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Barriers to Technology Integration Perceived by Kindergarten through Second-Grade Teachers

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Walden University
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Abstract

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MS, Walden University, 2015

BS, Kaplan University, 2010

Dissertation Submitted in Partial Fulfillment

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Abstract

A problem exists in southeastern United States where technology integration is limited in classrooms. Although researchers have found benefits for integrating technology, it was unknown why teachers were not integrating technology into instruction. The purpose of this generic qualitative study was to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. There have been studies about the barriers to technology integration experienced by teachers; however, it was uncertain what these barriers were for kindergarten through second-grade teachers. Bandura's self-efficacy theory was the conceptual framework for this study. Interviews were used to collect data from 10 participants who taught in a kindergarten through second-grade classroom with access to technology they could integrate into instruction. Interview transcripts were analyzed using inductive thematic analysis with constant comparison. Findings showed several barriers to integrating technology perceived by teachers. The most reoccurring barrier theme was student related barriers. The results also revealed multiple types of support needed to effectively integrate technology. The technology related training/professional development and technology support personnel themes appeared most often in the findings. Potential implications for a positive social change include reducing the barriers to integrating technology for kindergarten through second-grade teachers, which could strengthen technology integration in their instruction as they support students with gaining skills needed in their future careers.

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Dedication

I would like to thank God for allowing me to reach this milestone in life. Also, I would like to thank my husband for his support and encouragement throughout my journey. Special thanks go to my parents for always believing in me and supporting me in all of my endeavors since I was a child. Furthermore, I would like to thank all of the participants and my peer reviewer. I am thankful they scheduled time to support me with my research. This dissertation is dedicated to my family, friends, participants, and former students.

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I would like to thank my committee members for all of their support and encouragement during my study. Thank you to Dr. Karyn Hawkins-Scott, Dr. Amy White, Dr. Barbara Schirmer, and Dr. Christian Winterbottom for your feedback, countless conference calls, and encouraging words. Everyone was always willing to meet with me to provide feedback and to find solutions. I appreciate all of your assistance.

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Chapter 1: Introduction to the Study

The National Association for the Education of Young Children (NAEYC) and the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College (2012) issued a joint position statement that included how technology can support the learning and development of young children when intentionally used. This is evident in the study conducted by Puspitasari and Subiyanto (2017). In their study, kindergarten students who interacted with an android app for reading support had higher improvements in their reading abilities on the posttest than those who did not use the app. Shanley et al. (2020) also found similar results from their study. In the beginning of the study, kindergarten students' rate of accuracy was 50% to 60% when answering math questions on the KinderTEK app. By the end of the study, students were answering math questions with an accuracy rate 70% to 80%.

AdvancED (n.d.) is an organization that provides improvement and accreditation services to schools and institutions. The AdvancED External Review Team is a group of professionals with varied backgrounds and experiences. To participate on the team, individuals must complete AdvancED trainings to better understand the AdvancED tools and procedures. In southeastern United States, the members of the team observed several K-12 classrooms, and reported there was little to no technology integration in classrooms (e.g., Bibb County School District, 2018; Broward County Public Schools, 2016; Candler County School System, 2017; Chattahoochee County Schools, 2017; Charleston County School District, n.d.; Decatur County School System, 2017; Edgefield County School District, 2017; Forsyth County School System, 2017; Kershaw County School District,

2019; McDuffie County Schools, 2017; Oconee County Schools, 2018; Polk School District, 2018; Pulaski County Schools, 2019; Wayne County Public Schools, 2019; Whitfield County School System, 2018). The team also included in the reports that technology was available for teachers to integrate into instruction. The report did not identify why technology integration was limited.

Although researchers have found benefits for integrating technology, it was unknown why teachers were not integrating technology into instruction. This study was needed to address the gap in practice by exploring what is impeding teachers from integrating technology into instruction, and by finding ways to support teachers with integrating technology effectively. Potential implications for a positive social change include reducing the barriers to integrating technology for kindergarten through second-grade teachers, which could strengthen technology integration in their instruction as they support students with gaining skills needed in their future careers.

In this chapter, I present background information about the need to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. Also, I share the problem of the study, the purpose, and the approach to investigate the problem with the appropriate research methodology. The research questions are introduced along with the conceptual framework that grounds this study. This chapter closes with a summary of the study, and the potential contributions to the education field.

Background

The NAEYC and the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College (2012) issued a joint position statement to guide early childhood teachers using technology and interactive media with children 0-8 years old. This statement provided reasons why technology and interactive media should be intentionally used along with developmentally appropriate learning experiences for young children. Furthermore, "Effective uses of technology and media are active, hands-on, engaging, and empowering; give the child control; provide adaptive scaffolds to ease the accomplishment of tasks; and are used as one of many options to support children's learning" (National Association for the Education of Young Children & the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College, 2012, p. 6). Ultimately, technology should be used to support students' learning outcomes.

Likewise, the United States Department of Education and the United States Department of Health and Human Services (2016) indicated that early childhood educators should know how to use technology to support learning experiences for young children. They developed four guiding principles for early childhood educators to consider when integrating technology into the classroom. These principles suggested the use of technology can be a tool for learning, should increase learning opportunities, can strengthen relationships among the important individuals in a young child's life, and can provide more effective learning when children interact with peers or adults when using technology.

In addition to the guiding principles in the Early Learning and Educational Technology Brief, teachers can refer to the International Society for Technology in Education (ISTE) Standards for Educators and the National Education Technology Plan when planning to integrate technology to support instruction (ISTE, 2017; United States Department of Education, 2017; United States Department of Education & United States Department of Health and Human Services, 2016). The ISTE Standards for Educators were developed to outline the digital skills and pedagogical knowledge needed for educators to teach, learn, and work (ISTE, 2017). The National Education Technology Plan was created to establish a vision and plan for transformative use of technology in education (United States Department of Education, 2017). Educators could find these documents helpful when planning to integrate technology into instruction.

Research supports the benefit of technology integration in kindergarten through second-grade instruction. Puspitasari and Subiyanto (2017) presented findings where kindergarten students who interacted with an android app for reading support had more gains in their reading abilities on the posttest than those who did not use the app. Second-grade students in another study showed significant improvements in their word reading and spelling skills when they were involved in a digital reading intervention than when they participated in the school-based intervention (Ronimus et al., 2019). Similar results appeared in where kindergarten students engaged in a math app (Shanley et al., 2020). In the early stages of the study, kindergarten students' answered math questions with an accuracy rate of 50% to 60%. By the end of the study, students' accuracy rate went to 70% to 80%. After observing a first-grade teacher who integrated iPads in her instruction,

Woloshyn et al. (2017) found students engaged in several activities where they problem solved, inquired information, and created products to demonstrate their learning. A detailed analysis of additional studies can be found in Chapter 2.

AdvancED (n.d.) is an organization that provides improvement and accreditation services to schools and institutions. As part of the improvement and accreditation process, the AdvancED External Review Team observes classrooms to examine the learning environment using the eProve Effective Learning Environments Observation Tool (eleot). The eleot contains 30 items divided into seven learning environments. These learning environments are equitable learning, high expectations, supportive learning, active learning, progress monitoring and feedback, well-managed learning, and digital learning. During classroom observations, review team members rate each item observed within the learning environments. A four-point scale is used where four is very evident, three is evident, two is somewhat evident, and one is not observed. Many school districts post their AdvancED reports on the district's website for the public to view.

Within recent years, the AdvancED External Review Team (n.d.) observed several K-12 classrooms throughout school districts in southeastern United States (e.g., Bibb County School District, 2018; Broward County Public Schools, 2016; Candler County School System, 2017; Chattahoochee County Schools, 2017; Charleston County School District, n.d.; Decatur County School System, 2017; Edgefield County School District, 2017; Forsyth County School System, 2017; Kershaw County School District, 2019; McDuffie County Schools, 2017; Oconee County Schools, 2018; Polk School District, 2018; Pulaski County Schools, 2019; Wayne County Public Schools, 2019;

Whitfield County School System, 2018). Out of the seven learning environments, school districts in southeastern United States received the lowest ratings for the digital learning environment (see Table 1). Within the digital learning environment, observers looked for evidence of students using digital tools/technology to gather, evaluate, and/or use information for learning, students using digital tools/technology to conduct research, solve problems, and/or create original works for learning, and students using digital tools/technology to communicate and work collaboratively for learning. Unfortunately, the ratings within the digital learning environment indicated technology integration was not observed or somewhat observed throughout classrooms.

Table 1

School Districts' AdvancED Digital Learning Environment Ratings

	Classrooms Observed	Digital Learning Environment Rating	Learners use digital tools/technology to gather, evaluate, and/or use information for learning	Learners use digital tools/technology to conduct research, solve problems, and/or create original works for learning	Learners use digital tools/technology to communicate and/or work collaboratively for learning
District 1	50	1.96	2.20	1.90	1.78
District 2	63	1.86	2.22	1.90	1.46
District 3	119	1.46	1.51	1.42	1.44
District 4	55	1.92	2.15	1.95	1.67
District 5	128	1.66	1.80	1.67	1.50
District 6	41	1.31	1.29	1.46	1.17
District 7	65	1.75	1.98	1.79	1.48
District 8	57	1.85	1.95	1.84	1.77
District 9	70	2.13	2.21	2.17	2.01
District 10	61	1.90	2.38	1.80	1.52
District 11	54	1.60	1.70	1.50	1.61
District 12	61	1.71	1.93	1.61	1.59
District 13	60	1.76	1.82	1.77	1.68
District 14	517	1.70	1.92	1.62	1.56
District 15	55	1.92	2.13	1.87	1.76

Note. Scale: 4 = very evident, 3 = evident, 2 = somewhat evident, and 1 = not observed

Although the AdvancED External Review Team (n.d.) observed limited to no technology integration in classrooms, they reported technology was available for students to use in each classroom. The AdvancED reports did not include details regarding why teachers were not integrating technology into instruction. In current studies, researchers have found benefits for integrating technology. Unfortunately, it was unknown why teachers were not integrating technology into instruction. This study was needed to address the gap in practice by exploring what is impeding teachers from integrating technology into instruction, and by finding ways to support teachers with integrating technology effectively.

Problem Statement

According to personnel at the United States Department of Education (2017), "Technology can transform learning when used by teachers who know how to create engaging and effective learning experiences for their students" (p. 33). ISTE (2017) established standards for educators to serve as a roadmap when designing technology-enhanced learning experiences for students. To support young learners, officials at the United States Department of Education and the United States Department of Health and Human Services (2016) developed four guiding principles to aid early childhood educators with using technology in their classrooms: (a) technology use can be a tool for learning, (b) technology should increase learning opportunities, (c) technology can strengthen relationships among the important individuals in a young child's life, and (d)

technology can provide more effective learning when children interact with peers or adults when using technology.

To help guide early childhood educators with using technology and interactive media with children 0-8 years old, the NAEYC and the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College (2012) issued a joint position statement that includes reasons to intentionally use of technology and interactive media along with developmentally appropriate learning experiences. Multiple researchers have cited positive learning outcomes for kindergarten through second-grade students when they engaged in technology-enhanced activities and interventions, such as D'Agostino et al. (2016) who found that first-grade students who used an alphabet app in reading recovery had higher improvements in alphabetic measures than the first-grade students who solely used traditional magnetic letters in their reading recovery lessons.

As indicated in multiple AdvancEd (n.d.) reports, a problem exists throughout K-12 school districts in southeastern United States where there is little to no evidence of technology integration in classrooms (e.g., Bibb County School District, 2018; Broward County Public Schools, 2016; Candler County School System, 2017; Chattahoochee County Schools, 2017; Charleston County School District, n.d.; Decatur County School System, 2017; Edgefield County School District, 2017; Forsyth County School System, 2017; Kershaw County School District, 2019; McDuffie County Schools, 2017; Oconee County Schools, 2018; Polk School District, 2018; Pulaski County Schools, 2019; Wayne County Public Schools, 2019; Whitfield County School System, 2018). These reports contain data from all grade levels, including kindergarten through second-grade.

Although researchers have found benefits for integrating technology, it was unknown why teachers were not integrating technology into instruction. In recent years, multiple researchers have explored the barriers K-12 teachers experienced when integrating technology. Francom (2020) conducted a quantitative study with 1,096 K-12 educators in Midwestern United States. As part of the study, educators completed two surveys indicating barriers to technology integration. The surveys were administered 3 years apart. Francom found 59.2% of teachers reported time to plan and prepare as the highest barrier to technology integration. Training and technical support was reported by 37.6% of teachers as the second highest barrier to technology integration. Teacher beliefs were the least significant barrier where 15.6% of teachers selected this barrier in their responses. Özdemir (2017) conducted a qualitative study with 14 Turkish teachers to identify barriers to technology integration. The findings from this study revealed the most frequently highlighted barrier is lack of teacher's information and communications technologies (ICT) competency. Participants also indicated a proposed solution to this barrier is to have practical training on the use of ICT in their lessons. Similarly, Alenezi (2017) engaged in a qualitative study to explore barriers to technology integration experienced by teachers in Saudi Arabia. The researcher interviewed eight K-12 teachers where four participants were typical teachers, and the other four participants were identified by the district coordinator of professional development as exemplar teachers. Based on the interview findings, five out of eight teachers identified time as a barrier to technology integration. Also, the researcher found three of the four typical teachers

identified lack of comfort as a barrier, and three of the four exemplar teachers identified lack of resources to be a barrier (Alenezi, 2017).

In addition, some researchers conducted studies to explore the barriers to technology integration experienced by teacher subgroups. In a qualitative study, 400 secondary physical education teachers completed questionnaires to indicate any perceived obstacle they may have for integrating ICT within their classroom (Villalba, et al., 2017). Findings from this study revealed 61.5% physical education teachers agree or strongly agree that integrating technology in their class involves an investment in time and in training. Also, 51.5% of the physical education teachers indicated they did not know how to integrate technology within physical activity, and 48.2% of teachers perceived technical problems and delays caused by technical problems as another barrier to technology integration. Pribeanu et al. (2020) conducted a qualitative study with eight secondary teachers from Lithuania and eight secondary teachers from Romania. Based on the findings, the barriers to technology integration experienced by teachers in both countries are limited internet access, limited device access for students, limited school funds to purchase devices and educational applications, teachers' limited ICT skills, teachers' resistance to change, and their belief of students misusing technology (Pribeanu et al., 2020).

Even though researchers in these current studies explored the barriers teachers experienced when integrating technology into instruction, it was uncertain what the barriers were for kindergarten through second-grade teachers. Also, depending upon the location and teacher groups, findings from current studies revealed varying barriers to

technology integration. With standards and guiding principles available on effective practices for integrating technology at the early childhood level, and literature to support improved student outcomes with technology-enhanced activities and interventions, a study was needed to address the gap in practice in southeastern United States. For my study, I explored the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. The findings from this study could be used to reduce the barriers experienced by kindergarten through second-grade teachers when integrating technology into instruction. Also, the findings could contribute to the types of support created to assist teachers with integrating technology into instruction.

Purpose of the Study

The purpose of this generic qualitative study was to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. As mentioned, there is an overall problem in K-12 classrooms throughout southeastern United States where there is access to technology, but there is little to no evidence of technology integration. Researchers have found benefits for integrating technology, but it was unknown why teachers were not integrating technology into instruction. Furthermore, there have been studies about the barriers to technology integration experienced by teachers; however, it was uncertain what these barriers were for kindergarten through second-grade teachers.

Findings from this study could influence the types of support developed to help teachers with integrating technology into instruction. Also, this study could lead to the reduction of barriers experienced by kindergarten through second-grade teachers when integrating technology. As noted in the Early Learning and Educational Technology Policy Brief, additional research is needed in the areas of early learning and educational technology (United States Department of Education & United States Department of Health and Human Services, 2016). My study could add to these areas as well.

Research Questions

RQ1: What barriers are perceived by teachers of kindergarten through second-grade students for integrating technology into instruction?

RQ2: What support do teachers of kindergarten through second-grade students perceive needing to effectively integrate technology?

