Venkatesh et al., 2003).

Self-Efficacy and Technology Acceptance. Self-efficacy is the belief a person has in their ability to execute a particular task or behavior (Bandura, 1986). Computer self-efficacy (CSE) measures a person's confidence in the effective use of technology (Compeau & Higgings, 1995). An individual with a high CSE has confidence in their ability to be successful in using the technology. An individual with low CSE does not have confidence in using technology and believes they will have difficulty using it

independently (Lai, 2008). Downey (2006) and Strong, DiShaw, & Brady (2006) suggest an influence of CSE on the Technology Acceptance Model. According to technology acceptance theory, CSE will determine perceived ease of use with technology systems (Venkatesh & Davis, 1996). Increased CSE, in conjunction with a positive attitude towards technology use, can increase teacher technology acceptance and classroom technology usage (Delcourt & Kinzie, 1993). One method to increase teacher self-efficacy is through technology acceptance and increasing a teacher's computer self-efficacy.

The UTAUT model provides a framework that explains the acceptance of technology and explains the actual use of such technologies and systems. Due to the limitation of single technology acceptance models, researchers attempt to merge multiple theories to examine the phenomenon of technology acceptance. The UTAUT model is one of the results of combining these technology acceptance models to create a comprehensive technology acceptance model that outperformed the individual parts. Because of its capability to integrate the different technology acceptance models, the UTAUT model contributes substantially to the exploration of technology acceptance and usage (Venkatesh et al., 2003). Therefore, this study used the UTAUT model as the theoretical basis to evaluate the mentor relationship's influences on classroom technology beliefs.

Table 2.1

Technology Acceptance Models

#	Model	Acronym	Summary
1	The Unified Theory of Acceptance and Use of Technology	UTAUT	The unified framework used to explain the use of technology
2	The Technology Acceptance Model	TAM	Usefulness and ease of use to predict how and when technology will be used. Most widely known technology acceptance and use model.
3	The Theory of Reasoned Action	TRA	Attitudes and behaviors to explain human actions.
4	The Theory of Planned Behavior	TPB	Attitude, norms, and control shape behavioral intentions Extrinsic and intrinsic motivation is used to predict behavioral intention and action.
5	The Motivational Model	MM	Usefulness and ease of use to predict how and when technology will be used. Most widely known technology acceptance and use model.
6	The combinational theory of Technology Acceptance Model and the Theory of Planned Behavior	C-TAM-TPB	Combines TAM and TPB to predict behavior intention
7	The model of PC Utilization	MPCU	Predicts computer use in an organization based on personal and organizational factors
8	The Innovation Diffusion Theory	IDT	Model to explain how, why, and at what rate new ideas and technology spread
9	Social Cognitive Theory	SCT	Computer self-efficacy and the environment to predict information technology usage

Note: The eight models listed combined create the foundations of the UTAUT model

Conceptual Framework

Several concepts converge to create the conceptual idea encompassing this study. These concepts include the idea of the teacher lifecycle, teacher induction, teacher mentoring, instructional TPACK, and technology acceptance theories. Describing how these concepts relate to each other in this study will be the focus of this section of the literature review.

Novice Teacher

Although teachers learn new teaching methods, techniques, and strategies throughout their careers, the foundation is often built during their first few years in the profession for many teachers. The beginning years in the teacher lifecycle have been referred to as the *novice* stage (Berliner, 1994), the *apprentice* stage (Steffy, Wolfe, Pasach, & Enz, 2000), or the *induction* stage (Fessler & Christensen, 1992). Although these first years are termed differently by experts in the field to emphasize their unique definitions, they similarly define this period. First, this stage is the start of a teacher's professional career, and the teachers are responsible for developing their instruction. Second, teachers in this stage lack confidence and are primarily focusing on survival in the profession. Finally, teachers in this stage teach by using trial and error, seeking advice from peers, and imitating their teachers or other expert teachers. Teachers at this point in their careers are in the novice phase of the teaching lifecycle.

Teacher Induction

Teachers typically participate in a formal induction process during the initial teaching stage to acclimate them to an educational organization's social and professional aspects. Induction is defined as "a program-level support that spans all the roles and

responsibilities teachers fulfill and can be used to improve their effectiveness in serving students" (American Institutes, 2015, p. 1). Mentoring is one strategy typically used in teacher induction. A veteran teacher in the organization is matched with a novice teacher to help provide an avenue for support and guidance to the new teacher (Beginning Teacher, 2017).

Mentoring

The mentoring process is considered critical in preparing beginning teachers for a profession that requires professional knowledge that is learned while on the job. Teacher quality is one of the strongest influences on positive student outcomes (Hattie, 2003). Mentoring is one of the most successful strategies to improve beginning teacher quality and the performance of teachers and their learners (American Institutes, 2019). During the induction period, Novice teachers develop their foundational teaching practices and can rely heavily on the established best practices shared by their mentor. Borko (1986) stressed the importance of this critical time for professional development in teacher education because the established patterns and attitudes may last throughout the teacher's career. Establishing the novice teacher with solid instructional practices can provide an advantage to the novice teacher as they move through the subsequent phases in the teacher life cycle. In these later stages, the teacher who has established competency and confidence will generally have greater teacher efficacy and focus more on excelling through improving their practice rather than merely surviving (Fessler & Christensen, 1992).

TPACK

Teachers must be aware of the growth of pedagogical techniques by using technology to align with current understandings of learning and teaching and information technology capabilities (Lei, 2009). Educational leaders need to understand the best ways to disseminate and transform these understandings into effective classroom use (Stansbury & Zimmerman, 2000). Through the mentoring process, the novice teacher's instructional practices are influenced in one or more of the three domains: pedagogical knowledge, content knowledge, or technological knowledge. Shulman (1986) described early teacher education as focusing on content knowledge or expertise in a specific content field such as mathematics or science. He further describes a shift in teacher preparation in the mid-20th century, which moved the focus of teacher preparation from content to pedagogy, or the method and practice of teaching. However, Shulman advocated for content knowledge expertise in teacher preparation, but not at the cost of losing pedagogical understanding. This readjusted focus led to a change in teacher preparation programs in developing what has been termed pedagogical content knowledge (PCK). However, unforeseen by Shulman was the rapid adoption of technology use in the classroom, which led to the addition of a third knowledge domain of technology to his model. This addition created the TPACK model credited to Mishra and Koehler (2006). The TPACK model extends the PCK model to add technology's interaction with pedagogy, content, and pedagogical content. The TPACK model can be used to articulate instructional strategies and develop teacher knowledge with the infusion of technology.

Acceptance and Use of Technology

Teacher acceptance of technology use in the classroom is vital for successfully implementing technology within an educational setting. The unified theory of acceptance and use of technology (UTAUT), a theory developed by Vankatesch and colleagues (2003), is a model that explains intentions to use technology. This theory can be applied to instructional technology to explain teacher intent in their instructional practice. It is based on social cognitive theory and a combination of eight technology acceptance models. The UTAUT model has been proven to outperform all of the foundational theories upon which it was built. Factors in the TPACK model show a correlational influence on the critical constructs of UTAUT (Cheung et al., 2016). This model will serve as the overarching conceptual model for this study on the acceptance of classroom technology use.

Gap in the Literature

After a comprehensive review of the literature related to mentoring and induction programs considering the transference of technical knowledge related to teaching practice, there appears to be a gap in the literature that has not been fully explored. Three domains of literature are integrated into this study on mentoring and teacher induction. The first domain, teacher mentoring and induction, is the chief domain for the study. This domain is combined with the domains of TPACK and technology acceptance to form the basis of this study, examining the influence of mentoring on technology knowledge transferred through this relationship. Mentoring and teacher induction are well-known areas of study, and research on this subject is vast (American Institutes, 2015). Research on the comparatively newer field of technology acceptance is less established yet plentiful (Vankatesch et al., 2003)

and the newer research on TPACK (Mishra & Koehler, 2006). However, research of the three domains together is not well established.

In the modern K-12 classroom, technology use is in demand by local community residents, school board members, and educational administrators. Because these demands often force teachers who are uncomfortable with or lack knowledge about integrating technology into their instructional practices, many are either minimally compliant or outright defiant (Compeau & Higgins, 1995). Teacher mentoring programs have a general goal of increasing new teacher efficacy (Wechsler et al., 2010), and teacher efficacy can be impacted by the extent to which teachers are using technology effectively (Abbitt, 2011; Abbitt & Klett, 2007; Bandura, 2012; Bull, 2009). However, literature examining teacher technology acceptance and use transferred through the mentoring relationship is scarce or not well understood.

An assumption framing this study is that a mentor with powerful beliefs about the importance of technology use in the classroom and extensive experience with classroom technology use would positively influence a new teacher and thus impact their beliefs and actual use of instructional technology. Additionally, it appears logical that a mentor adverse to using technology for instructional purposes may discourage innovative technology infusion into traditional teaching methods. There is also the reciprocal aspect of the relationship with the mentee, similarly impacting the mentor's technology use beliefs. This study examines the influence of the mentoring relationship on instructional technology beliefs and how different mentoring activities may play a part in this influence.

Summary

This literature review focused on the literature regarding teacher induction and mentoring. The concepts were described by sharing the historical development of the mentoring and induction concepts as well as defining the mentor role. The formal and informal aspects of the mentoring relationships were explored along with the essential characteristics in mentor selection. Next, the mentee's role was examined, focusing on the struggles and needs as well as the potential supports available through mentoring programs. Additionally, the specific history, standards, and requirements of mentoring programs in Missouri were described with an investigation into Missouri's success. The literature review ends with a short introduction to the idea of the transfer of a mentor's knowledge of teaching practices specific to instructional technology. These topics were then linked together with ideas on teacher life cycle, TPACK, and technology acceptance theory to form the study's conceptual framework. Very few studies have been performed examining this area of mentoring research. The purpose of this study is to understand better mentoring regarding the influence on technology beliefs and its impact on beginning teachers. The next chapter explains the methodology to be used to conduct this study.

CHAPTER 3

METHODOLOGY

The purpose of this research was to examine the relationship between formal teacher mentors and their mentees and the influence this relationship had on classroom technology use for both the mentor and mentee during the first two years of the mentee's professional career. Additionally, this study was conducted during the global COVID-19 pandemic of 2020 and thus explored the related innovations and struggles during this time period. This chapter presents the research methodology and aspects of design for the research study.

Research Questions

The primary question driving this study was: *How does the teacher mentoring relationship influence mentor and mentee teacher beliefs on classroom technology use?* The purpose of this question was to understand how this relationship encourages or discourages classroom technology use and in what ways that is evident. A secondary question was developed as a result of the study being conducted during the global COVID-19 pandemic: *In what ways has the global pandemic influenced teacher technology adoption through formal mentoring programs?* Four guiding questions assisted me in answering the overarching research question:

1. What are the characteristics of the mentor-mentee pair that produce a high-functioning relationship for knowledge transfer?
2. What are the practices of the mentor-mentee pair that hinder the development of a high-functioning relationship for knowledge transfer?

3. What practices and experiences encourage the transfer of technology knowledge between the mentor and mentee?
4. When is the most effective time for providing early career teachers with mentoring in the use of instructional technology?

This chapter presents the study's methodology, describes how data were analyzed, and what strategies were used. It starts with a description of the research design. The chapter then continues with a narrative of the research setting and context, followed by a description of the sample and data sources. Next, the chapter explores the instrumentation used and the data collection and then discusses the data analysis used in this study. The chapter concludes with an examination of the role of the researcher in this study.

Research Design

The design intended to gain an understanding of the mentoring relationship and to answer the research questions guiding this study. This two-phased, multiple-case study examined this relationship through individual and focus-group interviews. The unit of analysis framing the case defined the boundaries to focus on the cases included in the study. The text below also presents literature on case study design to support the reasoning for the design choices made.

Case Study

A qualitative approach is the most appropriate examination method to explore the mentoring relationship (Creswell, 2007; Stake, 1995; Miles & Huberman, 1994; Yin, 2014). The case study method is one of the most common qualitative methods used in educational research because of the complex and unique nature of schools, learning, and

teaching. This research used a case study design because it is the most appropriate methodology for the examined phenomena.

Multiple Embedded Case Study

Case studies can focus on a single unit of analysis or compare multiple units of analysis (Merriam, 2009; Stake, 1995; Yin, 2014). A multiple case study consists of data gathering and analysis using several cases simultaneously or sequentially in an attempt to generate a greater understanding of the specific issue (Stake, 1995; Yin, 2014). This study used a multiple embedded case study approach, as described by Yin (2014), because of the numerous mentoring pairs that served as the units of analysis. Multiple cases enable the researcher to substantiate, elaborate, and connect findings that may not be visible when data are examined as a single case. Additionally, an embedded case provides a method that allows the replication of findings over multiple cases to increase confidence in the robustness of the findings (Miles & Huberman, 1994; Yin, 2014). The embedded case study was used with the embedded subunits consisting of the mentor and mentee pair described in the unit of analysis.

Unit of Analysis

In case study research, the definition of the case is the unit of analysis. The unit of analysis is one of the foundations of the method. A complete and well-defined description of a case is required for success. Hence, this study's unit of analysis and bounded system were the mentoring dyad of a mentor and mentee and the relationship established through a formal teacher-mentoring program at a Missouri public school district for the 2020-2021 school year. The mentoring dyads included multiple pairs with mentees in the first and second years of their professional teaching career. The choice for the unit of analysis

described in this study sought to answer the research questions. The definition of the unit of analysis was informed by the ideas developed by the prominent case study researchers (Creswell, 2007; Stake, 1995; Miles & Huberman, 1994; Yin, 2014). The unit of analysis was designed, as Stake (1995) would suggest, "to maximize what we can learn" (p. 4) from this research study.

Research Setting and Sample

This study examined the mentor and mentee relationship among novice teachers and their respective mentors in a K-12 Missouri public school district with a formal mentoring program. The study used a convenience sample with a population of 26 mentor-mentee pairs or 52 teachers eligible to volunteer to participate. This study had 16 teacher volunteers total. All participants were Missouri certified teachers for students ranging from Kindergarten to Grade 12 and multiple subject areas. The novice teacher participants were sought first. After gathering the novice teacher volunteers for this study, the assigned mentors were recruited. Mentors were already matched with mentees in the district loosely based on work location, students' age, and subject or discipline taught. Because participant recruitment began with mentee volunteers, more rigorous and thorough recruiting for mentors in the study was needed to form mentoring pairs. Strategies used to increase participation included school district leadership encouragement for participation as well as follow-up invites, personal phone calls, and requests from mentee teacher volunteers by the researcher to gain mentors' participation.

Data Collection

This study used two different methods and phases for data collection that included two qualitative approaches for the study. Multiple procedures were used to build an in-

depth description of each case (Creswell, 2007). The multiple collections of differing data were used for triangulation to corroborate data to improve the study results (Denzin, 1978; Yin, 2014). The data collection timeline is shared in table 3.1.

The first data collection strategy was face-to-face semi-structured interviews conducted at the end of the study's established period or near the end of the mentee teachers' first or second school year. Kvale (2008) perceives that the interview instrument gathers data on the participant's previous year or years of teaching. The goal in conducting interviews was to gather opinions, beliefs, personal feelings, and experiences regarding instructional technology use and the mentoring relationship. Additionally, the interviews sought to determine what changes in instruction and mentoring happened in response to the global pandemic, if those changes were attributed to the mentoring relationship, and the value or applicability of these changes for future and continued use.

The interview script was built on 11 general guiding questions (see Appendix B). The draft questions were refined and consolidated based on peer examination of the initial interview questions before application to assure relevance, reduce redundancy, and support time constraints. Additionally, some questions were merged by topic with prompts created for similar subtopics. A pretest of the interview protocol with a knowledgeable peer was utilized to gauge the time requirements, improve the interview instrument's timing, and test the interview questions' ability to solicit the intended desired data. Additionally, a cognitive interview (Desimone & Floch, 2004) with a peer that is considered an expert in instructional technology and mentoring practices was used to improve the interview questions. Notably, some wording in the interview questions was changed to improve the clarity of the sought information. Some additional prompts were

created to help gain more specific information to the research questions and provide a better understanding of the questions.

The 60-minute interviews were conducted via the Zoom video conference tool either in the teacher's classroom or in another location chosen by the participant to assure the teacher felt comfortable and to elicit relevant information. Additionally, the interviews were conducted after school or during the teachers' planning periods to ensure multiple opportunities for participation. The interviews were electronically recorded and transcribed for analysis, and I transcribed the field notes and memos (Given, 2008) after each interview. Data collected after both interview rounds were shared with participants to confirm the accuracy of the information and thus improve the study's validity.

Table 3.1

Timeline of the Data Collection

Order	Time	Event
1	April 12	Study participants were sent the invitation
2	April 17	Individual interviews started
3	May 24	Individual participant interviews ended
4	May 31	Focus-group interviews started
5	June 7	Focus-group and data collection ended

The definitive source for data was gathered via 60-minute focus-group interviews conducted via the Zoom video conference tool. Focus-group interviews allow group participants to interact and connect ideas collaboratively, which often clarified information gathered earlier in the study (Onwuegbuzie, Dickinson, Leech, & Zoran, 2009). These focus group interviews were organized into mentor and mentee groups to

enhance opportunities for group interaction that clarify ideas found in the initial interviews. The focus group interview protocol (see Appendix C) was developed after the initial data gathering and analysis of survey responses and individual interviews. These focus-group interviews collected more in-depth, explanatory information for the study that clarified data previously gathered or revealed potential data triangulation trends.

Institutional Review Board

The University of Kentucky research study guidelines were followed, and Institutional Research Board (IRB) approval (see Appendix A: IRB Approval) was received before data collection began. The participants were informed of the goals, purpose, and procedures used during this study.

Data Collection Completion

Saturation is vital to researchers collecting qualitative data: A data saturation point indicates that further collection will gain no additional insight into the research being performed. “Data saturation is reached when there is enough information to replicate the study, when the ability to obtain no additional new information has been attained, and when further coding is no longer feasible” (Fusch & Ness, 2015, p.1). The inability to reach data saturation harms the validity of one’s research (Bowen 2008). Following four general principles can be used as a guide for saturation: (1) When no new data is collected, (2) when no new themes are found, (3) when no new coding is developed, and (4) when study replication is possible (Fusch & Ness, 2015). Additionally, data saturation can be thought of as thick and rich (Dibley, 2011). Data is considered *thick* when there is a considerable amount, and data is considered *rich* when it is deep, intricate, detailed, and nuanced. *Saturation* happens when data is thick and rich

(Fusch & Ness, 2015). This research study reached a state of data saturation as proven by the considerable detailed information collected, the ability for replication had been achieved, and the lack of an ability to gather any additional information, themes, or codes. Once data saturation was achieved, the research study progressed into the analysis phase.

Ethical Considerations

A few ethical considerations were necessary to assure the credibility of this study. The first was informed consent, one of the most powerful tools in ensuring respect for individuals during research. Many individuals believe informed consent is a simple form that participants sign, yet it is the basis of the researcher and participant relationship. This relationship is vital in getting participants to trust the researcher and share their honest thoughts on the research topic. This trust is vital when working with teachers in the early stages of a relationship with their more experienced peers. Building a level of trust to enable candid responses from both sides of the relationship was essential.

The second aspect was confidentiality. This study includes interviews with participants actively working in an educational organization. The information shared in the interviews may not be information the participants wish shared with their mentoring partner or school building evaluators and leaders. Respecting the confidentiality of the study participants was thus critical in establishing the needed trust for open responses. Additionally, it was imperative to share aggregated data and anonymize specific findings if study findings are shared with the organization or organizational leaders.

