RURAL TENNESSEE ELEMENTARY SCHOOL TEACHERS’ EXPERIENCES IN IMPLEMENTING BRING YOUR OWN TECHNOLOGY

by

Lori Ann Riley

Liberty University

A Dissertation Presented in Partial Fulfillment Of the Requirements for the Degree Doctor of Education

Liberty University

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ABSTRACT

Many rural elementary school students and teachers have experienced challenges related to Bring Your Own Technology (BYOT) into the classroom. The purpose of this qualitative case study was to understand how teachers at a rural elementary school in the Southeastern United States implemented BYOT within an educational setting. Twelve elementary school teachers participated in the study focused on four research questions: (a) How do rural elementary school teachers implement BYOT? (b) How do the teachers describe their preparation for teaching in a classroom where BYOT has been implemented? (c) How do teachers describe their own transitions from a traditional classroom to a classroom where BYOT has been implemented? (d) How do teachers share BYOT ideas among colleagues? This study utilized the theoretical framework of Rogers’ diffusion of innovations theory and Bandura’s social cognitive theory. Purposeful sampling was used to identify rural elementary school teachers who have taught for at least five years in a traditional classroom. Data was collected using interviews from 12 teachers with at least three years of BYOT experience and at least five years of traditional classroom experience. Twelve participants were also observed and participated in two focus groups. Individual interviews and the two focus group interviews were audio-recorded and transcribed, and coded. Data analysis consisted of within-case analysis and descriptive coding, organizing, and synthesizing of emerging themes using NVivo software. Trustworthiness was addressed through triangulation and member checks.

*Keywords:* BYOT, diffusion of innovations theory, social cognitive theory, digital technologies
Dedication

I dedicate my dissertation to my husband, Jason, who has always believed in my ability to do anything I put my mind to and my sons, Colin and Harper, who I hope believe that they, too, can fulfill all of their dreams. Each of you have been a constant source of encouragement for me. I am so thankful for all three of you!
Acknowledgments

Thank you to Dr. Billie Jean Holubz for serving as the chair of my dissertation committee and encouraging me to push forward throughout this process, to Dr. Constance Pearson for meticulously checking my manuscript, and to Dr. Vicki Roberts for never letting me give up. Praise be to God for giving me the strength to finish. “For from him and through him and for him are all things. To him be the glory forever! Amen” (Romans, 11:36).
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List of Abbreviations

Bring Your Own Device (BYOD)
Bring Your Own Technology (BYOT)
Diffusion of Innovation (DOI)
English Language Learners (ELL)
Information Communication Technology (ICT)
Institutional Review Board (IRB)
International Society for Technology in Education (ISTE)
Professional Learning Community (PLC)
Social Cognitive Theory (SCT)
Technology Professional Development (TPD)
CHAPTER ONE: INTRODUCTION

Overview

Technology is a requirement in the modern classroom (Hajhashemi, Caltabiano, & Anderson, 2016). To prepare to enter a global marketplace, students must possess technology skills (O’Neal, Gibson, & Cotten, 2017; Swallows, 2017). Schools are not required to purchase a certain amount of technology; however, many schools decide to purchase technology to prepare students to work in a global society (Maher & Twining, 2017; Shute & Rahimi, 2017; Swallows, 2017). For many schools in rural areas, the practice of purchasing technology is not affordable (Maher & Twining, 2017). Bring Your Own Technology (BYOT) programs allow students to utilize technology using their own devices (Cheng, Guan, & Chau, 2016). I examined the experiences of 12 teachers at a rural elementary school in the Southeastern United States as BYOT was implemented in their own classrooms. I took a qualitative approach with a single case study design to understand how rural elementary teachers implement BYOT into their classrooms. Using Rogers’ (2003) diffusion of innovation (DOI) theory and Bandura’s (2001) social cognitive theory as a framework, the purpose of this qualitative case study was to understand how teachers at a rural elementary school in the Southeastern United States implement BYOT within an educational setting.

In Chapter One, I addressed the background of BYOT through a historical, social, and theoretical lens. This section will describe information about the origin of BYOT, the advances of technology in education, and the social impact of BYOT in the classroom. My connection to the study was presented along with the problem and purpose statements, which include the societal pressure on schools and teachers to prepare students for a digital society, and the impact technology may have in an elementary classroom. I discussed the significance of the study by
highlighting the possible benefits of the study including creating learning environments that prepare students for a global workforce. The next section of chapter one will present the research questions accompanied by supporting literature. Finally, defined key terms applicable to the study and then summarize the chapter.

**Background**

Many teachers are not confident implementing technology into their classrooms (Dogan & Akbarov, 2016). To gain confidence implementing technology, teachers need support from school leaders and technology training (Maher & Twining, 2017). Even with administrative support and technology training, teachers are hesitant to implement technology due to the challenges technology implementation presents to educators who are familiar with a traditional classroom environment (Cho, 2016). Teachers are the key to a successful transition from a traditional classroom to a digital classroom (O’Neal et al., 2017). Technology implementation changes how teachers teach and how students learn (Hajhashemi et al., 2016). Schools have constantly tried to maintain newer technology while abiding by strict rules regarding the use of personal technology inside the classroom. All the while, the cost of funding school technology continues to grow. School budgets are limited leaving little funding to purchase technology; therefore, schools are beginning to adjust their guidelines on personal technology by allowing students to bring their own technology into the classroom (Kotok & Kryst, 2017).

**Historical**

Advances in technology have changed the way teachers present content and the ways in which students learn (Al-Qirim, 2016; Cheng et al., 2016). Some educational tools like the desktop sandbox during the 1800s were introduced; however, teachers remained focused on students using memorization techniques and paper and pencil to learn (Russell, 2006).
Textbooks became the preferred teaching tool during the 20th century and this trend has slowly transitioned to using technology as a tool for teaching (Meehan & Salmun, 2016; Pahomov, 2014). During the 2000s, computers began to be placed in classrooms which gave way to computer labs. Gradually, many school systems purchased computers for students to incorporate in their learning. Utilizing technology to complete academic work has transitioned into using technology to learn (Cheng et al., 2016). The use of technology in the classroom gave way to a shift in teaching. With the increase in classroom size teachers have begun to change their teaching practice. The use of technology in the classroom has provided many teachers and students a way to communicate and learn more efficiently (Meehan & Salmun, 2016). Slowly, teachers have begun to become facilitators of learning with the incorporation of technology (Martinez & McGrath, 2014). Incorporating technology into the classroom has assisted many teachers in creating learning experiences that allow students the opportunity to engage in complex tasks with less teacher driven instruction as teachers have assumed the role of facilitator (Best, MacGregor, & Price, 2017).

Even though the interest in utilizing technology, was lacking at first, the use of technology has slowly grown in popularity (Camilleri & Camilleri, 2017; Mupinga, 2017; Song & Wen, 2018). Many school districts now mandate the use of technology in the classroom (Hajhashemi et al., 2016). Technology, such as portable devices, has grown to enormous popularity and usage (Cheng et al., 2016). Because of the rapidly evolving nature of modern technology and cost, most schools have trouble maintaining the newest devices. With the increasing cost of technology, school districts have transitioned to allowing student-owned technological devices into the classrooms to relieve some of the cost burden taken on by the school (Harper & Milman, 2016). Teachers provide opportunities for students to use technology,
but students make the choice to use the technology for learning (Parsons & Adhikari, 2016). Teachers are changing the way students are learning the curriculum by implementing technology. Best practices for technology implementation affects student learning (Chan, Borja, Welch, & Batiuk, 2016).

First known as bring your own device (BYOD), the concept of BYOT has grown dramatically (Cheng et al., 2016). BYOT first began in the corporate world to improve employee output as well as eliminate some of the costs that are incurred by purchasing technology for workers. In 2009, the Intel Company allowed their workers to utilize personal devices to increase productivity and the idea has continued to grow and eventually merged into education. BYOT is focused on students providing their own technology to facilitate learning. Student learning has changed with the introduction of BYOT into the educational system.

**Social**

The use of technology in the classroom has been mentioned in research studies (Kayalar, 2016; Sen & Ay, 2017; Song & Wen, 2018). However, most studies on the use of technology in the classroom have been completed in the middle school and high school settings (Alsaeed, 2017; Sen & Ay, 2017; Song & Wen, 2018). There is not a lot of research available on the implementation of technology at the elementary school level (Song, Sun, & Jong, 2016; Song & Wen, 2018). According to research, the importance of technology in the classroom continues to rise as many students need to be able to work in a global society (Carver, 2016; O’Neal et al., 2017).

Current students do not remember a time when the Internet and technology were unavailable to gain information (Moon, 2018; Scherer, Siddiq, & Tondeur, 2019). Technology continues to change and grow (Al-Qirim, 2016). Most students are competent with using
technology daily; however, despite the students’ familiarity with technology, some teachers continue to forgo using technology in their classrooms (Scherer et al., 2019). Many business executives question the technological preparedness of students to work in a society that is driven by technology (King, Marshall, & Zaharchuk, 2017). Students must be prepared to collaborate with colleagues digitally upon entering the workplace. However, some students lack the skills needed to open an email while others can build a website. Schools have a responsibility to build a curriculum that allows students to become digitally literate and be equally prepared to enter the workforce (Colbert, Yee, & George, 2016).

A digital gap exists between students and the workplace (King et al., 2017). A digital gap is defined as “[the] gap between individuals, households, businesses and geographic areas at different socio-economic levels regarding both of their opportunities to access Information Communication Technologies (ICTs) and to their use of the Internet for a wide variety of activities” (OECD, 2001, p. 5). One way to bridge this gap is by allowing students to utilize technology in the educational setting (Moon, 2018). While the cost of funding technology in the educational setting can be daunting, BYOT implementation provides a way to build digital skills in students while saving the school system money (Maher & Twining, 2017; Wasko, 2016). BYOT may be one way to satisfy the societal concerns of preparing students for a digital workplace and technological jobs that may not currently exist.

Society demands that teachers provide 21st century skills so that students are prepared to work in a global society (DiBenedetto & Myers, 2016). Without improving technological skills, students may not be prepared to work in society where innovation is constantly changing (Moreno, Tharp, Vogt, Newell, & Burnett, 2016). Students may continue to fall behind with their technological and innovative abilities if teachers do not change the way they prepare their
students for the workplace (Willis, Lynch, Fradale, & Yeigh, 2019). BYOT is one method that may provide an innovative way for teachers to prepare students to work in a digital society (Moon, 2018).

**Theoretical**

Technology implementation, including BYOT in classrooms is something that has been studied (Karam, et al., 2017; Lewin, Vinson, Stetzer, & Smith, 2016). Regarding technology implementation, teachers’ preparedness and access to resources for teaching in an elementary school classroom where technology has been implemented may vary (Maher & Twining, 2017; Marchionini & Teague, 1987; McLean, 2016; Song et al., 2016). The theoretical rationale for BYOT is that students and teachers learn how to use an innovation through modeling, thus placing the focus on how teachers implement BYOT in the classroom to assist students in gaining the technological skills needed to work in a digital society. Teachers may generate and distribute cooperative ideas among colleagues through modeling. Modeling behavior follows Bandura’s (1991) social cognitive theory. Teachers may also utilize the adoption processes included in Rogers’ (2003) diffusion of innovations theory or Bandura’s (1991) social cognitive theory when they transition from a traditional classroom to a classroom where BYOT has been implemented. Bandura’s (2001) social cognitive learning theory and Rogers’ (2003) DOI theory demonstrated that implementation of an innovation may occur when the learner is engaged in the action of learning. BYOT centers on social cognitive theory, which emphasizes that humans learn by observing and modeling after those around them (Devi, Khandelwal, & Das, 2017; Huh & Reigeluth, 2017). Bandura (1977) indicated that “fortunately, most human behavior is learned observationally through modeling: from observing others one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for
Rogers’ DOI theory (2003) contends that individuals learn about innovations by learning from others who are using the innovation. This theory relates to the implementation of any type of new technology or method used in a new way and how individuals decide to use the innovation through the act of modeling.