Conceptual Framework

Bandura's (1977) self-efficacy theory served as the framework for this study. Bandura defined self-efficacy as one's belief in ability to perform or complete certain tasks and meet goals. Performance accomplishments, vicarious experience, verbal persuasion, and physiological states are the four principal sources that impact a person's self-efficacy. Performance accomplishments are the most influential source of self-efficacy. This source is based on individuals' mastery of previous experiences. Vicarious experiences refer to beliefs individuals gain about performing a task when seeing or hearing about others' experiences. With verbal persuasion, one's views can be influenced by others who provide them with feedback and encouragement. Depending upon the

physiological state, an individual's self-efficacy could be high or low. This source encompasses how an individual's emotions can affect their ability to perform a task or meet a goal.

Through the lens of self-efficacy, I explored the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. The sources of self-efficacy were used to develop some of the open-ended questions for participants' interviews (see Appendix A). In Chapter 2, I discuss self-efficacy in more detail as it relates to my study.

Nature of the Study

A generic qualitative inquiry approach was the research design for this study. This research design allows researchers to focus on individuals' subjective experiences, beliefs, and opinions of things in the outer world (see Percy et al., 2015). In addition, I found this research design to be the most appropriate for my study because my goal was to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology.

I used one-on-one interviews to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. In a similar study, Özdemir (2017) interviewed participants to collect information about the barriers to technology they perceived and the support needed to overcome barriers to integrate

technology. Interviews in my study consisted of open-ended questions that were aligned to the research questions, conceptual framework, and literature (see Appendix A). When analyzing participants' responses, I used inductive thematic analysis with constant comparison. The discrepant cases that emerged during my analysis were used to strengthen the data closely related to the research questions. Using discrepant cases helped to decrease the chance of any biases occurring during the data analysis process. Responses related to the barriers perceived by teachers of kindergarten through second-grade students for integrating technology into instruction were used to answer RQ1, whereas responses related to the support teachers of kindergarten through second-grade students perceive needing to effectively integrate technology were used to answer RQ2. Comparing the literature and findings from similar studies also supported the findings for my study.

I employed multiple methods to ensure accuracy and credibility of my findings. Through member checks, participants reviewed and verified their interview transcript. Participants had the opportunity to offer suggestions to improve the accuracy of their transcript. I also engaged in peer review where a colleague reviewed my notes, interview transcripts, and data analysis. The peer reviewer provided feedback telling me my findings were logical and grounded in data, and my interpretations of the data were reasonable. Furthermore, I engaged in reflexivity since I was the sole data collector in my study. I typed a reflection in a password-protected online journal daily throughout my data collection and analysis process to reduce biases (see Creswell, 2012).

Definitions

The following terms are used throughout this study:

Barriers to technology integration: The obstacles teachers face when integrating technology (Ertmer, 1999).

Information and communications technologies (ICT): Devices, software, applications, and networks that provide digital interaction (Villalba, et al., 2017).

Self-efficacy: One's belief in ability to perform or complete certain tasks or meets goals (Bandura, 1977).

Technology integration: The incorporation of technology-based practices and resources into routines, school management, and work (National Center for Education Statistics, 2002).

Assumptions

I made two main assumptions related to this study. One assumption for this study was all participants would have access to technology they could integrate into instruction. Another assumption was that all participants would provide honest responses during the interview process.

Scope and Delimitations

Within the scope of this generic qualitative study, I explored the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. The scope for this study was determined based on the gap in practice and background literature. As reported by the AdvancED External Review Team (n.d.), a problem exists

throughout southeastern United States where there is little to no evidence of technology integration in K-12 classrooms (e.g., Bibb County School District, 2018; Broward County Public Schools, 2016; Candler County School System, 2017; Chattahoochee County Schools, 2017; Charleston County School District, n.d.; Decatur County School System, 2017; Edgefield County School District, 2017; Forsyth County School System, 2017; Kershaw County School District, 2019; McDuffie County Schools, 2017; Oconee County Schools, 2018; Polk School District, 2018; Pulaski County Schools, 2019; Wayne County Public Schools, 2019; Whitfield County School System, 2018). A gap in practice was identified after a thorough search and saturation of research. Although researchers have found benefits for integrating technology, it was unknown why teachers were not integrating technology into instruction. There have been studies about the barriers to technology integration experienced by teachers; however, it was uncertain what these barriers were for kindergarten through second-grade teachers. This study was needed to gain insight on the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. The findings could help reduce barriers when integrating technology into instruction.

The constructivism and mindset theories were considered for the conceptual framework but rejected. Constructivism proposes that individuals gain understanding of concepts based on their active involvement through experiences (see Rustam, 2008). Dweck's (2015) mindset theory claims individuals' abilities are innate (fixed mindset) or learned from experiences (growth mindset). I deemed self-efficacy to be the best

conceptual framework for the purpose of this study due to multiple sources contributing to an individual's beliefs in their abilities (see Bandura, 1977). The various sources of self-efficacy could contribute to teachers' perceptions about the barriers for integrating technology into instruction and the support perceive needed to effectively integrate technology.

This study was restricted to kindergarten through second-grade educators in southeastern United States. Since kindergarten through second-grade educators are early childhood educators who teach 5-8 years old students within formal school settings, they were the early childhood group of educators selected for this study (United States Department of Education & United States Department of Health and Human Services, 2016). All other grade levels in formal school were excluded from the selection process. Other studies have provided insight on the barriers experienced by teachers when integrating technology, but it was uncertain what these barriers were for kindergarten through second-grade teachers.

Participants in this study taught in a kindergarten through second-grade classroom with access to technology they could integrate into instruction. Since instructional coaches, technology coaches, and administrators do not have a classroom where they teach students, they were not considered within the scope of this study. The level of teaching experience varied per teacher who participated in the study. The findings from this study could shed light on ways to reduce the barriers experienced by kindergarten through second-grade teachers when integrating technology into instruction. Since the sample size of this study was small, transferability may be difficult. However, strategies

for transferability were used throughout this study, so it could be replicated in another setting. I included in-depth information about the participants, procedures, findings, and all other data for this study in the audit trail (see Lincoln & Guba, 1985). Also, I included a detailed description of the data collection and analysis process.

Limitations

There were some limitations for this generic qualitative study which made transferability difficult in other settings. For my study, I recruited participants through social media and the Walden University Participant Pool. Participants taught in a kindergarten through second-grade classroom where they had access to technology they could integrate into instruction. Based on similar studies to mine, I sought between eight to 14 participants, but I stopped recruiting once I reached data saturation at the 10th participant. The low number of participants makes transferability unlikely for all kindergarten through second-grade teachers. The location where I sought participants (southeastern United States) was another limitation as well. Limited research exists in the field I conducted my research, so it was difficult comparing my findings with previous research. This was also another limitation I experienced in my study.

Since I have previously served in an instructional technology role and as a first grade teacher, I used multiple strategies to address any biases that could influence the outcome of the study. To help remain unbiased during interviews, I followed the interview protocol (see Appendix A) while taking detailed notes and descriptions of the responses. I also applied Creswell's (2012) recommendation where I remained neutral and spoke in a positive tone when interacting with interview participants. Member checks

were used to increase the accuracy of the interview transcripts. Participants reviewed their interview transcripts and confirmed the accuracy of their transcript. If needed, participants made recommendations to strengthen the accuracy of the transcript. In addition, I used the peer review method to have one of my colleagues review my notes, interview transcripts, and data analysis to support validation of my data. The peer reviewer found my results to be logical and grounded in data, and my interpretations of the data to be reasonable. Lastly, I went through reflexivity since I was the sole data collector during my study. I typed my reflections in a password protected online journal daily throughout my data collection and analysis process to reduce biases.

Significance

With results from multiple studies revealing positive learning outcomes for kindergarten through second-grade students who engaged in technology-enhanced activities and interventions (see D'Agostino et al., 2016; Puspitasari & Subiyanto, 2017; Ronimus et al., 2019; Shanley et al. 2020; Woloshyn et al., 2017), it was important to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. The findings from my study could contribute to the types of support developed to strengthen how kindergarten through second-grade teachers integrate technology into instruction. Some possible supports could be professional development or resources that are relevant to kindergarten through second-grade educators. Potential implications for a positive social change include reducing the barriers to integrating technology for kindergarten through second-grade teachers, which could

strengthen technology integration in their instruction as they support students with gaining skills needed in their future careers. As noted in the Early Learning and Educational Technology Policy Brief, additional research is needed in the areas of early learning and educational technology (United States Department of Education & United States Department of Health and Human Services, 2016). My study could add to these areas as well.

Summary

In this chapter, I introduced research that encourages technology integration as a way to support educators' instruction. Some studies revealed positive learning outcomes for kindergarten through second-grade students who engaged in technology-enhanced activities and interventions. I also presented a problem identified in several AdvancED (n.d.) reports of limited to no evidence of technology integration in K-12 classrooms southeastern United States (e.g., Bibb County School District, 2018; Broward County Public Schools, 2016; Candler County School System, 2017; Chattahoochee County Schools, 2017; Charleston County School District, n.d.; Decatur County School System, 2017; Edgefield County School District, 2017; Forsyth County School System, 2017; Kershaw County School District, 2019; McDuffie County Schools, 2017; Oconee County Schools, 2018; Polk School District, 2018; Pulaski County Schools, 2019; Wayne County Public Schools, 2019; Whitfield County School System, 2018). Within the reports, the AdvancED External Review Team (n.d.) indicated technology was available for teachers to integrate into instruction but did not disclose why these educators did not integrate technology into instruction. Although researchers have found benefits for integrating

technology, it was unknown why teachers were not integrating technology into instruction. There have been studies about the barriers to technology integration experienced by teachers; however, it was uncertain what these barriers were for kindergarten through second-grade teachers. The purpose of this generic qualitative study was to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. The conceptual framework for this study was grounded Bandura's (1977) self-efficacy theory. Through administering one-on-one interviews with open-ended questions, I found information that addressed the gap in practice and contributed to the body of knowledge. Findings from this study could contribute to the types of support created to help kindergarten through second-grade educators as they integrate technology into instruction. Potential implications for a positive social change include reducing the barriers to integrating technology for kindergarten through second-grade teachers, which could strengthen technology integration in their instruction as they support students with gaining skills needed in their future careers.

Chapter 2 includes a detailed literature review for the need for this study where I explored the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. The literature review contains current and seminal sources that supported the need for this study. In addition, I present strategies for finding the literature. I also share the themes I identified while reading the literature. Furthermore, I share more details regarding the conceptual framework for this study.

Chapter 2: Literature Review

Several AdvancEd (n.d.) reports revealed a problem exists throughout K-12 school districts in southeastern United States where there is little to no evidence of technology integration in classrooms (e.g., Bibb County School District, 2018; Broward County Public Schools, 2016; Candler County School System, 2017; Chattahoochee County Schools, 2017; Charleston County School District, n.d.; Decatur County School System, 2017; Edgefield County School District, 2017; Forsyth County School System, 2017; Kershaw County School District, 2019; McDuffie County Schools, 2017; Oconee County Schools, 2018; Polk School District, 2018; Pulaski County Schools, 2019; Wayne County Public Schools, 2019; Whitfield County School System, 2018). These reports contain data from all grade levels, including kindergarten through second-grade. Although researchers have found benefits for integrating technology, it was unknown why teachers were not integrating technology into instruction. There have been studies about the barriers to technology integration experienced by teachers; however, it was uncertain what these barriers were for kindergarten through second-grade teachers. The purpose of this qualitative study was to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. Findings from this study could influence the types of support developed and offered to kindergarten through second-grade educators.

In this chapter, I share strategies on how I located literature to support the need for this generic qualitative study. Also, I elaborate on research related to the conceptual

framework for this study. In the literature review, I present research on technology integration in the classroom, barriers to technology integration, and overcoming barriers to technology integration. These themes emerged from the overall topics that I found in literature on the phenomenon of interest, research problem, and purpose of the study. I also reveal why my study was needed, and how it would address the gap in practice.

Literature Search Strategy

I conducted an in-depth search for literature through the Walden University Library. The databases that I used were Academic Search Complete, Education Source, ERIC, ProQuest Central, and SAGE Journals. When performing my searches, I used a combination of the following terms: *barriers to integrating technology, barriers to technology integration, challenges to integrating technology, challenges to technology integration, digital, digital learning, early childhood, early childhood education, early childhood educator, educational technology, edtech, instructional technology, obstacles to integrating technology, obstacles to technology integration, online, online learning, primary grades, self-efficacy, technology, technology integration, TPACK, TPACK framework,* and *TPACK in early childhood*. I filtered the search results to view current (within the last past 5 years) items that were peer reviewed. The literature review contains seminal work that relates to the study as well. When conducting research for the literature review, I found few studies that focused on kindergarten through second-grade levels.

Conceptual Framework

According to Bandura (1977), self-efficacy is an individual's belief in their ability to accomplish goals and complete tasks. He indicated that a person's self-efficacy is comprised of four principal sources, which are performance accomplishments, vicarious experience, verbal persuasion, and physiological states. Performance accomplishments are based on individuals' mastery of previous experiences. When individuals' beliefs are formed based on seeing or hearing about others' experiences is referred to as vicarious experiences. Individuals' views influenced by others who provide them with feedback and encouragement are verbal persuasion. A person's physiological state is comprised of how emotions can affect their ability to perform a task or meet a goal. Each source of self-efficacy can determine if a person has high or low self-efficacy (Bandura, 1977). From their findings, Coban and Atasoy (2019) and Oskay (2017) revealed that teachers with high self-efficacy perspective effectively integrated technology into their instruction. Additional researchers reported teachers' self-efficacy can influence how they perceive and use technology in their classrooms (see Coban & Atasoy 2019; Eyles, 2018; Oskay, 2017; Raphael & Mtebe, 2017). In relation to my study, having Bandura's self-efficacy theory as the conceptual framework allowed me to gain a better understanding of the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. The sources of self-efficacy were used to develop some of the open-ended interview questions (see Appendix A).

Several researchers explored the importance of the construct of performance accomplishments in self-efficacy for incorporating technology into instruction. Coban and Atasoy (2019) conducted research in Turkey where they surveyed 32,989 teachers to determine if their self-efficacy perspective has an impact on their use of ICT. According to the findings, if teachers' self-efficacy perspective regarding ICT is high, they can use ICT more effectively in the learning process for students. This was also evident in the findings from a quantitative study conducted by Raphael and Mtebe (2017) with 386 preservice educators. The authors found that though several participants had access to technology, they did not integrate it in their classrooms. Multiple participants indicated their beliefs towards technology were that technology offered an opportunity to enhance teaching activities, but integrating multimedia was difficult. Similarly, Kwon et al. (2019) found that middle school teachers' technical skills were a significant predictor of their self-efficacy. In addition, male participants who had higher technical skills than female participants demonstrated higher self-efficacy towards technology integration than their female counterparts.

Several other researchers explored the construct of persuasion. When educators received support regarding technology integration, it has increased their self-efficacy in using technology in the classroom (see Eyles, 2018; Oskay, 2017; Raphael & Mtebe, 2017). Eyles (2018) conducted a study with 280 participants in which 62% indicated they needed time, 57% indicated they needed professional development, 52% indicated they needed support to setup technology, and 46% indicated they needed support when using technology in the classroom. To help with increasing teachers' self-efficacy for

technology integration, Coyne et al. (2017) suggested that pedagogical strategies for technology integration must be increased in teacher preparation programs. They found that preservice teachers were knowledgeable about using technology in isolation but not as a way to support instructional practices. In addition, the preservice teachers in this study viewed limited technology integration within their teacher education classes. They noticed that only one university professor used technology, but it was only for passive use like projecting a PowerPoint presentation.

Literature Review Related to Key Concepts and Variable

While analyzing the literature, I identified reoccurring themes. These themes were technology integration in the classroom, barriers to technology integration, and overcoming barriers to technology integration. The themes emerged from topics aligned with the phenomenon of interest, research problem, and purpose of this study.