Finally, asking for feedback from participants about the data collected and gathering data that honestly represents what the teacher was sharing was essential to my understanding

of the relationship. Participant feedback helped to build the needed trusting relationship and invites the participants, as academics, to reflect and deeply and consider the information they are sharing for the study. It also allows the development of more robust data by linking ideas and further explaining thoughts. All of the ethical topics explored previously were considered in this study. However, informed consent, confidentiality, and feedback specifically stood out concerning this mentoring study's ethical considerations.

Data Organization

The ability to maintain a chain of evidence that enables another researcher to use the same data to reach similar conclusions is necessary in case study methodology (Yin 2014). The case study data in this study were organized into a manageable electronic data system based on organizational suggestions of Yin (2104) and Stake (1995). It was a database designed for quick and efficient retrieval. All data and analysis work were collected and electronically stored, backed up, and password protected on my computer. After interviews, all written notations or researcher reflections were scanned, organized, and stored by a naming scheme that included participant identifier, subject, and date. Additionally, during data analysis, documents were organized into an electronic folder system based on the thematic analysis as it unfolded in order to track and organize the analysis in progress. Creating this study database would allow other researchers to reconstruct this study.

Data Analysis

The purpose of data analysis is to “transform data into findings” (Patton 2002, p. 432) and allow the researcher to develop conclusions that strengthen the reliability of the study while keeping a robust chain of evidence (Yin, 2014). Case study research is a

flexible approach, and therefore, analysis can be conducted in diverse ways. Several different tools and strategies were used in this study to accomplish data analysis more effectively. Qualitative techniques were conducted by hand and through Dedoose, a research analysis software program. . One unique aspect of qualitative research, which is the primary method for this research study, is that analysis can be conducted simultaneously with data collection (Marriam, 2009). This characteristic adds flexibility to the study because the researcher gains new insights during the data analysis, which can lead to additional data collection and subsequent analyses that generate new insights about the topic being explored. Thus, I determined that data analysis would be carried out concurrently from the start of the data collection.

Qualitative Analysis

The purpose of the multiple case study was to examine the mentoring relationship among identified pairings using qualitative analysis to explain the observed patterns of influences. This exploration was accomplished through thematic analysis of the individual interviews. Miles and Huberman (1994) suggest that the creation of an initial set of codes in case study analysis can be made by considering the research questions, theoretical knowledge, problem areas, or critical variables. These domains served as the source for the initial coding for the study. In addition to using these sources for creating the codebook, the resulting analysis from the individual interviews also served to build on this foundation for the final analysis. The data and themes developed from the individual interviews were also utilized to inform the focus-group interview questions. This strategy enabled me to explore and clarify emerging themes from the individual interviews and improve additional types of data collected.

Additionally, semi-structured focus-group interviews were conducted near the conclusion of the study to gather additional information that clarified data gathered during previously conducted individual interviews. The focus-group interviews gathered data that dove deeper into the emerging themes and interesting relationships discovered through the initial analysis of existing interview data.

Immediately following both the individual participant interviews and the focus-group interview, the recorded commentary was transcribed using transcription software. I then compared the written transcription with the recorded interview to confirm that the transcribed interview was accurate. Additionally, memos and other reflective data collected during the interviews were added to the data to be included in the analysis.

A thematic coding process is "a method for identifying, analyzing, and reporting patterns (themes) within data . . . [that] minimally organizes and describes the data set in (rich) detail" (Braun & Clarke, 2006, p. 6). I used the process recommended by Yin (2014), Maxwell (2013), and Stake (1995) to highlight and note important and reoccurring concepts, quotes, and phrases while reviewing written transcriptions. Data gathered from the interviews were then entered into the Dedoose software to assist in additional coding and comparison analysis. I utilized a constant comparative method (Glaser, 2002; Glaser & Strauss, 1967; Marrium, 2009; Tracy, 2013) that included a codebook of keys, definitions, and patterns to analyze the qualitative data and develop themes throughout the process. The themes discovered were initially broadly organized into categories based on the research questions and then further broken down to specific themes that emerged. In addition, cross-case analysis was performed to find agreement,

contradiction, and additional themes across the study cases. These categories and themes are brought together to develop the research questions' answers (Merriam, 2009).

Role of the Researcher

Because the researcher is often considered the primary research instrument within a qualitative study (Creswell, 2007; Marshall & Gossman, 2006), it is important to share the researcher's professional background and qualifications. I was employed continuously from July 2020 to May 2021 as the Director of Technology for the district where this research was conducted. I earned an undergraduate degree in computer science and a master's degree in business administration with an emphasis in computer information systems. As a doctoral student, I focused my doctoral coursework on developing my understanding of instructional technology, instructional coaching and mentoring, and school leadership. Understanding these concepts was critical in gaining the background and understanding to conduct this study. As an experienced instructional technology leader, I made a concerted effort to remove previous assumptions, expectations, and other potential biases that could influence data collection and analysis. To diminish the potential for researcher bias, I engaged other instructional technology experts to confirm that appropriate qualitative data would be gathered using the instruments I created and that my interpretations of findings would not evidence researcher bias.

Data collection for this study involved face-to-face interviews with teachers within the school district where I work. Although I served as an executive-level leader in the district at the time the study was conducted, I was not a direct supervisor of any of the study participants, their supervisors, or the mentoring program involved in the study. Nonetheless, I took special care to stress to the study participants that my role in this project was of a

doctoral-candidate researcher and not as a district leader. My goal was to reduce any misinformation or invalid data from participants who may have wanted to please or impress me because of my leadership role in the district. I realized it was vital for me to establish trust with the participants as a researcher and not as a school district leader. I established the participants' trust by communicating directly with study participants, adhering to written agreements, respecting their privacy and confidentiality, and protecting all data collected for this study. Creswell (2007) emphasized that self-reflection is the center of proper qualitative research, and the comments in such reflections should shape the researcher's interpretations of his or her findings. Hence, I used self-reflection throughout the study to help avoid bias and other potential risks.

Credibility

Credibility can also be described as *validity* that can be achieved by using multiple strategies to document the accuracy of research being performed (Creswell, 2012). This study utilized the concepts of data triangulation, peer review, participant validation, and participant clarification. Including these concepts in the study enhanced study credibility and ensured that other researchers could replicate the data-analysis procedures to verify that my interpretations were accurate.

Summary

This chapter focused on the multiple-case study methods and design used in this qualitative research. The initial portion of this section reviewed the associated study's guiding questions and described the unit of analysis as the case's foundation. Next, the multiple case study design was described. The data collection method and instruments were then discussed, followed by an explanation of the data-analysis processes used in the study.

Finally, the section ended with a description of the role of the researcher in this study. Chapter 4 provides the finding of the study organized by the guiding questions. Chapter 5 provides a discussion and conclusion to the findings as well as suggestions for further research.

CHAPTER 4

INDIVIDUAL CASE FINDINGS

Chapter 4 presents individual case findings from a multiple case study designed to explore the impact of formal mentoring on the beliefs of K-12 teacher instructional technology use. This study was designed to answer the primary research question: *How does the teacher mentoring relationship influence mentor and mentee teacher beliefs on classroom technology use?* The initial findings from this qualitative study are presented in this chapter as individual cases composed of each mentoring dyad (i.e., mentor and mentee). The mentoring dyads were volunteers from the teacher population involved with the mentoring program at the district the study was conducted. The individual case findings were based on the examination of the interviews conducted with the mentor and mentee in each mentoring dyad and field notes taken during the interviews.

Individual Cases

The individual cases form the foundation of the findings in this study. This section is divided into the findings of seven case studies based on the mentoring dyads of the participants. Each case presents the demographics of each dyad and broad topics common in each of the semi-structured interviews with the mentors and mentees.

Case Study 1: Kathy and Stephanie

The first case in this study involved a 30-year-old mentor (Kathy) and a 22-year-old mentee (Stephanie). At the time that data were collected, Kathy had accrued six years of teaching experience and two years of mentoring experience. Stephanie was finishing her first year of teaching. Both teachers taught seventh-grade and eighth-grade elective classes with different curricular content: Kathy taught technology-related courses while

Stephanie taught art. Kathy considers herself very well versed in using technology in her classroom and self-rated her instructional technology knowledge as a nine out of ten. Stephanie considers herself moderately versed in using technology in her classroom and self-rated her instructional technology knowledge as six out of ten.

Similarity. Although this dyad was not matched based on instructional responsibilities (i.e., mentor and mentee taught different subjects), they both taught special or elective courses for the same age groups. Both members of the pair mentioned the limitations of not teaching similar subjects. For example, Kathy stated, "I personally felt bad because I know there have been times I don't know how to help" her mentee, Stephanie. She also shared how she sometimes had to say, "You are on your own," when referring to content-related assistance for her mentee. Kathy further mentioned that because of this miss-match, she focused more on the induction aspects of mentoring rather than on curricular or instructional topics. Stephanie stated that it would have been "nice to bounce ideas" off her mentor when she spoke about finding informal mentors for collaboration.

Relationship. The relationship in this dyad was classified as a friendship by both members. Kathy specifically stated she thought it was more of a friendship when the participants described the relationship. Stephanie mentioned how crucial her mentor was as a work friend and as a connection to others since she was new to the school and the pandemic restricted opportunities to meet and build relationships with others. She stated, "Just having someone to talk to has been nice." She also felt "super comfortable going [to Kathy] and asking questions."

Beliefs. Both members of this pairing consider technology in modern education as critical to the success of students. Kathy asserted, “I feel like it’s the direction that education is going, and I think it’s important in our world that students learn technology.” While Stephanie positively stated how technology in the field of art education is “taking over … people tend to [integrate] more graphic design [in their artistic creations] … so technology is starting to be a bigger and bigger piece.” Additionally, Kathy stated how important it was for a mentee to be open and comfortable asking questions. Stephanie concurred how great it was to have a mentor “readily available” to answer questions. Kathy also mentioned how vital patience was while working with a mentee to answer questions readily.

Negatives. Kathy shared that it was challenging to have the patience needed to work with a mentee while taking care of her teaching obligations. However, Stephanie could not think of a single negative aspect when asked about the help given by her mentor. The only negative related to mentoring that Stephanie mentioned throughout her interview was that her mentor taught in a different content area. Nonetheless, she was very grateful for all the help her mentor provided her.

Activities. Both members of this dyad indicated that soon after the team met, the mentee generally drove the topics and interactions based on her needs. Most of the pair's interactions were informal question sessions where they discussed topics and “talked things through.” Kathy specifically mentioned a session where she and Stephanie walked through the use and creation of courses in Canvas, the school-district learning management system. The mentoring program also required observations of each other

teaching and completion of reflection sheets. Kathy, the mentor, mentioned using the reflection sheets as a basis of discussion.

Knowledge and resources. In this pairing, both teachers struggled to share the knowledge they passed on to each other. Unlike other pairings, no mentor-developed classroom resources were shared directly with the mentee because the two did not teach in similar content areas. They both mentioned how not sharing a common discipline greatly limited their knowledge exchange. Thus, the mentor focused on the induction process, bringing the mentee into the organization, and providing support as a friend.

Stephanie mentioned how Kathy was always happy to answer any question she had, and if she did not know the answer, she would find it. Kathy, the mentor, did observe Stephanie a few times. Although Stephanie was supposed to observe Kathy teaching, she never had the opportunity. Stephanie mentioned how Kathy was very helpful to her when she first started working with Canvas, the district learning management system. She appreciated how Kathy helped her learn how to use Canvas as an instructional tool and was supportive in "finding new ways to make that a fun and engaging online classroom."

Reciprocal learning. Kathy and Stephanie both thought they learned from each other in this pairing and gained teaching knowledge, but they both struggled to articulate what they learned. They both thought the medium of mentoring fostered mutual learning and was a great way to transfer knowledge about technology and other teaching knowledge to each other. Kathy stated that the ability to influence a mentoring partner's instructional technology beliefs was "one hundred percent" happening in this relationship, and Stephanie agreed that it was a suitable medium. Kathy mentioned how

seeing new methods of instruction while observing her mentee gave her ideas for how she could incorporate them into her teaching. She also stated that reflection happened while working with her mentee. “I think that reflection piece, like actually looking and seeing. Then I go, Wow! I used to do it this way. Now I’m doing it another way. . . . I have grown for the better.”

Medium and timing. The timing of interaction and activities in this relationship was consistent and regular. Stephanie felt very comfortable with Kathy and thought the mentoring relationship was a powerful and more comfortable way to learn. She “preferred a one-on-one interaction” with a mentor to a group professional development session. Stephanie further explained how she sought out informal mentors in her field of art education since her formal mentor could not help her with content-specific questions. She preferred learning from their knowledge and experiences rather than working with instructional coaches or engaging in other professional development methods. Stephanie thought learning from her mentor was critical throughout the year but perceived that less busy times were more ideal for mentoring and coaching. Kathy concurred, stating she felt that constant knowledge sharing was important, especially related to instructional technology. She also noted that a one-on-one related to technology use with a new teacher at the start was important.

Pandemic. The pandemic greatly affected Stephanie, the mentee. She was in the middle of her student teaching when the pandemic hit and thus missed getting experience and working with her first mentor as a student teacher. She stated, “I felt like I lost out a lot on that.” Stephanie was happy to have a mentor during her first year of full-time teaching because Kathy helped her considerably but was a little disappointed she was not

an art teacher. She said it was difficult during the pandemic to build relationships with other teachers, and her mentor was her only connection at the start of full-time teaching—and thus very thankful to have her.

Kathy did not believe the pandemic impacted her mentoring much. She said it might have hurt the relationship building initially because she could not work with her mentee as closely as she wanted. It was not much different from her earlier mentoring experience, and she just performed "digitally… doing the same things." She felt the pandemic created additional ways to communicate easier, such as Zoom meetings that she plans to continue using to connect with her mentees.

Case Study 2: Cassie and Megan

The second case in this study was a dyad composed of a 48-year-old mentor and a 24-year-old mentee. Cassie, the mentor, had 24 years of teaching experience and 10 years of experience as a mentor; Megan, the mentee, was finishing her first year of teaching. Both teachers taught eighth-grade English. Cassie considers herself well versed in using technology in her classroom and self-rated her instructional technology knowledge as an eight out of ten. Megan considers herself well versed in using technology in her classroom and self-rated her instructional technology knowledge as an eight and a half out of ten.

Similarity. This dyad was matched well. The mentor and mentee both taught the same age of students and the same subject area (i.e., Grade 8 English). Megan thought it was essential and beneficial to have a well-matched mentor, sharing candidly her needs were quickly addressed: "If I were stuck with someone who was teaching math, I wouldn't be able to talk about instructional strategies the same way" as she did with her

mentor. Cassie felt that because of the close match, she provided many valuable resources to her mentee that could be immediately used if the mentee wanted. These mentor-provided resources "absolutely" provided a solid instructional foundation to a mentee. Megan also mentioned how she constantly sought others she considered informal mentors from her team and any other teacher for lessons, tools, and techniques she could use in her classroom. "I go around and ask people for advice, even when they don't want to give it."

Relationship. Cassie and Megan described their relationship as a friendship and as friendly, respectively. Megan mentioned that Cassie could be a combination of a friendly person and a formal teacher. Cassie was the most experienced mentor in the study, and she found the mentoring relationship a "mutually beneficial… relationship and that we were both getting something from this." Cassie also mentioned how vital this mentor relationship was to her and how a mentor and mentee can become valuable colleagues learning from each other for the rest of their careers.

Beliefs. The members of this dyad consider technology education a necessity and extremely important. Cassie describes technology as "very much a part of everyone's lives, and the more we can get kids used to using technology in a way that is productive for them . . . the better it is." Megan shared why instructional technology was important: "I think that it's necessary to have technology in the classroom, especially since the kids are just used to it all the time. It's ignorant to think … we would get away without it."

Negatives. The most significant limitation this pairing identified was lack of time. Megan mentioned several times how she wished she had more time with her mentor and how the pandemic made schedules more challenging to meet. Cassie shared how difficult

it was to meet with her mentor this year compared to past years because of pandemic restrictions. “We have days where we don't have a plan time, and we never have a lunch without students. So it was a little bit more difficult to find times to meet with her, and our schedules were so packed.” She believed her struggles with adjusting to the pandemic and reduction in time had a tremendous negative impact on her mentoring and probably all mentors. Cassie described the frustration she faces as a mentor and being a guide to a new teacher more than a direct supervisor:

> It's sometimes difficult when you give a suggestion, or you give advice, and you don't see that they necessarily accept or utilize that advice. It was difficult when [her mentee for this project] wasn't picking up on some of the things or wasn't doing some of the things that I was saying. It's really important to have [certain things] in place. When that wasn't followed through . . . that is kind of the hardest thing for me.

Cassie also shared her frustrations about this past year, during the pandemic. The difficulties she faced made her lose some of her confidence as a mentor. She was learning alongside her mentee about teaching during a pandemic, and she sometimes felt just as inexperienced as her mentee.

Activities. In this mentoring relationship, the mentor had scheduled activities she planned and drove the activities in this relationship. However, she was also flexible and available to the mentee as questions arose. Both dyad members shared that they used observation notes and reflections of each other’s teaching and regular meeting times for questions about their primary activities. As the mentor, Cassie felt she needed to be a bit of a coach in confidence-building. “Many times [novice teachers simply] need somebody to listen [to them share] . . . what's happening, to help build up their confidence.” She perceives it is vital for a mentor to tell a mentee: “It's okay. That happens to everyone. Everybody is feeling overwhelmed. You're not alone.” In addition to coaching, she

thought the most important aspects of working with new teachers were addressing classroom management and curriculum use.

Knowledge and resources. Megan had an enormous amount of respect and confidence in Cassie as her mentor: “She is a very experienced teacher, and she's really freaking good at what she does. So, anything I can learn or gain from her [is beneficial]. If I can get in her brain just a little bit, it's amazing. Chefs kiss to that!” She further described the large number of resources her mentor shared with her to get her started and how amazing it was to have that at the start. When discussing knowledge gained from her mentor, Megan felt she benefitted the most from discussions about pedagogy and technology and from working with her mentor. She candidly thought she needed to grow the most in her instructional aspects and naturally grew her technology knowledge through her discussions of “what works and doesn’t” with her mentor. Cassie mentioned how working with her mentee helps her grow professionally and stay abreast of things because of her mentee's questions, activities, and tools she tries to use. She stated, “If I can explain [technology tools] to someone else, then that solidifies my knowledge of it. . . Those kinds of things are beneficial, and I probably have grown.”

Reciprocal Learning. Cassie and Megan perceived they shared a learning relationship that benefited them both and that mentoring can be an excellent conduit for sharing teaching knowledge. Megan said she learned a lot about teaching from her mentor, especially regarding instructional strategies and technology used in the classroom. Somewhat surprising, Megan mentioned she was not confident that she taught her mentor much—even though she described how she shared new technology tools and discussed their use with her mentor. Cassie described how working with Megan made her

reflect on her own teaching, and as Megan started gaining more experience and confidence, she started sharing with Cassie tools and techniques she wanted to try. Megan's sharing caused Cassie to assess these tools for her own use. Cassie also mentioned how working with new teachers invigorates her because their passion helps remind her why she does this job and why she enjoys helping new teachers.

Medium and timing. The mentoring pair met regularly as well as when needed by the mentee. Megan expressed a tremendous amount of respect and admiration for her mentor. The members of this mentoring dyad agreed that they thought mentoring was a great medium to transfer teaching knowledge and, more specifically, knowledge of using instructional technology. Cassie was a very experienced mentor, having guided and supported new teachers for a decade. Although she had her routine fairly set and knew what new teachers needed, she seemed humble about her mentoring skills. Based on comments by others in the district, it sounded as if she was knowledgeable about mentoring and one of the more successful mentors in the district. When sharing her thoughts about the timing of the work she does with mentoring, Cassie felt what she shared with mentees was more intensive and specific at the start since they are just getting started. Nonetheless, she perceives that mentoring over time is necessary to assure novice teachers grow professionally in the area of instructional knowledge, especially use of instructional technology:

> I think you probably have [to spend] more [time on mentoring] at the beginning of the school year. So, the beginning of the school year is when [novice teachers are] learning kind of everything …it's more nuts and bolts like the technical system and tools. Then, as the year progresses …you can talk more about the curriculum and lesson planning and how those can be woven together.