**Situation to Self**

I use technology in both my personal life and professional career. For me, the benefits of using a personal technological device for a variety of daily tasks including staying organized and remaining aware of my scheduled meetings and events are many. My personal technological devices provide me with the tools and availability to resources that assist me in both my personal and professional life. I try to never travel far without a smartphone as the device allows me to remotely access the information and resources that I need to travel safely. As a college student, I utilized technology daily as the technology assisted me in successfully completing my courses. The use of technology for learning has had a lasting impression on me.

I utilized technology daily in my own classroom. My students seemed to remain engaged in their learning when I implemented technology into a lesson. The students would often ask to utilize technology at the middle school level. I am familiar with the use of BYOT at the middle school level; however, I would like to know how elementary school teachers experience BYOT inside their classrooms. Because I have been a middle school BYOT teacher, I would like to get as close to the phenomenon as possible, while learning about the participants’ lived experiences (Creswell, 2013).

To gain an understanding of teachers’ experiences implementing BYOT in the classrooms, I brought the research paradigm of constructivism to the study to allow for an understanding of how the participants interact in the environment in which they live or work.
(Vygotsky, 1978). I sought to understand my research study through the perspectives of the teacher participants (Patton, 2015). My research was completed from an epistemological assumption because I was conducting my research where the participants work to better understand their perspectives on the implementation of BYOT in the classroom. I also be focused on the direct quotes from each participant (Creswell, 2013). I researched from an ontological assumption because I believed that the participants each had their own perspective on the implementation of BYOT in the classroom (Creswell, 2013). The individuals in this study are elementary school teachers from rural Southeastern United States and their experiences will shape the study. As a former classroom teacher and current instructional coordinator, I am constantly seeking ways to improve learning for students. I do not hesitate to introduce new teaching methods and technology to classroom teachers and students. The implementation of technology is crucial in preparing students to work in a digital society (Swallows, 2017). My goal is to assist teachers and students with the implementation of technology into the classroom. Researching the experiences of teachers’ implementation of BYOT is an opportunity that will allow me to learn and contribute to the literature on the topic of educational technology.

**Problem Statement**

It is important for schools to prepare students for college and career, as acquisition of technological skills before entering college and the workforce continues to emerge as a societal concern (O’Neal et al., 2017; Shute & Rahimi, 2017; Swallows, 2017). The problem is that students are not prepared with the adequate technological skills needed to be successful in a digital society upon leaving school. The pressure to produce 21st century learners creates a heavy burden on teachers and administrators (DiBenedetto & Myers, 2016; Kotok & Kryst, 2017). Many students are discovering that they lack the necessary technological knowledge and
skills required to be successful in a digital society (Weber, Hillmert, & Rott, 2018).

Differentiated learning creates individualized learning and requires technology implementation (Cheng, et al., 2016). Many teachers struggle with implementing technology consistently into classrooms due to the lack of technology training and personal use (Christensen & Knezek, 2017).

The cost of many mobile devices continues to decline which makes the purchase of such devices common (Tsetsi & Rains, 2017). As a result, many students bring mobile devices to school (Mupinga, 2017). School systems have begun to allow students to utilize their mobile devices during classroom instruction to prepare students for a global marketplace (DiBenedetto & Myers, 2016). Therefore, some teachers are requesting permission from school leaders to use BYOT in their classrooms. Additionally, some school districts are initiating the BYOT programs and requiring teachers to utilize BYOT during instruction (Hajhashemi et al., 2016).

Recognizing how to implement technology in a way that will engage students and promote learning should be a focus for educators (Song et al., 2016). Providing a learning environment that ensures that students are learning and engaged has proven to be difficult for teachers (Farley et al., 2015). Kotok and Kryst (2017) mentioned that teachers who participate in professional development opportunities tend to be more successful than teachers who decide not to participate in professional development focused on implementing BYOT in the classroom.

While current research addresses the growth of implementation of BYOT in middle and high schools (Song et al., 2016; Song & Wen, 2018), few studies delve into the implementation of BYOT in rural elementary schools (McLean, 2016; Pollock & Al-Bataineh, 2018). A gap exists in peer-reviewed literature on rural elementary teachers’ perceptions and experiences implementing BYOT.
Purpose Statement

The purpose of this qualitative single case study was to understand how teachers at a rural elementary school in Southeastern United States implement BYOT within an educational setting. At this stage in the research, BYOT was defined as supplementary technology to use in an educational setting (Lee & Levins, 2012). The two theories guiding this study were the diffusion of innovations theory (Rogers, 2003) and social cognitive theory (Bandura, 2001). Rogers (2003) examined what happened when a new idea was implemented into a social construct. The action of trying new ideas spreads by seeing others implement the innovation. According to Sahin (2006) Rogers diffusion of innovations theory is the best to use when examining technology use in an educational setting because the theory focuses on instructional technology. Bandura (1977) discussed how social cognitive theory is used to examine how people learn by watching others or through modeling.

Significance of the Study

A shift in the way students are assessed in addition to the burden of purchasing technology are behind the push to implement BYOT into classrooms (Parsons & Adhikari, 2016; Swallows, 2017). Some rural schools have made the choice to utilize BYOT to meet the demands created by the change. BYOT could assist teachers in creating a learning environment where students are building the skills needed to work in a digital society. Technology is constantly changing; therefore, schools are always adjusting their plans for creating a digital learning environment (Swallows, 2017). Studies show that educators are interested in the benefits of technology in the classroom and are concerned with how to best implement the technology properly (Christensen & Knezek, 2017; Song et al., 2016). Researchers support the ideas that technology is changing the way students are learning in the classroom (Hajhashemi et
Although researchers have focused on secondary schools implementing BYOT, a gap exists on the research related to implementation of BYOT in rural elementary school classrooms (Cheng et al., 2016; Cho, 2016). Stakeholders in BYOT implementation may possibly utilize the results of this study in future decisions concerning BYOT policies and programs in their own schools. Ideally, this study may add to the current literature on BYOT implementation in an elementary school setting by addressing the challenges and benefits of implementing BYOT.

This study may add to the literature about rural elementary school teachers’ perceptions on implementing BYOT into the classroom, and how best to motivate reluctant teachers to use BYOT. This study may assist educators by providing new teaching strategies, as well as how to avoid negative results from implementing BYOT. Students may benefit from this study as their teachers may be willing to allow technological devices inside the classroom based on this studies’ results. In addition, this research may add to the diffusion of innovation theory (Bandura, 1977) and social cognitive theory (Rogers, 2003) focusing on the spread of teacher implementation of BYOT.

**Empirical Significance**

This study may contribute to the literature on BYOT implementation in elementary schools by filling some of the gaps in the literature (McLean, 2016; Pollock & Al-Bataineh, 2018). When studying technology implementation, research has focused on middle, high, and secondary school settings (Karam et al., 2017; Lewin, et al., 2016), but there is a lack of research available about the elementary school setting (Song et al., 2016; Song & Wen, 2018). Because of the gap in research there is a possible lack of technology implementation across elementary school classrooms (McLean, 2016; Pollock & Al-Bataineh, 2018). According to Haber-Curran
and Tillapaugh (2015), elementary school teachers’ experiences of technology implementation needs to be explored.

This study may be significant to researchers and to rural elementary school teachers. Other research articles mentioned that further research needs to be conducted on the implementation of BYOT at the elementary school level (Falloon, 2015; McLean, 2016). Researchers mentioned the importance of teachers implementing BYOT into the classroom (Davison & Lazaros, 2015; Song et al., 2016). This study may advise educators in learning best practices for the implementation of BYOT at the elementary school level and identifying professional development that builds best practice knowledge in educators who implement BYOT may create impactful research for teachers. Pipkin (2015) suggested that teachers need continuous training focused on teaching strategies and personalized learning that will assist with student achievement. Finally, the pressure on elementary teachers to prepare students to work in a digital society and to build 21st century skills in their students is a growing issue nationwide (Kayalar, 2016; Swallows, 2017).

**Theoretical Significance**

Hilton (2015) studied the implementation of technology in two middle school classrooms by examining implementation using substitutions and augmentation (SAMR) and technological pedagogical content knowledge (TPACK) lenses. The SAMR model allows educators the opportunity to challenge students learning abilities while utilizing technology. Other researchers have opted to explore the implementation of technology by utilizing the technology-acceptance model (TAM) (Van Horne, Russell, & Schuh, 2016). The TAM is often used to determine the perceptions of individuals when they use all types of technology including BYOT. Er and Kim (2017) studied teachers’ use of technology using episode-centered belief change (ECBC) model.
Their study focused on the ability to change teachers’ negative beliefs regarding technology into more positive beliefs. Al-Qirim (2016) used Rogers’ diffusion of innovations theory to study the implementation of technology in university teaching; however, the researcher also explored the use of the theory of planned behavior (TPB), the theory of reasoned action and the TAM before deciding to use DOI. Al-Qirim discussed how DOI theory was the best theory to use when exploring process of implementing technology into classrooms because DOI focuses on the process of accepting innovations.

Theoretically, this study may add to Rogers’ (2003) diffusion of innovations theory in education and to Bandura’s (2001) social cognitive theory. These two theories were constructed on the idea that individuals model successful behaviors after one another. If educators are successful in implementing BYOT, other educators may be interested in implementing BYOT inside their own classrooms. Using Rogers’ diffusion of innovations theory (2003) and Bandura’s (2001) social cognitive theory, this study may provide an understanding of the elementary school teachers’ perceptions of BYOT. The information gleaned from this study may add to the existing literature regarding these theories.

**Practical Significance**

This study may add to the practical understanding of how to implement BYOT into the elementary school classroom. When educators decide to take on a new idea in the classroom, it can be overwhelming (Noonoo, 2016). Identifying the simplest, most effective way to successfully implement an innovation in the classroom could be considered valuable to a teacher. Providing elementary school teachers with practical advice for BYOT implementation will simplify the process for them. School leaders have a huge decision to make about allowing students to use their own technology in the classroom (Mupinga, 2017). This is a difficult
situation because technology is constantly changing. In many schools, policies prevent students from bringing their own technology into the classroom. For BYOT to be effective, research about BYOT implementation is essential for policy makers, school leaders, parents, and teachers (McLean, 2016).

As stakeholders consider the technological needs of their students, saving money by allowing students to bring their own technology as a learning resource may become appealing in geographical areas that struggle financially (Parsons & Adhikari, 2016). Teachers who utilize BYOT may provide enough information to create changes in BYOT implementation in schools that have prohibited it previously (Song & Kong, 2017). The results from this study may provide additional information for schools to incorporate BYOT teaching practices, as well as policies for students to follow.

**Research Questions**

The purpose of this qualitative case study was to understand how teachers at a rural elementary school in Southeastern United States implement BYOT within an educational setting. There are four research questions that guided this study. The research questions were grounded in the theoretical frameworks of Rogers’ (2003) diffusion of innovations theory in education and Bandura’s (2001) social cognitive theory. I used my central research question to seek to understand teachers’ experiences while the following questions provided additional information about the teachers’ lived experiences. I used the following research questions to guide this study of teachers’ experiences of BYOT in the elementary school classroom:

**Central Research Question:** How do rural elementary school teachers in the Southeastern United States implement BYOT within their classrooms?
The central research question guided this study while the rural elementary school teachers described their experiences implementing BYOT into their classrooms. This central question is open-ended and is designed to reveal the experiences of the educators through rich details of their implementation of BYOT in their classrooms (Patton, 2002). Through interviews, direct observations, and two focus groups, a better understanding of teachers’ experiences was gained (Yin, 2014). Because of strained budget of many school systems, educators are turning to the implementation of BYOT (Parsons & Adhikari, 2016). Even educators that are unsure of how to implement successfully are turning to student technology for assistance in the classroom (Cheng et al., 2016). The teachers’ experiences of helpfulness with the implementation of BYOT in the classroom may impact implementation of student devices in the classroom.

**Sub-question 1:** How do elementary school teachers perceive their preparedness for teaching in a classroom where BYOT has been implemented?