Technology Integration in the Classroom

Mishra and Koehler (2006) developed the technological pedagogical content knowledge (TPACK) framework, which represents three knowledge areas needed for effective technology integration in the classroom. These areas are technological knowledge, pedagogical knowledge, and content knowledge. Each area should not be addressed in isolation, but as interchanging components to strengthen educators' knowledge on planning and teaching with technology. Content knowledge is the knowledge from subject-areas that educators must teach. Pedagogical knowledge is the knowledge about instructional strategies and techniques to best facilitate students'

learning. Technological knowledge is knowledge about various technologies that can be used for teaching (Mishra & Koehler, 2006). According to Koehler et al. (2014),

> The TPACK Framework argues that programs that emphasize the development of knowledge and skills in these three areas in an isolated manner are doomed to fail. Thus, effective teacher educational and professional development needs to craft systematic, long-term educational experiences where the participants can engage fruitfully in all three of these knowledge bases in an integrated manner. (p. 109)

To summarize, teachers' technological knowledge, pedagogical knowledge, and content knowledge should not be isolated when planning and integrating technology. In a related study, teachers shared how technology integration enhanced their current pedagogical approaches to teaching (Maher and Twining, 2017). They also mentioned technology extended their students' learning experiences. In this study, teachers reflected on their current teaching practice with integrating technology. Similarly, Lawrence et al. (2018) reported a teacher expressing the need to change her pedagogical approaches while integrating technology in a one-to-one computing environment. The teacher in this study was also reflective about teaching with technology and wanted to adjust how she approached it in a one-to-one computing environment. Overall, teachers should embrace their technological knowledge, pedagogical knowledge, and content knowledge to support how they integrate technology into their instruction.

Dunn et al. (2018) implied teachers should select programs that will foster students' creativity since this skill is beneficial in the 21st century. This purposeful consideration was evident within Nancy's first-grade classroom (Woloshyn et al., 2017).

Researchers observed Nancy's classroom where her students were one-to-one with iPads. Nancy's students engaged in several activities where they problem solved, inquired information, and created products to demonstrate their learning (Woloshyn et al., 2017). Similar observations were made in another study with four early childhood teachers' classrooms (Lu et al., 2017). Two of these teachers taught in a kindergarten classroom while the other two taught in a first-grade classroom. All four teachers had access to one-to-one iPads for their students. Researchers observed teachers integrating technology in their literacy instruction. They found the teachers used strategies incorporating teacher directed practices where teachers decided on the activities, and developmentally appropriate practices where teachers designed more student-centered experiences with their guidance. The teacher directed practices consisted of teacher assigned activities at learning stations, busy work, and transition work, and the developmentally appropriate practices consisted of student production projects. These findings complement Boulden's (2017) analysis on Dewey's pedagogical philosophies of a hands-on approach to learning and proposed a few items Dewey would have wanted to see in a classroom with one-to-one computing. Boulden concluded the instructional uses of devices in a one-to-one classroom should mirror real-life interactions like communicating, creating knowledge, and accessing and sharing information. Consequently, technology can enhance teaching and the learning experiences when used purposefully.

Danniels et al. (2020) conducted research with 20 kindergarten classrooms. Their research findings showed 17 out of 20 kindergarten teachers discussed technology to be a valuable way to assess students in a play-based classroom. Out of those 17 teachers, 11

were seen implementing technology for assessment practices, and six out of those 11 teachers were seen extending their assessment practices in meaningful ways. Several teachers indicated having students use the Seesaw application (https://web.seesaw.me) to demonstrate their learning (Danniels et al., 2020). From their research findings, Kara and Cagiltay (2017) uncovered ways preschool teachers were using technology in their curriculum. They found 12 out of 18 teachers used technology for storytelling with students, 10 out of 18 teachers used technology with math activities, and 11 out of 18 believe technology overall supports permanent learning of skills. In sum, teachers in both studies had a positive perception toward integrating technology with their young students. Ultimately, teachers' perception could impact the way they integrate technology into their instruction. For my study, I sought to determine if this contributed to the barriers perceived by teachers of kindergarten through second-grade students for integrating technology into instruction.

Reeves et al. (2017) found prekindergarten students who were in a one-to-one computing setting with iPads had greater improvements for their phonological awareness and mathematics than their peers who did not interact with any technology-enhanced activities. The experimental group practiced literacy and numeracy skills on the iPad for 2 days a week over a course of 7 months along with guided instruction. Researchers viewed notable differences in the pre- and posttest results from the Florida Voluntary Prekindergarten Education Program Assessment. Similarly, D'Agostino et al. (2016) found a significant increase in first-grade students' mean posttest data on three alphabetic measures at the end of 20 weeks. These students engaged in an alphabet app during

reading recovery lessons, instead of using traditional magnetic letters like their peers in the control group. Complimentary findings were in another study where an experimental group of 13 kindergarten students engaged in an android app for reading support (Puspitasari & Subiyanto, 2017). The control group consisted of 13 kindergarten students who did not use the android app at all during the study. They used the reading book for reading support. The average pretest result for the control group was 5.85 while the average pretest result for the experimental group was 5.69. Although students in both groups increased their posttest scores, the experimental group showed the most improvement. On average, the experimental group was 18.92 and the control group was 9.38 (Puspitasari & Subiyanto, 2017). To review, students' posttest scores were greater than their pretest scores after they engaged in technology-enhanced activities within these studies.

Additional gains in reading performance are evident in research provided by Telesman et al. (2019). Five first-grade students were selected to participate in Reading Relevant and Culturally Engaging Stories, a web-based reading intervention. These students scored significantly lower than their peers on several reading benchmark assessments that measured their oral reading fluency and their reading comprehension skills. While students engaged in the Reading Relevant and Culturally Engaging Stories program, their oral reading fluency and reading comprehension skills started improving. At the end of the intervention, all students showed improvements where four out of five had substantial gains. Ronimus et al. (2019) found another digital reading intervention program that had positive outcomes for students. Low performing second-grade students

were selected to participate in this study. The control group consisted of 20 students who only participated in a school-based intervention, whereas 17 students participated in a 6 week digital reading intervention. The experimental group participated in the school-based intervention after completing the digital reading intervention. Findings showed students' word reading and spelling skills developed significantly faster during the digital reading intervention period than the school-based intervention period. Additionally, kindergarten through second-grade students had substantial growth on their posttest after engaging in a blended learning approach to reading instruction using Lexia Reading Core5 (Prescott et al., 2018). As reported, kindergarten through second-grade students experienced significant growth from their pretest results to the posttest results.

Five kindergarten students interacted with an app called KinderTek for their math intervention (Shanley et al., 2020). KinderTek featured self-regulation and cueing support for students to help improve their accuracy when answering math problems. Students' baseline rate of accuracy was 50% to 60%. By the end of the study, students accurately answered questions with a 70% to 80% accuracy rate. In brief, students improved with their numeracy skills. Bardhoshi et al. (2019) found comparable improvements from pre- and posttest data for their experimental group who participated in a web-based social-emotional intervention. Both teachers in the experimental and control group rated their students' behavior using the Social Skills Improvement System Scale before and after the intervention. The experimental group's intervention included digital social stories with classroom lessons that reinforced the items students engaged in on the app, whereas the control group continued using the same curriculum without any technology-enhanced

opportunities. The posttest data revealed students in the experimental group made significant improvements than their peers who did not interact with digital media during their intervention. Students in both studies showed improvements using a digital intervention. To summarize, there was evidence of improved student outcomes with technology-enhanced activities and interventions.

Moreover, special education teachers have used technology in similar ways to support their students' diverse needs (Anderson & Putman, 2020). Five out of eight special education teachers valued how technology can be used to differentiate instruction, modify content, and provide accommodations. Similar results were found in Sulaimani's (2017) qualitative study. Six out of seven special education teachers were in favor of using technology with their autistic students and shared how using technology in the classroom positively impacted their students' learning experiences. Participants shared using technology has helped them to accommodate students' learning preferences, such as visual support. The special education teachers in both studies expressed how they used technology to support their students' needs. In addition, several kindergarten through ninth-grade teachers indicated having access to technology through one-to-one computing for students could support them with differentiating and personalizing instruction (Power et al., 2020). The general education teachers in this study expressed how they used technology to support the individual needs of their students as well. In conclusion, technology integration in the classroom could be beneficial for students' learning outcomes. This is why I sought to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology

into instruction and the support needed to effectively integrate technology. Findings could help reduce the barriers to technology integration leading teachers to integrate technology more into their instruction.

Barriers to Technology Integration

Barriers to technology integration are the obstacles teachers face when integrating technology (Ertmer, 1999). In her seminal research, Ertmer (1999) determined each barrier to technology integration can be identified as a first-order or second-order barrier. First-order barriers to technology integration are external barriers experienced by teachers, such as equipment, time, training, and support. On the other hand, second-order barriers to technology integration are internal barriers that could interfere with and impede fundamental change. These barriers are caused by teachers' underlying beliefs about teaching and learning. Since this initial research, Ertmer et al. (1999) conducted a study with seven kindergarten through second-grade educators, and found all participants identified lack of equipment and lack of time to be barriers to technology integration. The researchers also found the impact these barriers had on the way teachers integrated technology varied based on the other barriers to technology integration they experienced. Comparable barriers to technology integration were identified by preservice teachers in Dinc's (2019) study. Dinc asked 76 preservice teachers their opinion about the barriers to technology integration in education. The results revealed 93.4% claimed lack of funding/budget, 89.5% claimed lack of equipment, 69.7% claimed lack of ability, and 68.8% claimed time were the major barriers to technology integration. The barriers to technology integration with the lowest claims were for security (5.3%) and parents

(10.5%). Similarly, Pribeanu et al. (2020) found limited internet access, limited device access for students, limited school funds to purchase devices and educational applications, teachers' limited ICT skills, teachers' resistance to change, and their belief of students misusing technology were the barriers to technology integration eight secondary teachers from Lithuania and eight secondary teachers from Romania faced. In short, teachers experienced a variety of barriers that influenced the way they integrated technology into their instruction.

Nath (2019) found several barriers primary teachers faced when integrating technology in their instruction. In this study, 26 out of 30 primary teachers indicated having no training on integrating ICT negatively impacts the way they integrate ICT in the curriculum. Only 30% of teachers had formal ICT training as part of their undergraduate program. Teachers also identified funding as another to barrier to technology integration. There were 25 out of 30 teachers who thought limited finances were hindering their ability to integrate technology (Nath, 2019). Primary teachers in Botswana reported several first-order barriers that hindered their use of technology in their instruction (Mogwe & Balotlegi, 2020). Out of 11 teachers, 71% reported time as a barrier, 63% reported insufficient computers, 63% reported inadequate technical support, and 61% reported limited institutional support. Teachers in both studies experienced several first-order barriers to technology integration. Rolle-Greenidge and Walcott (2020) identified several themes that emerged from their study with primary teachers from the Dominican Republic. Those themes were inadequate support, lack of computer skills, lack of resources, ineffective ways to monitor students while using technology, time

restrictions, and insufficient training opportunities. Teachers were provided with devices but were not comfortable with using them due to limited training. Teachers also claimed to not know how to effectively plan to integrate technology into instruction. Overall, primary teachers were faced with various barriers to technology integration.

Carstens et al. (2021) found similar experiences with first-order barriers among K-12 educators in their study. Several teachers indicated not having enough devices for students, unreliable internet connection, and inadequate time to research tools and activities are challenges they face when integrating technology. Time was also reported by 11 high school teachers as a major barrier to technology integration (Rosenberg & An, 2019). Even though these teachers engaged in a mentoring program to help improve their technology integration skills, they did not find any remedies to resolve their time barrier. Before attending the mentoring program, nine out of 11 teachers reported not having enough time to plan and prepare for technology-enhanced activities. After the mentoring program, there were still nine out of 11 teachers claiming to not have enough time to learn, practice, and plan for technology-enhanced activities (Rosenberg & An, 2019). After interviewing eight K-12 teachers (four typical teachers and four exemplar teachers), Alenezi (2017) found five out of eight teachers identified time as a barrier to technology integration. The researcher also found three of the four typical teachers identified lack of comfort as a barrier, and three of the four exemplar teachers identified lack of resources to be a barrier to technology integration. These studies confirmed multiple barriers to technology integration; however, time was a significant barrier teachers encountered. It is important to support teachers by reducing these barriers, so they could effectively

integrate technology into their instruction. In my study, I sought to address this gap in practice by exploring the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology.

The findings from a mixed-method study in Indonesia provided unique challenges to integrating technology in the secondary setting (Abidin, et al., 2017). Secondary math teachers identified several issues regarding inappropriate use of mobile phones. Based on the survey data, 58.2% of teachers identified mobile phones as disruptive devices, 49.8% of teachers identified cyberbullying and sexting, 40.8% identified cheating, and 34.3% identified limited access to mobile devices as a barrier to technology integration. Unlike the previous study, Barbour et al. (2017) found different challenges experienced by secondary teachers. In a case study with four secondary science teachers, researchers revealed the gap between having available devices for students, and not having consistent internet access for the devices. Teachers shared there are times when they do not have internet access at their school, so they are limited to certain activities they could do with students on their devices. As a consequence, the lack of internet access negatively influenced the way teachers valued integrating iPads in their instruction. One teacher mentioned iPads did not enhance her instruction, especially when it involved lab work. Another teacher indicated applications on the iPad were not aligned to complex topics in her curriculum. Nicolas (2018) also found first-order barriers reported by secondary science teachers in Lebanon. Although 67% of teachers have access to technology and sufficient training opportunities, 57% reported it is difficult integrating technology into

the current educational system, and 27% reported they are unaware of ways to integrate technology in their classrooms. In the mid-Atlantic region of the United States, 398 secondary social studies teachers were surveyed about the barriers to technology integration they experienced (Kormos, 2019). Financial cost, student knowledge regarding technology, and time to prepare for technology-enhanced lessons were identified as the most significant barriers they have experienced. Although the barriers were different, secondary teachers in these studies experienced challenges that made it difficult to integrate technology. Addressing these barriers could increase teachers' use of technology to support their instruction.

Dong (2018) suggested that teachers' experience with professional development and research focused on educational technology play a role in the way they integrate technology in the classroom. Unfortunately, a quantitative study in China revealed 64% of 120 kindergarten teachers did not receive any training on how to integrate technology in the classroom (Weng & Li, 2018). This barrier to technology integration caused a negative impact on how the kindergarten teachers integrated technology in their instruction. Kilinc, et al. (2018) found external barriers to technology integration to be prevalent amongst those who did not attend professional development focused on technology integration. In another study, preservice teachers in the Netherlands reported that they received very little training on how to integrate technology in the classroom (Voogt & McKenney, 2017). The researchers proposed preservice teachers needed experience with integrating technology, but their instructors did not find it urgent to incorporate technology since it was not required in their internship. Brown and

Englehardt (2017) found in their study that programs struggled to provide early childhood preservice teachers with training needed to integrate technology into the classroom. To summarize, teachers and preservice teachers had limited training opportunities for technology integration. Arguably, technology specific trainings could support teachers with effectively integrating technology.

The findings from Francom's (2020) quantitative study highlighted several first-order barriers to technology integration experienced by 1,096 K-12 educators in Midwestern United States. Over the course of three years, participants completed two surveys indicating their barriers to technology where 59.2% of teachers reported time to plan and prepare as a barrier, 37.6% of teachers reported training and technical support as a barrier, 35.9% reported access as a barrier, and 33.3% reported administrative support as a barrier. Teacher beliefs were the least significant barrier where 15.6% of teachers selected this barrier in their responses. Similarly, Tarman, et al. (2019) surveyed 171 teachers, and found they mostly experienced first-order barriers, instead of second-order barriers. Using a five point Likert-type scale, with one representing strongly disagree and five representing strongly agree, the highest rated item with a mean of 3.88 was not having an effective computer lab in the school. Having slow internet in the school was another highly rated barrier to technology integration that received a mean score of 3.79, and attending irrelevant professional development courses for integrating technology received a mean score of 3.50. In both quantitative studies, teachers communicated more first-order barriers to technology integration than second-order barriers. Nevertheless, the

reduction of barriers teachers experienced could increase the way they integrate technology.