Megan agreed and thought she needed regular mentoring meetings throughout her first few years and wished she had more time with Cassie.

Pandemic. Both teachers reported that the past year during the pandemic had been a truly challenging experience. The most challenging aspect related to mentoring during the pandemic was lack of time: There were so many additional duties and adjustments or accommodations for students that there was little spare time. These changes left little extra time to devote to meetings and other activities. They also mentioned how difficult it was to meet because of their new schedules. Cassie mentioned that technologies like Zoom did help them to connect at alternative times, but creating the time to meet was the most significant barrier to mentoring caused by the pandemic.

Case Study 3: Jan and Beth

The third case in this study is a dyad composed of a 55-year-old mentor (Jan) and a 38-year-old mentee (Beth). Jan had completed 21 years of teaching and accrued 8 years of experience as a mentor. Beth, who was finishing her first year of teaching when interviewed, had a nontraditional start to her career in education, having accrued ten years of experience as an educational paraprofessional before becoming a teacher. Both educators teach in a unique K-12 behavioral school. Jan taught English to secondary students (Grades 9-12) and general education to elementary students (Grades 2-6); she also provided special education services to the two age groups. Beth serves as a special education teacher for students in Grades 4-6. Jan considers herself not well versed in using technology in her classroom, and she self-rated her instructional technology knowledge as a five out of ten. Beth considers herself moderately versed in using

technology in her classroom and self-rated her instructional technology knowledge as six out of ten.

Similarity. This dyad was not a fully matched dyad but had several similarities because of the unique school setting: The mentor and mentee both taught students with special needs. Jan worked primarily with older students and in the subject of English, whereas Beth worked with slightly younger students and was a general education teacher. Jan thought it is ideal to match a mentor with a mentee as closely as possible, but their unique instructional responsibilities and the small school setting did not lend itself to finding exact matches. She perceived her match with Beth was about as close as it could be, particularly since they both work in the same unique setting. Jan also mentioned how important it was to fit complimentary personalities together to build a successful mentoring relationship. Jan described how her more direct personality traits work well with certain types of people but not well with other types. Beth did not have a strong opinion on this topic but agreed that their relationship was significant. She asserted it was important to have "that kind of rapport where you don't feel stupid asking questions" She also added how important she felt it was for a mentor to be readily available, which was the case since they worked in the same school building.

Relationship. These two teachers both described their relationship as "fun" and "friendly." According to Beth, she and her mentor had a "relationship where we kind of tease each other back and forth." Jan stated that she "hoped we have a collegial and friendly relationship" when describing her relationship with her mentee because she described herself as a "micromanager." She expanded on the importance of a good relationship and shared how her personality had clashed with others in the past but

worked well in this situation. Beth also mentioned how important it was for a mentor to be careful about being condescending and "giving advice, without talking down to someone new to all of this."

Beliefs. This mentoring dyad had the lowest self-reported instructional technology rating and confidence in using technology of all the dyads in the study. Jan shared her thoughts on technology and her growth: "Well, I never feel overly comfortable, but like I said, one of the things with being the mentor is, in order for me to explain it, I had to learn how to do it better." She also described how she was very reluctant to use instructional technology just a few years ago and had to be "dragged kicking and screaming" into using technology in her classroom. Interestingly, she mentioned how fortunate she felt when the pandemic hit. Even though she was a reluctant participant, she recently realized that she could now operate and embrace technology in her classroom. Jan reluctantly admitted that technology provides another avenue for students to learn, but she expressed some concerns about working with students with social and emotional problems that need more teacher interaction and assistance.

Beth, who had worked as a teacher aide with preschool children during the previous decade, admitted she was struggling to use technology in her elementary classroom: "I tend to get really overwhelmed with all of the new technology, and it all sounds great, and you really want to incorporate everything and do it all. But then, I'm just trying to figure it out."

Negatives. The members of this pairing did not share many negative thoughts on mentoring. Jan's negative aspects focused on the pandemic, the quick changes in how things were done, and not having the time to do what was needed. The changes due to the

pandemic bled into her mentoring role and influenced her work with new teachers. Additionally, Beth shared, “A lot of times, I felt like I was learning right along with the students.” She attributed this struggle to being a new teacher as well as teaching during a pandemic. Beth admitted that she struggled to learn how to use Google Classroom and other technology tools in her lessons.

Activities. When reflecting on the current mentoring relationship, Jan openly admitted she was a micromanaging mentor, likely because she is one of the veteran teachers with several years of teaching and mentoring experience. She led and organized most of the activities, especially when first starting with a new teacher. Jan stated, “Initially, it's started with you really need to know this [topics Jan felt were important] because if I didn't have her set up with an organizational structure, there's no way she was going to be successful.” She later mentioned when referring to her mentee, “As the year progressed, it became more of her [Jan] asking questions … It kind of changed through the year to become more of her [mentee leading the conversation]” when referring to deciding mentoring needs. Beth agreed, explaining how activities and discussions were later more specific to her needs and her questions. Initially, the activities were discussions about how to do specific things, such as developing SPED Individualized Education Plans (IEPs) and using different district technologies, such as the student information system and the learning management system. Over time, the discussions focused more on observations and reflections and transformed into question-and-answer sessions.

Knowledge and resources. In this pairing, the mentor and mentee focused on the details of several sessions, working together on how to do specific things. Jan and Beth

shared an introduction to creating IEPs, using the student information system, the Accellus system, Reading A to Z, and Google Classroom to organize courses. Jan shared many of the resources she uses and her methods of organizing things, which Beth felt really helped be more effective in reporting information. Beth also reached out to instructional coaches for help with instructional strategies specific to the needs of the students she taught.

Reciprocal learning. When asked if her mentor learned anything from her, Beth had difficulty identifying anything specific because she did not think her mentor gained anything from their interactions. However, Jan strongly disagreed with Beth's perception of one-directional mentoring (i.e., mentor to mentee).

> Oh, absolutely, [my mentees] have taught me lots of things . . . . As a mentor, I learned things from the mentees too. We learn from each other, and I improve. I have to improve so that I can teach them. . . . I'm five years away from retirement. It [would] be really easy for me to just sit back and say," Okay, I'm not learning anything new." As a mentor, I have to [continue learning] . . . . It kind of keeps me sharp.

Jan further explained how mentoring invigorated her and motivated her during the closing years of her career. She also felt that mentees were an excellent source for innovative teaching methods and helped her stay on top of things and keep improving herself.

Medium and timing. This mentoring relationship was intense from the beginning because Jan covered a significant amount of information with her mentee. She was also an adamant scheduler with her mentee. Both Jan and Beth felt from the very beginning that it was crucial for a mentor and mentee to work together, especially with technology. However, Jan thought the second quarter of the school years was a better time to work with a mentee on specific things because the mentee would have progressed beyond the

"deer in the headlights" stage, have gained more experience in the classroom, and have more time to try new things and reflect on what was learned. They both thought mentoring provided great opportunities to transfer instructional technology knowledge.

Pandemic. For this pairing, both participants felt the pandemic did not affect their relationship. In fact, they thought that it provided opportunities for them to try new tools for connecting with each other such as Zoom. However, they also felt the pandemic caused many problems related to lesson preparation, particularly not having time to prepare things appropriately. They recalled frantically trying to prepare for Alternative Method of Instruction (AMI) days when the quarantine happened and having to use tools and techniques with which neither of them felt comfortable using. It was a struggle during such times to meet for mentoring. However, they both mentioned how it was nice being able to work through these challenges with someone else to make the necessary quick changes. While reflecting on the impact that the pandemic had on using instructional technology, Jan stated adamantly, "I definitely think this quarantine has accelerated the use of technology in the classroom."

Case Study 4: Denise and Andrea

The fourth case in this study was a dyad composed of a 34-year-old mentor (Denise) and a 23-year-old mentee (Andrea). Denise had nine years of teaching experience and one year of experience as a mentor, while Andrea, completing her first year of teaching. Denise taught art to students in Kindergarten through Grade 4, while Andrea provided general education students in Grade 2. Denise considers herself moderately versed in using technology in her classroom and self-rated her instructional technology knowledge as a seven out of ten. Andrea considers herself highly versed in

using technology in her classroom and self-rated her educational technology knowledge as nine out of ten.

Similarity. This pairing was not a matched dyad because the two teachers taught different subjects to children in different grades. Although both members of this pairing thought the mentoring was valuable, they perceived additional benefits would have been provided if the matching had been more similar (e.g., grade level, content area). When referring to matching her mentee, Denise stated,

> If you had somebody that was an expert in all those areas, I could see how they could give very specific help… I don't know the curriculum. But as far as just instructional strategies and teaching strategies, I was able to help with that and then behavior management in general.

Andrea mentioned how she sought support from other second-grade teachers with whom she worked to gain help specific with teaching strategies and get instructional resources they may have created. She sought their help and advice, explained to them, "I don't quite know how to teach this. Do you have anything?"

Relationship. Andrea considered her relationship with her mentor as a professional acquaintance, while Denise described the relationship as an open and trusting relationship for helping and giving feedback. They both mentioned that the pandemic and teaching different subject areas impacted developing a closer mentoring relationship. This dyad relationship had a more formal characteristic than the others in this study. Andrea explained, "I feel like I could talk to her in the morning. Say hi, how are you? I could go to her at any point during the school day, but we didn't really talk a lot outside of school." Denise similarly shared how she tried "being a friendly face in the hallway and saying hello and asking how she's doing." She also shared how she would try to be as available as possible if Andrea had any questions.

Beliefs. Both Denise and Andrea thought information technology was fundamental in education today and described how they used it in their teaching. Andrea (mentee) was more confident in her skill at using technology in her instruction than Denise (mentee) was. However, Andrea also admitted that at times she had concerns about balancing the use of technology in her classroom—what she called a "fine line." She explained further, "I don't think using [technology] every day is necessarily bad, [but it should be used] as a way to help kids learn instead of it being the primary way that they learn. I think it is important." Denise was very positive towards technology use in her classroom: "My general view of [technology] is positive, and I try to use technology as much as I can in my classroom to enhance student engagement and enhance the learning environment in general."

Negatives. The two members of this mentoring dyad did not report having many negative experiences; rather, their frustrations were based on the mismatch of curricular content and the time available to meet. Andrea appreciated Denise's constructive feedback that generally dealt more with classroom management and random topics, but she had to seek curricular peers or informal mentors for instructional help, particularly about technology-related tools and their use:

> Her classroom management advice was great, but [she could not provide] a lot of advice on technology or content area. Because what we teach is so different…I met with the other second-grade teachers as a team, and we kind of developed lessons and talked about our ideas together.

Denise agreed that she did not attempt to help in these areas and thus focused more on how she could help Andrea adapt to the new position. Both mentioned they desired more time to meet together. Both participants felt the time was very short, and there was not enough time to work together on learning new things. The changes to scheduling and

interactions because of the pandemic made finding time to spend together even more difficult.

Activities. Both members of this dyad indicated that they met regularly, but the mentee generally determined the topics and interactions based on her needs. Most of their interactions focused on weekly observations conducted by the mentor and informal question-and-discussion sessions. Denise perceived she served as a sounding board that addresses issues that Andrea had mentioned. According to Denise, when Andrea was "needing to figure out how to get something for her students or how to get support or just how things work in general in our building, "I was her go-to resource for that." To address her curricular and instructional needs, Andrea observed her mentor and several other teachers in her building, which became one of the primary activities assumed by her mentor.

Knowledge and resources. In this pairing, the mentor and mentee agreed that the knowledge passed between them was primarily instructionally oriented, and they both reported that lack of a close curricular match was the reason. Andrea shared her learning experiences with her mentor:

> My instructional strategies. That's something that I feel like really advanced by meeting with [my mentor].…With technology and content area, I feel like I went more to the other second-grade teacher across the hall to get advice from her on things like that.

Denise agreed with Andrea's assessment: "I would say, one hundred percent, she grew in instructional areas and probably not technology on my behalf." Andrea also said any ready-to-use resources generally came from the other teachers on her second-grade team.

Reciprocal learning. Denise and Andrea both thought they learned from each other. Although Andrea did not think Denise gained much from the relationship, Denise

disagreed: “One hundred percent. I think I could always be learning new things from her.” Both perceived the mentoring relationship as an excellent way to learn any teaching knowledge. However, Denise suggested that a mentee was more likely to influence her teaching after the new teacher settled into their position and became more confidant because a relationship then begins to become similar to other teaching peers.

Medium and timing. Although both members of the dyad asserted that a mentoring relationship could be an excellent means to learn and influence each other professionally, it was not extensively used in their case for influencing technology use in the classroom. They thought it had the potential, but the timing of activities for this relationship was, in the beginning, “heavy” with a lot of initial meetings. It then progressed to regular meetings during the first semester then became inconsistent during the second semester. Both Denise and Andrea thought it was better for mentees to learn from mentors early in the relationship. Their perception included knowledge of instructional technology. Andrea even expressed the desire to have more time before mentoring with students. Denise expressed the importance of starting early and building a good foundation for new teachers:

> The [more] things that you are learning and implementing in your classroom at the beginning of your teaching career, the more comfortable you get with [them], the more you'll utilize [what is learned] and expand on it and find ways to make it better.

Andrea expressed how her team, which served as informal mentors, met regularly and provided significant help in developing her resources and lessons and helped her learn how to use technology tools.

Pandemic. Andrea asserted that her student teaching helped prepare her for her work this past year. Despite the pandemic, her student teaching continued and was not

waived or minimized as some others experienced. She was able to figure out how several things were done at the end of her student teaching. Interestingly, she felt the pandemic increased communication options, but restrictions made meetings and observations difficult.

For Denise, this was her first year as a mentor. Even though she did not have previous experience, she thought the pandemic made it challenging to mentor a new teacher. She perceived that restrictions made relationship building and working with a new teacher difficult. She expressed frustration that she "wasn't even able to eat lunch" with her mentee and had to meet primarily via Zoom technology.

Case Study 5: Nancy and Jessica

The fifth case in this study included a dyad composed of a 57-year-old mentor and a 23-year-old mentee. Nancy, the mentor, had 15 years of teaching experience and one year of experience as a mentor. Jessica, the mentee, was finishing her first year of teaching. Both are general education elementary teachers: Nancy teaches first grade while Jessica teaches fourth grade. Nancy considers herself well versed in using technology in her classroom and self-rated her instructional technology knowledge as an eight out of ten. Jessica considers herself moderately versed in using technology in her classroom and self-rated her instructional technology knowledge as six out of ten.

Similarity. This dyad was somewhat well matched since both the mentor and mentee teach general education classes but to different age groups. Another difference was that Nancy served as one of the virtual teachers while Jessica was teaching students in person. She mentioned how she felt "blessed this year" for receiving all the help from her mentor, from members of her grade-level team, and even her principal. When

reflecting on her mentor's support, Jessica stated, "[My mentor] is really phenomenal . . . sharing resources with me. Showing me different websites or different things to utilize." When referring to her grade-level teaching team, she stated: "My other two grade-level teachers have been a huge support. If I've had questions, I know I can message them."

Relationship. The dyad members described this relationship as good and used words such as "trust," "honest," "positive," "comfortable," and "rewarding." Nancy stated, "I think it's been pretty smooth, and I think [my mentee] sees me as somebody that she can come to when she needs [help]." When reflecting on her relationship with Nancy, Jessica said, "We've really built a good relationship, and I feel like I can trust [my mentor]. She's somebody that would always give me honest feedback." She later mentioned that she felt Nancy really "helped her become a better educator."

Beliefs. Both Nancy and Jessica had a positive belief in using technology in their classroom, although Nancy felt very confident and positive in her instructional technology skill, while Jessica was less confidant but very positive. While reflecting on the use of instructional technology, Nancy stated, "I think it's essential, especially with students. Today, I think they're a lot more adept at using technology, and I think it holds [the student's] interest a lot more." In discussing her reasons for a positive outlook on instructional technology, Jessica stated, "I think we're moving so much into [being] technology-based for almost everything we do. I think as teachers, we need to implement that within our classroom."

Negatives. This dyad was very positive and had difficulty sharing any negative aspects related to mentoring this past year. However, Jessica mentioned her difficulty initially with the curriculum and some technology tools, stating that she desired to have

time to focus on technology: She would have liked "[to have] the time to really dig into the resources and be supported . . . [because] it honestly might have even been beneficial." She also thought some of the requirements and forms that the State of Missouri required for mentoring were not very helpful or a good use of time with her mentor. Nancy likewise shared that she could not work with her mentee as much as she wanted due to pandemic restrictions: "Because it's been such an odd year and because I haven't been able to be as present [with Jessica] on a regular basis, like a daily basis, I might normally be with planning."

Activities. In this dyad, there were regular bi-weekly meetings throughout the year, and both members mentioned some specific tasks led by and suggested by the mentor. However, the meetings mostly appeared to be geared toward whatever need the mentee was having at the time. Nancy shared the best thing about their regular meetings as "just being able to sit down and talk with her [mentor] about some of the things that she is doing and listen and just be able to have her bounce some ideas off me and vice versa." Jessica also talked about their regular planning meetings and how they were very beneficial to her as a new teacher. Unfortunately, this past year, the observations and other in-person activities beyond meetings were not utilized in this mentoring pair because of the pandemic.

Knowledge and resources. In this pairing, the mentee found her mentor was particularly supportive in helping her plan her instructional strategies, properly use district technology tools, and specifically improve her content experience in reading. She shared that her mentor has "been really, really helpful for me in reading instruction. [My mentor] has her master's degree in literacy, and she has been a really big help in

identifying my student needs and helping me analyze data." She further described how Nancy shared numerous resources and tools that she could readily use. Jessica also praised her teaching team for being supportive and helpful in sharing great resources.

Reciprocal learning. Both members of this dyad thought they learned from each other. Jessica perceived she did not contribute a lot to the relationship but thought there could have been some ideas and tools she learned in her student teaching or college education that she could have shared with Nancy: "I feel like [my mentor] shared a lot with me, and . . . I've shared some of the things that I utilized in my student teaching." Nancy reflected on learning a few things from Jessica that she had not known before that she thought would be good to use in developing her lessons and in teaching. Nancy also explained how mentoring helps her improve: "I think [mentoring] has helped me to reflect on my teaching and my interaction with kids, planning, and instruction . . . . I think all around, it's made me a little more cognizant [of personal growth]."

Medium and timing. The timing of interaction and activities in this relationship was consistent and regular. Jessica thought very highly of Nancy and her abilities as a teacher and that having support at the beginning of mentoring was the most critical time for learning instructional technology. Nancy agreed about the importance of the start and suggested continuing with regular meetings and the importance of continuous reflection:

> I think, probably at the beginning of the year for sure, it would be important to make sure that you [as a mentor] set some things up so that you're ready to try them and then a check in the middle of the year, to make that adjustment. Then at the end of the year … a reflection on how did it go and what are you [as a mentor] planning for next year?

Pandemic. The pandemic affected Jessica, the mentee, more than it affected her mentor. She was in the middle of her student teaching when the pandemic hit and shared

how she missed on a good portion of her student teaching experience: "[My student teaching] just pretty much, ended mid-semester . . . and we had a couple of virtual meetings after that." She felt the pandemic had a considerable detrimental impact on her preparations to start teaching as both a student teacher and as a new teacher. She shared how fortunate she felt having Nancy, her other grade-level teachers, and a supportive principal to help her throughout this first year.