Educators are looking for ways to engage their students with technology to learn new concepts (Al-Qirim, 2016). Because of this, classrooms where BYOT have been implemented are becoming common (Mupinga, 2017). The perceived preparation and professional development for educators who implement BYOT may impact the implementation of BYOT into the classroom (Kotok & Kryst, 2017). Many teachers find the concept of implementing technology into their lesson plans overwhelming. Teachers feel defeated without the knowledge required to operate the technology even before technology implementation begins. Technology training could possibly decrease teachers’ resistance to implementing technology (Cheng et al., 2016). Training could boost teachers’ confidence and create an environment in which they might be apt to implement BYOT into their classrooms (Elstad & Christophersen, 2017).
**Sub-question 2:** How do elementary school teachers describe their own transitions from a traditional classroom to a classroom where BYOT has been implemented?

Educators make the decision to implement students’ devices into their classrooms. The process of implementing new teaching practices into a classroom may come with difficulties (Herold, 2015). The perceived challenges of implementing BYOT in the classroom may impact the implementation of BYOT (Carver, 2016). BYOT implementation also requires that teachers change the way that they view technology. Green and Hayes (2015), stated that a change in teachers’ attitudes toward the transition to implementing technology has a large impact on the success of implementation. Students will follow the example of the teacher, whether it be positive or negative (Kayalar, 2016).

**Sub-question 3:** How do elementary school teachers generate and distribute cooperative ideas among colleagues about BYOT?

Educators share ideas hoping to improve their own teaching practices. Collaborating and sharing ideas guide individuals during new experiences (Bandura, 2001; Rogers, 2003). Owen (2015) mentioned that teacher collaboration is essential to improve student learning. Technology is part of the improvement in student learning through teacher collaboration (Moon, 2018). Research has demonstrated that technology can improve collaboration between teachers and their students (Pierce & Cleary, 2016).

**Definitions**

1. *Bring Your Own Device (BYOD)* - Students utilize their own technological devices in the classroom (Norris & Soloway, 2011).

2. *Bring Your Own Technology (BYOT)* – An educational development and a supplementary school technology resourcing model where the home and the school collaborate in
arranging for the youths’ 24/7/365 use of their own digital technology/ies to be extended into the classroom to assist their teaching and learning and the organization of their schooling and where relevant the complementary education outside the classroom (Lee & Levins, 2012, p.11).

3. **Diffusion of Innovation** - “Innovation is communicated over time among members of a social system” (Rogers, 2003, p.12).

4. **Digital Technologies** - Electronic devices including laptops, tablets, cell phones, iPods, and smartphones (Cavanagh, 2015).

**Summary**

Chapter One overviews the implementation of BYOT in a rural elementary school in the Southeastern United States. The study was a qualitative single case study conducted to understand the implementation of BYOT in rural elementary school classrooms. The purpose of this qualitative case study was to understand how teachers at a rural elementary school in Southeastern United States implement BYOT within an educational setting. Four research questions will shape the study. Rogers’ (2003) diffusion of innovations theory and Bandura’s (2001) social cognitive theory will make up the theoretical framework of the study. The impact of this study may assist educators in successfully implementing BYOT into their classrooms. Because research shows that teachers are essential to the successful implementation of technology (Ruggiero & Mong, 2015), the experiences of these teachers were needed to understand how best to implement BYOT programs.
CHAPTER TWO: LITERATURE REVIEW

Overview

The purpose of this qualitative case study was to understand how teachers at a rural elementary school in the Southeastern United States implement BYOT within an educational setting. Researchers have primarily focused on technological implementation in college, high school, and middle school (Alsaeed, 2017; Karam et al., 2017; Karchmer-Klein, Mouza, Shinas, & Park, 2017; Sen & Ay, 2017), but there is a lack of research available about the elementary school setting (Davison & Lazaros, 2015; Song et al., 2016). The gap in the research lends itself to the possibility that there is a lack of technology implementation in elementary school classrooms (McLean, 2016; Pollock & Al-Bataineh, 2018). It is vital to explore the challenges and successes that elementary school teachers face as they implement technology (Haber-Curran & Tillapaugh, 2015).

In this chapter, I analyzed the literature surrounding the implementation of technology and BYOT. BYOT research and other educational technology research was gathered from peer reviewed articles and scholarly journals. Within this chapter, I offered the foundation of the theoretical framework that guided the study. The review of literature will examine growth of technology as it relates to Bandura’s social cognitive theory (1991) and Rogers (2003) diffusion of innovations theory. In addition, the review of literature begins with a discussion of the skills needed to be college and career ready and will expand to how technology in the classroom is both embraced and resisted by educators. Finally, by synthesizing the research and utilizing the theoretical framework, I focused on the research about teachers’ uses of technology implementation in the classroom.
**Theoretical Framework**

I used two main theories to provide the framework for this study. Both theories focused on why teachers may be reluctant to implement technology in an educational setting. I also used the theories to assist in understanding possible barriers to technology implementation. Rogers’ (2003) diffusions of innovations theory is defined as “the process by which an innovation is communicated through certain channels over time among members of a social system” (p. 5). Rogers examined how ideas are shared through diverse groups of people. Diffusion of innovations theory examined what happens when a new idea is implemented into a social construct.

The second theory, Bandura’s (1977) social cognitive theory, emphasized that humans learn by observing those around them. Bandura indicated, “Most human behavior is learned observationally through modeling: from observing others, one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action” (p. 1). The diffusions of innovations theory (Rogers, 2003) and the social cognitive theory (Bandura, 1977) both provided the lens through which I viewed this study.

**Diffusion of Innovation**

I utilized Rogers’ (2003) DOI theory to understand how and why rural elementary school teachers implement BYOT into their classrooms. DOI theory focused on the implementation of any type of new technology or method used in a new way. Sahin (2006) indicated that implementation of the innovation takes time, “the degree to which an innovation is changed or modified by a user in the process of its adoption and implementation” (p. 14). Rogers (1995) contended that learners adopted innovations by three ways: personal research, interaction with other individuals, and change agents.
**Adoption rate.** Adoption rate measures the time that it takes for an innovation to be adopted (Rogers, 1995; Sahin, 2006). According to Rogers (1995), the rate of adoption may improve if the innovation is believed to surpass previous innovations. Five features are vital for adoption of an innovation: relative advantage, compatibility, complexity, trialability, and observability (Rogers, 1995; Sahin, 2006). Rogers (1995) showed that innovations adoption rates vary. Sahin (2006) indicated that the rate of adoption may be improved if the innovation is considered useful. By utilizing DOI theory I was able to determine the adoption of the innovation (BYOT) implementation within the rural elementary school educational setting.

**Adopter categories.** Rogers (1995) stated that there are five adopter categories: (a) Innovators, (b) early adopters, (c) early majority, (d) late majority, and (e) laggards. Rural elementary school teachers that have implemented BYOT into their classrooms may be represented in each of the adopter categories. The innovators consist of 2.5% of the population, and are likely to utilize technology. The early adopters consist of 13.5% of the population are the leaders. Individuals who learn how to use the technology, are likely to convince others of the innovations usefulness. The early majority, consist of 34% of the population; this group of individuals desire to watch and see how others adjust to the innovation before trying it out for themselves; however, they also want to try the innovation for themselves while not being the last people to do so. The late majority group consist of 34% of the population and are most often the individuals that question an innovation. The final group, the laggards, consist of 16% of the population and are extremely hesitant in adopting an innovation (Rogers, 1962).

**Adoption process.** Rogers’ (1995) diffusion of innovation (DOI) theory described adoption of innovations over time. The adoption of BYOT in schools took place over a long period of time (Parsons & Adhikari, 2016). The four focuses of this theory are (an) innovation,
(b) communication channels, (c) time, and (d) social system (Sahin, 2006). The process of adopting innovations has five steps that are accomplished in a certain order: (a) knowledge, (b) persuasion, (c) decision, (d) implementation, and (e) confirmation (Rogers, 1995). The first step is questioning using how and why questions about the innovation. Next is the persuasion stage, which is focused on the individual’s positive or negative attitudes about the innovation. Then, the decision stage is a pivotal time when the individual must decide whether to adopt or reject the innovation (Sahin, 2006). After that, the implementation of the innovation stage measures the “the degree to which an innovation is changed or modified by a user in the process of its adoption and implementation” (p. 14). Finally, the confirmation stage focused on the individual searching for support and approval of the adoption of the innovation. The advantages that the innovation will have is an important component for adoption approval (Mkhize, Mtsweni, & Buthelezi, 2016). This approval may lead into the initiation and implementation stages.

After an individual makes the decision to adopt the innovation, the implementation stage commences (Rogers, 1995). The implementation stage also occurs in stages much like the adoption process. Adoption of innovations may be a long process as it passes through groups of individuals. Rogers contended that an innovation may be refused, and the process of adoption ended at any time. I utilized Rogers’ adoption process to understand how BYOT implementation was adopted by rural elementary school teachers over time.

Rogers (1995) mentioned that integrating innovation takes time as it moves through the social structure in which it is introduced. In recent studies, this theory has been applied to the implementation of BYOT by educators that implement BYOT and attempted to use technology in a new and innovative way (Al-Qirim, 2016; Friedrichsen, Smith, & Koretsky, 2017). This attempt at innovation could change the experience of classroom teachers’ implementation of
technology. New technologies are often the only ideas that are considered innovations (Rogers, 2003). According to Rogers, an innovation is any new idea or item that may be used by someone to change the way an activity was previously completed. I used Rogers’ DOI theory to understand what changes BYOT implementation has had in rural elementary school classroom settings.

In recent studies, Joo, Lim, and Kim (2016) utilized Rogers’ diffusion of innovations theory while exploring the impact technostress had on teachers’ decisions to utilize technology in the classroom, and Kaufman (2015) used diffusion of innovations theory to explore teachers’ implementation of technology in K-12 classrooms to teach students how to work and learn using 21st century tools. Because BYOT could be viewed as an innovation, I used the diffusion of innovations theory to guide this research and I focused on elementary teachers’ perspectives on the implementation of BYOT in the classroom. I used Rogers’ (2003) DOI theory as the framework to understand how teachers at a rural elementary school in Tennessee implement BYOT within their classrooms. The diffusion of innovations theory connects to the implementation of BYOT in the classroom through the teachers’ preparedness and access to technological resources and how the teachers generate and distribute cooperative ideas among their colleagues.

**Social Cognitive Theory**

The second theory that frames my research study is Bandura’s social cognitive theory (1977, 2001). Bandura’s (1977, 2001) social cognitive theory and social learning theories are closely related. Bandura’s social learning theory grew into social cognitive theory. I used both theories to aid in explaining the implementation of BYOT into a classroom. Bandura’s (1977) social learning theory has been described as a way that individuals learn using observation and
modeling. One of the main concepts of social cognitive theory is reciprocal determinism (Bandura, 1989). According to Bandura (1989), “Social cognitive theory favors a model of causation involving triadic reciprocal determinism” (p.2). I utilized Bandura’s social cognitive theory to understand how and why BYOT implementation impacted the rural elementary classroom learning environment.

Bandura’s (1991) social cognitive theory focuses on observational learning. Individuals learn new concepts by observing those around them (van Manen, 1990). In a study by Devi et al., (2017) social cognitive theory was used to determine how individuals learn by observations. In their study Devi et al., described how social cognitive theory is demonstrated when students model their teachers’ actions and how teachers model their colleagues’ actions. Devi et al., found that teachers implement new ideas after seeing a colleague model the new behavior through an observation or training.

As teachers become more familiar with the technology, or observe other teachers that know how to utilize the technology, they may be able to utilize the technology more confidently. When teachers become confident in their ability to use technology they can then share their knowledge about implementing the technology (Kayalar, 2016). Teachers may become mentors for other teachers unfamiliar with the new technology. In a recent study, Shanmugam and Balakrishnan (2019) studied the use of Information Communication Technology (ICT) use with 100 science students. The researchers focused their study on Bandura’s social cognitive theory (Bandura, 1989). They found that students using ICT were motivated to learn science after watching their teachers model the utilization of the technology (Shanmugam & Balakrishnan, 2019).

In recent studies, Spriggs, Gast, and Knight (2016) utilized Bandura’s social cognitive
theory while exploring observational learning on students with autism. In another study, Haug, Paz Castro, Wegner, and Schaub (2018) used social cognitive theory to explore teenagers’ use of mobile phone life skills training. Bandura’s social cognitive theory helps to explain BYOT implementation in the educational setting by exploring how teachers prepare to implement BYOT as well as how teachers share their ideas on how to implement BYOT into their classrooms with colleagues. Bandura observed students while in a collaborative learning environment and found that students desire social interaction while learning new concepts (Devi et al., 2017). By working together to model what their teachers and peers are doing, students grow academically and socially (Bandura, 1977). This is the focus observational learning as described by Bandura (1986).