Although, second-order barriers were not reported as often in previous studies, they can impact the way teachers integrate technology. In a study conducted in England, researchers examined how a teacher's pedagogical practices with technology shifted after her beliefs of technology in the classroom changed (Vidal-Hall, et al., 2020). At first, the teacher was skeptical about using technology in the classroom because she did not believe it could support her three and four year old students. Throughout this study, the teacher engaged in intervention where she adopted new practices for digital technologies, reflected on those practices, and observed how her students interacted with technology. At the end of the study, the teacher's perspective changed, and she embraced using technology within her classroom. Jeong and Kim (2017) conducted a quantitative study where they investigated 160 kindergarten teachers' views and uses of technology in their classrooms. The results showed that educators' perceived usefulness of technology significantly influenced their intent to use. In both studies, teachers' beliefs affected the way they integrated technology into their instruction. Comparable results were found in a study where 30 preschool teachers used the Read It Again-Mobile language and literacy curriculum (Xie et al., 2019). Teachers' perception of the technology curriculum's usefulness and ease of use positively influenced the way they integrated this tool in the classroom. After conducting a study with 400 physical education teachers, Villalba et al. (2017) identified several obstacles teachers perceived related to ICT integration. Out of the 400 participants, 61.5% agreed or strongly agreed a perceived obstacle is that

integrating ICT into the classroom is an investment in time and in training, 51.5% agreed or strongly agreed they do not know how to integrate ICT into the physical education classroom, and 48.2% agreed or strongly agreed that technical problems and the delays caused by technical problems are issues when integrating ICT. In summary, teachers' perception could influence the way they use technology in the classroom. Addressing this barrier could improve the way teachers integrate technology.

Although researchers have found benefits to integrating technology, it was unknown why teachers in southeastern United States were not integrating technology into instruction. There have been studies about the barriers to technology integration experienced by teachers; however, it was uncertain what these barriers were for kindergarten through second-grade teachers. My study addressed the gap in practice where I explored the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction. Furthermore, researchers have used various methodologies in similar studies, but I employed a generic qualitative inquiry approach for the current study. I used interviews to engage teachers in discussion where they elaborated on their perceptions about the barriers for integrating technology into instruction and the support needed to effectively integrate technology.

Overcoming Barriers to Technology Integration

Hannaway and Steyn (2017) recommended teachers should receive training to increase their technological skills and pedagogical skills. Based on their findings, they suggested teachers should not only attend sessions to learn how to use technology, but they should also attend sessions where they learn strategies to effectively integrate

technology in their curriculum. According to DeCoito and Richardson (2018), "support needs to be readily available for teachers to incorporate technologies early in their practice rather than later" (p. 373). In recent studies, multiple participants engaged in professional learning opportunities in efforts to reduce the barriers to technology integration they were experiencing. Thoma et al. (2017) conducted a study with three fifth-grade teachers who engaged in professional learning opportunities on the technology integration planning cycle to strengthen how they integrate technology in literacy instruction. After a year of participating in professional development and using the technology integration planning cycle, teachers claimed their thoughts and actions regarding integrating technology in their literacy instruction have improved. In brief, targeted support could help improve how teachers integrate technology into instruction.

At the lower elementary level, St. Hilaire & Gallagher (2020) conducted a study with four kindergarten teachers who engaged in differentiated coaching sessions focused on strengthening their technology integration in literacy instruction. Throughout the study, teachers attended 17 coaching sessions with a technology coach. As a result, teachers reported an increase of technology integration in their literacy instruction. Having a technology coach deemed beneficial with improving teachers' technology integration skills. A positive change in the way teachers integrate technology into instruction was also evident for eight teachers after they attended a graduate course (Sibert et al., 2020). Before taking the five weeks course, teachers mainly rated their pedagogical knowledge and content knowledge to be high, and their technological knowledge and overall TPACK to be low. At the end of the course, all teachers rated

their TPACK to be high or very high. Additional findings revealed teachers were more inclined to integrate the different technologies they experienced within their graduate course. In sum, teachers' positive experience with using technology shifted the way they thought about integrating technology. Positive learning experiences could support the way teachers effectively integrate technology into their instruction.

Jones and Dexter (2018) conducted a mixed-methods study with twelve middle school teachers, and found evidence to support having various styles for technology integration professional development. Teachers identified not having time to attend formal professional development sessions and irrelevant session topics as barriers. As a result, teachers indicated they engaged more in informal learning opportunities with peers and independently. Within this study, one principal recognized teachers' independent professional learning efforts, and provided them with compensation. Additional evidence revealed some teachers were willing to engage in professional learning outside of their normal working hours if the independent learning was recognized, they were compensated for their time, and the learning was relevant to what they were teaching. Barton and Dexter (2020) found comparable results in their study with six middle school teachers. All the teachers shared during their interviews that they participated in informal and independent professional learning opportunities more than they participated in formal professional learning. To review, informal and independent learning were favorable among teachers in both studies. In addition, Durff and Carter's (2019) study revealed how eight elementary teachers overcame attitudinal, sociocultural, and pedagogical barriers to technology by collaborating with their peers. However, they indicated

attending professional development sessions contributed to them overcoming barriers to technology integration as well. To summarize, teachers learned about ways to improve their technology integration skills through a variety of professional learning methods. Teachers should have the opportunity to choose how they want to learn.

Although solutions to reduce barriers to technology integration were identified in previous studies, Özdemir (2017) asked participants to share solutions they believe would help reduce the barriers to technology integration they experienced. After analyzing the data, five themes emerged. These themes were improvement of the school's ICT infrastructure; practical training on the use of ICT; a curriculum directing to ICT; development of course materials/software for Turkish lessons; and giving information and equipment to students. The most frequently reoccurring themes in the data were practical training on the use of ICT for lessons at 31 times, access to a curriculum that supports ICT integration at 30 times, and improvements to ICT infrastructure in their school at 25 times. The researcher noticed the solutions participants proposed were aligned to the barriers to technology integration they identified. For my study, I took the same approach by asking kindergarten through second-grade teachers about the support they need to effectively integrate technology. Gaining insight about the support needed directly from teachers could lead to them getting help with integrating technology into instruction.

Summary and Conclusions

After a thorough investigation, I identified multiple themes from the literature. In the technology integration in the classroom section, studies showcased how teachers

integrated technology into instruction. If teachers are knowledgeable on how to use technology to support their pedagogical and content needs, they are more inclined to use it in their lessons. As cited in Lawrence et al. (2018), a teacher recognized the need to adjust her pedagogical approaches to successfully integrate technology in her classroom. It was also revealed that students had positive learning outcomes when engaged in technology-enhanced activities and interventions (see Lu et al., 2017; Reeves et al., 2017; Woloshyn et al., 2017).

When it comes to the barriers to technology integration section, there were studies that shed light on several first-order and second-order barriers experienced by teachers. Some of these barriers included having little to no access to devices, software, or internet, little to no training or professional development sessions on integrating technology, time to plan or time to integrate technology in the classroom (see Abidin, et al., 2017; Carstens et al., 2021; Nath, 2019; Voogt & McKenney, 2017; Weng & Li, 2018). Vidal-Hall, et al. (2020) provided evidence of how a teacher's perspective shifted regarding using technology to support her instruction. She initially believed she could not use technology to assist her students, but changed her perspective after she understood how to use it to support her instruction.

The overcoming barriers to technology integration section provided an in-depth analysis of solution-oriented findings. Researchers shared how teachers' ability to integrate technology into instruction increased after attending professional learning sessions (see St. Hilaire & Gallagher, 2020 and Thoma et al., 2017). Complimentary studies conducted by Jones and Dexter (2018) and Barton and Dexter (2020) provided

benefits of various methods of professional learning opportunities. Educators were more likely to participate in informal and independent sessions, as oppose to formal sessions. Özdemir (2017) adopted a different approach to finding solutions to overcome barriers to technology integration. This researcher asked educators to provide their input on solutions they perceive needed to help reduce the barriers to technology integration they were experiencing.

Depending upon the grade-level, subject-area, and location, the barriers experienced by educators when integrating technology into instruction differs. As mentioned, current studies only provide some insight to the barriers experienced by teachers. However, it was uncertain what those barriers were for kindergarten through second-grade teachers. In my study, I addressed the gap in practice with a generic qualitative inquiry approach. I conducted interviews where I explored the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. Findings from my study could lead to various types of support created to aid kindergarten through second-grade educators when integrating technology into instruction. Also, the findings could help reduce the barriers experienced by kindergarten through second-grade teachers when integrating technology into instruction.

In Chapter 3, I share the rationale for selecting a generic qualitative study to address the gap in practice. I also provide details about the participant selection criteria, types of instruments used to collect data, the data analysis process, and strategies to

establish trustworthiness of the findings. For the ethical procedures, I provide strategies to eliminate my biased views throughout this study.

Chapter 3: Research Method

The purpose of this generic qualitative study was to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. A generic qualitative inquiry approach was used as the research design for this study. As noted in the Early Learning and Educational Technology Policy Brief, additional research is needed in the areas of early learning and educational technology (United States Department of Education & United States Department of Health and Human Services, 2016). My study could add insight to these areas by finding ways to reduce the barriers experienced by kindergarten through second-grade teachers when integrating technology.

In this chapter, I justify why a generic qualitative study is selected as the research design for my study. Also, I provide details about my role as a researcher, the participant recruitment process, the types of instruments used during the study, and the data analysis process. The ethical procedures and trustworthiness of the generic qualitative study are addressed. This study did not officially begin until the proposal was approved by the Walden University Institutional Review Board.

Research Design and Rationale

For my qualitative study, I used a generic qualitative inquiry approach. Researchers who use a generic qualitative inquiry approach tend to focus on individuals' subjective experiences, beliefs, and opinions of things in the outer world (see Percy et al., 2015). Unlike a phenomenological approach, researchers using a generic qualitative inquiry approach are not focused on the inner dimensions of individuals' experiences,

beliefs, or opinions, but more focused on the actual experiences, beliefs, or opinions. A generic qualitative inquiry approach was the most appropriate research design for my study because my goal was to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. I gathered data through interviews to address the phenomenon of interest.

Other qualitative research designs were considered but rejected. An ethnographic study would allow researchers to be immersed in the daily activities of kindergarten through second-grade educators to get a better understanding of their culture (see Creswell, 2012). Researchers could use this information to show how it influences educators' actions. This research design did not work for this study because the focus was not on multiple aspects of kindergarten through second-grade educators' culture. Also, the required prolonged time in the field was not feasible for this study.

According to Creswell (2012), research studies with a narrative design allow researchers to get a chronological view on a participant's direct experiences with a phenomenon. This type of study brings forth potential ethical issues where the individual or individuals provide false information. Whether intentional or unintentional, participants can leave out key information about their experiences with a phenomenon. This information is needed to shape a narrative study. For that reason, this research design was declined.

A grounded theory design is used when the researcher wants to generate a theory that explains a process, actions, or interactions about a topic at a broad conceptual level.

This research design is used when researchers are seeking to answer questions about how something changes over time (Ozanne, 1992). Grounded theory was rejected for this study because an analysis of data did not occur to develop a theory, or to answer how something has evolved over time.

Creswell (2012) claimed a case study research design allows researchers to focus on a specific bounded system, such as people, events, and so forth. Researchers in a case study engage in an in-depth investigation and employ multiple methods for data collection. This research design was rejected for the current study because data were only collected through interviews to answer the research questions.

In addition, a quantitative design was rejected for this study because a statistical test to investigate relationships between two or more variables was not needed. Unlike a quantitative study, a qualitative study allowed me to ask participants open-ended questions in an interview to explore their perceptions about the barriers for integrating technology into instruction and the support needed to effectively integrate technology (see Creswell, 2012).

The following research questions were explored:

RQ1: What barriers are perceived by educators of kindergarten through second-grade students for integrating technology into instruction?

RQ2: What support do educators of kindergarten through second-grade students perceive needing to effectively integrate technology?

Role of the Researcher

During this generic qualitative study, I served as an external researcher. I currently work for an educational company. Previously, I worked in a K-12 school district located in southeastern United States in an instructional technology support role and as a first-grade teacher. For this study, I recruited participants via social media and through the Walden University Participant Pool. Participants taught in schools located in southeastern United States. Since I was an external researcher, I offered a $10.00 gift card as an incentive to all participants.

With my current role and previous roles, remaining unbiased throughout the data collection process was a top priority. Since I was the only data collector in this generic qualitative study, I practiced reflexivity by typing my experiences throughout the data collection and analysis process in a password protected online journal. Also, I followed an interview protocol (see Appendix A) to help alleviate any biases while interviewing participants. Creswell (2012) shared that researchers should remain neutral and speak in a positive tone when interacting with interview participants. Throughout the data collection process, I assured participants that their responses will be confidential, and their identifiable information will not be connected to their interview responses. Although I did not have any previous interactions with the participants of my study, I made sure they felt comfortable, so they could provide the most accurate responses.

Methodology

Participant Selection

Before contacting potential participants for this generic qualitative study, I received approval from the Walden University Institutional Review Board (approval number: 01-04-22-0477190). Purposeful sampling was used to select participants. With this sampling strategy, I set criteria to select participants who could provide rich information related to the phenomenon of interest (see Palinkas et al., 2015). Participants for this study consisted of kindergarten through second-grade teachers who taught in school districts located in southeastern United States. All participants taught in schools with access to technology they could integrate into instruction. As stated in the problem, the AdvancEd (n.d.) reports indicated all classrooms with limited to no evidence of technology integration had technology available for use (e.g., Bibb County School District, 2018; Broward County Public Schools, 2016; Candler County School System, 2017; Chattahoochee County Schools, 2017; Charleston County School District, n.d.; Decatur County School System, 2017; Edgefield County School District, 2017; Forsyth County School System, 2017; Kershaw County School District, 2019; McDuffie County Schools, 2017; Oconee County Schools, 2018; Polk School District, 2018; Pulaski County Schools, 2019; Wayne County Public Schools, 2019; Whitfield County School System, 2018). Since access to technology was not a barrier for teachers in the reports, kindergarten through second-grade teachers who do not have access to technology were excluded from my study. Their perceived barriers and support could be based on not

having access to technology. Their responses would not have been beneficial towards answering the research questions of my study.

One recruitment method I used for my study was to share a flyer on social media, such as Facebook (https://www.facebook.com) and LinkedIn (https://www.linkedin.com). The flyer included information about the study with a link and QR code where interested individuals could access a Google Form (https://docs.google.com/forms). The Google Form contained questions, such as name, grade-level, state, email address, and phone number. I also used the Walden University Participant Pool to recruit participants for my study. Based on the number of participants in similar studies, I sought between eight to 14 participants. I stopped recruiting participants once data saturation was reached. Data saturation was reached when there were no longer any new information, codes, and themes found in participants' interview responses (Guest et al., 2006). Evidence of data saturation occurred at 10 participants, unlike 14 participants in Özdemir's (2017) study.

Before collecting data from potential participants, I sent an email to confirm their interest in participating in the study along with a consent form where they acknowledged their agreement with the terms of the study, their understanding of their role as a participant, and their understanding that all information will remain confidential. Individuals signed the consent form by responding to the email with the words, "I consent". All participants received a $10.00 gift card as an incentive. At any time during the study, participants could have terminated their participation.

Instrumentation

One-on-one interviews were used to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. The interview consisted of open-ended questions where I recorded the responses shared by participants. Interview questions were developed to focus on the research questions, literature review, and conceptual framework of this study.

When developing the interview questions, I referred to Bandura's (1977) self-efficacy theory. I also referred to Ertmer's (1999) seminal research on first-order and second-order barriers to technology integration. In addition, I adapted questions used in similar studies (e.g., Alenezi, 2017; Francom, 2020; Pribeanu, 2020; Özdemir, 2017, Tarman et al., 2019). All questions were included in the interview protocol (see Appendix A) along with opening and closing remarks. All participants received a copy of the questions through email prior to participating in the interview.

Procedures for Recruitment, Participation, and Data Collection

Prior to beginning this study, I received approval from the Walden University Institutional Review Board. After I received approval, I shared a flyer on social media, such as Facebook (https://www.facebook.com) and LinkedIn (https://www.linkedin.com). The flyer had information about the study with a link and QR code connecting individuals to a Google Form (https://docs.google.com/forms). Interested individuals completed the Google Form where they included their name, grade-level, state, email address, and phone number. Another recruitment method I used

for my study was the Walden University Participant Pool. For this generic qualitative study, I sought kindergarten through second-grade teachers in southeastern United States. All participants taught in schools with access to technology they can use to integrate into instruction. I used interviews to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. Based on the number of participants in similar studies, I sought between eight to 14 participants. I stopped recruiting participants once data saturation was reached at the 10th participant. As I received potential participants' responses on the Google Form, I contacted them through email to confirm their interest.