Nancy had never taught virtually before the pandemic and started teaching entirely virtually this past year. She shared that the new mode of instruction was a stretch and created additional work for her. Nonetheless, she mentioned some positives in delivering instruction virtually: "[Mentoring] made me think about who I am as a teacher. It made me rethink what effective instruction is and how to meet students' needs." She shared how, through her preparations, she learned about several different technology tools and strategies she could employ in her virtual classroom as well as when she returned to in-person teaching. She asserted that she was growing alongside her mentor and that their discussions had helped both the mentee and her. The working situation and additional pandemic rules also impacted the time for meeting and not performing other activities such as observations.

Case Study 6: Cherin and Laura

The sixth case in this study included a dyad formed with a 52-year-old mentor (Cherin) and a 27-year-old mentee (Laura). Cherin had accrued eight years of teaching experience and two years of experience as a mentor at the beginning of the school year. Laura was in her third year of teaching. Generally, teachers in Missouri are required to participate in only two years of formal mentoring, but because Laura had changed school

district and teaching position, she opted for a third year of mentoring. Laura was thus the most experienced mentee in the program.

Both teachers taught seventh-grade science. Cherin considers herself well versed in using technology in her classroom and self-rated her instructional technology knowledge as an eight and a half out of ten. Laura considers herself well versed in using technology in her classroom but self-rated her instructional technology knowledge as seven out of ten.

Similarity. This dyad was matched reasonably well. The mentor and mentee taught the same grade level and were a part of the same science content-area team. However, they had different content area expertise and taught different areas of science, but they mentioned how the content they taught overlapped at times. Laura stated how she obtained numerous resources from her new mentor as well as her new department team members: “The whole science department, we kind of plan together, which is super helpful. We bounce ideas off each other, and I've learned a lot from both my peers and my mentor.”

Cherin described how she and the rest of the team of science teachers shared most of their resources with Laura when she was getting started. She explained that her department colleagues typically shared previously created resources while planning together as a team:

> As a seventh-grade science team, we pretty much have everything in a shared folder. Then we make a folder for each year, and inside that, we do it for each different unit so that way everything that we've used in the past is available.

This mentoring dyad was significantly supplemented by a team mentoring approach with the other teachers also serving as a constant influence and resource provider.

Relationship. The relationship within this dyad was classified as a friendship and as peers by both members. In their second year of being paired together, the women formed a team that was a mentoring relationship and appeared to have advanced into the generally desired peer relationship. Many of Laura's references to their relationship was "the team." She asserted how important her mentor's strong leadership was and explained that one of the best traits of her mentor was how she was "able to advocate for her team." Cherin explained how she assumed an open, non-judgmental stance. She utilized a guiding approach and thus did not want to be the person that walked into her mentee's room and just told her "everything wrong she was doing." Since Laura was an experienced third-year teacher, rather than a first-year novice, this pairing was more collegial than other dyads in the study.

Beliefs. Cherin and Laura were very positive in their thoughts regarding instructional technology: They believe it is an essential part of life today and the future, and both mentioned how it is a great way to engage students. While reflecting on using technology in the classroom, Cherin shared: "I think [technology] can really enhance their engagement. . . . Students can do things now that I could never do when I was a student." Laura shared her thoughts about technology as an instructional tool and about her recent growth:

> I think that technology is huge, especially if you're in a global pandemic. The things that I have learned personally this year have been incredible. I'm kind of excited to be able to see where technology goes inside of the classroom. I think that it's so important.

Negatives. This dyad was very positive about their professional collaboration and had difficulty sharing any negative aspects related to mentoring this past year. Both,

however, mentioned a desire for more time to work together. When reflecting on the difficulties they experienced that year, Cherin shared,

> It's hard to find it, but just more time for the mentee and a mentor to get together. You know whether that's co-teaching or [observing] each other's classroom or [simply having] time to meet that's not actually still planning time too.

This lack of time was occurring before the pandemic but became even more pronounced during the pandemic when dealing with the special rules and learning curve related to virtual instruction. Laura mentioned one unique frustration: Her requirement to be in the mentoring program for a third year. She mentioned the additional time it took was frustrating, but she also felt it was beneficial since she felt as if she was a new teacher all over again working as a virtual teacher during the pandemic.

Activities. This mentoring pair was in its second year of mentoring, and the mentee teacher was in her third year of teaching. This unique situation led to a more collegial and peer relationship than in other dyads in this study. Their relationship was equally driven by the mentor's focus on professional development for an experienced teacher, planning topics related to the science department team, and the mentee's unique needs. Their activities included classroom observations, planning with the department team, sharing reflections, developing questions to use in the classroom, and participating in team discussion sessions. Cherin shared how her sessions usually ended up being a team discussion with the science department and how everyone benefited. These discussions ranged from how grading was done to technology tools used in the classroom.

Knowledge and resources. Cherin and Laura thought a significant amount of knowledge was passed between each other as well as among the other team members

who also served as informal mentors to Laura. As a result of these diverse collaborations, Laura thought her understanding of content, instruction, and technology grew significantly. During an interview for this study, Laura reflected on her recent mentoring experiences:

> I definitely think that we focused on instruction the most. Like what we were going to do [for lessons]… then [that] kind of led to how we were going to do it with technology… Then it all relates to our content because that's what we're teaching.

Cherin asserted that content knowledge exchange was a lesser focus in the relationship because teachers usually were generally strong at knowing the subject. Like Laura, they specialized in a content area while participating in preservice studies. The mentoring they need is typically focused on instructional techniques and technology tools.

Reciprocal learning. The members of this dyad asserted that they learned from each other. Cherin emphatically stated that they "absolutely learned from each other." This mentoring pair and the team of science teachers with whom they worked created a great learning community that was very beneficial to the new teacher in the group. The fact that Laura was also in her third year of teaching also added to this peer-like relationship of reciprocal learning. Laura shared about her mentoring experience and influence on her mentor over the past three years:

> [In] my first year of teaching, I was not super comfortable. I felt a little lost. Then in the second year, I got a little bit more confident. Then this third year, I definitely think I am more comfortable and able to [contribute].

Cherin asserted that she has an open learning attitude when working with any teacher—perhaps because she was alternatively certified, and teaching was not her first profession. She shared that when she works with a teacher who took a traditional path to a teaching career, "I can learn some things because I always wonder if I missed some things

whenever I didn't [achieve teacher certification] that way." She felt even a new teacher could share a pedagogical theory with her that she may have missed along with any innovative or new techniques or technologies.

Medium and timing. This dyad evidenced an excellent regularity of working together because of the work and planning that was done together in the content area team. It allowed the mentee and mentor to work together regularly beyond the required meetings and interactions of the official mentoring program. Cherin and Laura thought mentoring was a great medium to learn. Laura commented that she felt the third year in the mentoring program was uniquely beneficial and needed, especially in her changing teaching situation each year. She felt the beginning of each year was the most crucial time for learning and getting resources from a mentor. Technology was not prevalent in the first district where she worked, and she also perceived that learning about it was a low priority there. Because there is a greater emphasis on instructional technology use in the district where she currently works, she feels learning to integrate it was "critical for the foundation of her teaching."

Likewise, Cherin felt that working with her mentee on technology integration into the classroom early in their relationship was essential, even though that added a lot of work at the start of the school year. Starting critical items only at first is better than overwhelming new teachers. Nonetheless, she also stressed, "You don't want to be all the way at the end when [a mentee] already struggled through their whole year and could have used the help."

Pandemic. Time was the aspect that most drastically impacted the work completed by this pair. Cherin and Laura thought that the pandemic truly limited their

time for specific mentoring activities, and thus, they relied on team meetings instead of many other activities that the mentor typically uses. Cherin discussed how the changes in schedules and rules established to address the pandemic made it challenging to have the time to meet with her mentee. Laura agreed, mentioning how they could not get together in person as much as they had in the past. Somewhat surprising, they perceived that the pandemic was helpful to both of them. The work of developing lessons and deciding on tools as a team was very beneficial because they both were struggling with adapting to teaching during the pandemic. Laura shared how "it was nice to be able to bounce ideas off my mentor and other people [and] . . . see how they are utilizing things inside the classroom this year." Both dyad members were excited about the instructional technology gains they made working together during the pandemic. They hope to continue to use much of it in their teaching going forward.

Case Study 7: Karmen and Amanda

The seventh case in this study included a dyad that included a 34-year-old mentor (Karmen) and a 31-year-old mentee (Amanda). Karmen had completed ten years of teaching experience and one year of experience as a mentor when the dyad was formed, while Amanda was finishing her second year of teaching and participation in the mentoring program. Both served as special education teachers for elementary students: At the time this study was conducted, Karmen was teaching Kindergarten through Grade 6, while Amanda served students in Grade 2 through Grade 6. Karmen considered herself moderately versed in using technology in her classroom and self-rated her instructional technology knowledge as a seven out of ten. Amanda considered herself well versed in

using technology in her classroom and self-rated her instructional technology knowledge as eight out of ten.

Similarity. This dyad was reasonably well-matched since both the mentor and mentee were SPED teachers who taught similar age ranges. Amanda shared how important it was to have a mentor that worked with SPED students and asserted that both of them serving SPED students was most important to her. "Yes, definitely because of what Special Education [teachers have] to do. Especially for resources and the scheduling of students with all these different teachers… It is definitely [important having] someone who is close to what I do." Amanda also shared how her second mentor was more valuable because of their similarity. "I definitely feel like I was more successful as a second-year teacher because of the mentors I had." She also shared how she gathered most of her starting resources from her mentors, and they were vital in helping her get started.

Relationship. The relationship in this dyad was classified as "a helpful friendship" by both members. When referring to her mentee, Karmen said she feels her role is about "guiding her [mentee] in the right direction." Both teachers mentioned how they felt closer to each other because they had a lot in common. They were close in age, and both had babies earlier that year. Amanda described her mentor as "confident" and "very experienced"; thus, she trusted her mentor's opinions on situations. She shared how Karmen is "a wealth of information." Amanda also felt that having a "considerate and easy to talk to" mentor was essential to their relationship.

Beliefs. Both members of this dyad had a favorable opinion about using technology in their instruction. Although neither of the members of this dyad considered

themselves experts at using technology, they appeared to be confident in their use of it in their teaching. Karman shared,

> I believe it's imperative for the future to mend the old and the new. I know [in] special education it's difficult to integrate technology because they [her students] are all on different levels. But, it's actually been a huge benefit to my teaching-especially this last year. I did hybrid teaching, so it was extremely important for me to know a lot about technology.

Amanda asserted that she thought technology was everywhere now, and thus, it was essential for kids to learn to navigate it. She also expressed a concern about finding time to balance using technology in the classroom.

Negatives. Similar to all other participants in this study, the members of this mentoring pair shared how time and pandemic-related changes were the most significant struggle they faced this past year. Difficulties mentioned included not being able to meet regularly, having to do more with less time, and addressing the discouraging aspects of the pandemic requirements, such as having to wear a mask and social distancing. Also, meeting face-to-face with parents and other educators was also a difficulty they experienced during the year. Amanda lamented not having adequate time to meet with her mentor: "Last year [we] definitely had the time. This year, not as much, again just due to the pandemic." Karmen described how they would try to fit in meetings while doing other things such as front-door duty in the morning.

Activities. In this relationship, the mentor was the individual who organized and led most of the activities. These included regular meetings, a few observations, and the required reflections for the mentoring program. Additionally, there were several specific discussions on SPED-related topics, such as planning individualized education plans. The topics for discussion or review appeared to be based on the needs of the mentee, although

Karmen mentioned how there were many times she initiated topics because her mentee "doesn't know what she doesn't know." Theirs was a new mentoring relationship this past year because Amanda had moved to a different school prior to her second year of teaching. Hence, the dyad more closely resembled first-year interactions within a mentor and mentee relationship.

Knowledge and resources. In this pairing, both teachers thought knowledge of pedagogy, content, and technology was shared. Most of the examples they provided were instructional-related but had a technology component to them (e.g., teaching a skill by using an online tool). Additionally, both the mentor and mentee asserted that Amanda used a vast number of the resources given to her by Karmen, her mentor. Amanda stated that these resources "absolutely provided a great foundation for her teaching," while Karmen thought that sharing developed and tested resources was one of the most valuable things a mentor can do for a new teacher. Additionally, Karmen's example of learning from her mentee included technology-related tools primarily, which they often learned together to use.

Reciprocal learning. Both members of this dyad thought they learned from each other. Karmen emphasized that her learning was related to teaching with technology, which occurred while implementing lessons they created together during the pandemic. Amanda thought she was the more skilled member of the pair regarding technology use and felt they complemented each other during planning sessions because Karmen had more instructional knowledge and experience. Amanda suggested that pairing someone weaker in technology use with someone stronger might benefit the mentoring pair. Most

of what she taught her mentor was related to instructional technology. Karmen also shared her thoughts about what happened while going over things with mentees:

> Going through the questions that they give you, you kind of reflect on your own teaching. You're like [thinking], okay, so am I doing that, and I haven't thought about it in a while. You know things you think about right out of college. I've been teaching for a decade.

She indicated that these reflections were valuable for her personal improvement, even though she primarily used them to help her mentee.

Medium and timing. Karmen and Amanda thought the mentoring relationship was a fantastic medium through which to learn about technology. Karmen shared why the relationship was great for the exchange of technical knowledge: “A first-year teacher or somebody at a college may have different knowledge than I have on technology. So, they're teaching me, and then, at the same time, I can say, and this is how we use it.” Amanda shared why she thought mentoring was a great way to share technology knowledge. She described how “some of the best ideas I got for my classroom I got during the mentoring program.” As for the timing of these interactions, both mentor and mentee thought earlier in the program was better and suggested a constant interaction was helpful in continued growth throughout the program.

Pandemic. The members of this mentoring pair stated that the pandemic restrictions and adjustments caused a vast issue related to time availability. Regarding the difference in experience from her first to the second year, Amanda shared, “It [the pandemic] just made it more difficult to collaborate.” Karmen reflected on how much time it took to transform her lessons into online or hybrid versions while working with her mentee and helping her do the same. However, they both asserted that they made

huge strides in their instructional technology use and hoped to continue using the tools and solutions even when things returned to normal.

Case Study 8: Samantha and Ashley

The final case in this study included a dyad made up of a 31-year-old mentor (Samantha) and a 22-year-old mentee (Ashley). Samantha had nine years of teaching experience and four years of experience as a mentor, while Ashley was finishing her first year of teaching. Both teachers taught general education elementary classes: Samantha taught sixth grade while Ashley taught fifth grade. Samantha considers herself well versed in using technology in her classroom and self-rated her instructional technology knowledge as a seven out of ten. Ashley did not provide an estimated rating of her classroom technology knowledge and withdrew from the study before her interview. Because this case was missing the mentee member of the dyad, a case-level analysis was not completed for this case. However, the information gathered from this mentor was used in the overarching analysis.

Summary

In this chapter, an analysis of each mentoring dyad case in this multiple case study was provided. Each case analysis included nine topic areas discussed in the individual interviews, and themes from the interviews were presented for each of the topic areas. The themes found and shared in this chapter were the foundations for the cross-case analysis presented in the next chapter.

CHAPTER 5

MULTIPLE CASE FINDINGS

Chapter 5 combined findings from a multiple case study designed to explore the impact of formal mentoring on the beliefs of K-12 teachers' use of instructional technology. This study was designed to answer the primary research question: *How does the teacher mentoring relationship influence mentor and mentee teacher beliefs on classroom technology use?* A secondary question was developed because the study was conducted during the global COVID-19 pandemic: *In what ways has the global pandemic influenced teacher technology adoption through formal mentoring programs?* This chapter presents themes that emerged through analysis of findings across all individual cases, which were presented in Chapter 4. Chapter 5 begins with a discussion of the characteristics among all participants in this multiple case study, presents collective information gained through analysis of participant responses gathered during focus-group interviews, and concludes with the presentation of themes evident across all the dyad cases.

Characteristics of Participants

Participants for the study included eight mentoring dyads consisting of one experienced mentor teacher and one mentee teacher with little to no experience working independently in a P12 classroom. The study participants were all White women. Mentors ranged in age from 30 to 57 years with 6 to 24 years of teaching experience and 1 to 10 years of mentoring experience. Mentees ranged in age from 22 to 38 years with 1 to 3 years of teaching experience. Table 5.1 provides a summary of key participant information.

Table 5.1

Participant Summary

Name	Mentor or Mentee Number	Age	Years Exp.	Mentoring Program Exp.	Grade Level	Subject Area	Perceived Instructional Technology Rating
Kathy	Mentor 1	30	6	2	7/8	Tech[a]	9
Stephanie	Mentee 1	22	1	1	7/8	Art	6
Cassie	Mentor 2	48	24	10	8	ELA[b]	8
Megan	Mentee 2	24	1	1	8	ELA	8.5
Jan	Mentor 3	55	21	8	2-12	Gen/ SPED[c]	5
Beth	Mentee 3	38	1	1	4-6	SPED	6
Denise	Mentor 4	34	9	1	K-4	Art	7
Andrea	Mentee 4	23	1	1	2	Gen[d]	9
Nancy	Mentor 5	57	15	1	1	Gen	8
Jessica	Mentee 5	23	1	1	4	Gen	6
Cherin	Mentor 6	52	8	2	7	Sci[e]	8.5
Laura	Mentee 6	27	3	3	7	Sci	7
Karmen	Mentor 7	34	10	1	K-6	SPED	7
Amanda	Mentee 7	31	2	2	2-6	SPED	8

Note: An additional Mentor, Samantha, participated in the study and commentary was included in the overall findings. The mentee, Ashley, in the dyad withdrew from the study.

[a]Tech=Technology

[b]ELA=English Language

[c]SPED=Special Education

[d]Gen=General Education

[e]Sci=Science

Focus Group Findings

The second phase of information gathering in this study included two focus-group interviews with study participants split into two groups, one group consisting of mentors and the other of mentees. The discussion for both groups started with three brainstorming

activities to help the participants focus on what they did and clarify these aspects for the researcher. The second half of the focus group sessions were guided by semi-formal interview questions created to delve deeper into the topics prominent in the previously conducted individual interviews and clarify study participants' previously expressed ideas. The focus group questions (see Appendix C) included prompts to encourage further discussions on the topics originally presented during the individual interviews.

The two focus-group sessions provided additional information to reinforce and clarify themes developed in analyzing the individual cases in this study and aid in the multiple case study analysis. The following section presents the information and themes gathered from these focus groups. It is divided and presented by each focus group and the themes discussed.

Mentor Group

The mentor focus group included only six of the eight mentor participants. Unfortunately, two mentors were unable to participate in this group interview due to a scheduling conflict. This section presents a summary of the information they shared as a group.

Traits. The focus group started with a brainstorming discussion about traits that participants felt were the essential traits for an effective (see Table 5.2). All traits in the table align closely with the information provided during individual interviews with the mentors. When asked if these traits impact the transfer of technology knowledge and influence instructional technology beliefs of those in the dyad, all participants agreed that all do. The group also agreed upon the top three traits essential for an effective mentor: nonjudgmental, good communicator, and resourceful.

Table 5.2

Focus Group Mentor Brainstorm

#	Traits	Activities	Role
1	Nonjudgmental	Reflective questioning	Observation and feedback
2	Good communicator	Availability	Providing time
3	Resourceful	Observations	Simplifying and prioritizing
4	Helpful	Asking about needs	Providing resources
5	Flexible	Regular check ins	Advocate for mentee
6	Organized	Observing needs	Frequent check-ins
7	Understanding	Scheduling time	Observation of other duties
8	Compassionate	Providing resources	Organization procedures
9	Friendly	Praise and encouragement	Open to needs
10	Open	Helping with unique resources	Help mentee observe others
11	Discrete		Emotional support
12			Guide
13			Protect
14			Feel welcome
15			Organization procedures

Note: Top three items of each were agreed upon as the most important.