Educators who have implemented BYOT into their classrooms may practice Bandura’s social cognitive theory throughout the implementation process. Social learning theory focuses on the belief that humans’ decisions and actions are based on the decisions and actions of those around them (Bandura, 1977). Bandura stated that students could learn how to perform a new task by watching other students. Bandura’s theory (1977) focused on the way humans use observations and modeling to learn new concepts. The connection of social interaction and learning is another concept of Bandura’s social cognitive theory (as cited in Devi et al., 2017). In this research study, I sought to understand how teachers at a rural elementary school in Southeastern United States implemented BYOT within an educational setting.

**Related Literature**

In this section, I discussed the research that focused on the implementation of BYOT, the benefits of BYOT implementation, BYOT implementation resistance, and the rationale for implementing BYOT. Student motivation and engagement with technology is well documented
in the literature (Carver, 2016; Dogan & Akbarov, 2016; Parsons & Adhikari, 2016). In addition, most research on BYOT has occurred in the high school setting (Davison & Lazaros, 2015; Song et al., 2016). The research regarding the use of technology in the elementary classroom is lacking (McLean, 2016; Pollock & Al-Bataineh, 2018). I focused on the elementary education setting in this case study, as well as the perspectives of educators with the implementation of BYOT.

**College Readiness**

To understand what modern-day skills that students need to be college and career ready, it is important to recognize what colleges expect students to be able to do (Deming, 2017). Colleges are interested in potential students that possess a set of higher-order thinking and problem-solving skills that will assist them as they navigate the challenges they will face after high school (Alismail & McGuire, 2015). Individuals that have both soft skills and 21st century technological skills are highly sought after by colleges (Deming, 2017). Soft skills, like the ability to communicate effectively and problem solve cooperatively, coupled with technological skills are essential for success in college and beyond (Brundiers & Wiek, 2017; Finch, Peacock, Levallet, & Foster, 2015). Over the last several years students have been faced with the challenge of preparing to thrive in a digital society (DiBenedetto & Myers, 2016; Scherer et al., 2019). Societal changes within the economy and technology have presented schools with a challenge (Moreno et al., 2016). This challenge is to prepare students with the knowledge and ability to work with technology (Shmatko, 2016).

**Career Readiness**

As society changes the desired set of skills that employers want potential employees to demonstrate has changed (Cappelli, 2015). In 2009, the Intel Company incorporated personal
technology into the workplace to improve productivity (Cheng et al., 2016). The addition of mobile devices in the workplace changed the corporate world. With this change in the corporate sector, today’s students must be prepared for jobs that will require technologically savvy workers (Parsons & Adhikari, 2016; Swart, 2017). Shmatko (2016) found that employers want their employees to be able to navigate new innovations. The ability to communicate with a diverse population is also important to employers as this may translate into good relationships with customers and co-workers. In a study by Hurrell (2016), employers were surveyed and reported that many of their workers struggle with communication, social and technical skills. Employers are looking for employees with both technological skills and interpersonal skills (Finch et al., 2015).

**Stakeholders’ Beliefs About Technology**

In a longitudinal case study, Scott, Dortmans, Rath, Meeussen, and Boin (2015) explored the use of technology inside the classroom and how it has changed since it was first introduced. Scott et al. determined that there is greater support of technology implementation inside the classroom. Determining the correlation between educators’ personal beliefs and technology implementation may help to determine the use of technology in the classroom (Chiu & Churchill, 2016). Studies found that when educators are familiar with technology, they are likely to utilize technology as a resource to assist learners (Davison & Lazaros, 2015; Song et al., 2016). Salleh’s (2016) study focused on teachers’ perceptions on technology use in the classroom and found that teachers’ personal preferences may be very different from what they practice in the classroom. The study uncovered that teachers may not like using technology, however they find it useful for personal daily tasks. Teachers also find technology helpful in the classroom and believe that current technology was available for a short amount of time before it is replaced by
new technology that they must relearn. For this reason, teachers do not invest much time into utilizing the technology in the classroom (Harper & Milman, 2016).

Changes will occur with the use of classroom technology when teachers believe that technology is needed to improve their students’ learning (Lee, Longhurst, & Campbell, 2017). Lee et al. pointed out that not only is training an important indicator of technology use in the classroom, but also a teachers’ belief that the technology is worth the time to learn how to implement into the curriculum. Teachers’ beliefs regarding technology use within the classroom were found to be a main reason for integrating technology. School leaders are a vital component to the implementation of technology in classrooms (Dolan, 2016; Howard & Thompson, 2016). According to Machado and Chung (2015), school leader support toward technology implementation could have a major impact on successful use of technology in teachers’ classrooms. A lack of leadership toward technology implementation may promote resistance in teachers (Machado & Chung, 2015). Many researchers have found that by modeling the use of technology, teachers and school leaders are demonstrating the importance and ease of use for their students (Dolan, 2016; Howard & Thompson, 2016). In recent studies, modeling the technology for students and teachers could be a way to create buy in and build teacher confidence to utilize the technology within their classrooms (Heath, 2017; Howard & Thompson, 2016).

Although BYOT integration is easy for some teachers, it may be challenging for others. Typically, teachers will only implement technology or BYOT into their classrooms if they believe it is worthwhile or is consistent with their personal views on education (Prestridge, 2017). Integration of technology must be led by the teacher and teachers’ views are shaped by their own educational experiences which will ultimately drive what type of instruction students
receive (Howard, Chan, & Caputi, 2015). While some teachers seem to stay with familiar teaching practices, some teachers like to explore new ideas and new ways to teach the curriculum (Kafyulido, Fisser, & Voogt, 2016). Without the support and belief that teachers show in technology integration BYOT will not be successful (Kayalar, 2016). Teachers are the leaders of the technology integration process; therefore, their belief in technology integration is vital for success of the program (Ismail, 2015; Kayalar, 2016).

**BYOT and Preparing Students for the Future**

The importance of preparing students for a digital society has been mentioned in research studies (Patrick & Sturgis, 2015; Swallows, 2017). Leinonen, Keune, Veermans, and Toikkanen (2016) concluded that society has a growing interest in digital technology use in the classroom. Implementation of BYOT has been shown to increase skills that assist students’ need to obtain employment in a digital society (Kayalar, 2016). An increased interest is rooted in a focus on preparing students for jobs. Kayalar indicated that all stakeholders should encourage educators to implement technology to prepare students to be competitive in the job market. Research studies support the use of BYOT as a strategy that teachers use to prepare students for success in school and in a global workforce (Halili, Hijja, Rabihah, & Razak, 2019; Patrick & Sturgis, 2015; Swallows, 2017).

Many researchers have found that today’s educators must prepare students with technological skills for the future (Davison & Lazaros, 2015; Song et al., 2016; Zhao, 2015). Technology implementation has been shown to assist teachers in building these digital skills in learners (Benade, 2017). In a quantitative study by Kilinc et al. (2016), teachers were surveyed about technology use in the classroom; and the researchers uncovered that teachers agree that
they are preparing students for their future in a global marketplace when they implement different types of technology into the classroom.

Students may utilize technology throughout the day making them extremely familiar with their personal technological devices (Daghan, 2017). Allowing students to use their own technology in the classroom may allow learners the chance to cultivate the technological skills they may need as they enter the workforce (Kilinc et al., 2016). Teachers that implement technology also assist students who are not as comfortable working with mobile devices by allowing them to explore the use of technology within the classroom (Cayton, Hollebrands, Okumus, & Boehm, 2017). This creates a connection to students’ interest in technology and therefore generates a learning process that could make learning and teaching enjoyable (Rowen, 2015).

In an international qualitative study by Elkaseh, Wong, and Fung (2016) researchers found that the Internet played a role in the lives of both students and teachers which may influence the classroom. In a digital society, many new technologies are becoming everyday tools for students (Leinonen et al., 2016). A meta-analysis by Hartmann, Braae, Pedersen, and Khalid (2017) found that with the growth of the Internet, the growth of BYOT within the classroom has expanded. Hartmann et al. identified the usefulness of technology in the classroom and how technology could be implemented further into the classroom to benefit students. Urban and Falvo (2016) argued that students need to be utilizing technology at an early age to; however, many students do not utilize technology in the classroom until they reach middle or high school. Urban and Falvo (2016) found that more research on the use of technology in the elementary school setting was needed to determine how schools are preparing students to work in a digital society.
Motivation for Implementation

Technology implementation is part of the educational shifts that educators and administrators face (Patrick & Sturgis, 2015; Swallows, 2017). Any time there is a shift in educational practice there is always apprehension (Fulton, Paek, & Taoka, 2017). Motivation for BYOT implementation is necessary to overcome this major change or shift for many teachers, even teachers that are familiar with utilizing technology in the classroom (Cheong, Shuter, & Suwinyattichaiporn, 2016). Despite the struggle that BYOT implementation may have on teachers, they are focused on student learning and often motivated by wanting to find new ways to help their students learn Research studies show that technology use often could improve student learning; therefore, educators need to implement technology consistently for it to be beneficial for the students (Fabian, Topping, & Barron, 2018).

Teachers’ motivation impacts the implementation of technology in an educational setting (Plass, Homer, & Kinzer, 2015). Implementation of BYOT in the classroom may create excitement and apprehension (Fulton, et al., 2017). BYOT implementation into the classroom is often a dynamic change for teachers. Therefore, teachers often need motivation to make this change. According to Dogan and Akbarov (2016), the importance regarding teacher motivation with BYOT in the classroom is vital to successful implementation. Teachers are sometimes motivated to implement technology because students often make deeper learning connections when technology is utilized in the classroom (Parsons & Adhikari, 2016).

Many teachers are motivated to use technology in their classrooms (Heath, 2017). The motivation to use technology in the classroom based on students gaining knowledge to solve a problem or learn about a certain topic (Urban & Falvo, 2016).
Improved student achievement may also be a factor in motivating teachers to implement technology in the classroom. Shadiev, Hwang, Huang, and Liu (2015) studied two groups of students during group work. One group used only textbooks while another group utilized technology. The group that used technology scored higher on the assessment than the group that used only textbooks. Based on research, technology has been shown to improve achievement for students that utilize the technology to learn (Domingo & Garganté, 2016). The implementation of technology is believed to assist students in their effort to gain a greater understanding of the curriculum and in the math classroom has been shown to improve learning outcomes.

**Teachers’ Attitudes Toward Implementation of BYOT**

Teachers’ attitudes toward the use of technology can also have an impact on whether technology is implemented into the classroom. Some teachers have attempted to utilize technology in the classroom without success which can lead to a lack of interest and negative attitude toward the use technology (Heath, 2017; Robinson, 2016).

In a mixed methods study by Carver (2016) the researcher explored teachers’ attitudes toward the implementation of technology in the classroom. The study determined that teachers’ attitudes towards technology may be affected by the level of difficulty in mastering the technology. Many educators desire to implement BYOT learning into their curriculum. However, if the technology is very difficult to master, teachers may become frustrated and develop a negative attitude to implementing any technology into the classroom (Chiu & Churchill, 2016). This is unfortunate due to the importance that teacher’s attitudes play in the successful implementation of technology in the classroom (Carver, 2016). BYOT and BYOD classrooms may create students and teachers that are comfortable using technology since the devices are often the students’ personal technological device (Delgado, Wardlow, McKnight, &
O’Malley, 2015). Teachers’ confidence and comfortable implementation of technology impacts their attitude toward technology within the classrooms. Educators must feel comfortable working with mobile technology for the implementation to be successful (Kayalar, 2016). BYOT implementation may require a shift in the way teachers view technology, such as smartphones and other personal technological devices.