Before collecting data from potential participants, I sent them an email along with a consent form, which included information about the study and their rights as a participant. If individuals agreed with the terms, they responded to the email with the words, "I consent". They made a copy of the consent form for their own records. In the reply email, participants also included available days and times they could participate in a 1 hour interview. Once a date and time was scheduled, I sent participants a confirmation email with the number to dial for the Zoom call (https://zoom.us) and the interview questions. I also sent the confirmation email 2 days before the interview. Prior to starting the interview, I asked participants for permission to record the audio on the Zoom call. Each interview was scheduled for an hour but occurred in less time than that. Participant interviews occurred between 10 to 25 minutes. During the interview, I took notes regarding the participants' responses. Notes did not have any identifiable information

about the participants. At the end of interview, participants were thanked for participating in the study. The audio recording from the interview on Zoom was transcribed using the audio transcription feature on the platform. After the interview, I download the interview transcript. The audio and transcripts were stored electronically in a password protected device within a password protected account. Within 48 hours of each participant's interview, I sent a debrief email along with the interview transcript. Participants had 3 days to confirm the accuracy or make recommendations to strengthen the accuracy of the transcript. This process took 1 hour to complete. In the debrief email, I thanked the participant again for participating in the study. The email also included some of the items that were on the consent form, for example, purpose of the study, participants' rights, confidentiality, and so forth. Participants were able to opt out of participating at any time during the process. A $10.00 gift card was given to participants at the end of the study.

Data Analysis Plan

As part of the data analysis process, member checks were used where participants reviewed and verified their interview transcript. Participants had the opportunity to offer suggestions to improve the accuracy of the transcripts. After each participant confirmed or offered suggestions to strengthen the accuracy of their interview transcript, I used inductive thematic analysis with constant comparison to analyze the responses. During inductive thematic analysis with constant comparison, data analysis occurs during the data collection process. Each participant's transcript was analyzed to identify patterns and themes without any preexisting categories. After the first transcript was analyzed, another

transcript was analyzed and compared with the previously analyzed transcript. This process continued until data saturation was met.

Based on the recommendations from expert sources, I followed a step-by-step process for inductive thematic analysis with constant comparison (see Merriam & Tisdell 2016; Percy et al., 2015). I used these steps to help ensure accuracy of the findings. While analyzing participants' interview transcripts, I used the Kami application (https://www.kamiapp.com) to highlight and annotate on the transcript. For my first step, I reviewed the first participant's interview transcript and the notes I took during the interview process. These items were reviewed multiple times. Next, I highlighted any sentences, phrases, quotes, or words that appeared to be meaningful to the study. Then, I reviewed the highlighted data with the research questions to determine if the highlighted data were related to the research questions. If the highlighted data were not related to the research questions, I changed the highlight color of this data to separate them from the original highlighted data. I continued analyzing the original data but reevaluated this data later in the data analysis. With the highlighted data related to the research questions, I coded or named the data by making notations near the text. During this stage, I created a spreadsheet to add coded data from the transcript. After coding the data, I began clustering any related codes on the spreadsheet. Then, I developed patterns from the connected clusters of data.

After completing this process from the first participant's interview transcript, I completed the process for each subsequent participant's transcript. Throughout the data analysis process, each participant's data were compared with previously analyzed data.

Patterns were identified and placed with corresponding patterns. I selected quotes from the transcripts, and added them to the spreadsheet to help elucidate the patterns. As I continued analyzing the data, I clustered and combined patterns to determine themes. Since data were analyzed throughout the data collection process, patterns and themes changed due to new data. When no new information, patterns, or themes derived from the data, I stopped recruiting participants for the study since data saturation was met. With all the analyzed data on the spreadsheet, I arranged the themes to correspond with the supporting patterns, and wrote a detailed analysis describing the scope and substance of each theme. Each pattern was also described and elucidated by supporting quotes from interview transcripts. If there were any findings that did not fit into the major themes and patterns, I reviewed these findings to determine how they support the other findings for the study. I used these discrepant cases to strengthen the data closely related to the research questions. Using discrepant cases in my findings helped eliminate any biases that may have occurred during the data analysis process.

The last step in the data analysis process was to synthesize the data to form a composite synthesis for each research question used in this study. Data related to the barriers perceived by teachers of kindergarten through second-grade students for integrating technology into instruction was used to answer RQ1. Data related to the support teachers of kindergarten through second-grade students perceive needing to effectively integrate technology was used to answer RQ2. The comparison of literature and findings that used the same conceptual framework along with other research studies strengthened the interpretation of the findings as well.

Trustworthiness

Within qualitative research studies, it is imperative for the researcher to prove the findings are trustworthy. Trustworthiness is represented by how a study is credible, transferable, dependable, and confirmable (see Creswell, 2012). It is vital for the researcher to conduct interviews, collect data, and interpret the findings in the same manner for each participant. For my study, I used multiple strategies to validate the accuracy of the findings.

Credibility

To establish credibility, I used member checks, data saturation, reflexivity and peer review. These methods supported the validity of the findings. With interviews being the sole method for data collection in my study, I followed an interview protocol (see Appendix A). I asked each participant the same questions in the same manner. Member checks were used to confirm the accuracy of my findings. Each participant was asked to review their interview transcript and had the opportunity to confirm or offer recommendations for changes based on their account (see Creswell, 2012).

As outlined in the data analysis section, I used inductive thematic analysis with constant comparison when analyzing the data collected from each participant's interview. When there was no longer any new information, patterns, or themes deriving from the current data, I stopped recruiting participants for the study since I reached data saturation. Since I was the sole data collector and analyzer for my study, I engaged in reflexivity. I typed my reflections in a password protected online journal daily throughout my data collection and analysis process to reduce the chances of any biases from occurring.

Another method I used to help increase accuracy of my findings was peer review. I had a colleague with a doctorate degree review my notes, interview transcripts, findings, and codes to help me strengthen my data analysis. My colleague signed a confidentiality agreement before reviewing my notes, coded transcripts, and data analysis spreadsheet where she agreed to keep all information confidential. My peer reviewer provided feedback telling me my findings were logical and grounded in data, and my interpretations were reasonable. These methods alleviated biases from developing when interpreting the findings.

Transferability

Diane (2014) recommended researchers provide thorough details about the study, so readers can determine if it can be transferable. Although the limited number of participants for this generic qualitative study makes transferability unlikely in other settings, a detailed description of the data collection and analysis process is included in case other researchers find they could replicate this study in other settings. I included in-depth information about the participants, procedures, findings, and all other data for this study in the audit trail (see Lincoln & Guba, 1985).

Dependability

To show dependability, researchers should remain consistent throughout the data collection and data analysis process (see Creswell, 2012). Thorough details regarding the participants, procedures, findings, and all other data pertaining to this study were included in the audit trail. As recommended by Lincoln and Guba (1985), I included raw data from interviews, transcripts, audio recordings, and any additional information related

to the findings. All information is stored electronically in a password secured Google Drive account (https://drive.google.com). Within this same password secured account, all items were dated along with hyperlinks to the files and folders on a Google Sheet (https://docs.google.com/spreadsheets). During the interview, I followed the interview protocol (see Appendix A) to ensure each participant is asked the same questions in the same manner. Through member checks, participants reviewed and confirmed the accuracy of their interview transcripts. Participants had the opportunity to provide feedback to strengthen their transcripts. I also engaged in peer review where one of my colleagues, who has successfully completed a doctoral program, reviewed the data I collected and analyzed. This person informed me that my findings were logical and grounded in data, and my interpretations were reasonable.

Confirmability

Confirmability can be established when it is evident the interpretation of findings was derived from the data (Fusch & Ness, 2015). With an audit trail, a researcher can prove the interpretations of findings are consistent with the data and not personal views (Morrow, 2005). Since I was the sole data collector and analyzer for my study, I engaged in reflexivity. I kept an online journal where I typed my daily reflections throughout the data collection and analysis process. This journal is kept in a password protected account.

Ethical Procedures

I did not engage in the data collection process for this study until I gained approval by the Walden University Institutional Review Board. Upon approval, a flyer was shared on social media, such as Facebook (https://www.facebook.com) and LinkedIn

(https://www.linkedin.com), and information about my study was shared in the Walden University Participant Pool. The flyer included information about the study with a link and QR code where potential participants could access a Google Form (https://docs.google.com/forms). The Google Form had questions interested individuals could answer, such as name, grade-level, state, email address, and phone number. Based on the number of participants in similar studies, I sought between eight to 14 participants. I stopped recruiting participants once data saturation was reached at the 10th participant. Participation in the study was voluntary.

As I received potential participants' responses, I contacted them through email to confirm their interest. Participants received a consent form, which included information about the study and their rights as a participant. Individuals who agreed with the terms responded to the email with the words, "I consent". They could print a copy of the consent form for their records. Throughout the study, participants were reassured that their information will remain confidential. I wanted participants to feel comfortable, so they can share truthful and accurate responses during the interview process. At any time during the study, they could have terminated their participation. Participants received a $10.00 gift certificate at the end of the study.

Interview transcripts and audio recordings have a special numeric code to promote confidentiality of the participants. All notes, transcripts, and audio recordings are secured in a password protected account on a password protected computer. All data collected throughout this study will be locked and destroyed after five years.

Summary

In this chapter, I justified why a generic qualitative inquiry approach was the research design I used to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. I also provided extensive information about the participant recruitment process, the type of instrument used during the study, and data analysis. Multiple strategies were included to promote trustworthiness of the findings. Ethical procedures were addressed as well.

In Chapter 4, there is a discussion on the implementation of this generic qualitative study. The findings from interviews will be revealed. Descriptions, codes, and themes are used to classify the data. The strategies used to establish trustworthiness are evident.

Chapter 4: Results

The purpose of this generic qualitative study was to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. With my study's findings, I sought to uncover ways to reduce the barriers experienced by kindergarten through second-grade teachers when integrating technology into instruction. The following research questions were used to guide my study:

RQ1: What barriers are perceived by educators of kindergarten through second-grade students for integrating technology into instruction?

RQ2: What support do educators of kindergarten through second-grade students perceive needing to effectively integrate technology?

In this chapter, I provide the setting of the study along with the demographics of the participants. The data collection and data analysis process are described as well. Details about the results for each research question are shared in addition to evidence of trustworthiness.

Setting

All participants for my study met the criteria set forth in Chapter 3. Participants taught in a kindergarten, first-grade, or second-grade classroom in southeastern United States. They also had access to technology they could integrate into instruction. Some of the types of technology were Chromebooks, iPads, i-Ready (https://login.i-ready.com), Seesaw (https://web.seesaw.me), Smarty Ants (https://play.smartyants.com), and a variety of other programs and applications (see Appendix B). My study had two

kindergarten teachers, four first-grade teachers, and four second-grade teachers. The years of teaching experience varied for participants. The participants' teaching experience ranged from 4 years to over 35 years. The teachers taught in their current grade level from 2 years to 24 years. In addition, participants had a variety of degrees for their highest level of education. Their highest level of education ranged from bachelor's degree to educational specialist degree (see Table 2).

All participants in this study have experienced the effects of the COVID-19 pandemic. Although participants did not list the COVID-19 pandemic as a barrier to technology integration, some participants referenced the COVID-19 pandemic during their interview. Due to the nature of the virus, participants and their students may have had to quarantine or have engaged in virtual instruction. Nevertheless, this did not hinder participants from providing responses to the interview questions.

Table 2

Participant Demographics

Participant	Current Grade-Level	Number of Years in Current Grade-Level	Number of Years in Education	Highest Degree
P1	First-grade	3	10	Master's Degree in Educational Leadership and Administration
P2	Second-grade	3	4	Bachelor's Degree in Early Childhood
P3	Second-grade	4	20	Master's Degree in Administration and Leadership
P4	Second-grade	6	11	Master's Degree in Educational Leadership
P5	First-grade	3	8	Bachelor of Science in Early Childhood Education
P6	Second-grade	7	26	Educational Specialist in Curriculum and Instruction
P7	First-grade	24	Over 35	Bachelor of Science in Early Childhood
P8	Kindergarten	4	14	Bachelor of Science in Early Childhood Education
P9	Kindergarten	8	16	Master's Degree in Elementary Education
P10	First-grade	2	Over 30	Master's Degree in Early Childhood

Data Collection

Before I started recruiting participants, I received approval from the Walden University Institutional Review Board. After I received approval, I shared a flyer on various social media platforms. The flyer contained information about the study with a link and QR code connecting potential participants to a Google Form (https://docs.google.com/forms). Anyone who was interested in participating in my study completed the Google Form where they included their name, grade-level, state, email address, and phone number. I also used the Walden University Participant Pool to recruit participants. Interested individuals who saw my study on the Walden University Participant Pool's website sent me an email to express interest. Once I received their email, I sent them the Google Form to complete. The Google Form allowed me to see who met the eligibility requirements to participate in my study. Eligible potential participants were sent an email upon their Google Form completion along with a consent form, which included information about the study and their rights as a participant. Individuals responded to the email with the words, "I consent" to agree with the terms of the consent form. They also made a copy of the consent form for their own records.

In addition, individuals were instructed to provide their available days and times they could participate in a 1 hour interview in the reply email with their consent. Some participants did not initially include their availability along with their consent, so I emailed them again to please include their availability. I also sent a text to let them know I sent an email about scheduling their interview. Once I scheduled the interview, I sent participants a confirmation email with the Zoom call (https://zoom.us) information and

the interview questions. Within 2 days before the interview, I emailed the confirmation email again. Due to the availability some participants shared with me, their interviews occurred the next day after they informed me of their availability. In those cases, they only received one confirmation email.

All participants' interviews took place through the Zoom platform. Participants connected on the Zoom call in a quiet and private location. Before starting the interview, I asked participants for permission to record the audio on Zoom. All participants agreed to have their interviews recorded. Initially, interviews were scheduled to last for an hour. The length of time for participants' interviews varied between 10 to 25 minutes. Although participants' interview times were not as projected, participants were able to answer each interview prompt. Throughout the interview, I followed the interview protocol (see Appendix A). For one participant, P2, I had to use a synonym for the word barrier in an interview prompt to help her understand. Even though we spoke English, our dialects differed, so using the synonym challenge for the word barrier helped her understand the prompt. She was able to answer without any issues. I also took notes during the interview based on participants' responses. Notes did not have any identifiable information about the participants.

Participants had little trouble with connection during the Zoom interviews. Three participants (P1, P8, and P10) were disconnected from the Zoom call in the middle of the recording. When this occurred, I paused the recording, and waited for them to rejoin the Zoom call. After they rejoined the Zoom call, I restarted the recording and continued the

interview. This event did not impact the interview or participants' ability to provide responses.

At the conclusion of the interviews, I thanked participants and informed them of what will occur next. I informed the participants that I would send them a debrief email along with their transcript. With the embedded transcription feature in Zoom, the audio was transcribed. I downloaded the transcript for each interview to send to participants. The audio and transcripts were stored electronically in a password protected device within a password protected account. Within 48 hours of each participant's interview, I sent a debrief email along with the interview transcript. Participants were asked to review their transcripts and confirm if they were accurate. The email also included some of the items that were on the consent form, for example, purpose of the study, participants' rights, confidentiality, and so forth. The participant transcript review process took 1 hour to complete. They had 3 days to respond to me by email. All participants responded that they were pleased with their transcripts except P10. For the participants who initially confirmed the accuracy of their transcripts, I sent them a $10 gift card via email for their participation in the study immediately after I received their confirmation.

Since P10 recommended items she wanted adjusted on her transcript to strengthen her responses, I made the adjustments to the transcript for her. I sent her an email with the updated transcript and asked her to let me know if I should make any additional changes to strengthen the accuracy of her transcript. She did not respond to the email. After 3 days, I sent her a $10 gift card via email for her participation in the study. At any

time during the study, participants had the opportunity to opt out of participating. All participants who consented to participating in the study fully completed their duties.

Data Analysis

Member checks were an integral part of my data collection process. Within 48 hours of each participant's interview, I emailed them their transcript to review and verify. Participants had 3 days to confirm the accuracy or offer suggestions to improve the accuracy of their transcripts. After each participant confirmed or offered suggestions to strengthen the accuracy of their interview transcript, I used inductive thematic analysis with constant comparison to analyze the responses. P1-P9 confirmed the accuracy of their transcript within 3 days of receiving it. P10 recommended changes within 3 days of receiving her transcript. I applied the changes immediately and emailed her an updated transcript. She did not state if the updated transcript needed any additional changes or not. After 3 days, I analyzed her most recent transcript with the updates she suggested during the member checks process. While engaged in inductive thematic analysis with constant comparison, I was still collecting data for my study. All transcripts were analyzed without any preexisting categories in mind.