Activities. Next, the mentors discussed activities that help encourage knowledge transfer within the mentoring dyad. Table 5.2 presents the findings of the brainstorming session in the Activities column. At least one mentor mentioned each activity during the individual interviews, but not all mentors mentioned all of the activities listed. Nonetheless, all experienced mentors agreed that these activities (a) were undertakings in which they participated (b) were helpful in the transfer of technology knowledge and influencing instructional technology beliefs. The top three activities mentioned by the mentors in their group interview were “reflective questioning,” “availability,” and “observations.”

Duties. The final brainstorming activity examined the role the mentors thought they assumed while mentoring a new teacher (see right column in Table 5.2). This discussion generated more topics than those generated during individual interviews and

extended beyond topics related to technology or teaching (e.g., being an advocate for the mentee, making them feel welcome at the school). Most topics mentioned during the focus group coincided with information gathered during individual interviews. Of the ideas shared, only their role of making a mentee feel welcome was not related to transferring technology knowledge and influencing instructional technology beliefs. The top three most important tasks the mentors thought they completed were (a) observing and giving feedback, (b) giving time as needed, and (c) helping a mentee simplify and prioritize.

Mentee foundation. Another topic of discussion among the mentors covered their thoughts about where a mentee finds foundational lessons and resources. Their first assessment was how the mentor provides sample lessons and resources to a new teacher. Additional sources mentioned were the mentees' grade-level team, informal mentors, instructional coaches, and district curriculum depository. After further discussion, the mentors also mentioned the mentees' college education experiences and their student teaching as professional development resources for the mentees. Interestingly, the mentors also commented about how resources are more accessible today than when they were new teachers. Karmen how more accessible information is today compared to when she first started teaching: "So many resources are available online now." Denise asserted that the district curriculum resources are valuable, and thus, she just guided her mentee through those resources more often than she shared resources. This guidance appeared to be the most beneficial approach in this dyad because Denise taught elective courses while her mentee taught general education courses. Finally, the mentors expressed how vital the foundational resources are for assuring new teachers use instructional technology. Denise

stated, “I think [the foundational resources] are super important because it just builds on that all year.”

Mentor growth. When discussing foundational instructional technology, Denise and Samantha stated that they thought their mentees were more knowledgeable than they were, and thus, they learned a great deal from the mentees. Samantha shared, “I feel like that was kind of my mentee’s time to shine and [thus] . . . she was kind of teaching me.” Interestingly, the mentors with second-year mentees were confident in their technology use. They felt as if their mentees quickly became more of a peer of theirs regarding instructional technology, and thus, they worked together on developing strategies with instructional technology. The mentors also briefly discussed how they thought the pandemic was a tremendous driving force for improving their instructional technology knowledge and expertise in using it.

Relationship. When discussing the mentoring relationship and how knowledge flowed between the dyad members, the mentors suggested that a friendlier and less formal relationship seemed more effective than a strictly formal mentoring relationship. Two mentors mentioned the impact of different personalities within a dyad and how those differences can impact the relationship negatively. However, the critical aspect all the mentors agreed upon was the need to create a trusting relationship with a mentee: It was viewed as most important in the relationship to foster knowledge exchange.

Mentor-mentee matching. When discussing the impact that matching a mentor with a mentee has on the overall experience, the first thing mentioned was the limitations when the two participants were not matched according to the academic subject taught. Kathy explained:

> It's extremely difficult to be a mentor when you don't teach what [the mentees] teach. I cannot tell [them] how to teach when [they] know a certain subject that I know nothing about. But, I can give [them] the basic tools they need…I think it's a lot easier [to say simply], Hey, I tried this in my class. It may work for yours too.

Additionally, Cherin mentioned that her current mentor was not her mentee the previous year, although she informally sought Cherin for instructional guidance and resources.

> I know that the mentee went to her mentor for the procedural things that they had to do, but she checked in with me for everything else because we taught the same grade level and content area. . . . [Nonetheless], it just felt artificial and weird. The [assigned] mentor didn't feel like she can help the mentee as much because they weren't in the same shoes [i.e., taught in the same curricular topic].

Based on the discussion with the mentors, it seemed the more closely matched to a common curricular subject, the better the chance for a professional relationship. However, all the mentors thought none of the specific general demographics were necessarily limiting factors—what was most important was the mentor and mentee's teaching role. The second most important matching considerations were the teachers' personalities and teaching schedules.

Mentoring process. When discussing how mentoring activities are led and what is done, the group appeared to take a hybrid approach, with some leaning more toward mentor direction and others leaving it more up to the mentee. At the start, many activities and topics were driven by the mentor. According to Cherin, "there's some stuff you just got to make sure that they know" when referring to discussions that happen at the beginning of the year and other critical times. It appeared these topics included orientation-related items, instructions for basic computer platform use, and critically important rules and regulations. After that, the consensus among the mentors was that activities were based on the need of the mentee (i.e., what mentees stated implicitly, what

difficulties mentors observed mentees having). These could range from difficulty with properly using curricular resources or technology tools to any number of instructional or personal needs.

Mentee Group

The mentee focus group consisted of six of the eight mentee participants. One of the mentees could not participate in this meeting due to a scheduling conflict, while the other withdrew from the study before any interview sessions. This section presents highlights of the information they shared.

Traits. The focus group started with a brainstorming discussion about traits that the mentees felt were important for a mentor to have. Table 5.3 presents the findings of that brainstorming session in the Traits column. The traits corresponded well with information provided by study participants during individual interviews. When asked if these traits impact the transfer of technology and other knowledge and influence instructional technology beliefs in the dyad, all participants agreed that all do. The group also agreed upon a mentor's top three traits of (a) being a good leader and guide, (b) being knowledgeable, and (c) being approachable.

Activities. The mentees next discussed activities that help encourage knowledge transfer within the mentoring dyad (see findings in Activities column in Table 5.3). Similar to mentors' comments during their individual interviews, all activities were mentioned by a mentee during the individual interviews. All mentees agreed that these activities were undertakings in which they participated and helped transfer technology knowledge and influence instructional technology beliefs. The top three activities were (a) teacher observations, (b) resource sharing, and (c) help in organizing lesson plans.

The group also mentioned how they wished they had had opportunities to co-teach with their mentor, scheduled time set aside for mentoring activities, and had more time to work with their mentor. They asserted that these activities would have improved knowledge transfer within the mentoring dyad.

Table 5.3

Focus Group Mentee Brainstorm

#	Traits	Activities
1	Leader/Guide	Observations
2	Knowledgeable	Resource sharing
3	Approachable	Organization
4	Nonjudgmental	Working with data together
5	Accountable	Cover for other observations
6	Dependable	Paperwork assistance
7	Honest	Mentor participation
8	Understanding	Lesson planning
9	Prepared	Q&A
10	Open minded	Reflection
11	Involved	

Note: Top three items of each were agreed upon as the most important.

Mentee foundation. The first discussion question posed during the focus group with mentees led to a discussion about initial resources mentees used and where they were originated. The majority of the information shared about initial resources involved another person (e.g., their mentor, their cooperating teacher while student-teaching, teachers on their instructional or class-level team, teachers who had taught the mentors). Additionally, some mentees mentioned how they found resources online from various teacher resource sites; however, this discovery was primarily after they became more comfortable working as a classroom teacher and was generally in the later part of the academic year. Jessica shared her experiences near the end of the first year:

> My informal [mentor] and my actual mentor are just very knowledgeable…I know I can always get resources from them. But, I've also [started] to branch out

> more and do my own research. I follow a lot of teachers on different social media platforms, and I'll utilize a lot of ideas from there too.

Andrea shared that even near the end of the school year, if she found a resource she wanted to use, she would often consult with her mentor about it before putting it into use.

Sharing with mentor. The discussion moved to mentees sharing resources with their mentors. Most of the mentees admitted feeling intimidated and hesitant at first to share resources they found with their mentor. They generally held their mentor in very high esteem for their expertise and were not confident in their skills. Megan shared, "I think I was pretty timid at first just because my mentor is super-duper knowledgeable, and I felt like I was coming in knowing nothing. . . . I didn't want to look dumb." Interestingly, however, most mentees felt most comfortable sharing technology resources and instructional technology techniques with their mentor. Laura, the mentee who primarily worked with her team alongside her mentor, seemed to feel the most comfortable sharing with others even though she was in the middle of the group in her self-reported instructional technology skill.

Matching. The discussion moved to challenges that arose when mentors and mentees were not well matched. The matching discussion settled into the difficulties of knowledge transfer when mentors and mentees did not teach in the same content area. The two mentees that did not match their mentor's content area were the primary participants: Their general thoughts were that they did not have a large amount of knowledge or resources shared in their dyad, and they generally sought out other informal mentors instead of their formal mentor to serve in this manner.

Relationship. The subsequent discussion topic then moved to the relationship needed to encourage a flow of knowledge within the mentoring relationship. The topic

that dominated this discussion focused on building a relationship where both members of the dyad were comfortable working with each other. Ideas included trust, confidence, friendship, and openness. When sharing about her relationship with her mentor, Jessica emphasized the importance of trust and how she "was more apt to be vulnerable with her [mentor]" and ask for help. Beth shared how her personality aligned well with her mentor's personality: When referring to her mentoring relationship, she felt she "could be herself around her [mentor]" and "felt like [her mentor] really cared."

Timing. The ensuing discussion topic settled on when mentees thought gaining technology knowledge was most important. The consensus was that it was always important, but the start was critical, especially for what they felt were high-priority aspects that would affect their teaching. Laura started the conversation by stating, "I think it was super important to get the technology down from day one." Jessica agreed: "I think there were really important aspects of utilizing technology that we needed to know right away." She continued, "but then, as it went on, I think there were some things that could be put on the backburner" (i.e., referring to less critical things that were important). Beth shared her sentiment about pacing and the need for the right things at the start: "At the beginning of the year, when we had the technology [professional development] days, to me, that was really overwhelming. I just wanted to really know the nuts and bolts. What's the most important thing?"

Lead. The final topic discussed was how the mentoring relationship and activities were led. Although the mentees came to the consensus that "it depends" on who should lead, the direction of activities should be determined mutually. The mentees were unanimous in their assessment that at the beginning of the mentoring relationship, they

wanted the mentor to lead, but they also wanted to get the specific help they needed at the right time. Megan felt she experienced moments when she "didn't know enough to know what she was missing." Jessica asserted that mentoring should be flexible and shared: "A lot of times, I kind of drove the conversation based on what I was needing. There would be times [my mentor] wanted to directly share things with me. So, it just kind of depended on the circumstance."

Multiple Case Study Findings

Thematic analysis techniques using Dedoose analytics software helped to develop themes within the data collected through the multiple case study. The data sources used included comments by the mentors and mentees within the seven individual cases studies, researcher memos drafted during the process, and commentary recorded during the focus group interviews. Data analysis consisted of an initial review of interviews for the individual cases and progressed to developing codes for repetitive ideas, phrases, and other data types. While I was analyzing the data, I developed and defined one hundred codes. These codes were refined, reduced, and grouped into more significant ideas. Findings of this initial analysis of commentary derived from individual study participants were shared for each case in Chapter 4.

The themes developed in the individual case studies were reviewed and clarified using data gathered during the mentor and mentee focus group interviews. A cross-case analysis yielded several major themes by comparing and contrasting the individual cases. This analysis of the multiple cases and focus groups provided answers for the study and to the primary research question: *How does the teacher mentoring relationship influence mentor and mentee teacher beliefs on classroom technology use?*

Multiple Case Themes

This section presents the themes that emerged from the cross-case analysis of the findings of the individual cases in Chapter 4 and from data generated through the focus-group interviews. Eleven notable themes emerged and are presented below.

Knowledge and Resource Exchange. The study's first and most prominent theme is the transfer of knowledge and resources that happens within a mentoring relationship. All study participants thought mentoring was an excellent way to share knowledge and resources. They also shared how a good mentoring relationship creates an excellent learning environment because it is comfortable and safe. The participants' accounts evidenced the exchange of the three types of teacher knowledge: (a) content, (b) pedagogy, and (c) technology.

The focus of this study was on the knowledge domain of technology, but the stories and examples shared generally included knowledge from all three of the domains. These examples of knowledge exchange were usually about instructional practices that included incorporating technology tools. However, teachers in different content areas reported reduced knowledge exchange and no content or combined technology and content-related exchange. In these situations, the mentees reported working with an informal mentor they sought to fill this role. One example is how Laura, a mentee, thought her understanding of content, instruction, and technology grew significantly. She worked with her formal and informal mentors to plan instruction together regularly. Laura shared, “I definitely think that we focused on instruction the most. Like what we were going to do… that led to how we were going to do it with technology…Then it all relates to our content because that's what we're teaching.”

The sharing of resources was the other prominent aspect within this theme. Mentors, especially those that teach the same content area as their mentees, reportedly provided a wealth of resources to their mentees. Informal mentors also filled this role in the instances when a formal mentor's instructional assignment did not match the content area of the mentee. In regards to mentee contributions in the dyad, the most common initial resources shared from mentee to mentor were technology tools they desired to incorporate in their teaching. However, as the relationship progressed and the mentee's skill and experience grew, the mentee's sharing progressed in other ways with their mentors.

Mentor and Mentee Matching. The next theme that emerged from data analysis was the importance of a closely matched mentor and mentee pair. There were two aspects stated by study participants that were impacted by the matching or mismatching of a mentor and mentee. The affected aspects were knowledge transfer and relationships. Regarding knowledge transfer, the three characteristics most discussed by participants were content area, age of students taught, and the type of students taught. Of these three, content area matching was widely agreed upon as the most beneficial aspect of matching. However, special education teachers felt that being paired with another special education teacher was just as beneficial. The age of students taught was the other characteristic significantly mentioned as a beneficial characteristic to improved knowledge transfer. Mentors and mentees on the same grade level team found it beneficial when planning together. Additionally, it was felt that the other team members acted as informal mentors in these groups. This circumstance created a team-mentoring situation.

Two characteristics appeared to impact the relationship-building of a mentoring dyad. These were similarities and personalities. Participants stated they did not feel that matching any traditional demographic characteristic was more beneficial than others were. However, many participants mentioned how being similar to their mentoring partner helped build a relationship. Karmen and Amanda stated how they had a closer relationship because they were both pregnant during their mentoring, and the shared experience created a stronger bond in their mentoring dyad. Jan and Beth mentioned how their similar sense of humor was something that strengthened their relationship. Personality matching was mentioned, but participants perceived it differently and felt that matching might not be the best situation in a relationship. A discussion included how similar strong personality types could cause conflict in the pair, and they felt complementary personalities were better than matching personalities.

Informal Mentors. A correlating theme that emerged alongside the importance of mentor matching was the finding of informal mentors. All mentee participants mentioned finding informal mentors in their first year of teaching. These were often teachers on their teaching teams, teachers with previous relationships, teachers in near physical proximity, or teachers teaching the same subject or grade. Mentees that were not matched well with their mentor relied more heavily on their informal mentors and more actively sought them out over their well-matched peers. Stephanie, an art teacher matched with a technology teacher, mentioned difficulties with seeking out her peers for help with lessons and projects: “I've talked a lot project-wise with some of my friends who have middle school teaching positions… I tried reaching out to elementary and high school art teachers.” Andrea shared how her second-grade teaching team helped fill the gap: “I met

with the other second-grade teachers as a team, and we kind of developed lessons and talked about our ideas together." Other mentees had an affinity towards the other teachers on their department or grade-level teams, and these teachers were the most often cited source of informal mentors.

Relationship Importance. In a vast number of discussions with mentors and mentees, the importance of the relationship is evident. Mentees mentioned traits of their mentor as knowledgeable, dependable, understanding, approachable, non-judgmental, and open-minded. Mentors shared the traits they attempt to exude as organized, flexible, understanding, compassionate, friendly, open, discrete, resourceful, and non-judgmental. Two relationship aspects appear the most often among the participants.

The first relationship aspect is the general idea of expertise and mentees' confidence in the mentor. Most mentees had great confidence in their mentor's expertise. In some of the more successful pairings, the mentees appear to revere their mentor. There is a tremendous amount of respect given to their mentor and their opinions. Megan, whose mentor had the most significant amount of experience, shared about her mentor: "She's really freaking good at what she does. Anything I can learn from her…it's amazing." She emphasized her statement with a chef's kiss.

The second relationship aspect is a comfortable relationship for learning. The traits shared by both mentor and mentees previously focused on creating this ideal comfortable environment for the mentee to learn from the mentor primarily, a similar concept many experienced teachers use with their students. An example is how Jessica described her relationship with Nancy: "We've really built a good relationship, and I feel like I can trust [my mentor]. [My mentor] is somebody that would always give me honest

feedback." This environment seemed to be beneficial to the mentors as well. Several mentors mentioned similarly how they "don't know everything." Being open, honest, and candid with their mentee can lead to their improvement. This idea was more evident as the mentees gained confidence and would share more innovative thoughts and ideas with their mentor.

Impact of Beliefs. The participants in this study were all favorable about the use of technology in education and its role. When describing their thoughts on using technology for instruction, the mentors and mentees used descriptions such as "fundamental," "important," "imperative for the future," "enhancing," "engaging," and "essential." A few that worked with younger students mentioned the balance needed with technology and using it appropriately. Andrea described it as a "fine line" and being conscious of "using it as a way to help kids learn."

The study's mentor and mentee participants were generally very open to learning and trying new technologies for their classrooms. Most mentees felt their most significant contribution to their mentor's growth was the innovative ideas using technology tools they shared. Jan, a mentor who described herself as one of the least skilled in using technology in the study, shared her openness to learn: "Well, I never feel overly comfortable [with technology], but like I said, one of the things with being the mentor is…I had to learn how to do it better."

Impact of Limited Time. When discussing negative aspects of mentoring, mentors and mentees had difficulty thinking of anything substantial. Mentees found anything their mentor did for them as extremely helpful and did not seem to want to share anything negative. However, all of the mentoring dyads in this study appeared reasonably

successful and happy with their experiences during the time of this study. Because of previous discussions, the obvious negative they brought up was not closely matching their mentoring partner. This theme was shared as a major theme.

The other negative that participants shared was the lack of time. There was general thinking from all involved that they wished they had more time to work with their mentoring partner. This thinking was especially true if mentoring included more than induction into the organization and included a focus on knowledge transfer. Many pairs struggled with finding time for the minimal formal requirements and had difficulty finding time for any other aspect. Mentors generally did not primarily focus on knowledge transfer, and it was a secondary goal. Cherin shared: “It's hard to find it, but just more time for the mentee and a mentor to get together. Whether that's co-teaching or seeing each other's classroom or a time to meet that's not actually still planning time too.” It was also stated that the impact of the pandemic exacerbated this lack of time needed to utilize the mentoring relationship fully.

Impact of Pandemic. The COVID-19 pandemic was mentioned numerous times during the interviews, and how it impacted mentoring was evident. The participants cited both positive and negative impacts related to mentoring because of the pandemic. The participants’ most shared impact was how the pandemic affected their time negatively. The impact was twofold. The first issue was how the mentor had to rebuild their lessons while learning to teach in a new online or hybrid format. Cassie, a mentor, mentioned how she felt like she was “a new teacher navigating teaching online.” This extra load made it more difficult to spend adequate time with her mentee.

The second issue was how the pandemic restrictions made meeting very difficult. Schedules no longer matched up, and in-person observations and co-teaching were not allowed. Planning periods were spent covering for quarantined teachers, and teachers were not allowed in other teachers' rooms for any significant amount of time. These restrictions made relationship building very difficult for the new teachers. Denise shared how limiting the restrictions were. When sharing her difficulties building a relationship with her mentee, she stated she "wasn't even able to eat lunch together [with her mentee]" and primarily had to meet over Zoom meetings. The mentees also mentioned how difficult it was to build relationships with other teachers in their buildings that could potentially serve as informal mentors. These pandemic changes left new teachers lonely and lost at times.