In a study about personal technological devices, Green and Hayes (2015) stated that teachers should consider cell phones a resource instead of a burden within the classroom. If a teacher displays a negative attitude toward the implementation of technology within the classroom, the students will notice and possibly mimic the modeled behavior (Kayalar, 2016). Parsons and Adhikari (2016), conducted a quantitative study to analyze the attitudes of students and teachers toward the use of technology in the classroom. It was determined that the students’ and teachers’ attitudes toward integrating technology was positive. Teacher attitudes and beliefs toward technology implementation have an enormous influence on the programs’ success (Kayalar, 2016). Sahin, Top, and Delen (2016) found that teachers’ attitudes toward technology may begin as positive, but without proper technology training, teachers’ attitudes toward the implementation of technology became negative.

**Teachers as Facilitators**

Educators learning to use technology in the classroom is just the beginning. The implementation of technology truly takes place when the teacher takes the role of a facilitator of learning in the classroom. This allows students to use the technology to learn (Meehan & Salmun, 2016). As the teacher becomes a facilitator of learning, the students are driving the instruction rather than the teacher, which often leads to greater learning outcomes (Meehan & Salmun, 2016). When the teacher allows students to drive the instruction, students can learn at a
rate that is comfortable (Brahimi & Sarirete, 2015). Facilitating student learning through technology implementation creates an opportunity for students to learn how to use technology as well as learn how to gather information and knowledge on their own (Delgado et al., 2015; Tate, Warschauer, & Abedi, 2016). When students use technology to learn they are building skills necessary to do work in a global workforce (Delgado et al., 2015; Tate et al., 2016). Teachers become facilitators of learning using technology when the students begin to create their own understanding of the content (Delgado et al., 2015).

Teacher Resistance to Implementation

The technological knowledge divide is great between teachers and students, and it seems to continue to grow (Delgado et al., 2015). This divide is in part due to the resistance of integrating technology into the classroom. Most educators understand the vital role technology plays in the classroom but are still uneasy about implementing technology into their classrooms due to their lack of daily technological use (Ozdamli & Uzunboylu, 2015). Technology implementation may have been proven to be beneficial to teachers and students, but teachers continue to show resistance to the implementation process (Farley et al., 2015). Implementation of BYOT may be difficult for teachers which may create resistance to technology use in the classroom. Teachers often complain about changes to the classroom and many are already overwhelmed with multiple daily tasks that they must complete (Barbour, Tamme, Grant, & Siko, 2017). This focus on completing a daily list of tasks could cause resistance in learning how to implement technology in the classroom (Barbour, et al., 2017). In many instances, implementing technologies into pedagogical practices is resisted due to the changes in personal teaching practices that technology implementation may create (Shifflet & Weilbacher, 2015).

Teachers often resist the idea of implementing new technology because they may not
know how to use the technology themselves even for personal use (Afolabi, 2015; Ozdamli & Uzunboylu, 2015). This lack of daily use may create stress or apprehension toward incorporating technology into the classroom. Teachers are less likely to stress over implementing technology when they use technology in their daily lives outside of the classroom (Afolabi, 2015; Ozdamli & Uzunboylu, 2015). For some educators, learning to use the ever-changing technology is just another issue to deal with in an already stressful job (Anshari, Almunawar, Shahrill, Danang, & Huda, 2017).

Teachers may also be resistant to the use of technology due the concern that students may become hard to managed when technology is implemented into the classroom. Lynne et al., (2017) studied the effectiveness of technology to manage and improve student behavior. The researchers determined that technology improved repetitive small behaviors. Researchers also documented more positive teacher-student interactions while the technology was being utilized.

Teacher Training

Many educators may become overwhelmed at the idea of integrating technology into their lesson plans without the knowledge required to operate the technology. Ruggiero and Mong (2015) suggested that technology training during professional development could possibly help to eliminate educators’ resistance to technology. The results of this study supported technological use in teacher training to improve teacher perception about technology implementation. In another study researchers found that the frequency with which teachers incorporate technology into their instruction could be impacted by how knowledgeable they are about technology (Kena et al., 2015; McGarr & Ó Gallchóir, 2020). Preparing teachers and principals for technology implementation is the first step toward successful implementation. Educators must be given proper training and support to effectively utilize technology in a school
setting. Teachers may find that they need to consider how to become skilled in mobile learning
design (Farley et al., 2015). School systems struggle to provide training for teachers to educate
themselves on how to implement BYOT into the classroom (Tallvid, 2016). Without training,
the technology may go unused (Ruggiero & Mong, 2015).

According to many research studies, it is vital for teachers to be trained in the use of
technology for implementation to work well (Bakir, 2016; Kim, Xie, & Cheng, 2017; Wright,
2017; Xie, Kim, Cheng, & Luthy, 2017). Teachers are uncertain how to implement technology
into the classroom (Braisel, Martin, Jeong, & Yuan, 2016). Technological uncertainty is
compounded by the lack of time that teachers need to learn how to implement technology (Urban
technology in their classrooms if they received training. Many school districts are implementing
BYOD at the middle and high school levels (Crompton, Olszewski, & Bielefeldt, 2016).
Research shows that schools are slowly providing more technology training and professional
development for teachers (Crompton et al., 2016; Heath, 2017). Wright (2017) suggests that the
training teachers are receiving is not quality training and therefore the teachers continue to be
unprepared to implement technology (Wright, 2017).

Teachers play an important part in connecting the learning to the technology (Evseeva &
Solozhenko, 2015). In a multi-year study, researchers found that many educators come to find
that the benefits of incorporating technology in the classroom are worth the personal time spent
training and becoming comfortable with utilizing technology for student learning (Cayton et al.,
2017). In a qualitative study, Dolan (2016) discovered that technology training is essential at
any school where teachers was utilizing technology to support student learning. Research shows
that teachers are likely to accept the integration of technology into their classrooms when
training is provided (Beriswill, Bracey, Sherman-Morris, Huang, & Lee, 2016). Without the proper training, the lack of knowledge about how to implement BYOT in the classroom. Carpenter (2016) stated that training helped teachers provide teachers with the knowledge needed to utilize technology in the classroom. Teachers are expected to implement technology into their classrooms and teaching practices despite not being trained on the technology (Bakir, 2016; Kim et al., 2017; Tallvid, 2016; Wright, 2017; Xie et al., 2017).

Training and pre-service teachers. The leaders of teacher education programs could design courses that focus on how teachers implement technology into their curriculum (Dolan, 2016). Unfortunately, most teacher training programs do not require many technology courses as part of curriculum (Chiu & Churchill, 2016). Technology training during pre-service training may reduce apprehension regarding technology in the classroom (Longhurst et al., 2016). Elstad and Christophersen (2017) teachers’ perceptions of technology use and found that teachers are expected to be well trained in technology upon entering the classroom professionally. Elstad and Christophersen found that technological training is vital for teachers’ success in the classroom as they may need to use technology daily within the educational setting. Pre-service teachers should be taught how to incorporate mobile devices into the students’ curriculum (Newhouse, Cooper, & Pagram, 2015). Preparing pre-service teachers to use technology with the curriculum is necessary in preparing students for a digital society.

Technology training and professional development. Teachers need to understand how best to use the technology before they agree to implement it into their teaching, and teachers trained in technology may be willing to implement BYOT into their classrooms (Carver, 2016; Dolan, 2016). According Longhurst et al., (2016), technology professional development (TPD) improves not only the likelihood that teachers will use technology within the classroom but also
student achievement. Longhurst et al. showed that the students of teachers that had participated in one year of TPD had higher achievement than the students of teachers that did not participate in TPD. In addition, students of teachers that participated in two years of TPD had higher achievement than the students of teachers that only participated in one year of TPD. Overbaugh, Lu, and Diacopoulous (2015) found that the teachers’ ability to implement technology into their teaching improved student learning. Training for technology integration is a necessary element in creating a learning environment in which teachers believe that technology is beneficial to both the students and teachers (Howard & Thompson, 2016). In a case study by McKnight et al., (2016) researchers determined that even with previous training, teachers must stay current by spending time training on the newest technology to become familiar enough to use the technology in the classroom. However, teachers are often burdened with the task of finding time within their own schedule to attend additional professional development training (Carver, 2016).

Attending workshops and professional development meetings that train educators on technology for their classroom improves teachers’ opinions and willingness to incorporate technology into their lesson plans (Carver, 2016; Dolan, 2016). Overbaugh, et al. (2015) researchers found that professional development in technology integration had a positive impact on technology integration. In another study Blanchard, LePrevost, Tolin, and Gutierrez (2016) indicated that teachers need professional development time with technology to discover what will work best for them in the classroom. A three-year longitudinal study by Blanchard et al. (2016) explored continuous technology professional development of 20 mathematics and science teachers at schools with a large population of students that have a low socio-economic status. The researchers found that educators that attended TDP developed an increase in their ease of utilizing technology in the classroom. In addition, the students in these classrooms that took part
in the TDP scored higher than the students that did not participate in the TDP. Students that had multiple teachers that had participated in TDP had greater achievement than the students that only a single teacher with TDP training.

**Teacher time.** Teachers tend to use educational strategies they are most comfortable with that may not include the use of technology (Liu, Ritzhaupt, Dawson, & Barron, 2017). How comfortable a teacher becomes with the technology plays a part in the likelihood the technology will become part of the teacher’s instruction (Knezek & Christensen, 2016). Training time to become comfortable with technology will involve the teacher’s personal time (Salleh, 2016). Without proper technology training prior to classroom use, the interaction with classroom technology could become negative creating resistance toward technology integration (Sahin, et al., 2016). Teachers are busy individuals and many lesson plans involving the implementation of technology can require additional time that teachers are unwilling to sacrifice (McKnight et al., 2016). Teachers may also feel as if they do not possess the knowledge required to properly implement technology (Liu et al., 2017). This is where teachers may use some personal time to learn how to use the technology (Carver, 2016). Teachers must believe that it is right for their students before agreeing to take on such a time-consuming task (Carver, 2016). Changing teaching practices may be a challenging and time-consuming process that teachers are not willing to start (Ellern & Buchanan, 2018).

**Teacher collaboration.** The technological learning environment that BYOT implementation creates allows for interaction between teachers (Evseeva & Solozhenko, 2015). Collaboration between teachers may be a vital component in successful implementation of technology in an educational setting. Teachers utilize online discussion boards to collaborate and discuss new ways to teach their curriculum (Kearney, Burden, & Rai, 2015). These online
discussion boards are often in the form of blogging. Turvey and Hayler (2017) mentioned that blogging allows for socialization and collaboration of teachers which is important when integrating technology into the classroom. Owen (2015) mentioned that the importance of teachers’ collaboration around how best to improve student learning is vital to improving learning outcomes.

Technology is assisting and improving teacher collaboration (Brown & Hocutt, 2015). Holmes, Tracy, Painter, Oestreich, and Park (2015) studied collaboration and found that technology improved collaboration between teachers. In a similar study, Reychav and Wu (2015) studied collaboration and the use of technology in education and found that technology consistently built and increased collaboration between teachers. Collaboration becomes important as teachers must learn to utilize technology for student learning to build a connection with their students (Pierce & Cleary, 2016).

**Student Engagement and BYOT**

The importance of student engagement in the classroom is essential when utilizing and implementing technology (Li, 2017). Carver (2016) mentioned that teachers find that technology improves student engagement. Technology has been shown to improve student engagement within the classroom (Baszuk & Heath, 2020; Bond, Buntins, Bedenlier, Zawacki-Richter, & Kerres, 2020; Collins & Halverson, 2018; Dana & Yendol-Hoppey, 2020; Maher & Twining, 2017). Research shows that teachers’ implementation of BYOT engages and encourages students to have a major role in their education (Compton & Almpanis, 2018). Technology is valuable for both educators and students by creating engaging and interactive classrooms while providing a unique way to cover the essential curriculum (Plass et al., 2015). Witecki and Nonnecke (2015) examined students that used technological devices and students that did not
utilize technological devices. In this study, students that did not use the devices were not as engaged as those that did have a device. The students with devices also had higher grades at the end of the course, but standardized test scores did not show much improvement.