As recommended by expert sources, I followed a step-by-step process for inductive thematic analysis with constant comparison (see Merriam & Tisdell 2016; Percy et al., 2015). These steps were used to help ensure the accuracy of the findings. I used the Kami application (https://www.kamiapp.com) to highlight and annotate on the transcript while I analyzed participants' interview transcripts. First, I reviewed the interview transcript from P1 and any notes I took during the interview process. I

reviewed the transcript and notes multiple times. Next, I highlighted any sentences, phrases, quotes, or words that appeared to be meaningful to the study. Then, I reviewed the highlighted data with the research questions to determine if they are related to any of the research questions. If the highlighted data were not related to the research questions, I changed the highlight color of this data to separate them from the original highlighted data. I continued reviewing and analyzing the original highlighted data that is related to the research questions but revisited the other colored data as I completed the data analysis process. I revisited this data to confirm I did not miss anything pertinent to the research questions. I noticed I did not miss anything pertinent to the research questions, but some of the data were used for the participants' demographic information.

With the highlighted data related to the research questions, I coded the data by making notations near the text. Initially, there were 17 codes from the transcript. I created a spreadsheet using Google Sheets (https://docs.google.com/spreadsheets) to add the codes. After I coded the data, I began clustering any related codes on the spreadsheet. As I clustered codes on the spreadsheet, I noticed several repetitive codes. For instance, the need for a school based technology support person was coded four times in the transcript from the interview with P1. Once clustered, codes from the transcript were condensed to nine codes. After I completed this process with the interview transcript from P1, I completed the process for each subsequent participant's transcript. From participants' transcripts, I generated 73 codes (see Table 3). I also developed patterns from connected clusters of coded data.

Table 3

Codes from Participants' Interview Transcripts

Participant	Codes
P1	younger students limited understanding/experience with tech; hands on when supporting young students use tech; young students learn how to use tech fast once they are taught; parents/guardians' limited knowledge and understanding of tech and student use; internet/connectivity; affordable internet; school based technology support person; needs hands on demonstrations; more professional development
P2	children not confident with using technology; electricity issues; internet issues; inadequate laptops (devices); limited training opportunities (sporadic); no support from management/admin; need administration should provide training on technology; more training opportunities for technology; need parental involvement/support with students using technology at home
P3	having to train students on how to use applications and websites (they have limited knowledge); teacher's (her) limited knowledge of software/Apps to use; her beliefs about technology in the classroom inhibit her to take the necessary help (resources and support); no support needed; no additional professional development needed at this time due to so many offerings by the district that are already available; no additional resources would be helpful due to the amount already available
P4	students limited experience with using technology for education; limited devices for students; time is limited in school schedule to integrate; school based technology personnel (technology coach); more professional development; STEM related trainings; professional development type of technology events to show parents how to use technology; professional development or technology events to show student how to use technology; partnerships with technology industries
P5	not having access to programs for students; limited funding; limited training available; not having knowledge of what programs are available; more training; more funding
P6	not having access to programs for students; limited funding; need more money/funding
P7	students misusing technology; internet issues; electricity issues; lack of resources; distractions at home (students' homes); support needed from technology personnel; support needed from an instructional coach; professional development; writing specific professional development (could be integrated with technology); need a program for parents to understand what their child needs
P8	young students limited experience/proficiency with using technology; a lot of parent resistance to technology; limited Wi-Fi; her (teacher) limited proficiency with technology; her (teacher) discomfort with technology; need to co-teach with professionals (technology); more one-to-one technology training; more training
P9	students' age (young); large class size; students need assistance, but only one teacher able to provide help; lack of parents support; need technology coach to push in classroom; more professional development on ways to support younger students with technology; parental support; extra person to help students with using technology; technology lab for students to work on technology
P10	teacher is the barrier due to limited knowledge of different programs; more technologists to come to classroom to support with technology integration; more hands on, face to face sessions; more one on one support

Throughout the data analysis process, each participant's data were compared with previously analyzed data. I added new codes on the spreadsheet and clustered them with existing clusters of codes and patterns if they were related. New patterns were created to reflect new data that were not related to existing patterns. Direct quotes from each participant's transcripts were added to the spreadsheet to support their data as well. As I continued analyzing participants' data, I clustered and combined patterns to determine themes.

By the interview with P7, I noticed student related barriers to technology integration codes and patterns repeatedly emerged from participants' data. I also noticed a repetitive need for technology related training/professional development. I continued the interview process because I had not interviewed any kindergarten teachers yet. P8 and P9 were kindergarten teachers who were scheduled to be interviewed the next day after the interview with P7. I noticed P8 and P9 provided similar responses to previously interviewed participants. They also shared student related barriers to technology integration and the need for technology related training/professional development to support them with integrating technology effectively. In addition, they added to the need for technology support personnel. I decided to interview one more participant to see if any new information would be revealed. The barriers to technology integration and the types of support needed to effectively integrate technology shared by P10 were consistent with previous participants. Since no more new information, codes, patterns, or themes derived from the current data, I stopped recruiting participants for the study. Data saturation was met at the 10th participant.

All themes and patterns were described and supported by quotes from participants' interview transcripts. Overall, there were 27 patterns and 13 themes that emerged from the data. I noticed there were three findings related to RQ1 and one finding related to RQ2 that did not fit into the major themes and patterns. I reviewed these findings to determine how they support the other findings for the study. I found that the three findings related to RQ1 supported other barriers to technology integration themes, and the one finding related to RQ2 was aligned to a barrier to technology integration theme in RQ1. The discrepant cases were used to strengthen the data closely related to the research questions. Although I strived to remain unbiased during the data analysis process, using discrepant cases may have helped to eliminate any biases in the analyzed data.

As a final step in the data analysis process, I synthesized the data to form a composite synthesis for each research question. Data related to the barriers perceived by teachers of kindergarten through second-grade students for integrating technology into instruction were used to answer RQ1. There were eight themes related to this research question (see Table 4).

Table 4

Patterns, Themes, and Quotes Related to Research Question 1

Patterns	Themes	Quotes
young students' limited experience with technology; students need support with using technology; students misusing technology	student related barriers	"Those kids are at this age, they are younger. And they not quite as proficient in utilizing or navigating the technology platforms." *(P8)* "A barrier would be just that sometimes they need assistance in order to use it, and there's only one of me and so many of them." *(P9)*
lack of parental support; parents/guardians limited understanding of technology	parent/guardian related barriers	"They need parents support at home to be successful with utilizing technology and some of them don't have that, so it kind of hinders using technology." *(P9)* "We do have some older guardians, some older parents, so they're not familiar with a lot of these programs or using the Chromebook in general." *(P1)*
internet issues; electricity issues; limited affordable internet	connectivity related barriers	"Okay, the barriers sometimes could be the internet may go down or anything. The lights could go out." *(P7)* "The Wi-Fi access is limited." *(P8*
lack of resources; limited technology (hardware and software); inadequate devices	access to technology related barriers	"Everybody doesn't have access to the devices. Again, you have a limited. In my second grade, we don't have a device for each student in the class." *(P4)* "The laptops, though they are inadequate." *(P2)*
limited funding	funding related barriers	"Another thing is just having the ease of if something is needed, like say a program or even some type of activity that I would like to use. It's just not having the funding there for it or waiting and you've waited so long the kids have already gone to the next grade level." *(P5)* "And the barrier again would be that the district's not able to provide because they have to allot the money for other types of Apps or websites." *(P6)*
limited training opportunities	training/professional development related barriers	"A barrier is just the training. A lot of the things that I've learned when it comes to integrating technology into my classroom, I had to kind of either figure it out on my own or grab like a training that was beyond my contract hours." *(P5)* "It's a challenge, like we required to be updated on everything, yet you're not having the training." *(P2)*
limited knowledge of technology	teachers' knowledge related barriers	"My barriers have been my own knowledge of different softwares or Apps." *(P3)* "I feel as if sometimes I am the barrier, not the children. Um sometime there are programs that I personally do not feel well versed on, so I need help." *(P10)*
teacher beliefs	teachers' beliefs related barriers	"The school district that I'm in, they provide a lot of resources, a lot of support, but there are a lot of times that I'm hesitant to take the necessary help and that's due to my beliefs about technology and the classroom." *(P3)* "The areas that I experienced is my limited proficiency as well as my discomfort in utilizing a lot of the technology." *(P8)*

Data related to the support teachers of kindergarten through second-grade students perceive needing to effectively integrate technology were used to answer RQ2. For this research question, there were five themes (see Table 5). To help strengthen the interpretation of the findings, I compared previous literature, studies that used the same conceptual framework, and other research studies.

Table 5

Patterns, Themes, and Quotes Related to Research Question 2

Patterns	Themes	Quotes
hands-on training; more PD; content/tech specific PD for teachers of younger students; one on one training	technology related training/professional development	"I would really like it if there could be some more items and classes that are geared towards younger kids." *(P9)* "I personally would need more of a one-to-one tutoring of technology. I would also need more training in how to utilize the technology that's being introduced. I would like to have the district provide more in depth training." *(P8)*
technology coach/instructional; school based technology personnel	technology support personnel	"Maybe if the school had a tech coach that was kindergarten through second then another tech coach that was third through fifth. That would help alleviate some things." *(P4)* "I think, having a school based technology person like we've had in the past, I think that would be really helpful because that way you can really feel like you're getting your needs met." *(P1)*
training for parents; parental involvement/support	parent/guardian related technology support	"If we could have a program for parents to come and understand what their child needs that would be very helpful as well." (*P7)* "Parents should guide students at home when engaged in technology." *(P2)*
training for students; extra help/support for students using technology	student related technology support	"For the kids and parents, professional development for them or just training and resources for them would be very beneficial as well." *(P4)* "A time where our class could go to like a technology lab where it was like allotted in our schedule and there was someone there to help assist an extra set of hands, I think it would be very beneficial." *(P9)*
more money/funding needed; money needed to purchase technology (software/programs)	funding	"I wish I had more funding." *(P5)* "In order for us to have the technology, we've got to be able to get money." (*P6)*

Results

During my study, I sought to address the gap in practice by exploring the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. Through one-on-one interviews with open-ended questions, I collected data that provided me with insight to answer my research questions. Participant responses related to the barriers perceived by teachers of kindergarten through second-grade students for integrating technology into instruction were used to answer RQ1, whereas participant responses related to the support teachers of kindergarten through second-grade students perceive needing to effectively integrate technology were used to answer RQ2.

Research Question 1

There were several themes that emerged for each research question. For RQ1, I divided the themes into two groups like Ertmer (1999) did in her seminal research. All external barriers were grouped together as first-order barriers to technology integration (see Table 6), and all internal barriers were grouped together as second-order barriers to technology integration (see Table 7). The first-order barriers to technology integration themes were (a) student related barriers, (b) parent/guardian related barriers, (c) connectivity related barriers, (d) access to technology related barriers, (e) funding related barriers, and (f) training/professional development related barriers. The second-order barriers to technology integration themes were (a) teachers' knowledge related barriers and (b) teachers' beliefs related barriers.

Student Related Barriers

The most reoccurring first-order barrier theme among participants was student related barriers. Seven out of 10 participants shared how students' young age and inexperience with technology was a barrier to integrating technology. The second-grade students of P2 and the kindergarten students of P8 were not proficient with navigating on technology platforms. P9, another kindergarten teacher, shared a similar perception about students' young age being a barrier. She also stated, "A barrier would be just that sometimes they need assistance in order to use it, and there's only one of me and so many of them." Similarly, P3 has declared it to be difficult to train her second-grade students on using different applications and websites. A concurring response was provided by P1 about her first-grade students, but she believes that once she gets through the growing pains of teaching her students how to use a certain type of technology program and they understand how to use it, then she is good to go. P4 shared his second-grade students may have experience using technology at home through gaming consoles, but have little experience with using technology for educational purposes. Using technology for educational purposes is something P7 wants her first-grade students to do as well, but she mentioned students misusing technology as one of her barriers to technology integration.

Parent/Guardian Related Barriers

Another first-order barrier theme that emerged from the data was parent/guardian related barriers. P1, P8, and P9 had parent/guardian related barriers, but they varied. The parent/guardian related barrier from P1 was contributed to parents' limited understanding of the technology her first-grade students used. She stated, "We do have some older

guardians, some older parents, so they're not familiar with a lot of these programs or using the Chromebook in general." This makes it difficult for parents to support and reinforce certain skills students acquired at school while using various technologies. Parental support could help students retain technological skills they could apply throughout their learning experiences. P9 sheds light on the lack of parental support at home for her students, which hinders how students use technology. Occasionally, her kindergarten students attended school virtually due to the COVID-19 pandemic, but struggled navigating on their devices since they had limited parental support. Also, this negatively affected her instruction, for students could not access the technology-enhanced activities. Likewise, P8 identified resistance from parents regarding technology use for their children as a barrier. Again, with students' young age being a major barrier identified by participants, it is important for students to practice navigating on their devices and in different programs and applications. This could result in students using technology seamlessly to support their learning.

Connectivity Related Barriers

Connectivity related barriers was the third first-order barrier theme that derived from the data. P1, P2, P7, and P8 mentioned unstable internet was a barrier in their location. P1 and P8 contributed their internet issues to the rural area their schools were located. Not only was the internet unstable in the community P1 works, she also mentioned the internet was not affordable for parents to purchase. Again, this makes it challenging for parents to support and reinforce certain skills students have acquired at school while using various technologies since they do not have access to the internet at

home. Electricity issues were communicated in the interviews as well. P2 and P7 shared how they experienced internet and electrical disruptions while integrating technology in their classrooms.

Access to Technology Related Barriers

Five out of 10 participants expressed an access to technology related barrier. The technology related barriers from P4 and P2 focused on hardware while the technology related barriers from P5, P6, and P7 focused on software. The third through fifth grade students at the school P4 works are one-to-one with Chromebooks, but there are not enough devices for each student to use in his second-grade classroom. P2 also has access to devices for her students, but mentioned they were inadequate. Limited software options were the commonality among P5, P6, and P7. On multiple occasions, P6 used a certain program with her students, and then the next year it is not available at her school to use. She also communicated her concern for limited software licenses at her school. She said she is not able to fully utilize the program with her students since she has to share with other teachers on her grade-level.

Funding Related Barriers

The funding related barriers theme appeared while I was analyzing the data for this study. P5 and P6 expressed how limited funding to purchase technology based software and programs was prevalent at their schools. P5 said she would request certain software for her students, but may not receive it until the students are in the next grade level. She has had to adapt and modify her lessons to use another program that is not as good as the one she requested.

Training/Professional Development Related Barriers

The last first-order barrier theme that appeared in the data was training/professional development related barriers. Training was limited at the school P2 works. She communicated concern about her and the other teachers at her school being required to be up to date with using technology, yet there was not any training available. P5 shared a similar situation where there was limited training at her school. She said,

> A barrier is just the training. A lot of the things that I've learned when it comes to integrating technology into my classroom, I had to kind of either figure it out on my own or grab like a training that was beyond my contract hours.

Table 6

First-order Barriers to Technology Integration

Participant	Student Related Barriers	Parent/ Guardian Related Barriers	Connectivity Related Barriers	Access to Technology Related Barriers	Funding Related Barriers	Training/Professional Development Related Barriers
P1	X	X	X			
P2	X		X	X		X
P3	X					
P4	X			X		
P5				X	X	X
P6				X	X	
P7	X		X	X		
P8	X	X	X			
P9	X	X				
P10						

Teachers' Knowledge Related Barriers

In addition to the first-order barriers to technology related themes, two second-order barriers to technology integration themes derived from the data. The first theme was teachers' knowledge related barriers. P3, P5, P8, and P10 shared information regarding their limited knowledge of technology as a barrier. P3 stated her own knowledge of software and applications have been a barrier to integrating technology into her instruction. P10 feels she is the barrier since she is not well versed on programs to integrate.

Teachers' Beliefs Related Barriers

Teachers' beliefs related barriers was the other second-order barriers to technology integration theme. P3 considered herself to be a traditional teacher who does not integrate technology. She also said she did not really see a need for it to be integrated into the primary grade levels, so it has been a struggle for her to integrate technology into

her instruction. Her beliefs about technology use in the classroom have also restricted her from getting help and using resources her district provides. On the contrary, P8 believes technology is essential to learning, but does not really integrate it due to her discomfort in utilizing it.