Interestingly, the pandemic created a few positive impacts on mentoring. The first is how it opened up new ways of meeting and communicating. Most teachers had never participated in a Zoom meeting, much less taught using one. Most participants shared how Zoom was the primary way used to meet with their mentoring partner and perform their mentoring activities. The second way is how dealing with the pandemic related struggles encouraged innovative teaching and new ideas as the mentoring dyad developed lessons. Jan, a mentor, shared her thoughts on the pandemic impact: "I definitely think this quarantine has accelerated the use of technology in the classroom.

Activities and Leadership. The mentoring activities varied some by dyad. Aspects such as the formal mentoring program requirements, dyad matching, teaching role, and available time influenced the activities. These aspects are explored in other themes. However, the decision of what activities are performed during formal mentoring

activities was primarily chosen based on the program requirements and further by the decisions of the mentor and mentee. The group's consensus was that activities at the beginning of the first year and at critical times were driven and chosen by the mentor. The remainder of the time was generally flexible and driven by the mentee's needs at the time. These needs could be identified by the mentee's requests or the mentor's observed mentee needs.

The activities were shared in interviews and focus groups. Activities shared by mentors are included in Table 5.2. The top three activities shared by mentors were (a) reflective questioning, (b) availability for mentee needs, and (c) observations. Activities shared by mentees are included in Table 5.3. The vast majority of these activities were said to contribute to the transfer of technology knowledge in the pair. The information shared about activities in individual interviews primarily focused on (a) observations, (b) resource sharing, and (c) question and answer sessions. Other favorable activities mentioned in individual interviews were lesson planning and working together with student data.

Mentoring Skill and Experience. Mentoring skills and experience appeared to improve the mentoring experience. The more seasoned mentors with the most experience appeared to have enhanced mentoring experiences and better understand how mentoring can be used. The experienced mentors also appeared to have more confidence in their abilities and more comfort in not knowing the answer to everything. The mentee often mentioned the mentors' expertise, experience, and confidence in a reverent manner when describing their mentor. The very experienced mentors were infallible for many mentees, and they took their recommendations to be the official way of doing things. Megan

shared about her mentor: “[My mentor] is a very experienced teacher, and she's really freaking good at what she does. So, anything I can learn from her… and if I can get in her brain just a little bit, it's amazing.”

Reciprocal Nature of Mentoring Knowledge Exchange. The mentoring relationship is a benefit to both members of the dyad. Most would agree that the mentees are the primary focus and the member of the pair that likely receives the most significant benefit in a mentoring relationship. However, even though most mentees feel as if they contribute very little to their mentor, the mentors in the study found that mentoring positively affected their teaching practices. The mentors' most mentioned reason for growth was how working with their mentees prompted reflection on their own practices. Mentors felt that when new teachers asked for advice or brought up suggestions, it caused them to evaluate what they did, why they did it, and if it was the best way of doing things. Karmen, a mentor, shared about the reflection that happens when going through exercises with her mentee: “Going through the questions that they [the school district] give you, you kind of reflect on your own teaching...am I doing that? I haven't thought about it in a while.” The one area mentees felt they might have contributed to their mentor’s growth is their understanding of technology and the related instructional tools brought with them from their preservice education. When referring to classroom technology tools she contributed, Jessica, a mentee, stated: “I’ve shared some of the [technology tools] that I utilized in my student teaching.”

Foundational. A few suggestions of sources were shared during the interviews when discussing new teachers' initial resources and practices. These foundational resources and knowledge sources included educational preparation programs, student

teaching, teacher peers, online resources, and mentors. All participants felt that most of their resources and initial lessons came from others. Some indicated they could rely heavily on their formal mentor for their starting resources, and others sought out other teachers as informal mentors for these resources. The mentors who were closely aligned with their mentees readily shared time-tested resources that could be immediately used. Other mentees that did not directly match their mentor expressed how they struggled and sought out others for help in finding and developing these resources.

When mentors were asked if resources they shared with mentees were critical to a mentee teacher's foundation, all mentors agreed. Cassie, the mentor with the most experience teaching and mentoring in the study, stated how mentoring "absolutely did" provide a solid instruction foundation for these teachers. Mentors that did not match the content area of their mentee believed they did help develop the foundational resources but did not do so as directly as the other similar mentoring pairs. That role fell to an informal mentor in their content area or grade level team for these mentees. Denise expressed the importance of these foundational resources and knowledge: "The things that you are learning and implementing in your classroom at the beginning of your teaching career, the more comfortable you [as a teacher] get with that, the more you'll utilize it and expand on it and find ways to make it better." It was clear from the interview data that the resources and knowledge learned at the beginning of a career were considered critical in a teacher's success.

Summary

This chapter included the findings of the analysis of the focus group interviews and the multiple case analysis. The closing chapter will conclude this study and contains the implications to practice of the themes shared in chapters 4 and 5. Additionally, the final chapter will include other relevant ideas found during this study, a discussion of the findings, and recommendations for further study.

CHAPTER 6

DISCUSSION AND CONCLUSIONS

This multiple-case study examined teacher mentoring and its influence on teacher technology beliefs and knowledge transfer. Chapter 6 summarizes the findings and suggests conclusions. It includes a discussion of the results with insight into the interpretation of the data, connections to the larger body of literature on teacher mentoring and instructional technology, limitations to the study, and implications to mentoring practice. This study specifically examined the influence of mentoring on teacher instructional technology beliefs and its impact on classroom technology use of members in the mentoring pairings. I used interviews and focus groups as the means to gather data to explore ways to improve the preparation and induction of new teachers into the teaching profession to increase teacher success and retention.

Summary of the Findings

Findings from this study were informed by the primary and secondary research questions as well as the additional guiding questions of the study. The overall themes developed from the data collected compels me to suggest that the relationship developed during mentoring can be an excellent medium to transfer knowledge and resources that impact the beliefs of teacher technology usage in P12 classrooms. My secondary examination of study findings revealed several aspects of the teacher mentoring relationship that influenced both mentor and mentee's instructional technology beliefs and usage: (a) the importance of creating a solid personal relationship between the mentor and mentee, (b) the need for improved teacher matching for optimal knowledge and resource transfer within mentoring dyads, (c) the importance of creating a solid

foundation for new teachers, (d) the reciprocal nature of knowledge exchange within the relationship, and (e) the impact the pandemic had on mentoring. These aspects are explored, and the implications to practice are discussed in the next section.

Implications for Practice

This study is limited to findings based on the established scope and the mentoring dyads serving as cases. It is reasonable to share recommendations developed from this study for suggested changes in mentoring practices. Changes in practices in programs such as this improve the mentoring relationship's impact on teacher competency and confidence.

Importance of a Personal Relationship

My initial assertion about mentoring is that a strong professional relationship is beneficial in strengthening the influence on the members of the mentoring dyad in regards to educational technology beliefs and use. This assertion is based on previous research on the mentoring relationship by multiple scholars (Bott, 2012; Clawson, 1996; Gold, 1999; Howey, 1988; King, 1986; Louis, 2007; Odell, 1990; Tschannen-Moran, 2009; Wang & Odell, 2002). After reviewing the findings from this study, this assertion—the need for a strong personal relationship between mentee and mentor—is supported by the data. However, there is more than just a strengthening of influence. A strong relationship is critical to the transfer of technical knowledge, resources, and beliefs. The primary factors influencing this relationship are the referent power of the mentor built through trust and expertise (French & Raven, 1959).

The trust developed while engaged in the mentoring relationship is a dimension of building professional capacity. Tschannen-Moran (2009) performed a survey study that

revealed that 57% of the variance in building teacher professional capacity is explained through trust issues. Hence, a greater amount of trust between mentor and mentee improves how a new teacher is willing to change and improve (Louis, 2007). Additionally, expertise or the perceived expertise of the mentor builds admiration and respect (French & Raven, 1959) and is vital in building a strong relationship. This referent power created through this relationship creates a desire for mentees to please, emulate and associate with the mentor. Referent power is the most valuable and potent source of power because its influence stems from internal self-motivation (French & Raven, 1959).

In this study, all mentees held their mentors in high esteem and valued their input greatly. This reverence was observed to be at a higher degree when the two teachers taught in the same content areas and within dyads with a highly experienced mentor. Some mentees felt their mentors could do no wrong, and their advice was the method of operating. Thus, this study concurs with previous research and extends it to instructional technology knowledge. Building this referent relationship between the experienced and the novice teacher is vital to developing a successful mentoring relationship that influences and transfers valuable knowledge and experience of instructional technology to the mentee.

In this study, only two of the 8 mentor participants had over 20 years of teaching experience and over 5 years of mentoring experience. The rest averaged 9 years of teaching experience and 1.8 years of mentoring experience. The findings from this study support the recommendation for offering incentives to veteran teachers to encourage more of them to volunteer to participate in mentoring. Teachers with more experience

have a greater chance to establish the expert role desired for mentoring. Additionally, the study findings suggest that more time should be available for a mentor to work with a mentee before the start of the school year to help the mentee establish foundational lessons and resources and establish a trusting relationship through this work and additional team-building activities. Although these recommendations are specific to the participants and district in this study, similar conclusions can be assumed for peer mentoring within other school systems.

Improved Strategies for Mentor-Mentee Matching

A researcher assumption prior to data collection was that teacher matching in forming the mentoring dyads would enhance the possibility of a closer relationship between the two teachers and that matching provided for more opportunities to influence beliefs and exchange knowledge and resources. Within the study findings, this belief appears to be generally true. However, matching teaching content areas and relative age of students within teachers' classrooms appears crucial if one of the primary mentoring goals is professional knowledge and resource exchange.

Algozzine and colleagues (2007) completed a study that examined common activities and methods of assistance in teacher mentoring and induction programs. One of this study's crucial findings was the importance of assigning a mentee to a mentor in the same licensure area. In the study reported here, there appears to be some minor technology knowledge exchange in any pairing. Unfortunately, in this study, the novice teachers who were not matched well in content and age with mentor teachers made very few attempts to share knowledge and resources. Thus, instructional technology tools and the related pedagogical techniques are closely tied to the content area and age

appropriateness. This study's findings aligned with those of Algozzine and his colleagues: Closer matching in all aspects provides a more effective mentoring dyad.

Another recommendation from the examination of study findings is that mentoring program administrators should prioritize mentor and mentee matching and develop tactics for mitigating the problems if a match is not available. In order to increase the amount of knowledge and resource transfer, content area matching should be the top priority in forming mentoring dyads. However, it is understood that a close match is not available in some situations due to circumstances (e.g., teachers in unique subject areas, location issues, lack of viable mentors). In these situations, the use of a team approach may be more effective. This approach would provide a local mentoring buddy for building-level support, relational support, and induction into the organization. Another teacher from within the district whose content area and student populations more closely align with those of the novice teacher would serve as a content area mentor, thus assuring that the mentee gains the benefits of guidance from someone in the same field of study.

Importance of Creating Solid Foundation for New Teachers

This study was designed on the researcher's assumption that experienced teachers are an excellent source for foundational instructional knowledge, techniques, and resources. Additionally, one of the study propositions was that this concept extended into instructional technology knowledge, techniques, and resources. Another of the researcher's assertions was that experienced teachers working in a mentoring relationship with novice teachers is a powerful method to influence instructional beliefs and share foundational knowledge and resources related to instructional technology with new teacher mentees. These assumptions were informed by professional literature on

communities of practice (Kadji, Zachariou, & Flogaitis, 2014; Hitt & Tucker, 2016; Waniganayake et al., 2012).

In this study, all mentees were immensely grateful for the help, guidance, and resources their mentor shared with them and often asserted that their mentors were critical to their success. Additionally, the mentors perceived that their mentees could readily use the information, practices, and resources they shared. Further, this shared knowledge could help provide successful instruction within the new teacher's classroom without the new teachers understanding why these resources are successful. Thus, findings from this study suggest that mentoring is critical to building the foundational beliefs, lessons, tools, and resources required for beginning teachers. These foundations included a teacher's beliefs and knowledge of instructional technology.

Unfortunately, not all mentors had this understanding, and thus, some were more effective than others in helping beginning teachers establish their professional foundation. This finding suggests that mentor training must be a high priority within school districts that assign experienced mentors to novice teachers. An experienced mentor's skilled support is reported as a critical component in the mentee's early success (Brindley et al., 2000).

A number of the mentors in this study have minimal mentoring experience. Their training consisted of participating in an online self-paced orientation and training modules to prepare them to work with new teachers. During their interviews, many mentors did not appear to have a deep understanding of mentoring and the associated best practices in supporting novice teachers. The mentors had inconsistent practices across mentoring dyads and did not collaborate or work together to create a mentoring

community to improve their mentoring practices, skills, and knowledge. The California County Superintendents Educational Services Association (2016) suggests that mentors receive up to two weeks of initial mentoring training to prepare for their role as mentors. Hence, another recommendation emerging from this study is implementing an initial two-week training as well as ongoing monthly training and dedicated bi-weekly times for mentor collaboration and group development.

Reciprocal Nature of Mentoring Relationship

One of the propositions in the development of this study was that both members of the mentoring relationship would gain new knowledge and improve their professional practice through participating in mentoring activities. This proposition was based on research literature on teacher relationship building, collaborative learning, and the power of creating communities of practice (Kadji, Zachariou, & Flogaitis, 2014; Hitt & Tucker, 2016; Waniganayake et al., 2012). At the start of this study, I likewise perceived that reciprocity within any pairing of professionals would influence both partners. However, I did not realize the degree of growth and improvement that an expert teacher can experience when working with a novice.

In this study, most mentee teachers believed mentoring was mainly a one-way relationship, with only the mentee gaining from mentoring. The few examples the mentors shared were the possibilities of their mentees contributing their technical knowledge, although the mentees were tentative about its value. They also agreed that most of the direct contributions to their practice from the mentees related to new or innovative teaching practices involving technology. The power of this contribution

appeared to be greater than in past years because of the pandemic and the need for both teachers to solve new problems, innovate, and use unfamiliar technology.

Within ordinary teacher mentoring situations, the more significant learning value lies in the mentor's reflections on their current practices and the desire to share the best of their knowledge and experience with their mentee (Holloway,2001; Kadji, Zachariou, & Flogaitis, 2014; Waniganayake et al., 2012). In this study, the mentors unanimously felt they gained a much greater understanding of their practices because of reflection. Regarding technical knowledge, the act of mentoring challenged mentors to use a technology tool and understand deeply what they were doing with it in their instruction and why. The mentoring relationship can thus force a mentor to stretch and grow because they must be the expert in the relationship to guide the mentee. This motivation is an excellent inspiration for expanding the knowledge of instructional technology and reinvigorating a teacher in the later stages of their professional career.

Data gathered during this study confirms that mentoring is a reciprocal learning relationship. Mentors learned much while helping build the foundational knowledge and resources of their mentees. Thus, to enhance the capacity of all teachers, all experienced teachers should be encouraged, motivated, and rewarded for serving as a mentor to novice teachers. This growth, reinvigoration, and purpose could lead to experienced teachers staying in the field and improving their instructional performance.

One phenomenon that I hoped to examine was how mentoring could lead to stagnation in the teaching profession by the perpetuation of proven established practices versus encouraging innovative methods in the teaching field (Beck & Kosnik, 2000; Blackwell, 1989; Hobson & Malderez, 2013; Iowa, 2014; Lawson, 1992; Long, 1997;

Ying, 2009). The data gathered during this study only allowed a partial examination of this phenomenon. These mentoring pairs had a positive outlook on technology use, and all participants were fairly accepting of innovation. In the narrow aspect of the phenomenon related to participants with positive beliefs, the mentoring relationships did not cause stagnation because the participants were open and encouraging to implementing innovation and using technology. However, this study also occurred during a global pandemic that forced teachers to use innovative and technology-rich instruction methods without an alternative. To further examine this phenomenon, participants adverse to innovation with negative instructional technology beliefs would be needed in addition to removing the impact of the global pandemic.

Impact of Pandemic

The pandemic was not an initially planned part of this study. Due to its impact on the delivery of instruction and the working environment for teachers in educational systems worldwide, I felt it was essential to consider the pandemic within this study. In almost every conversation with participants, the pandemic was mentioned. I anticipated the pandemic would significantly affect the ability of mentoring dyads to build strong relationships and thus influence the relationship between mentor and mentee and the amount of knowledge and resource exchange that occurred. Somewhat surprising, the pandemic had a mixed impact on technology adoption and knowledge exchange within the mentoring relationships. The anticipated impact was only mildly evident in the mentoring relationship, and the shared adversity had the general effect of bringing mentoring dyads together to solve instructional difficulties. However, the pandemic did appear to impact the informal mentoring and peer relationships during this time.

During this study, the idea of a common foe or major adverse event bringing people together and motivating them to find innovative solutions to overcome the adversity was validated by study participants' comments. The positive effects were generally attributed to the leap in technology use because of the need to deliver instruction virtually. Mentoring pairs found technological tools that improved their ability to meet and collaborate with each other and their students. This common problem and mutual need related to instruction during a pandemic brought mentor and mentee together to solve new, technology-related problems that both experienced and novice teachers were experiencing. These learning opportunities improved the confidence of many mentors' technical and online teaching skills while allowing their mentees to contribute and thus gain confidence in their knowledge and skill. This reality leads to the conclusion that team-building strategies could be used within the mentoring dyads to improve positive beliefs and exchange knowledge and resources.

The adverse effects of the pandemic were minimal and attributed to the changes and restrictions that were implemented by the school district because of the pandemic. These effects included increased difficulty in building relationships with other teachers and in finding time to focus on the mentoring program. Many study participants mentioned how hard it was to build new relationships. New teachers reported often feeling isolated and frustrated due to challenges in making peer connections because they could not observe teachers in other classrooms, eat lunch in their classrooms with students, and distance themselves when around other teachers. However, mentoring meetings were required by the district, and technology solutions such as Zoom meetings helped teachers to meet virtually. Nonetheless, solutions for building other relationships

were not found, which caused the new teachers to cling tightly to their relationships. This situation appeared to enhance the strength of the mentoring relationship. It potentially increased the amount of technical knowledge reciprocally exchanged experienced due to the importance of technology during the pandemic.

Finally, the pandemic restrictions and adaptations made it difficult for teachers to find time to devote to the mentoring program. Available opportunities to meet were reduced, and both mentor and mentee teachers spent more time scrambling to adjust and learn to teach in a virtual or hybrid teaching environment. Many mentors felt they were new teachers again due to developing lessons for delivery within new learning environments and did not have the time to assist their mentees appropriately because of their own needs. Literature on mentoring reveals that a mentor and mentee having sufficient time to work together is an essential factor in successful mentoring programs (California, 2016; Jones et al., 2014; Womack-Wynne et al., 2011). The mentors in this study felt their mentees suffered during the 2000-2021 school year due to inadequate time together.

The problem of teachers not having adequate time for addressing their professional growth is common. Literature on mentoring reveals that the amount of time provided for a mentor and a mentee to work together is an essential factor in successful mentoring programs (California, 2016; Jones et al., 2014; Womack-Wynne et al., 2011). Although mentoring programs are implemented to facilitate this growth, school districts commonly do not provide adequate time to do more than the minimum. The exchange of knowledge and resources requires more time than the minimum typically provided. Data gathered through this study indicates that the district does not allocate adequate time to

maximize the potential of this medium for learning. For example, the California County Superintendents Educational Service Association suggests that 1.25 to 2.5 hours a week be allocated as specific protected time for intentional mentoring activities (California, 2016). Findings from this study suggest that dedicated time for a mentoring planning period be regularly available to provide mentors and mentees the time necessary to improve their teaching practices.

Discussion

Four significant areas of literature informed this study: (a) professional teacher lifecycle, (b) TPACK, (c) UTAUT, and (d) mentoring theory. This section presents how this study reinforces, contradicts, and expands the existing literature and understandings in these areas.