The need to implement technology into the elementary school classroom is apparent (Muis, Ranellucci, Trevors, & Duffy, 2015). Muis et al. (2015) found utilizing technology in the classroom increased kindergarten student engagement due to the immediate feedback given to the students. Data was collected from 64 kindergarteners using interviews and apps. The researchers found that student engagement was greater when the students received immediate feedback using technology. In an study with college students Kong and Song (2015) found that BYOD improved student learning and engagement. The researchers determined that BYOD use in the classroom lead to a deeper understanding of the content. Parsons and Adhikari (2016) also studied the use of BYOD and reported that student engagement improved with the use of BYOD. Falloon (2015) examined elementary school students utilizing iPads according to the BYOD initiative at their school. The researcher completed a longitudinal study of 100 elementary school students who use their iPads during their class-time to complete various assignments and activities. Fallon determined that the use of BYOD created more student engagement and collaboration. In another study, O’Bannon and Thomas (2015) examined the perceptions of pre-service elementary and pre-school teachers on the use of BYOD in the classroom. Half of the teachers reported that the utilization of BYOD in the classroom improved student engagement.

A qualitative multi-case study determined that student engagement is a benefit of implementing technology into the classroom (Zimlich, 2015). In another study by Downes and Bishop (2015), researchers determined that student engagement is increased as well as learning relevance with the use of technology integration. Technology integration could increase student
engagement and encourage students to learn and become comfortable with using technology themselves. Downes and Bishop indicated that teachers must utilize technology to maintain student engagement in the classroom. Student involvement also increases students’ enjoyment of the classroom and in turn possibly improves student achievement (Kim & Downey, 2016). Being engaged during a lesson may improve student learning. Technology assists schools striving to create an interactive environment in which students was engaged (Carver, 2016).

**Gaming and student engagement.** Gaming has been credited with maintaining student engagement (Hebert, Jenson, & Fong, 2018). In a study by Hebert et al. (2018), researchers completed a quantitative research study on game-based learning in 24 middle schools. 795 students and 32 teachers participated in the research study. The researchers determined that student learning and engagement did occur with the use of game-based learning. According to Reinders and Wattana (2015), technological gaming may allow the reserved students to interact and be engaged. Reinders and Wattana’s (2015) research suggested that students were likely to participate and remain engaged when using the technology in the classroom. According to Hsieh, Lin, and Hou (2015), using technological gaming to engage and motivate learners has proven successful. Hsieh et al. focused on the engagement of elementary students during a game that utilized technology. The researchers found that students’ express engagement when using gaming technology to learn. Sung, Hwang, Wu, and Lin (2018) conducted a quantitative experimental study on elementary school students. The researchers found that students that used gaming technology to learn demonstrated greater learning and engagement than the students who did not utilize technology. Strickland and Kaylor (2016) found that gaming is an effective strategy to review material and maintain student engagement. The engagement that technology integration creates far outweighs the negative aspects of the use of technology in the classroom,
but the negative aspects are what often hinders teachers from integrating technology (Reinders & Wattana, 2015).

**Asynchronous learning and student engagement.** Teachers focus on maintaining student engagement to improve learning (Northey, Bucic, Chylinski, & Govind, 2015). Asynchronous learning, without careful monitoring from the classroom teacher, can result in a learning environment that lacks student to student and student to teacher connections (Bickle & Rucker, 2018). Asynchronous learning is unique way to cultivate student engagement; however, it can be difficult because the students have the freedom to choose their level of participation in the activity. Asynchronous collaboration between students can be challenging for teachers to establish (Delahunty, 2018). Bickle and Rucker (2018) conducted a quantitative research study on the interactions between college students enrolled in an online college course that utilized a technology known as VoiceThread. The technology increased student-to-student interaction which decreased the sense of isolation for students. Northey et al. (2015) examined asynchronous learning and its impact on student engagement. They found that student engagement continues to be a challenging for teachers; however, with the use of asynchronous learning utilizing technology student learning may be improved.

Larbi-Shaw and Owusu-Agyeman (2017) investigated students’ engagement in an asynchronous learning environment. The researchers gained information from the 500 participants using questionnaires. Asynchronous learning was found to increase student learning outcomes. Asynchronous learning can improve student engagement as it allows learners to engage in the learning process when it is most suitable for them. According to Larbi-Shaw and Owusu-Agyeman found that students remain engaged with technology through asynchronous
learning. The study also found that student engagement with the use of technology improved learning occurs through the interaction that asynchronous learning promotes.

**Synchronous learning and student engagement.** Synchronous learning utilizing technology may lead to greater student engagement (Krishnan, Cusimano, Wang, & Yim, 2018). Rehn, Maor, and McConney (2018) conducted a collective case study with eight teacher participants from a rural high school. The teachers participated in observations and interviews while teaching using synchronous video-conferencing. The researchers determined that a synchronous classroom provides stronger teacher-student interaction. A quantitative research study completed by Krishnan et al. (2018) explored the use of collaborative writing using an online learning tool. The research study’s participants were from a rural Title I school, and the students were of mixed learning abilities. The use of online writing support improved students’ engagement in the writing process. The students reported that the use of synchronous learning through peer writing assistance via technology provided them with enough encouragement to continue to improve their writing. Writing within collaborative groups kept students engaged and inspired thorough feedback.

Synchronous learning is often used to improved engagement in the classroom. In a study by Wolverton (2018), synchronous learning increases student engagement with the use of technology. Wolverton found that student discussion and engagement improved using synchronous learning. Wolverton explored the use of synchronous teaching methods to improve student engagement and involvement in the class. The researcher found that student communication and engagement occurred using technology and synchronous learning.
Funding and Impacts on Implementation

Studies find that technology implementation improves learning, but also implementation may also create a burden for schools with low funding (Maher & Twining, 2017; Wasko, 2016). In additional studies, it is noted that the change of implementing technology in the classroom continues to grow at a rapid pace (O’Neal et al., 2017; Song et al., 2016). Growth of technology implementation is leaving teachers with little option but to learn to implement technological devices while leaving schools with the burden of purchasing technology for students; therefore, schools need a plan to purchase and implement technology into the classroom (Kafyulido et al., 2016). Many schools that lack funding for technology only have access to technology through a computer lab located outside of the classroom, while other schools have a designated classroom that houses the school-wide technology (Whyte, House, & Keys, 2016).

Despite the expansion of technology, schools are behind in purchasing technology due to the cost (Delgado et al., 2015). Schools have adopted a solution to offset the financial burden known as BYOD or BYOT (Wasko, 2016). This solution provides a cost-effective way to incorporate technology for students by allowing them to bring their own technology into the classroom (Herold, 2015; Parsons & Adhikari, 2016). With a BYOD or BYOT implemented in the classroom, students bring their own technological devices to the classroom to aide in learning (Delgado et al., 2015; Song & Kong, 2017). Technological cost decreases when students are provided with the ability to utilize their own devices within the classroom (Delgado et al., 2015; Parsons & Adhikari, 2016).

In some cases, the loss of school funding for technology has created a need for students to provide their own technology to assist with learning in the classroom (Kotok & Kryst, 2017). Allowing students to bring their own technology rather than struggle with purchasing enough
technology for every student was one way to lighten the cost burden with which schools must contend (McLean, 2016). Education is constantly changing; therefore, funding educational reforms is often a stressful debate among stakeholders (Delgado et al., 2015). Because of funding in education, technology integration is at the forefront of many schools since students need to be trained on technology to be college and career ready.

School systems struggle with funding and many school systems cannot afford to purchase additional bandwidth or build larger infrastructure needed to support BYOT implementation (Kalonde, 2017). BYOT implementation in the classroom could be impacted by internet availability (Mudra, 2018). Without strong internet capabilities BYOT implementation could be impeded (Smadi, Mohammad, & Ab Ab Rahman, 2020). The need for reliable Wi-Fi could create a barrier for the use of BYOT (Smadi et al., 2020). Even though students have their personal technology to utilize in the classroom this technology would not be useful without reliable internet connectivity (Mudra, 2018).

**Digital Citizenship**

Many schools have decided to make use of BYOD or BYOT programs that encourage students to bring their own personal technological devices to assist in learning. The BYOD and BYOT initiatives often lack support from parents and teachers (Preston & Younie, 2016). Schools ease some of these concerns by providing all stakeholders with the knowledge on how to use technology safely and wisely (Larosiliere, Kobelsky, & Mchaney, 2016). As schools adopt more technological devices, teachers are tasked with teaching students how to be responsible digital citizens (Moon, 2018).

Students have a responsibility in taking part in learning how to properly use technology (Atif & Chou, 2018). Current students will live and work in a global society therefore, they need
to be trained on how to be a respectful digital citizen (Delacruz, 2019). Hui and Campbell (2018) focused on the topic of digital citizenship. Hui and Campbell found that students lack the skills needed for proper digital citizenship. The need for digital citizenship education at the elementary level is documented (Herold, 2015). The International Society for Technology in Education (ISTE) has information for all educational stakeholders about the importance of teaching students how to responsibly utilize technology (Atif & Chou, 2018).

According to Atif and Chou (2018) there are many resources that support teaching student digital citizenship. The use of these resources may help improve students’ digital awareness and ethical use of technology. The increase of BYOT use in the classroom makes the importance of teaching responsible technology use imperative for students (Mitchell, 2016). Students need to learn how to avoid common misuses such as cyberbullying and talking with online strangers but also how to interact with others in a respectful, appropriate manner (Mitchell, 2016).

Students today are constantly utilizing technology which means they desperately need to learn how to engage digitally with others in a socially acceptable way (Mitchell, 2016). Due to the increasing use of technology, schools are vital in teaching students digital citizenship (Dishon & Ben-Porath, 2018). Knowledge of digital citizenship may be presented by teachers because many students may not learn this essential information outside of a classroom. Ghosn-Chelala (2018) explored 17 public schools and found that more digital citizenship needs to be taught to students. The focus of teaching digital citizenship is teaching responsible use (Kiger & Herro, 2015). Research shows that students need to be taught how to regulate their use of technology to improve digital citizenship (Atif & Chou, 2018).
Misuse of Technology

The implementation of BYOT by teachers has been growing in popularity for many years in classrooms across the nation (O’Neal et al., 2017; Song, et al., 2016). Yet technology implementation may have unintended results. Research has shown that students often use technology inappropriately during instruction (Attia, Baig, Marzouk, & Khan, 2017). Perry and Steck (2015) studied the implementation of technology on student engagement. The researchers found that students who utilized technology seemed to have an increase of misused class time. The misuse of technology may lead to distractions in the classroom. Teachers often spend time limiting students’ distractions when utilizing technology in the classroom (Kay, Benzimra, & Li, 2017).

In a mixed methods study, Kay et al.,(2017) examined three high schools that were utilizing BYOD in the classroom. 81 students were studied utilizing personal technological devices to complete assignments. The researchers determined that students were more distracted by technology when working individually rather than collaboratively. In another study by Attia et al. (2017), researchers studied 200 students as they utilized technology in the classroom. The researchers found that the distractions from the use of technology could be mitigated by creating policies and rules. Teachers may need to learn how best to create expectations for students so that off task behavior will not take place while using technology. When used properly, technology may improve instruction and leave a positive impression on students that follows them into post-secondary and beyond (Iftakhar, 2016).

Teachers face many obstacles when trying to implement technology including students misusing technology (Fulton et al., 2017). Some types of misuse include cyberbullying and gaming. To limit the misuse of student devices, some school districts have created expectations
and policies that students and parents must follow (Harper & Milman, 2016). Programs are also put in place to keep watch over student devices (Ugar & Koc, 2015). In addition to cyberbullying, cheating, and gaming during classroom instruction, students may also have access to social media apps and the accessibility to communicate with individuals inappropriately.

Some schools are hesitant to allow students to bring their own technology due to students’ misuse of technology (Cho, 2016; Mupinga, 2017). Regardless of the built-in safety precautions districts use when technology is implemented into classrooms, teachers are still responsible for what their students decide to do with the technology (Langan et al., 2016). Teachers must be well prepared to set student expectations when it comes to dealing with technology misuse (Wasko, 2016). It is challenging for many teachers to supervise the many different devices that may be in a classroom where BYOT has been implemented while still focusing on the learning objective (O’Bannon & Thomas, 2015).