Table 7

Second-order Barriers to Technology Integration

Participant	Teachers' Knowledge Related Barriers	Teachers' Beliefs Related Barriers
P1		
P2		
P3	X	X
P4		
P5	X	
P6		
P7		
P8	X	X
P9		
P10	X	

Discrepant Cases

While analyzing participants' data, I found three discrepant cases of barriers. These barriers were all first-order barriers that support another reoccurring theme. P2 identified having no support from administration as a barrier to technology integration. She further mentioned that administrators should not assume that teachers are good with technology, and that they should offer training on it. Although she identified no support from administration as a barrier to technology integration, it supports the training/professional development related barriers theme. Limited time to integrate

technology was another discrepant case identified by P4. He claimed there were several items he has to cover within the school day, and it was difficult to integrate technology due to him having to show his students how to use and access various technologies. This discrepant case supports the student related barriers theme since it reflects how students' inexperience with technology causes the teacher to not be able to maximize instructional time since he has to show them how to use various technologies. The last discrepant case came from P7. She listed distractions at students' homes as a barrier to technology integration. This discrepant case supports the parent/guardian related barriers theme since parents and guardians are responsible for supporting young students while they are at home. Parents and guardians could help ensure students have minimal distractions, so it does not hinder their learning experiences while using technology.

Research Question 2

In the interviews, all participants shared they would integrate technology more if they did not experience any barriers. P5 claimed she would be able to offer more opportunities and activities. Similarly, P8 would like to integrate technology more across the curriculum, and find ways to help parents embrace technology. Fortunately, participants shared the types of support they need to effectively integrate technology. The themes for RQ2 were grouped collectively as types of support needed (see Table 8). Those themes were (a) technology related training/professional development, (b) technology support personnel, (c) parent/guardian related technology support, (d) student related technology support, and (e) funding.

Technology Related Training/Professional Development

Technology related training/professional development was deemed to be the most reoccurring theme for the types of support participants perceived needing to effectively integrate technology. Eight out of 10 participants articulated this need during their interviews. In the district where P9 works, technology training opportunities were available, but they were not tailored for teachers with kindergarten students. She said, "I would really like it if there could be some more items and classes that are geared towards younger kids." Although her district offered sessions, P8 would like more in-depth trainings on how to use the technology with her students that were introduced in previous trainings. P1 and P10 would like more hands-on training opportunities based on their learning styles. P10 shared her district has been offering technology professional development sessions virtually instead of face to face sessions. This change occurred as a response to the COVID-19 pandemic. Since the district P4 works in uses Microsoft products, he suggested personnel from Microsoft could train teachers to use the products better with students. Also, the Microsoft employees could provide them with insight of the different skills students need to work in a technology industry. He said teachers could use this information to help prepare students for the future.

Technology Support Personnel

The need for technology support personnel was another noticeable theme for types of support needed. P1 and P4 had similar perceptions about having a school-based technology coach. They shared that they could get their needs met when it comes to getting support for effective technology integration. P1 no longer has a technology coach

at her school, but she expressed a need for that position. P4 has a technology coach at his school, but the person is responsible for multiple grade-levels. He suggested that there could be a technology coach that supports teachers in kindergarten through second-grade and another for third through fifth grade. Similar statements were shared by P9. The technology coach at her school supports 50 teachers in kindergarten through fifth grade. She wished her technology coach had more time to push into her classroom to support her with integrating technology into her instruction. Correspondingly, P8 and P10 would like for technology support personnel to assist them while they are integrating technology in the classroom.

Parent/Guardian Related Technology Support

The third reoccurring theme for the types of support needed was parent/guardian related technology support. P2, P4, P7, and P9 conveyed the importance of parental support when it comes to young students using technology. P9 acknowledged how hard it was to make a difference and see growth in her kindergarten students when there is no parental support, so she finds parental support a necessity for students when using technology. Likewise, P2 suggested parents should support their children by guiding them on various technology platforms they are using at home. P4 and P7 shared additional needs regarding support opportunities for parents. P4 shared it would be beneficial if there were trainings for parents to attend that focused on the technologies students use in the classroom. This will allow parents to see how to use various technology programs and hardware, and help their children with using them at home. P7 echoed similar statements by saying, “If we could have a program for parents to come

and understand what their child needs that would be very helpful as well." She also claimed if parents understand how to use the various technologies and are supportive, then they could encourage their children to use them.

Student Related Technology Support

The student related technology support theme derived from the data as one of the types of support needed. P4 and P9 recognized student related technology support is essential to them effectively integrating technology in their classroom. With her kindergarten class in mind, P9 wished her school had a technology lab with embedded time in her schedule to go to the technology lab to work on academic concepts. She also suggested a designated support person could work in the technology lab to assist her with students using technology. She claimed an extra person helping her students would be beneficial. P4 provided different support needed for his second-grade students. As he shared for parents, he believed students should receive training on how to use various technologies as well. He also shared the need for professionals from technology industries to speak with students about the uses of various technologies in their careers. This will allow students to hear first-hand experiences from technology professionals that could shape their outlook on future endeavors.

Funding

The last reoccurring theme for types of support needed was funding. P5 and P6 previously shared barriers related to funding, so their need for funding could support them with integrating technology effectively. P6 claimed, "In order for us to have the technology, we've got to be able to get money." She further communicated that funding is

needed to purchase programs she could use as part of her instruction. Similarly, P5 wished she had more funding, so it is easy to purchase programs to use within her lessons without any delays.

Discrepant Case

There was only one discrepant case that occurred for the types of support needed. P3 did not identify any support she would need to effectively integrate technology. She said, "The school district that I'm in, they provide a lot of resources, a lot of support, but there are a lot of times that I'm hesitant to take the necessary help and that's due to my beliefs about technology and the classroom." This discrepant case aligns with the second-order barrier theme of teachers' beliefs related barriers. Based upon her perception of technology in the classroom, the teacher did not list any additional support she would need because she was not partaking in the support currently offered in her district.

Table 8

Types of Support Needed

Participant	Technology Related Training/Professional Development	Technology Support Personnel	Parent/ Guardian Related Technology Support	Student Related Technology Support	Funding
P1	X	X			
P2	X		X		
P3					
P4	X	X	X	X	
P5	X				X
P6					X
P7	X	X	X		
P8	X	X			
P9	X	X	X	X	
P10	X	X			

Evidence of Trustworthiness

Credibility

Throughout my study, I used member checks, data saturation, reflexivity and peer review as strategies to establish credibility. These methods helped to validate my findings. During each interview, I followed an interview protocol (see Appendix A). Each participant was asked the same questions in the same manner. Participants also engaged in member checks where they reviewed their interview transcript to confirm its accuracy. They had the opportunity to confirm or offer recommendations for changes based on their account (see Creswell, 2012).

While analyzing the data for my study, I used inductive thematic analysis with constant comparison for each participant's interview data. The recruiting process stopped once I reached data saturation. Data saturation occurred when there was no longer any new information, patterns, or themes deriving from the data. Throughout the study, I engaged in reflexivity to reduce the chances of any biases that could have occurred. All of my reflections were typed in a password protected online journal.

As a final strategy, I used peer reviewing. My peer reviewer has a doctorate degree and experience in the early childhood field. Before reviewing my notes, coded transcripts, and data analysis spreadsheet, she signed a confidentiality agreement where she agreed to keep all information confidential. My peer reviewer provided me with feedback about my results being logical and grounded in data, and my interpretations were reasonable.

Transferability

Although the limited number of 10 participants for this generic qualitative study makes transferability unlikely in other settings, I included a detailed description of the data collection and analysis process in case other researchers find they could replicate this study in other settings. I kept an audit trail of information about the participants, procedures, findings, and all other data for this study (see Lincoln & Guba, 1985). As recommended by Diane (2014), I provided thorough details, so readers can determine if the study can be transferable in another setting.

Dependability

As recommended by Creswell (2012), researchers should remain consistent throughout the data collection analysis process to help promote dependability. I followed Lincoln and Guba's (1985) recommendation by keeping an audit trail with thorough details regarding the participants, procedures, raw data, transcripts, audio recordings, analyzed data, and any additional information related to the findings. I stored all of the information in my audit trail electronically in a password secured Google Drive account (https://drive.google.com). All items were dated along with hyperlinks to the files and folders on a Google Sheet (https://docs.google.com/spreadsheets).

During the interview, I followed the interview protocol (see Appendix A) to ensure the participants were asked the same questions in the same manner. Through member checks, participants reviewed and confirmed the accuracy of their interview transcripts. If participants needed to provide feedback to strengthen their transcripts, they had the opportunity to do so. During the member checks process, P10 was the only

participant to provide feedback to strengthen her interview responses. Furthermore, I also engaged in peer review where one of my colleagues reviewed the data I collected and analyzed. She previously earned a doctorate degree, and has experience in the early childhood field. My peer reviewer was able to provide me with feedback regarding my analysis. She mentioned my findings and interpretations were grounded in the data I collected from participants.

Confirmability

Fusch and Ness (2015) mentioned confirmability can be established when it is evident the interpretation of findings was derived from the data. As the sole data collector and analyzer for my study, I kept an online journal where I practiced reflexivity. The journal was a part of my audit trail where I included all information related to my research. In the journal, I reflected on the data collection and analysis process. This journal is kept in a password protected account.

Summary

By interviewing kindergarten through second-grade teachers in southeastern United States, I was able to gain insight of their perception on the barriers for integrating technology into instruction and the support they need to effectively integrate technology. For RQ1, participants shared several first-order barriers to technology integration in comparison to second-order barriers. Many participants communicated student related barriers with using technology. The other first-order barriers to technology integration themes were parent/guardian related barriers, connectivity related barriers, access to technology related barriers, funding related barriers, and training/professional

development related barriers. Teachers' knowledge related barriers and teachers' beliefs related barriers were the second-order barriers to technology integration themes. In addition, participants shared various types of support they need to effectively integrate technology. Technology related training/professional development was the most reoccurring theme for RQ2. The other themes were technology support personnel, parent/guardian related technology support, student related technology support, and funding.

In Chapter 5, I interpret the findings by connecting them to previous studies in the literature. I also provide the limitations I experienced when conducting my study. Furthermore, I offer recommendations and implications based on what I found during my generic qualitative study.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of my study was to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. With my study's results, I sought to find ways to reduce the barriers experienced by kindergarten through second-grade teachers when integrating technology into instruction. A generic qualitative inquiry approach was the best design for my study because it allows researchers to focus on participants' experiences, beliefs, and opinions of things in the outer world (see Percy et al., 2015).

Through open-ended interviews, I gained insight of participants' perception on the barriers for integrating technology into instruction and the support they need to effectively integrate technology. Findings for RQ1 indicated participants experienced more first-order barriers to technology integration than second-order barriers to technology integration. The most reoccurring theme was student related barriers with using technology. Several participants shared students' young age and inexperience with technology posed as a barrier. Additional first-order barriers shared by kindergarten through second-grade teachers were parent/guardian related barriers, connectivity related barriers, access to technology related barriers, funding related barriers, and training/professional development related barriers. There were a few teachers who shared second-order barriers to technology integration. The reoccurring themes for those barriers were teachers' knowledge related barriers and teachers' beliefs related barriers. For RQ2, participants expressed the types of support needed to effectively integrate technology.

Technology related training/professional development was the most reoccurring theme for this question. Additional themes found were technology support personnel, parent/guardian related technology support, student related technology support, and funding.

Interpretation of the Findings

After analyzing participants' data, I gained insight on their perceptions of the barriers for integrating technology into instruction and the support needed to effectively integrate technology. The findings from my study had several similarities and differences to the findings in previous studies. Overall, my barriers to technology integration themes were closely related to the themes found in Pribeanu, et al.'s (2020) study. They found eight secondary teachers from Lithuania and eight secondary teachers from Romania who declared limited internet access, limited device access for students, limited school funds to purchase devices and educational applications, teachers' limited ICT skills, teachers' resistance to change, and their belief of students misusing technology to be the barriers they were faced with. As reported in Chapter 4, participants shared several first-order barriers to technology integration in comparison to second-order barriers to technology integration. Francom (2020) and Tarman, et al. (2019) found a similar trend in their research findings where participants shared more first-order barriers to technology integration than second-order barriers to technology integration.

Research Question 1

Although participants in my study worked at schools with access to technology they could use to integrate into instruction, they still experienced first-order barriers. The

first-order barriers to technology integration themes were (a) student related barriers, (b) parent/guardian related barriers, (c) connectivity related barriers, (d) access to technology related barriers, (e) funding related barriers, and (f) training/professional development related barriers. The most significant theme for first-order barriers to technology integration was student related barriers. Eight out of 10 participants shared students' young age and inexperience with technology was a barrier. Comparable results were seen in Kormos's (2019) study where students' knowledge regarding technology was one of the most significant barriers experienced by secondary social studies teachers in the mid-Atlantic region of the United States. Funding was also another significant barrier to technology integration shared among the teachers in Kormos's study, but it differed in mine. Only two out of the 10 teachers shared funding as one of their barriers. These results were also contrary to Nath's (2019) study where 25 out of 30 teachers expressed limited funding as one of their barriers to technology integration, and in Dinc's (2019) study where 93.4% of 76 preservice teachers identified funding as a barrier.

Access to technology related barriers were shared by five out of 10 participants, but the specific technology varied. Two of them had device specific barriers where there were not enough for each student. Limited devices for students were seen as a barrier in multiple studies (see Abidin, et al., 2017; Carstens et al., 2021; Francom, 2020; Mogwe & Balotlegi, 2020). Primary teachers in Rolle-Greenidge and Walcott's (2020) study declared lack of resources was a barrier like the teachers in my study. Connectivity related barriers were identified by four out of 10 participants in my study and is comparable to previous findings where participants shared connectivity related barriers,

such as internet issues (see Barbour et al., 2017; Carstens et al., 2021; Tarman, et al., 2019).

Only two out of 10 teachers in my study identified training/professional development related barrier although it was a major barrier to technology integration in multiple studies. Weng and Li (2018) found 64% of 120 kindergarten teachers did not receive training on how to integrate technology into the classroom. Comparable results were found in Francom's (2020) study where 37.6% of 1,096 K-12 teachers identified training and technical support as a barrier. Nath (2019) identified 26 out of 30 primary teachers did not have training support them with integrating ICT, and it negatively impacts the way they integrate ICT into the curriculum.

The barrier of time was identified as a discrepant case in my study, but it was prevalent as a major barrier in several studies. When Ertmer et al. (1999) conducted their study with seven kindergarten through second-grade teachers, they found all participants identified time as a barrier. Primary teachers in Mogwe and Balotlegi (2020) and Greenidge and Walcott's (2020) study had similar experiences where teachers reported time as a barrier. Similarly, Rosenberg and An (2019) found nine out of 11 teachers claimed time was a barrier at the high school level. Likewise, five out of eight K-12 teachers in Alenezi's (2017) study declared time to be a barrier to technology integration, and 68.8% of preservice teachers in Dinc's (2019) study claimed time was a barrier.

Another discrepant case in my study was not having administrative support. Only one participant identified this as a barrier to technology integration. Unlike in Mogwe and Balotlegi's (2020) study where they found 61% of 11 teachers identified not having

support as a barrier. Comparably, Francom (2020) found 33.3% of 1,096 teachers said administrative support was a barrier to technology integration.

The discrepant case of distractions at home was not comparable with any barriers in previous studies; however, this discrepant case supports the parent/guardian related barriers theme in my study, and there was a comparable study related to that theme. Only three out of 10 teachers identified a parent/guardian related barrier to technology integration in my study. This low number of reported parent/guardian related barriers could be found in Dinc's (2019) study as well. Out of the 76 preservice teachers, only 10.5% of the participants identified parents as a barrier to technology integration.

Second-order barriers to technology integration were not as common in my study as the first-order barriers to technology integration, but there were comparable results in previous studies. Francom (2020) found teachers' beliefs to be the least significant barrier experienced by 15.6% of 1,096 teachers. In my study, only two out of 10 teachers' beliefs were a barrier. Likewise, Jeong and Kim (2017) and Xie et al. (2019) found teachers' perception of technology influenced how teachers used it in the classroom. One participant in my study does not believe technology should be integrated in the primary classroom, so she minimally integrates it into the classroom. Another teacher's discomfort was like the findings in Alenezi's (2017) study. Three out of four typical teachers identified lack of comfort as a barrier to integrating technology. As it related to the conceptual framework, this second-order barrier to technology integration theme aligns to the construct of performance accomplishments in self-efficacy. This is

supported by Coban and Atasoy's (2019) research where they found teachers' self-efficacy has an impact on how they integrate technology.