Teacher Professional Lifecycle

This qualitative study examined two different phases of teachers in the conceptual classifications in the research on the professional teacher lifecycle (Huberman, 1993; Fessler & Christensen, 1992; Leithwood, 1992; Steffy, 2000). Even though the experts term their phases slightly differently in their specific model, the phases roughly overlap. The levels involved in this study are the *apprentice* and *master* phases in each of the models.

Apprentice. According to the experts in the field (Huberman, 1993; Fessler & Christensen, 1992; Leithwood, 1992; Steffy, 2000), teachers in the early stages of the teaching profession are considered to be in the apprentice phase. In this phase, teachers are given their first professional teaching responsibility. Thus, the apprentice phase can be a stressful and dangerous phase where many teachers fail and leave the profession.

Teachers in this phase are passionate and eager but often lack experience and confidence, which generally places them in a survival mode when they make decisions based on what can help them get through. They readily accept input and resources in the attempt to become proficient (Huberman, 1993; Fessler & Christensen, 1992; Leithwood, 1992; Steffy, 2000). This apprentice level is where mentees in this study lie.

Findings from this study suggest that effective mentoring helps move teachers into the next phase, the professional phase, where resources and teaching practices have been established. This research focuses on the specific topic of growing technology knowledge, confidence, and resources for teachers. As described in the TPACK model (Mishra & Koehler, 2006), technology knowledge is one of the teaching knowledge domains. The results of this study show how mentors can be a critical component in providing these foundational resources and how new mentee teachers readily accept and use these resources derived from their mentor sources. This phase is thus the time with the least resistance to teachers accepting and using instructional technology knowledge and resources. Implementing proven resources and practices at this foundational level gives the teacher a head start in the profession and helps to set the teacher up for success. Borko (1986) stresses the importance of this critical time for professional development in teacher education because the established patterns and attitudes may last throughout a teacher's career. Further, Stansbury and Zimmerman (2000) agree that the initial period in teachers' careers is critical in developing their professional practice: Performing successfully during this period can keep new teachers in the field. A successful start leads to improved teacher confidence, skill, and happiness and thus improves the skill of mentees and the retention of new teachers in the profession.

Master. According to the experts in the field of the professional lifecycle of teachers (Huberman, 1993; Fessler & Christensen, 1992; Leithwood, 1992; Steffy, 2000), teachers in the later stages of their professional career are considered to be in the *master* phase. These veteran teachers are experts and have significant confidence, knowledge, and experience. The experienced mentors in this study fall into this category. However, teachers in this stage can become disengaged and stagnant in their professional growth.

The results from this study indicate that mentoring can have a rejuvenating effect on the mentor teacher and encourage engagement and reciprocal growth in their practice. The findings suggest there were two prominent ways mentors grew during this relationship. This growth was through reflection on current practices while working with mentees and through the mentee sharing innovative tools and practices learned in their preservice education. Reflection occurred when establishing the best of their resources and knowledge to share with the mentee while helping the mentee develop and plan lessons and when posed thought-provoking questions by the mentee. Moir (2009) asserts that being a mentor allows one to reflect on one's professional practice, improve understanding of teaching, and adopt progressive teaching practices.

Technology was the area that most mentors mentioned as something valuable their mentee taught them. New teachers appeared to bring new ideas and methods with them into the profession. Many of the ideas include innovative technology tools that veteran teachers have not experienced. This personal engagement and growth, along with their mentee's growth, can invigorate a teacher in the later professional stages and increase job satisfaction

TPACK

The TPACK model was used in this study to examine how knowledge was exchanged between mentor and mentee teachers. This model divides knowledge into the three domains: *technology*, *pedagogy*, and *content* (Koehler & Mishra, 2006). TPACK "involves asking how technology can support and expand effective learning and teaching within the discipline, while simultaneously adjusting to the changes in content and pedagogy that technology by its very nature brings about" (Swenson, Rozema, Young, McGrail, & Whitin, 2005, p. 222). It can be thought of as how teachers decide how to teach, what to teach, and how technology can help accomplish these teaching tasks. The model further uses concentric circles to show the overlapping relationship of the knowledge domains. See Figure 2.1 for the depiction of the model. The primary areas of this model examined in this study were Technological Knowledge and the overlapping areas of Technological Content Knowledge, Technological Pedagogical Knowledge, and Technological Pedagogical Content Knowledge.

Findings from this study suggest that, in a mentoring relationship, knowledge of technology is passed to members of the mentoring dyad similarly to the knowledge of pedagogy and knowledge of content. It was also the most likely of the knowledge areas that mentees contributed to the growth of the mentor. All participants suggested that having a mentor and mentee that taught the same content area was the optimal arrangement for knowledge transfer of all three knowledge domains. The study participants asserted that teachers generally do not focus on technology alone. Most of their stories and shared experiences consisted of the combined domains of Technological Content Knowledge, Technological Pedagogical Knowledge, and Technological

Pedagogical Content Knowledge. A logical assumption can be made: A mentor experienced only in a particular content area would not be skilled at using technology or instructional techniques for a different content area. This study indicates that the optimal mentoring relationship for technology knowledge and resource transfer is a relationship that closely matches teachers in their content area. Interestingly, technical knowledge transfer alone was the most cited domain of knowledge transfer for non-matching mentoring pairs. During the induction period, novice teachers develop their foundational teaching practices and can rely heavily on the established best practices shared by their mentors (Borko, 1986). By matching mentoring dyads, mentoring will create a better foundation of knowledge and resources to build upon for a new teacher.

UTAUT

The Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003) is an advanced theory on technology acceptance. UTAUT can be applied to how teachers accept and use a given technology and how that technology can be applied to teachers' use of educational technologies. Beliefs about the intention to perform a behavior originate through various sources, such as education, prior cultural and social experiences, and personality (Fishbein & Ajzen, 2011). These collective beliefs are the deciding factor on whether an individual intends to perform a particular behavior or not. The foundational idea of UTAUT is how several factors can be combined to predict an individual's acceptance of technology and therefore use of technology based on their beliefs (Venkatesh et al., 2003).

The basic UTAUT model suggests that four key constructs (i.e., performance expectancy, effort expectancy, social influence, facilitating conditions) are direct

determinants or predictors of usage intention and behavior (Venkatesh et al., 2003). Gender, age, experience, and voluntariness of use mediate the impact of the four critical constructs on usage intention and behavior in the manner indicated in Figure 2.2. Other extended models have added additional factors such as trust, self-efficacy, enjoyment, and satisfaction to improve the model. These are intriguing additions; however, this study focuses on the base model.

This model is generally used to predict beliefs and use of technology quantitatively. I examined how the mentoring relationship appeared to fit into this model of predicting beliefs and use for this study. According to this model, the influence of the mentoring relationship fits primarily in the determinant area of social influence. Since this model bases the determining factors on an individual's beliefs, it seems appropriate to assume that the mentoring relationship influences the beliefs driving the other three key determinants. A mentor's influence on a mentee is derived from the relationship aspects of trust and benevolence and the personal power of expertise, experience, and confidence to impact the mentee's beliefs in all predicting factors. In the reciprocal situation of mentees influencing mentors, there appears to be little influence on beliefs in general. However, while working with mentees, mentors are generally open to new ideas that could be implemented to improve their performance, making the critical influence for mentees on mentors in the relationship the performance expectancy.

Examining the moderators in the UTAUT model and the findings from this study age had minimal impact. It was expected that age would significantly impact the four predictors as a moderator in the model since mentoring typically includes younger and older participants in the respective roles, and lower levels of technology acceptance are

traditionally associated with increased age. However, this was not evident in this mentoring study. Perception of job performance, effort, and social influence are different for new teachers and for experienced teachers. The moderating factor of experience would similarly factor with age as they are generally aligned in a mentoring situation. Finally, the voluntariness of use appears to be an individual trait. However, from the researcher's experience, it would also generally negatively relate with higher age and experience as older, more experienced teachers are more inclined to use previously proven methods of instruction over more innovative, technology-driven practices.

Based on this examination and the results of this study, mentoring can influence behavioral intentions and use through the constructs of this model. Mentor beliefs would likely positively relate to mentee beliefs. Therefore, positive or negative beliefs in a mentor's predictor areas would also influence positive or negative beliefs in predictors for mentees. For a mentoring relationship to be effective for mentees accepting and using technology in an instructional setting, it is ideal for the mentor to have positive beliefs. These beliefs will likely influence those in key predicting factors.

Mentoring

The literature and theory on teacher mentoring served as the framework for this study. This research examined the gap in the literature on mentoring related to a mentoring relationship's influence of technology beliefs in a teacher's classroom technology use. Knowledge transfer in a mentoring relationship has been examined deeply. However, past studies have only focused on pedagogical and content knowledge and resources shared during this relationship (American Institutes, 2015; Wechsler et al., 2010) and left out the idea of technological knowledge.

The idea of technology beliefs used in this study was founded on the combination of knowledge, experience, confidence, and developed resources of a teacher and how they choose to use them in their classroom. The TPACK model (Mishra & Koehler, 2006) was employed to divide knowledge into the perspective areas to better user stand it for the study. These areas of knowledge were technology, pedagogy, and content.

An interesting observation in this study was that most of the knowledge learned in any knowledge area was based on practitioner experience versus theoretical knowledge. It was a "front line" and "in the trenches" kind of knowledge that would be difficult to gain in other ways. Most people entering the teaching profession are not adequately prepared for the daily challenges of managing a classroom: "Whatever you learned in college probably did not include the day-to-day mechanics with which we all contend" (Delisle, 2004, p. 31).

As explored in other parts of the study findings, the transfer of technical knowledge within some mentor-mentee relationships was similar to other areas, except for the knowledge passed to a mentor. Generally, direct knowledge and resources in all TPACK domains are passed from mentor to mentee significantly earlier in the relationship. This idea agrees with Villani's (2002) views on how mentoring improves teacher practices. However, in this study, technology knowledge was the most likely area of knowledge passed to a mentor from a mentee and often a strength of the mentee and source of confidence in the relationship. Some mentors mentioned reliance on the mentee more for technological input. Being a mentor allows one to reflect on one's professional practice, improve understanding of teaching, and adopt progressive teaching practices

(Moir, 2009). When mentors and new teachers work collaboratively, they both have the potential to gain knowledge from each other (Kadji, Zachariou, & Flogaitis, 2014).

According to the research literature, the potential to gain knowledge in this relationship can be severely limited if the mentoring dyad is poorly matched. Beaudette and Nolan (2013) suggest essential factors to consider for mentoring success, such as pairings where there is teaching the same grade and subject area, classrooms near one another, and availability to meet regularly. However, many mentors and mentees in formal mentoring programs have to be paired based on the common planning times, location, and mentor availability (California, 2016). Findings from this study suggest that this practice can lead to a less productive mentoring relationship regarding knowledge and resource exchange. However, findings also suggest that mentees will seek out an informal mentor as a source to fill deficiencies in specific areas of needed professional growth. Mentees in this study mentioned how they would seek support from teachers in adjacent classrooms, teachers on their department teams, or any teacher that may have the professional knowledge to address their needs. Scholars generally believe informal mentoring is the more effective type of mentoring because the source of the relationship is kindred thinking and mutual commitment (Sosik et al., 2005). However, naturally occurring mentoring relationships can be slow to develop independently and may never develop for many new teachers. Hence, the need exists to create formal mentoring programs that attempt to expedite this relationship's creation.

The mentoring relationship is critical to the mentoring processes' success (Kram, 1985; Long et al., 2012; Marable & Raimondi, 2007). Many conditions influence the development of successful mentoring relationships, including the personal characteristics

of the individuals involved (Turban & Lee, 2007). Personality traits deeply influence mentoring relationships and can have an impact when mentors are assigned in formal pairings. Mentors in this study agreed with this idea. Rowley (1999) developed six essential characteristics of good mentors that were also reiterated by Huling and Resta (2007). These include a commitment to the role of mentoring, acceptance of the beginning teacher, skill at providing instructional support, effectiveness in different interpersonal contexts, a model of a continuous learner, and being a communicator of hope and optimism. Rodd (2013) compares the mentoring relationship to that of a critical friend and suggests the relationship should be supportive and non-judgmental as well as based on trust, honesty, and mutual respect. These align with the traits shared by mentors and mentees, respectively, in Table 5.2 and Table 5.3.

Limitations

Four limitations potentially impacted these study findings. The first is the potential impact the researcher had on influencing the participants' answers in the study. I serve as the Director of Technology for the school district where the study was conducted and am responsible for the technical operations and instructional technology integration and training in all schools. Although I serve in a district leadership capacity and am a member of the executive leadership team, I did not directly supervise any of the study participants or the mentoring program provided by the district. Nonetheless, my leadership position within the district has the potential to skew the data with participants offering answers that are more desirable or not disclosing potentially damaging perspectives. Hence, the study's first limitation is the researcher's leadership position in the district of the participants.

The second potential limitation of the study is that it relies on participant experiences and perceptions of technology and mentoring. Data were gathered through individual interviews and focus-group interviews with the participants sharing their personal thoughts and feelings. Thus, these findings may have been impacted by participants' knowledge of technology education, instruction, and mentoring practices, which varied based on each participant's expertise. No expert observation or other methods were employed to confirm the validity of the participant statements, and information provided was based on study participants' opinions and their self-assessments of varying skill levels.

The third limitation of the study may be the lack of diversity among the study participants. Despite an open invitation to all teachers to participate, all volunteer participants were White women who had a positive view of technology and significant confidence in using instructional technology. Additionally, none of the volunteer participants taught high-school level students. The mentee population consisted of all White women, five White men, and one person of Asian descent. It is speculated that High School teacher participation was affected by the increased workload of teaching students virtually and in person during the pandemic. A more diverse population may have provided results that are more comprehensive.

The study's final limitation was the impact that a global pandemic had on participants and the work they did. The COVID-19 pandemic caused many shifts and modifications in P-12 education. These shifts affected both the formal mentoring program and the actual instructional practices used by all teachers. Many practices were more technologically advanced than previously used practices, and some may have been

required but were not adopted by the study participants. Additionally, these technology-integrated practices were adopted quickly, with very little formal training on using them or assessing their effectiveness. The influences related to these semi-forced and rapidly adopted teaching methods could have unknown effects as well as both positive and negative influences on the study.

Recommendations for Further Study

This research offered insight into a limited population of teachers in a specific mentoring program performed in a single school district. Several paths of additional research were easily identified for future research. After reflection on the study findings, I identified several areas for further research.

The first recommendation would be to replicate the study in different school district environments using more diverse populations. The population of this study was not diverse. Participants of a different race, gender, and other demographics could potentially have completely different mentoring experiences and perceptions.

The second recommendation is to perform a similar study examining the informal mentoring relationship and its influences. Mentees choose their informal mentors, who often work in classrooms adjacent to or near a new teacher's classroom, and research has indicated that this choice by a novice teacher can have a powerful impact on that teacher's professional performance and utilization of information technology in the classroom. An informal mentoring relationship may be a better medium for the exchange of instructional technology knowledge and resources than a formal mentoring relationship focused on a novice teacher's overall professional growth.

The third recommendation is to replicate this study and examine the team mentoring approach and the relationships and influences on members. One of the significant ideas within building professional capacity among teachers is the idea of everyone learning together within communities of practice, both expert and novice (Hitt & Tucker, 2016). The team-mentoring concept appeared to be a powerful method to improve the success of new teachers. The team approach to mentoring and the relationships provided would appear to have a multiple factor impact on assisting a new teacher in reaching proficiency faster.

The fourth recommendation is to conduct a study that measures the TPACK score of participants and quantitatively determines the impact of mentoring on instructional technology use. The teacher's perspective and opinion provide researchers valuable information. However, this information is skewed by what the participant knows or does not know. Tangible scoring and data would create a more equivalent and precise understanding.

The final recommendation for further research is to replicate this study when there are no significant disruptions to P-12 education. Most discussions during the interviews mentioned the pandemic's impact on teachers, and it was difficult to determine how much it influenced the study findings. This influence could have played a significant role in the instructional technology experience during the year of this study.

Conclusion

Teacher quality is one of the strongest influences on positive student outcomes (Hattie, 2003). Mentoring is one of the most successful strategies to improve beginning teacher quality and the performance of teachers and their learners (American Institutes,

2019). Teacher mentoring impacts every educator, and mentors play a critical role in building the knowledge and resource foundations that influence the instructional beliefs of every teacher. Technology knowledge and resources are now a critical part of these foundations.

This impact is often forgotten or minimized during the induction of beginning teachers, and this misstep can severely cripple novice educators navigating the first phase of their careers. A poor mentoring experience can lead a beginning teacher into an insurmountable learning deficit and cause low levels of teacher confidence. This poor experience can ultimately lead to a teacher leaving the profession. With the teacher shortage occurring in the country and more educators exiting the profession each year (Goldrick, 2016; Little, 1990), educational organizations must make a concerted effort to maximize the impact mentor teachers can make on the success of teachers entering the profession. Little (1990) and Goldrick (2016), scholars who focus on teacher development and practice, suggest that mentoring programs are a critical strategy to effectively increase new teacher retention and combat the growing shortage of skilled teachers in education.

This study examined the influence formal mentoring relationships have on teacher technology beliefs in the classroom. Teacher instructional beliefs are formed based on their knowledge, experience, and confidence in teaching strategies and resources. Technology is an infused part of the knowledge base used in teacher instruction and growing every day. Technology knowledge is transferred through the mentoring relationship along with the traditional areas of content and pedagogical knowledge. Ideally, these areas are woven together closely and applied in conjunction with the others.

This exchange of knowledge, resources, and ideas flow both ways in the relationship. Mentoring is a natural, comfortable, and powerful learning method to build confidence and share knowledge and resources. When not formally established, the mentoring method naturally occurs through informal mentoring.

Formal mentoring programs must be more than simple induction programs. They must be focused on improving teacher retention, increasing teacher ability, and making the desired impact of preparing and empowering new teachers beginning their careers. The findings of this study reinforce this idea and extend it to include teacher technology knowledge as an essential part of the knowledge exchange for mentoring success. The acclaimed actor Denzel Washington once stated:

> Show me a successful individual, and I'll show you someone who had real positive influences in his or her life. I don't care what you do for a living. If you do it well, I'm sure there was someone cheering you on and showing you the way. A mentor. (Mentor Resources, 2021)

Mentors can impact their mentees for a lifetime. Great teacher mentoring programs that fully leverage the mentoring relationship can perpetually impact their teachers and the teaching profession. Everyone deserves a great mentor to make a difference in their life.

APPENDIX A

IRB APPROVAL

University of Kentucky | Office of Research Integrity
IRB, RDRC

EXEMPTION CERTIFICATION

IRB Number: 65490

TO: Anthony Arbisi
Educational Leadership Studies
PI phone #: [redacted]

PI email: [redacted]

FROM: Chairperson/Vice Chairperson
Nonmedical Institutional Review Board (IRB)

SUBJECT: Approval for Exemption Certification

DATE: 4/22/2021

On 4/22/2021, it was determined that your project entitled "*THE INFLUENCE OF FORMAL MENTORING ON TEACHER BELIEFS OF K-12 CLASSROOM TECHNOLOGY USE DURING A GLOBAL PANDEMIC*" meets federal criteria to qualify as an exempt study.

Because the study has been certified as exempt, you will not be required to complete continuation or final review reports. However, it is your responsibility to notify the IRB prior to making any changes to the study. Please note that changes made to an exempt protocol may disqualify it from exempt status and may require an expedited or full review.

The Office of Research Integrity will hold your exemption application for six years. Before the end of the sixth year, you will be notified that your file will be closed and the application destroyed. If your project is still ongoing, you will need to contact the Office of Research Integrity upon receipt of that letter and follow the instructions for completing a new exemption application. It is, therefore, important that you keep your address current with the Office of Research Integrity.