**BYOT Strategies and Methods**

BYOT could be implemented into an educational setting by way of a variety of strategies and methods. BYOT also offers teachers the opportunity to use multiple learning strategies such as differentiation, personalized learning and student-centered learning. Student collaboration may also be a method that BYOT implementation may improve (Parsons & Adhikari, 2016). The variation of learning and teaching strategies that BYOT offers may assist teachers in meeting the diverse needs of their students. Some strategies that teachers utilize assist in implementing BYOT may be time consuming for teachers while some strategies are easier to implement (Hodges & Weber, 2015). Teachers’ strategies and methods that depend on the students’ knowledge of technology may provide the teachers with ways to incorporate technology into the classroom while not taking as much time to plan how to utilize the
technology for student learning (Hwang, Lai, & Wang, 2015). For example, personalized learning strategies can be time intensive for both the teacher and the student to learn how to use (Jensen, Kummer, & Godoy, 2017).

**Differentiation.** Teachers from all grade levels can struggle to differentiate curriculum for their students (Wan, 2017). Despite the challenging that differentiation can create, it can improve student learning and classroom participation (Maeng, 2017; Swanson, Ficarra, & Chapin, 2020). Student participation tends to improve with differentiation, because it creates an opportunity for struggling students to reach a learning goal (Deunk, Smale-Jacobse, de Boer, Doolaard, & Bosker, 2018). Maeng (2017) conducted a qualitative study of one science teacher that differentiated her lesson plans utilizing technology. The researcher found that the technology was vital in the teacher’s planning and implementation of differentiated curriculum. The technology assisted the teacher in creating a lesson plan that served the diverse needs of all the students that the teacher served.

According to Urban and Falvo (2016), teachers think that the utilization of technology in the classroom improves students’ learning. One reason that teachers believe technology is beneficial to students is due to the ability that a teacher has differentiating the curriculum (Braisel et al., 2016). Technology provides teachers with a way to differentiate for all students so that students that need content presented at different grade levels can be provided with enrichment or remediation (Braisel et al., 2016). Alsaeed (2017) conducted a qualitative study that involved three middle schools. The researcher used a questionnaire to determine if teachers viewed technology as beneficial to students when they were learning how to do Algebra. According to Alsaeed (2017), teachers did feel that students benefitted from using technology and that the technology provided teachers with an additional resource to assist with
differentiating the curriculum. In a similar study, Cabus, Haelermans, and Franken (2017) conducted a quantitative study on the effects of technology use and students’ achievement in mathematics. The researchers found that the utilization of technology did improve students’ understanding of the math concept that was taught. It was also mentioned that the technology may improve the ease of differentiation of the curriculum.

**Mobile devices.** Allowing students to bring their mobile devices may be easier on both the students and the teachers (Falloon, 2015). Research confirmed that BYOT supports teaching and learning (Cheng et al., 2016). According to Maher (2015), there is a connection between learning and students’ mobile devices. Developing the best way to implemented mobile devices rather than omit them from the classroom may be successful for students. Farley et al. (2015) reported that most students do have access to internet and mobile devices.

The use of mobile devices has led to several changes in the classroom. Researchers studied BYOT implementation in a classroom in Hong Kong and found that this technology integration contributed to improved students’ learning outcomes (Song et al., 2016). Fabian, et al. (2018) used a mixed methods study to examine the effects of mobile technology on students’ attitudes and achievement. 52 students from 6th and 7th grades were participants in the research study. The researchers discovered that mobile technology had a positive impact on student perception of a technology during a math activity and student performance in mathematics.

Most students and their teachers own and use a mobile device daily. These devices have also taken up a large part of individuals’ lives (Baek, Zhang, & Yun, 2017). Students are already familiar with their personal mobile devices, which eliminates teachers having to explain how to use the device (Welsh et al., 2015). Knowing how to use their mobile devices provides teachers
with confidence showing students how to learn while utilizing personal devices as a resource during instruction (Howlett & Waemusa, 2018).

**Personalized learning.** Although it might be challenging teachers could personalize student learning using technology (Lee, Huh, Lin, & Reigeluth, 2018; Mothibi, 2015). According to Roberts-Mahoney, Means, and Garrison (2016) schools that have utilized technology to personalize student learning are leading the way in closing learning gaps for students. Teachers desire ways to implement technology in a way that promotes and improves student learning (Cavanagh, 2015). Lee, et al. (2018) conducted a survey study to identify issues with the implementation of technology when utilized for personalized learning. The participants of this study included 41 schools and 245 teachers. The researchers found that technology was implemented most often for teacher planning and instruction. Students’ learning may increase with technology implementation which may or may not occur in a traditional learning environment (Downes & Bishop, 2015).

Personalizing student learning may build intrinsic motivation in students and encourages them to shape their own learning (Bray & McClaskey, 2015). Bingham (2017) conducted a qualitative case study and found that technology is vital to the success of personalized learning. The researcher also mentioned that technology can assist teachers with personalizing a lesson for an individual student to close a learning deficit for that student. Connecting BYOT with personalized learning could change a traditional classroom into a digital classroom where the focus is on the students and not the teacher (Hartmann et al., 2017).

**Student collaboration and technology implementation.** Technology implementation has changed classroom dynamics by creating opportunities for student collaboration (Hajhashemi et al., 2016). Technology has been shown to improve collaborative learning environments
and research finds that students must collaborate with their peers and their teacher to truly learn a concept (Lee & Hannafin, 2016). Utilizing technology in the classroom could improve collaboration between students (Stover & Yearta, 2017), and increase students’ social skills (Davison & Lazaros, 2015; Song et al., 2016). While mobile technology has broadened the scope of collaboration, (Heflin et al., 2017) the use of technology has increased in the classroom as well (Kotok & Kryst, 2017) creating an environment for student collaboration (Heflin et al., 2017). This collaboration could assist students in working together to solve real-world problems or gain social interaction skills they will need in the workforce (Song et al., 2016).

Collaboration has become increasingly important in a digital society (Song, 2018). Collaborative learning may improve students’ ability to problem solve. Song (2018) conducted a mix methods study focused on elementary school students’ collaborative problem-solving skills using mobile technology. The study provided data that supported use of mobile technologies and collaborative learning to improve students’ understanding of the curriculum. Utilizing technology in the classroom could improve interactions between students preparing them for the workplace (von Davier, Hao, Liu, & Kylonen, 2017).

**Student-centered learning.** Student-centered learning focuses on the process of questioning and learning (Clark, Zhang, & Strudler, 2015). Students drive the instruction within a student-centered learning environment (Buss, Wetzel, Foulger, & Lindsey, 2015). By implementing technology, teachers create a student-centered learning environment. BYOD has been found to assist teachers in merging their traditional teacher-centered classrooms into a student-centered learning environment that improves students learning (Parsons & Adhikari, 2016). Kim and Downey (2016) mentioned that a student-centered classroom improves with the
use of technology implementation. Student-centered learning incorporated with technology has been shown to improve student ownership of learning (Song, et al., 2016). A classroom where BYOT has been implemented could be student-centered and may also offer students an opportunity to take ownership in their learning which often results in higher student performance (Kim & Downey, 2016). The use of mobile technology in the classroom builds a student-centered learning environment (Kim, Suh, & Song, 2015).

Innovations in technology have changed learning environments and created student-centered learning (Cheng et al., 2016). A student-centered learning environment provides a way for students to learn at their own speed. BYOT has been shown to be successful in meeting the needs of diverse learners (Kang, 2016). Harris and Al-Bataineh (2015) found that technology-based education assists teachers in helping students learn using differentiated instruction. Students that are ahead or behind their peers could work on assignments that are at their learning level. This also provides enrichment or remediation for students (Pipkin, 2015). Technology provides teachers opportunities to differentiate their instruction so that they may meet the needs of the diverse learners (Harris & Al-Bataineh, 2015). When used correctly, technology can assist teachers in differentiating their instruction.

Transitioning to a student-centered learning takes all stakeholders and students working together to make the shifts required to implement technology (Pipkin, 2015). Technology provides students with a way to access learning materials outside of the classroom to be self-paced (Liu et al., 2017). The shift from a teacher-centered classroom to a student-centered classroom may create learners that develop a higher level of knowledge about the content (Long, Logan, Cummins, & Waugh, 2016). However, not every student learns the same and sometimes student-centered learning environments become too distracting for some students to learn (Birbal
& Hewitt-Bradshaw, 2016). Adjusting the learning environment so that all students have the chance to be successful is essential (Yavuz-Mumcu & Cansiz-Aktas, 2015).

**Technology Use with English Language Learners**

There have been several studies completed about the use of technology in ELL classrooms (Chen, 2016; Darling-Aduana & Heinrich, 2018; Menon, 2018). Research shows that the use of technology in the ELL classroom builds student engagement and motivation in students (Chen, 2016). Menon (2018) studied the implementation of interactive whiteboards in a 7th grade ELL classroom. The researcher found that the use of technology provided students with a way to collaborate and participate more easily in classroom discussions with their non-ELL peers. Technology has also been utilized successfully and has shown to improve student learning in the ELL classroom (Chen, 2016). According to Darling-Aduana and Heinrich (2018), learning occurs because the teachers know how to utilize the technology in a way that provides an enriched learning environment that improves student learning.

Students need to practice using technology in the classroom to be prepare to enter society after leaving high school (Swallows, 2017). Despite the importance of preparing students to use technology, implementation of technology in the ELL classroom is not always well received by teachers (Miller, 2018). ELL classrooms are mostly lectured based and are not student-centered which often means that technology is not implemented (Vani, 2016). Teachers need to be willing to implement technology into the classroom for technology to be used effectively (Chen, 2016). As teachers gain familiarity with technology, they become more inclined to have students use technology to complete assignments, tasks, and projects (Zwahlen, 2018). Technology has also improved learning for all types of learners, especially visual and kinesthetic learners (Sen & Ay, 2017). For example, teachers can utilize technology to show students videos or websites that
they can watch and interact with (Sen & Ay, 2017). ELL teachers have also reported an improvement in students learning challenging topics with the use of technology (Chen, 2016). According to Andrei (2017), the use of technology in the ESL classroom could improve student learning and engagement.

**Summary**

Chapter two has provided the framework for this qualitative case study. I described the significance of this study through the problem statement and the gap in the current literature. Within the overview, I described how the chapter was organized and the topics that was discussed. In addition, I mentioned the two theories that will guide the study, Rogers (2003) diffusion of innovations theory and Bandura’s (2001) social cognitive theory. In this section, I also discussed how diffusion of innovations theory and social cognitive theory have informed the literature on the implementation of BYOT in the classroom as well as how my research may impact the two theories. In the remainder of the chapter, I provided a synthesis of the existing literature connected to BYOT and preparing students for the future, stakeholder’s beliefs about technology, teacher attitudes and motivation for BYOT, technology use with English language learners, teacher resistance to technology implementation, teacher training, student engagement and BYOT, lack of funding, misuse of technology in the classroom, and BYOT strategies. The amount of research concerning BYOT implementation in rural elementary schools is lacking (McLean, 2016; Pollock & Al-Bataineh, 2018). However, there are studies focused on BYOT in the secondary education setting (Davison & Lazaros, 2015; Song et al., 2016). This study sought to understand rural elementary school teachers’ perceptions on the benefits and challenges of BYOT implementation.
CHAPTER THREE: METHODS

Overview

BYOT implementation is increasing in many classrooms (Song et al., 2016). To utilize technology successfully, teachers must maintain a positive attitude toward its integration (Kayalar, 2016). According to the existing research, BYOT increases student learning and interest (Song et al., 2016). I sought to understand how teachers at a rural elementary school in the Southeastern United States implemented BYOT in an educational setting. I interviewed participants to explore their experiences implementing BYOT. There are some studies in which the experiences of teachers implementing BYOT were examined; however, most of these studies focused on high school and secondary education (Davison & Lazaros, 2015; Song et al., 2016). I questioned how teachers at a rural elementary school in the rural Southeastern United States implemented BYOT in their classrooms. I sought to understand how rural elementary schools benefited from allowing students to utilize their own technology devices within the classroom.

In Chapter Three, I described the study’s overview, design, research questions, setting, participants, the procedures for obtaining approval to conduct research and my role as the researcher are addressed. The data collection process which consisted of interviews, direct observations, and two focus group interviews are described. I read the transcribed individual interviews and focus group transcripts multiple times to ensure full immersion in the details of the data that was collected. My data analysis included memos, categorizing, and coding of the data. Next, I established themes known as categories and then I interpreted the data to gain an understanding of what is occurring (Lincoln & Guba, 1985). Finally, I provided an explanation of the data, both textually and visually. The chapter will conclude with a description of
trustworthiness, ethical considerations, and a summary of the chapter.