Teachers' knowledge related barriers were identified by four out of 10 teachers and compared with results from Rolle-Greenidge and Walcott (2020) as a barrier to technology integration. Similar results were found by Kwon et al. (2019) when they noticed middle school teachers' technical skills were a significant predictor of their self-efficacy. This second-order barrier to technology integration theme also aligns to the construct of performance accomplishments in self-efficacy.

Research Question 2

The themes that derived for RQ2 were (a) technology related training/professional development, (b) technology support personnel, (c) parent/guardian related technology support, (d) student related technology support, and (e) funding. When it comes to the technology related training/professional development theme, eight out of 10 participants identified that as a support needed. This equivalent support was also shared by teachers in Özdemir's (2017) research. They believed this support could help reduce their barriers to technology integration. Additional studies provided evidence of teachers' technology integration skills improving after attending professional development sessions targeting effective technology integration (see Durff & Carter, 2019; Sibert et al., 2020; Thoma et al., 2017).

Technology support personnel was also identified as a type of support needed theme in my study. Six out of 10 participants would like to receive support with integrating technology from technology support personnel. Multiple participants

expressed by having technology support personnel at their school that they would be able to get their needs met faster. This is like DeCoito and Richardson (2018) shared about the importance of teachers getting readily available support early when they are integrating technology. Kindergarten teachers in St. Hilaire & Gallagher's (2020) study attended 17 coaching sessions with a technology coach. By the end of the last session, teachers reported an increase in technology integration within their literacy instruction.

Technology related training/professional development and technology support personnel were the highest indicated types of support needed by participants. In a study conducted by Eyles (2018), participants indicated a high need for similar types of support. Out of 280 participants, 57% indicated they needed professional development, 52% indicated they needed support to setup technology, and 46% indicated they needed support when using technology in the classroom. In relation to the conceptual framework, these themes align with the verbal persuasion construct of self-efficacy. The kindergarten through second-grade educators in my study believed these supports would help them effectively integrate technology. Similar results were found in studies conducted by Eyles (2018), Oskay (2017), and Raphael and Mtebe (2017) when educators' self-efficacy toward integrating technology in the classroom increased after receiving support.

To answer RQ2, I took the same approach as Özdemir (2017) by asking participants about the support needed to effectively integrate technology. Unlike Özdemir, there were major differences in the types of support needed by participants and the barriers they experienced. For instance, seven out of 10 participants shared student related barriers, but only two out of 10 participants expressed needing student related

technology support to effectively integrate technology. On the other hand, two out of 10 participants shared training/professional development related barriers, but eight out of 10 participants would like to have technology related training/professional development. There was one instance where the barrier and type of support needed aligned, and that was for funding.

Furthermore, when comparing my study's themes related to the types of support needed with previous studies, I noticed there were some themes I could not compare. Current research findings focused on technology related training/professional development and technology support personnel, as opposed to parent/guardian related technology support, student related technology support, and funding. Also, there were no findings in previous research related to the discrepant case of no support needed. My study added new insight on the types of support needed by kindergarten through second-grade teachers to effectively integrate technology.

Limitations of the Study

For my generic qualitative study, I experienced some limitations. One limitation was the low number of participants. Initially, I sought between eight to 14 participants like in similar studies, but I stopped recruiting when I reached data saturation at the 10th participant. The low number of participants makes transferability to other kindergarten through second-grade teachers unlikely. The second limitation I experienced for my study was the location. I only recruited kindergarten through second-grade teachers who taught in schools with access to technology they could integrate into instruction located in southeastern United States. Another limitation was limited research in the field for

kindergarten through second-grade teachers that focused on the barriers to technology integration and the support needed to effectively integrate technology. When comparing my findings to previous research, most of the barrier related findings I compared my barrier related findings to focused on teacher subgroups, for example, secondary teachers, specific subject-matter teachers, and so forth. In addition, some of the types of support needed by kindergarten through second-grade teachers to effectively integrate technology did not exist in previous research.

Serving as the sole data collector who has experience in the field I conducted my study in was the fourth limitation. Since I used to work in an instructional technology role and as first grade teacher, I employed multiple strategies to address any biases that could influence the outcome of the study. To help remain unbiased during interviews, I followed the interview protocol (see Appendix A) while taking detailed notes and descriptions of the responses. I also remained neutral and spoke in a positive tone when interacting with interview participants (see Creswell, 2012). Member checks were used to increase the accuracy of the interview transcripts. Participants reviewed their interview transcripts, and confirmed the accuracy of their transcript. If needed, participants had the opportunity to recommend ways to strengthen the accuracy of their transcript. Nine out of 10 participants were satisfied with their transcripts the way they were initially. Only one participant made recommendations to strengthen the accuracy of her transcript. In addition, I used the peer review method to have one of my colleagues review my notes, interview transcripts, and data analysis to support validation of my data. The peer reviewer provided feedback telling me my findings were logical and grounded in data,

and my interpretations were reasonable. For my last strategy, I went through reflexivity. I typed my reflections in a password protected online journal daily throughout my data collection and analysis process to reduce biases.

Recommendations

Additional research is needed to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology at the school or district level. My study was limited to southeastern United States. The information from my study provided insight into kindergarten through second-grade teachers' perception on the barriers for integrating technology into instruction and the support they need to effectively integrate technology, but it was not transferrable to the general population. If this study is conducted at a school or district level, leaders could use this information to potentially reduce the barriers experienced by kindergarten through second-grade teachers. Also, they could provide teachers with targeted support to help them effectively integrate technology.

Implications

The findings from my study revealed several barriers to technology integration perceived by teachers of kindergarten through second-grade students and the support needed to effectively integrate technology. Potential implications for a positive social change include reducing the barriers to integrating technology for kindergarten through second-grade teachers, which could strengthen technology integration in their instruction as they support students with gaining skills needed in their future careers. School and

district leaders could consider the findings from my study to provide support and resources that will assist kindergarten through second-grade teachers with integrating technology into instruction. Based on the findings in my study, several kindergarten through second-grade teachers expressed the need for technology related training/professional development. As recommended by Hannaway and Steyn (2017), teachers should receive training to increase their technological skills and pedagogical skills. They also suggested teachers should not only attend sessions to learn how to use technology, but they should also attend sessions where they learn strategies to effectively integrate technology in their curriculum. Consistent with their recommendation, I also recommend kindergarten through second-grade teachers receive technology related training/professional development. Another recommendation would be for school and district leaders to consider having technology support personnel available at schools. This recommendation embraces the verbal persuasion construct of Bandura's (1977) self-efficacy theory where individuals' views are influenced by others who provide them with feedback and encouragement Technology support personnel was another type of support that multiple kindergarten through second-grade teachers expressed they needed to effectively integrate technology.

Conclusion

During my study, I explored the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. There was an overall problem in southeastern United States where there was little to no technology integration in

classrooms (e.g., Bibb County School District, 2018; Broward County Public Schools, 2016; Candler County School System, 2017; Chattahoochee County Schools, 2017; Charleston County School District, n.d.; Decatur County School System, 2017; Edgefield County School District, 2017; Forsyth County School System, 2017; Kershaw County School District, 2019; McDuffie County Schools, 2017; Oconee County Schools, 2018; Polk School District, 2018; Pulaski County Schools, 2019; Wayne County Public Schools, 2019; Whitfield County School System, 2018). Several researchers explored the barriers to technology integration experienced by teachers, but they did not focus on kindergarten through second-grade teachers (see Alenezi, 2017; Francom, 2020; Özdemir, 2017; Pribeanu, et al., 2020; Villalba, et al., 2017). However, research was available to support the benefits of technology integration in kindergarten through second-grade classrooms (see Puspitasari and Subiyanto, 2017; Ronimus et al., 2019; Shanley et al., 2020; Woloshyn et al., 2017). My study was needed to address the gap in practice by exploring the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology.

For my study, I used a generic qualitative inquiry approach where I interviewed 10 kindergarten through second-grade teachers. All participants were located in southeastern United States, and they had access to technology they could integrate into their instruction. Throughout the interview, teachers elaborated on their perceptions about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. After analyzing the data, I found several themes for the

barriers to technology integration and the support they need to effectively integrate technology. Since Ertmer (1999) claimed external barriers are first-order barriers, and internal barriers are second-order barriers, I grouped the themes for RQ1 by first-order barriers to technology integration and second-order barriers to technology integration. The first-order barriers to technology integration themes were (a) student related barriers, (b) parent/guardian related barriers, (c) connectivity related barriers, (d) access to technology related barriers, (e) funding related barriers, and (f) training/professional development related barriers. The second-order barriers to technology integration themes were (a) teachers' knowledge related barriers and (b) teachers' beliefs related barriers. The student related barriers to technology theme appeared the most in the findings. The types of support needed themes were used to answer RQ2. Those themes were (a) technology related training/professional development, (b) technology support personnel, (c) parent/guardian related technology support, (d) student related technology support, and (e) funding. The technology related training/professional development and technology support personnel themes appeared the most in the data.

The findings from my study shed light on the barriers to technology integration perceived by teachers of kindergarten through second-grade students and the support needed to effectively integrate technology. The types of support needed expressed by kindergarten through second-grade teachers should be considered by school and district leaders. These types of support could be used to reduce the barriers experienced by kindergarten through second-grade teachers when integrating technology into instruction.

In summary, kindergarten through second-grade teachers could integrate technology more effectively if they did not experience barriers to technology integration.

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Appendix A: Interview Protocol

Date: _____ Time: _____

Interviewer: Interviewee: Participant ___

Position of Interviewee: _____

Opening Remarks:

Hello. I am doctoral student at Walden University. I currently work for an educational company, and I previously worked for a K-12 school district in an instructional technology role and as a first-grade teacher. Thank you for agreeing to meet with me today. I have received your consent, and I appreciate your willingness to participate in the study. The interview will be for an hour. At any time during the study, you can revoke your participation. As shared in the consent form, the purpose of this qualitative study is to explore the perceptions of teachers of kindergarten through second-grade students about the barriers for integrating technology into instruction and the support needed to effectively integrate technology. Information from this interview will be used to gain insight on ways to support kindergarten through second-grade educators when integrating technology into instruction. Your personal information will not be added to any files throughout this study. I will use specific codes to keep your identity confidential. All data collected in this study will be secured in a password protected device within a password protected account. Information will be destroyed after five years. With your permission, I will record the audio of this interview. The audio will be transcribed for you to review. After reviewing the transcript, you can confirm everything

is accurate, or provide suggestions to increase the accuracy of the transcript. Before we get started, do you have any questions?

Do you grant me permission to record this interview?

Turn on recorder. Proceed with interview questions.

Questions:

1. How many years have you been in education? How many years have you taught {insert grade level}? What other grade levels have you worked in *(if applicable)*?
2. What is your highest level of education? What specialization do you have your degree(s) in?
3. What types of technology do you have access to use when integrating into instruction?
4. Please describe how you currently integrate technology into instruction.
5. Please share how your beliefs on integrating technology influence the way you integrate technology into instruction.
6. Please share any barriers you experienced when integrating technology into instruction.
7. Please describe how you would integrate technology into instruction if you did not experience this barrier/these barriers.
8. What support(s) do you perceive needing to effectively integrate technology?
9. What training/professional development opportunities are available to assist you with integrating technology?
10. Which professional development activities have you participated in?

11. What other types of professional development would you like to see your district offer?
12. What resources are available in your school/district to assist you with integrating technology?
13. What other resources would be helpful?
14. Is there anything I haven't asked that you would like to share with me?

Closing Remarks:

This concludes our interview. Thanks again for participating in this study. As shared before, all of your responses will remain confidential. All responses will be labeled with unidentifiable codes. Within 48 hours, you will receive an email debriefing you about the data collecting process. The transcript from the interview will be included for you to review as well. You will have 3 days to confirm the accuracy, or make recommendations to strengthen the accuracy of the transcript. This process should take 1 hour to complete. If you have any questions, please email me.

Appendix B: Types of Technology Accessible in the Classroom

Table B1

Types of Technology Accessible in the Classroom

Participant	Types of Technology Accessible in the Classroom
P1	Chromebooks
	iPads
	Quizziz (https://quizizz.com)
	Seesaw (https://web.seesaw.me)
	i-Ready (https://login.i-ready.com)
	Capit (https://capitlearning.com)
	Dreambox (https://www.dreambox.com)
	Other websites and programs
P2	Tablets
	Internet/websites
	Smartboard
	Projector
	Smart tables
P3	Dell laptop
	Smartboard
	Chromebook
	Doc camera
	Kami software (https://www.kamiapp.com)
	i-Ready (https://login.i-ready.com)
	Smarty Ants (https://play.smartyants.com)
	Kahoot (https://kahoot.com)
	Prodigy (https://www.prodigygame.com)
	PowerPoints (https://www.microsoft.com/en-us/microsoft-365/powerpoint)
	Google Meet (https://meet.google.com)
	Google Slides (https://slides.google.com)
	Screencastify (https://www.screencastify.com)
P4	Chromebooks
	iPads
	Seesaw (https://web.seesaw.me)
	Nearpod (https://nearpod.com)
	Brain Pop Junior (https://jr.brainpop.com)
	Academic text books (Reading, Math, Science and Social Studies)
	Microsoft Teams (https://www.microsoft.com/en-us/microsoft-teams)
	Microsoft Notebook (https://www.microsoft.com/en-us/microsoft-365/onenote)
	Other Microsoft Applications (https://www.office.com)

Participant	Types of Technology Accessible in the Classroom
	Smartboard
	i-Ready (https://login.i-ready.com)
	YouTube (https://www.youtube.com)
P5	Chromebooks
	iPads
	i-Ready (https://login.i-ready.com)
	Reflex (https://www.reflexmath.com)
	Seesaw (https://web.seesaw.me)
	Class Dojo (https://classdojo.com)
	Raz Kids Plus (https://www.raz-plus.com)
	Epic Books (https://www.getepic.com)
	Google Site (https://sites.google.com)
	Google Apps (https://gsuite.google.com)
	Osmo
	Other websites and programs
P6	Flat panel
	PowerPoint (https://www.microsoft.com/en-us/microsoft-365/powerpoint)
	Formative (https://www.formative.com)
	Quizizz (https://quizizz.com)
	Brain Pop (https://www.brainpop.com)
	Other websites and programs
	Laptops
	Academic text books (Reading, Math, Science and Social Studies)
	Nearpod (https://nearpod.com)
	Flocabulary (https://www.flocabulary.com)
	Khan Academy (https://www.khanacademy.org)
	Scholastic News (https://scholasticnews.scholastic.com)
	Raz Kids Plus (https://www.raz-plus.com)
	Lumio (https://legacy.smarttech.com/en/lumio)
	OneDrive (https://onedrive.live.com)
	Docking Station
P7	Laptop
	Chromebooks
	PowerPoints (https://www.microsoft.com/en-us/microsoft-365/powerpoint)
	Games
	Google Classroom (https://classroom.google.com)
	Digital Field Trips
	Videos
	Capit (https://capitlearning.com)
	i-Ready (https://login.i-ready.com)
	Smarty Ants (https://play.smartyants.com)

Participant	Types of Technology Accessible in the Classroom
	Seesaw (https://web.seesaw.me)
P8	Chromebooks
	iPads
	Smart panels
	Digital cameras
	Seesaw (https://web.seesaw.me)
	Smarty Ants (https://play.smartyants.com)
	Dreambox (https://www.dreambox.com)
	Epic (https://www.getepic.com)
	Class Dojo (https://classdojo.com)
	Smartboard
	Google platform (https://gsuite.google.com)
P9	Chromebooks
	Elmos
	Smartboards
	Laptop
	Osmos
	iPads
	Websites
	Lexia (https://www.lexialearning.com)
	i-Ready (https://login.i-ready.com)
	Other applications
	ABC Mouse (https://www.abcmouse.com)
P10	Desktop
	Laptop
	Chromebooks
	Smartboard
	Videos
	Other applications and programs

Note 1. This table contains the types of technology accessible in participants' classrooms.