For information describing investigator responsibilities after obtaining IRB approval, download and read the document "PI Guidance to Responsibilities, Qualifications, Records and Documentation of Human Subjects Research" available in the online Office of Research Integrity's IRB Survival Handbook. Additional information regarding IRB review, federal regulations, and institutional policies may be found through ORI's web site. If you have questions, need additional information, or would like a paper copy of the above mentioned document, contact the Office of Research Integrity at 859-257-9428.

see blue.
405 Kinkead Hall | Lexington, KY 40506-0057 | P: 859-257-9428 | F: 859-257-8995 | www.research.uky.edu/ori/
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APPENDIX B

MENTEE/MENTOR TEACHER INTERVIEW

1. What are your thoughts and beliefs about integrating technology into learning and teaching? How has this changed since you started working with a mentor? How has the pandemic changed your thinking?

2. (for mentors and 2nd-year teachers) In what ways has the mentoring experience this year changed from your previous experiences before the pandemic? Do you believe these changes had a positive or negative effect on technology use? How so?

3. In what ways did the mentoring program help you grow as a teacher? Can you tell me a specific thing you did in the program that was more valuable than others in helping you grow as a teacher? Tell me about the best mentoring experience you had in the program. Did any experience influence your beliefs or use of technology? What happened in that encounter? How about negative mentoring experiences? Did they influence your beliefs or uses of technology?

4. In what ways did the mentoring program help build your confidence in your teaching abilities related to technology? Specifics. Was there a time when you felt the lowest or had the least amount of self-confidence as a teacher using technology in the classroom?

5. How did mentoring align/support your technology, pedagogical, and content knowledge growth? How has your thinking related to these three knowledge areas changed since the beginning of your mentoring experience this year? (or last if in second year or mentor)

6. How has your mentor/mentee changed your perspective or understanding of technology use in education? What are some of the specific classroom instructional technology practices you learned or developed because of your mentoring experience?

7. (Mentees only) What type of support did you receive from your mentor? How did these help you in your understanding of teaching using technology? Tell me the best thing your mentor did that was valuable for you? Tell me about anything your mentor did that hindered or discouraged your use of technology. How did these things play into your teaching? How do you think the pandemic influenced the support you received?

8. (Mentors only) What type of support did you give to your mentee? What do you believe is the most valuable support to give a mentee? Are there any supports you intentionally give that you believe impact a mentee's technology, pedagogical, or content knowledge? What additional different supports did you provide because of the pandemic? Either intentional or unintentional.

9. What type of relationship did you build with your mentor/mentee? Clarifier—Give me some traits of your mentor/mentee that helped you build a collegial rapport. What aspects caused you to build a positive relationship? What mentoring practices were used that helped build a relationship? What practices were used that were unsuccessful and hurt the mentoring relationship? Why?

10. Do you believe mentoring can be a good medium to improve knowledge of instructional technology? Why?

11. Do you believe the time during the mentoring process is an opportune time to develop an understanding of instructional technology for you or your mentoring partner? When do you believe a mentor/mentee most influenced your classroom use of technology? At what point during the mentoring process do you believe to be the best time to influence or be influenced in technology use? Why?

12. Is there anything else you have thought of during our conversation that you feel may be important to share related to your formal mentoring experience and technology used in the previous year or during the pandemic?

APPENDIX C

FOCUS GROUP INTERVIEW

Mentors

1. To start with. Something we touched on in all of your interviews was the traits of a good mentor. So, I would like you all to do a group brainstorm of these traits. As you share these, I will be typing them down, and feel free to share what you shared with me previously
2. Ok, those look like some good traits to me. Here is what I have. So, we all discussed the mentoring aspect of knowledge transfer in our individual interviews.
3. Of these traits listed, which do you think help in knowledge transfer between a mentor and mentee
4. Which do you think would be the top 3?
5. Are any of these more conducive to the transfer of technology knowledge or technology combined with content or pedagogical knowledge? How about any that are not related to knowledge transfer?
6. OK, now let's talk about activities. I would like you all to brainstorm the activities that happened because of the mentoring program or working with your mentee.
7. Of these activities, which do you think help in knowledge transfer between mentor and mentee?
8. What do you think are the top 3 activities to help transfer knowledge?
   Any more so for technology knowledge or combined technology knowledge? Is any not related?
9. Ok, one more brainstorm. How would you describe your jobs or roles involved with being a mentor in one or maybe a few words? For example, a mentor is an emotional support.
10. Ok, so once again, which of these roles do you think help in knowledge transfer between mentor and mentee?
11. What do you think are the top 3 activities to help transfer knowledge?
12. Any more so for technology knowledge or combined technology knowledge? Any not related?
13. Let's talk about the first few months of a new teacher's professional life. Where do you think they get their foundational lessons and other resources they initially started with? Was that similar for you?
14. Is it fair to say at least some of it came from both formal and informal mentors?
15. Now, what about the technology tools and integration techniques used with these lessons and resources. How did they figure out these things? Did you help them in this area? Did you have to learn them or learn how to use them to help them?
16. How do you feel these foundational resources teachers develop are used going forward? Do you feel they were reused or serve as a basis or reference for future planning?
17. So let's talk about you all for a second. Many of you mentioned how mentoring gets you to reflect on your practice and really understand things you do. How did any growth in your knowledge gained from working with a mentee impact your teaching? How about when we look specifically at innovative or technology-infused methods.

18. Ok, let's talk about relationships. How important is the relationship between the mentoring dyad to create an environment to share knowledge? What kind of relationship is needed to encourage this? Or maybe what kind of relationship is the most effective?
19. How about similarities in mentoring pairs? How important do you think things like similar student age and content area of mentor and mentee are to this idea of transfer of knowledge? What about aspects such as gender or non-traditional age difference? Does that play a factor in things?
    What factors were affected the most? What isn't impacted by differences?
20. Let's talk about time. Generally, people shared the thinking of 3 different timeframes when it came to the best time for transferring teaching and technology knowledge. (Right at the start - building a good foundation, a little in - when things are not so hectic, or none specifically - just a little continuously). What do you think about timing for sharing teaching knowledge?
21. Finally, let's talk about what topics you share with your mentee. How do you decide what to share or discuss with your mentee? Do you feel it is better if a mentor leads the show in the relationship or the mentee drives the interactions based on need? Does this change at some point?
22. Ok, that just about wraps things up. Is there anything else you have thought of during our conversation that you feel may be important to share that may have crossed your mind that you didn't get the chance to share?

Mentees

1. Something we touched on in all of your interviews was the traits of a good mentor. So to start with, I would like you all to do a group brainstorm of these traits.
2. Ok, those look like some good traits to me. Here is what I have So, we all discussed the three knowledge domains of a modern teacher in our individual interviews – pedagogy, content, and technology knowledge
3. Of these traits listed, which do you think help in knowledge transfer between a mentor and mentee
4. Which do you think would be the top 3?
5. Are any of these not conducive to technology knowledge transfer?
6. OK, now let's talk about activities. I would like you all to brainstorm the activities that happened because of the mentoring program or working with your mentor.
7. Of these activities, which do you think help in knowledge transfer between mentor and mentee? How about things you see that you think could be helpful.
8. What do you think are the top 3 activities to help transfer knowledge?
9. Are any not conducive to technology knowledge transfer?
10. Let's talk about your first few months of teaching. Where did your foundational lessons and other resources come from that you started within your classes? Is it fair to say a lot of it came from both formal and informal mentors?
11. Now, what about the technology tools and integration techniques used with these lessons and resources. Did you have to learn them or learn how to use them in your teaching? Do you feel they were reused or a basis or reference for future planning?
12. What about later? Did your sources change?

13. When did you all start sharing resources with others?
14. Did anybody get the chance to share resources with your mentor?
15. Any technology resources shared from you to your mentor?
16. Is there anything you did or asked about that your mentor may not have known about and may have made your mentor stretch to help you with it?
17. What do you think impacts or influences the transfer of these knowledge domains through mentoring?
18. How important is the relationship between the two to create an environment to share knowledge? What kind of relationship is needed to encourage this?
19. How important do you think similar student age and content area of mentor and mentee are to this transfer of knowledge? What is impacted more? What isn't impacted by differences?
20. Let's talk about time. You all fell in the thinking of 3 different timeframes when it came to the best time for transferring teaching and technology knowledge. (Right at the start - building a good foundation, a little in - when things are not so hectic, or none specifically - just a little continuously)
21. Finally, let's talk about what topics a mentor shares with you. Do you feel it is better if a mentor leads the show in the relationship or the mentee drives the interactions based on need? Does this change at some point?
22. Ok, that just about wraps things up. Is there anything else you have thought of during our conversation that you feel may be important to share that may have crossed your mind that you didn't get the chance to share?

APPENDIX D

INDIVIDUAL INTERVIEW CONSENT FORM

THE INFLUENCE OF FORMAL MENTORING ON TEACHER BELIEFS OF K-12 CLASSROOM TECHNOLOGY USE DURING A GLOBAL PANDEMIC

Individual Interview Consent

You are being invited to participate in this research study because you are currently serving as a mentor or mentee teacher in the [Redacted] School District. If you volunteer to participate in this study, you will be one of up to 52 people to do so.

Researcher Conducting Study

The person in charge of this study is Tony Arbisi, a doctoral candidate in the Department of Educational Leadership Studies at the University of Kentucky. He is being guided in this research by Dr. Tricia Browne-Ferrigno, a professor in the Department of Educational Leadership at the University of Kentucky.

Purpose Of Study

The purpose of this study is to examine the influences a mentoring relationship has on teacher educational technology beliefs and use. It will explore the relationship between teacher mentors, their mentees and its impact on classroom technology use of both members in the pairing.

Are There Reasons Why You Should Not Take Part In This Study?

You should not participate in this study if you are not a mentor or mentee teacher in the [Redacted] School District located in [Redacted], Missouri. Additionally, you should not participate if you are under 18 years of age.

Where Is The Study Going To Take Place, And How Long Will It Last?

Your consent is sought to participate in an individual interview. The interviews will be conducted via the zoom video conference tool. It can be completed at a location of your convenience that will ensure your desired level of privacy and comfort. Suggestions of locations include your school classroom, office, or conference room. For the study, you are asked to participate in two research sessions. The first session is an individual interview conducted by the researcher that will take approximately 60 minutes. The second session is a focus group made up of study participants that will last approximately 60 minutes. It will also be facilitated by the researcher.

What Will You Be Asked To Do?

For this portion of the study, you will be asked to participate in one semi-structured interview. This research session will include questions about your educational experiences related to mentoring and the influence of this relationship on educational technology use and beliefs. This document is for consent to the interview session. You will be interviewed separately from other participants via the zoom video conference tool. In the second research session, you will be asked to participate in a focus group conducted through the Zoom video conference tool as well. Focus groups will be split into separate groups of mentors and mentees consisting of approximately 6-8 participants. Interviews and focus group audio and video will be recorded, audio will be transcribed for analysis, and the video will be destroyed after the transcription. You will be asked for additional consent for the focus group participation.

What Are The Possible Risks And Discomforts?

Participation during the interviews has no more risk of harm than you would experience in everyday life.

Will You Receive Any Rewards For Taking Part In This Study?

You will receive one $10 amazon gift card after participation in the interview and the focus group for the study.

Will You Benefit From Taking Part In This Study?

There are no direct benefits to participating in this study. However, your participation will help grow the existing body of knowledge of educational technology acceptance and use by teachers and improve the understanding of how mentoring relates to this knowledge.

Do You Have To Take Part In The Study?

If you decide to participate in the study, it should be because of your desire to volunteer to help grow the body of knowledge of this research. You will not lose any benefits or rights you would normally have if you choose not to volunteer. You can stop at any time during the study and still keep the benefits and rights you had before volunteering.

If You Do Not Want To Take Part In The Study, Are There Other Choices?

If you do not want to be in the study, there are no other choices except not to take part in the study.

What Will It Cost You To Participate?

There are no costs associated with taking part in the study.

Who Will See The Information That You Give?

Every effort will be made to keep confidential all records that identify you to the extent allowed by law.

Your information will be combined with information from other people taking part in the study. When I write about the study to share it with other researchers, I will write about the combined information I gathered. You will not be personally identified in these written materials. Although I may publish this study's results, I shall keep your name and other identifying information private. I may be required to show information that identifies you to the people who need to confirm I have done the research correctly. These individuals would be from the University of Kentucky organization.

I cannot guarantee the security of data obtained via the Internet. Third-party applications used in this study may have Terms of Service and Privacy policies outside of the control of the principal investigator and the University of Kentucky. Zoom audio and video recordings of the meeting will be created and temporarily stored in the Zoom cloud while audio transcription is performed. Audio and text transcriptions will be saved to the researcher's personal computer and protected appropriately with the other research data. Video and audio will be deleted from the cloud at that point and additionally removed from the zoom account trash, permanently destroying this data.

Data will be stored in a password-protected computer accessible by only the researcher. While no absolute guarantees can be made regarding security, these measures provide safeguards against outside agents accessing the electronic data.

Can You Withdraw From The Study Early?

If you decide to take part in the study, you still have the right to decide at any time that you no longer want to continue. You will not be treated differently if you decide to stop participating in the study. Any data collected up to the point of withdrawal will be used in the research unless you specifically contact the principal investigator requesting the removal of all data pertaining to your involvement. Any physical data will be destroyed, and any electronic data will be deleted upon this request. The amazon gift card will only be provided to participants that complete both the interview and focus group sessions. No reward will be given to participants that withdraw after partial participation in the study.

Will Your Information Be Used For Future Research?

All identifiable information (e.g., your name, school location, and recorded audio and video) will be removed from the information collected in this study. After I remove all identifiers, the information may be used for future research or shared with other researchers without your additional informed consent.

What If You Have Questions, Suggestions, Concerns, Or Complaints?

Before you decide to accept this invitation to participate in the study, please ask any questions that might come to mind now. If you later have any questions, suggestions, concerns, or complaints about the study, please contact the principal investigator Tony Arbisi by e-mail (tarbisi@bsd124.org) or telephone (660-287-2509). Additionally, the faculty advisor of the principal investigator, Dr. Tricia Browne-Ferrigno, may be contacted by email (tricia.ferrigno@uky.edu) or telephone (859-257-8921. If you have any questions about your rights as a volunteer in this research, please contact the staff in the Office of Research Integrity at the University of Kentucky at 859-257-9428 or toll-free at 1-866-400-9428.

APPENDIX E

FOCUS GROUP CONSENT FORM

THE INFLUENCE OF FORMAL MENTORING ON TEACHER BELIEFS OF K-12 CLASSROOM TECHNOLOGY USE DURING A GLOBAL PANDEMIC

Focus Group Consent

You are being invited to participate in this research study because you are currently serving as a mentor or mentee teacher in the [Redacted] School District. If you volunteer to participate in this study, you will be one of up to 52 people to do so.

Researcher Conducting Study

The person in charge of this study is Tony Arbisi, a doctoral candidate in the Department of Educational Leadership Studies at the University of Kentucky. He is being guided in this research by Dr. Tricia Browne-Ferrigno, a professor in the Department of Educational Leadership at the University of Kentucky.

Purpose Of Study

The purpose of this study is to examine the influences a mentoring relationship has on teacher educational technology beliefs and use. It will explore the relationship between teacher mentors, their mentees and its impact on classroom technology use of both members in the pairing.

Are There Reasons Why You Should Not Take Part In This Study?

You should not participate in this study if you are not a mentor or mentee teacher in the [Redacted] School District located in [Redacted], Missouri. Additionally, you should not participate if you are under 18 years of age.

Where Is The Study Going To Take Place, And How Long Will It Last?

Your consent is sought to participate in a focus group session. The focus group will be conducted via the zoom video conference tool and will include other study participants. It can be completed at a location of your convenience that will ensure your desired level of privacy and comfort. Suggestions of locations include your school classroom, office, or conference room. This session will last approximately 60 minutes. It will be facilitated by the researcher.

What Will You Be Asked To Do?

For this portion of the study, you will be asked to participate in one focus group with other study participants that include questions about your educational experiences related to mentoring and the influence of this relationship on educational technology use and beliefs. In this second research session, you will be asked to participate in a focus group conducted through the Zoom video conference tool. This document is for consent to the focus group session. Focus groups will be split into separate groups for mentors and mentees, consisting of approximately 6 to 8 participants. This focus group audio and video will be recorded. The audio will be transcribed for analysis, and the video will be destroyed after the transcription.

What Are The Possible Risks And Discomforts?

Participation during the focus groups has no more risk of harm than you would experience in everyday life.

Will You Receive Any Rewards For Taking Part In This Study?

You will receive one $10 amazon gift card after participation in the interview and the focus group for the study.

Will You Benefit From Taking Part In This Study?

There are no direct benefits to participating in this study. However, your participation will help grow the existing body of knowledge of educational technology acceptance and use by teachers and improve the understanding of how mentoring relates to this knowledge.

Do You Have To Take Part In The Study?

If you decide to participate in the study, it should be because of your desire to volunteer to help grow the body of knowledge of this research. You will not lose any benefits or rights you would normally have if you choose not to volunteer. You can stop at any time during the study and still keep the benefits and rights you had before volunteering.

If You Do Not Want To Take Part In The Study, Are There Other Choices?

If you do not want to be in the study, there are no other choices except not to take part in the study.

What Will It Cost You To Participate?

There are no costs associated with taking part in the study.

Who Will See The Information That You Give?

Every effort will be made to keep confidential all records that identify you to the extent allowed by law.

Your information will be combined with information from other people taking part in the study. When I write about the study to share it with other researchers, I will write about the combined information I gathered. You will not be personally identified in these written materials. However, due to the nature of focus groups, confidentiality cannot be guaranteed because other subjects will know what was said by whom. All focus group participants will be asked not to share information disclosed by others to anyone outside of the focus group. Although I may publish this study's results, I shall keep your name and other identifying information private. I may be required to show information that identifies you to the people who need to confirm I have done the research correctly. These individuals would be from the University of Kentucky organization.

I cannot guarantee the security of data obtained via the Internet. Third-party applications used in this study may have Terms of Service and Privacy policies outside of the control of the principal investigator and the University of Kentucky. Zoom audio and video recordings of the meeting will be created and temporarily stored in the Zoom cloud while audio transcription is performed. Audio and text transcriptions will be saved to the researcher's personal computer and protected appropriately with the other research data. Video and audio will be deleted from the cloud at that point and additionally removed from the zoom account trash, permanently destroying this data.

Data will be stored in a password-protected computer accessible by only the researcher. While no absolute guarantees can be made regarding security, these measures provide safeguards against outside agents accessing the electronic data.

Can You Withdraw From The Study Early?

If you decide to take part in the study, you still have the right to decide at any time that you no longer want to continue. You will not be treated differently if you decide to stop participating in

the study. Any data collected up to the point of withdrawal will be used in the research unless you specifically contact the principal investigator requesting the removal of all data pertaining to your involvement. Any physical data will be destroyed, and any electronic data will be deleted upon this request. The amazon gift card will only be provided to participants that complete both the interview and focus group sessions. No reward will be given to participants that withdraw after partial participation in the study.

Will Your Information Be Used For Future Research?

All identifiable information (e.g., your name, school location, and recorded audio and video) will be removed from the information collected in this study. After I remove all identifiers, the information may be used for future research or shared with other researchers without your additional informed consent.

What If You Have Questions. Suggestions. Concerns. Or Complaints?

Before you decide to accept this invitation to participate in the study, please ask any questions that might come to mind now. If you later have any questions, suggestions, concerns, or complaints about the study, please contact the principal investigator Tony Arbisi by e-mail (tarbisi@bsd124.org) or telephone (660-287-2509). Additionally, the faculty advisor of the principal investigator, Dr. Tricia Browne-Ferrigno, may be contacted by email (tricia.ferrigno@uky.edu) or telephone (859-257-8921). If you have any questions about your rights as a volunteer in this research, please contact the staff in the Office of Research Integrity at the University of Kentucky at 859-257-9428 or toll-free at 1-866-400-9428.

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