**Design**

Of the types of case study designs, I chose a qualitative single case study to examine the case in more detail (Yin, 2018). An instrumental case study focuses on the case itself and was not chosen for this study because instrumental case studies typically focus on an unusual phenomenon or issue, which is not the case with this study. I used a qualitative case study research design to understand how teachers at a rural Southeastern elementary school implement BYOT within their classrooms because case study is appropriate when a researcher is trying to answer “how” and “why” questions (Tichnor-Wagner, Harrison, & Cohen-Vogel, 2016; Yin, 2017). A case study design is “an empirical inquiry that investigates a phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2017, p. 13). I used a case study design to describe the perspectives of 12 elementary school teachers’ perceptions on the implementation of BYOT.

Case studies must be bounded (Stake, 1995). Creswell (2002) defined a study as being bounded when “the case is separated out for research in terms of time, space, or some physical boundaries” (p. 436). The teachers with a minimum of five years of teaching experience and a minimum of three years of experience implementing BYOT within their classrooms at a rural elementary school in Tennessee were the bounded system of focus for this case study. I used purposeful sampling to gain participants for this study. During a case study, researchers collect data, analyze the data and share the results of the study. I used three types of data collection for this study: interviews, direct observations, and focus groups (Krueger & Casey, 2014; Rubin & Rubin, 2012). I analyzed the data by using within-case analysis and NVivo (Yin, 2017).
Research Questions

Central Research Question: How do elementary school teachers in the rural Southeastern United States implement BYOT within their classrooms?

Sub-Question 1: How do elementary school teachers perceive their preparedness and access to resources for teaching in a classroom where BYOT has been implemented in rural Southeastern United States?

Sub-Question 2: How do elementary school teachers from rural Southeastern United States describe their own transition from a traditional classroom to a classroom where they have implemented BYOT?

Sub-Question 3: How do teachers generate and distribute cooperative ideas among colleagues about BYOT?

Setting

I conducted this study at Davey School (pseudonym) a rural, public elementary school located in the Southeastern United States. Teachers from this school have been implementing BYOT into the classroom for at least three years. I conducted this research study in the Motlow County School District (pseudonym), a public-school district in Middle Tennessee. The school serves families with a median income of $34,000 per year (NICHE, 2017). I chose the participants based on their implementation of BYOT and their willingness to participate in the study. The criteria for participants was having a minimum of five years of teaching experience and have implemented BYOT in the classroom for a minimum of three years. To maintain privacy for participants, I used pseudonyms for the county, school, name of the school district, and participants’ names. District 3 School System (pseudonym) is in the Southeastern United States. I chose this rural school in District 3 because not every student in the school has
technology provided by the school district or any other private benefactors. NICHE (2017) stated that District 3 serves around 6,700 students per school year, with an average student-teacher ratio of 15:1.

The minority enrollment for Davey School (pseudonym) is 6.67%, a majority of which is Hispanic (NICHE, 2017). The teachers that participated in this study have an approximate student population of 480. According to NICHE (2017), 3.7% of teachers are in their first or second year of teaching; therefore, most of the teachers have taught a minimum of three years. The school serves students in grades kindergarten through eighth grade. Over 60% of the population in this school district is economically disadvantaged. This is evident by the student population at the data collection site, which has nearly 50% of students qualifying for the free and reduced lunch program (NICHE, 2017).

**Participants**

I used purposeful sampling for this case study (Patton, 2015). I chose the participants based on specific criteria related to the phenomenon being investigated, including teachers who were teaching in an elementary school within the Motlow County School District (pseudonym). Additionally, these same teachers must have been teaching for a minimum of five years and have three years of experience implementing BYOT. This ensured that the participants had enough teaching experience to understand the content they teach and had experience in BYOT implementation. I asked the secretary at the school to email the teachers a letter (see Appendix A) about the questionnaire with a link to the actual participant questionnaire (see Appendix B) to prospective participants. The questions focused on specific demographic information about the participants. The participants varied by age, gender, ethnicity, education, teaching experience, number of years taught, and number of years implementing BYOT, which enhanced credibility
through random, purposeful selection. I conducted the questionnaire while maintaining participant confidentiality.

The requirements for this study were limited due the sample of rural elementary school teachers with five or more years of teaching experience and at least three years’ experience implementing BYOT. The sample included male and female participants. Participants’ teaching experience will ranged from five years to twenty plus years. The participants’ educational degrees ranged from a bachelor’s degree in education to a master’s degree. I chose participants based on the specified criteria and their willingness to be interviewed, observed in their classrooms and participate in a focus group. I based the number of participants on the requirements of Patton (2015). I chose 12 participants for this case study. I chose participants from a rural Southeastern school district in the United States. I obtained Institutional Review Board (IRB) approval before the research study began (see Appendix C). I was granted Research site approval (see Appendix D) by the school district before the research study was conducted, and participants signed a consent form (see Appendix E) prior to participating in the study. I assigned pseudonyms to all participants to maintain confidentiality.

**Procedures**

Before the research began, I obtained Institutional Review Board (IRB) approval from Liberty University (see Appendix C) as well as approval to conduct research at an elementary school. All participants signed the consent form prior to conducting research (see Appendix E). Once I obtained IRB approval, I notified the school district by email that approval had been granted and the timetable of the data collection. I informed the participating school that the data collection process will take approximately two months. Once all permissions were granted to conduct research, I selected participants using criterion sampling, including rural elementary
school teachers with five or more years of teaching experience. I obtained participants for my research by composing a participant email (see Appendix A) that was sent to the entire teaching staff asking teachers to consider participating in my research study if they have at least five years of classroom experience and have implemented BYOT for a minimum of three years. If the participant does not meet the criteria mentioned in the email, the participant was informed via the information in the email that he/she cannot participate in this study. My participants were volunteers from a rural elementary school in the Southeastern United States. As the participants respond with interest in the study, I emailed the participants requesting to schedule a mutually agreed-upon interview time. I collected the consent forms prior to the participants’ interview sessions. I used interviews, direct observations, and focus groups to gather data.

I audio recorded all interviews, and I then transcribed the interviews for coding purposes. As data was collected, I transcribed the interviews verbatim. I protected participants’ identities using pseudonyms. Once I transcribed the interviews, I copied each transcribed interview, and then I sent the transcribed interview to each participant. Peer review added to the dependability of the study. I asked participants to provide clarification from the information gathered at their interviews, and I asked participants to respond by email within a predetermined timeframe. Next, the participants participated in direct observations. I used an observation collection form (see Appendix F) during the classroom observations. Finally, the participants were invited to take part in focus group interviews (see Appendix G). After the interview, I scheduled the observations and the focus group portions of the study.

After I transcribed my data, I used with-in case analysis and the computer software NVivo to organize and analyze the data. I reviewed each transcript, adding marginal notes and memos. I reviewed the transcripts multiple times. No monetary compensation was offered for
participating in the study. I stored all transcribed interviews, emailed responses and files on a password protected computer and I will delete the data three years after the study is completed. To ensure privacy and confidentiality, I assigned pseudonyms to the participants and the location of the research sites.

**The Researcher's Role**

I am pursuing an educational doctorate degree in curriculum and instruction from Liberty University. I earned a Master's degree in Secondary Education and Bachelor of Science degree in secondary education from Tennessee Technological University. I am a former middle school teacher. I now work as an instructional coordinator for a middle school. I taught sixth grade World History for eight years. I currently assist teachers with any curricular needs that they may have. I began teaching middle school in 2009 as a World History teacher in a Title I school. The school struggled to fund technology, which led to the implementation of BYOT. Integrating BYOT at my school saved money, and the students’ responses were positive. I enjoyed integrating BYOT in my own classroom. I found that it not only assisted with instruction but also improved student learning. Due to my positions in a school system, every effort was made to limit my bias by allowing the study participants to review the statements made during the interviews and/or focus groups. I used memoing to minimize my personal bias from this study.

To gain an understanding of teachers’ experiences implementing BYOT in the classrooms, I brought the research paradigm of constructivism to the study to allow for an understanding of how the participants interacted in the environment in which they lived (Vygotsky, 1978). I based my research upon a Christian worldview which will guide me while I work to understand my participants’ perceptions. As a past educator who finds importance in utilizing technology in the classroom to improve student readiness for college and career, I often encouraged educators to
implement technology into the classroom. I strived to remain objective throughout my research study.

Participants’ voices made up Chapter Four which added to the trustworthiness of the study. I had no prior relationship with the participants of this study. There was no connections between myself and the setting of the study, nor did I have any prior experience at the research site. The procedures that I used during the study assisted in preventing bias during the data collection and analysis stages of the research. I identified and documented rural elementary school teachers’ perceptions of implementing BYOT in their classrooms.

Data Collection

Yin (2017) identified five components of case study research: “a case study’s questions; its propositions, if any; its case(s); the logic linking the data to the propositions; and the criteria for interpreting the findings” (p. 27). The use of case study is largely driven by the research question(s). Yin (2017) identified six types of data collection for case study: “documentation, archival records, interviews, direct observations, participant-observation, and physical artifacts” (p. 111). Of these six types of data collection, I utilized a questionnaire, interviews, direct observations, and two focus groups to learn about how teachers implement BYOT. I modified participant’s identification by assigning each participant a pseudonym. I used a questionnaire (see Appendix B) prior to individual interviews to select participants to ensure all the criteria was met. Interviews were the primary source of data collection. I used observations so I that I can experience first-hand the interaction between the teacher, the student, and the technological devices. I also used two focus groups. Two focus groups were utilized to gather data from the participants while discussing the research topic in a collaborative setting. Utilizing three or more types of data collection allowed for triangulation of the data which strengthened the validity of
this research study (Yin, 2017).

I utilized multiple data collection methods to provide credibility and trustworthiness within the study. I conducted interviews, direct observations, and two focus groups to describe the phenomenon, as well as the experiences of the participants as they implement BYOT in their classrooms. I scheduled interview times with each participant that was convenient for the teacher. Prior to the interview, the participants were informed that the interview would last approximately 20 to 40 minutes. I audio recorded and transcribed the interviews.

Collection of data from the focus group interviews were made through prearranged meeting times that were convenient for the teacher participants. Two focus group interviews were conducted at an elementary school research site. Before the focus group interviews began, the participants were informed that the focus group interviews lasted approximately 20 to 40 minutes. I audio-taped and transcribed focus group interviews.

Classroom observations were prearranged with the participant for a time that is convenient for the teacher. I used an observation collection form (see Appendix F). Notes and memos were used during the classroom observation. Each classroom observation lasted for one complete class period which was approximately 55 minutes.

**Questionnaire**

While the questionnaire was completed prior to individual interviews, it was an important part of the data collection. Because I wanted to have 12-15 participants with a minimum of 5 years of teaching experience and 3 years of experience with the implementation of BYOT. The questionnaire ensured that the participants were elementary teachers who have implemented BYOT in their classrooms. It also provided general information such as the age, gender, ethnicity, education, teaching experience, number of years taught, and number of years
implementing BYOT. The questionnaire (see Appendix B) took place in a private Google form, with the answers protected in a locked account.

**Interviews**

All interviews were one-on-one, semi-structured, and open-ended. I piloted interview questions (see Appendix H) with colleagues outside of the study to ensure that the interview questions were formulated to provide valuable and relatable information. After receiving consent forms from eligible participants, I scheduled my one-on-one interviews with my participants by phone, in person, or by email. Each participant was required to sign an informed consent form. Each interview lasted approximately 20 to 40 minutes. I conducted each interview in person. I audio recorded and transcribed each interview. Teacher participants have experienced the phenomenon of integrating BYOT into their elementary school classrooms and discussed their experiences of implementing BYOT in the classroom. The interview questions were also reviewed and approved by my dissertation committee prior to conducting any interviews.

Interview questions remained the same for each participant’s interview and interviews were conducted by using the recommendations from Rubin and Rubin (2012). According to Rubin and Rubin (2012) maintaining a conversational flow during an interview is established by asking one question at a time, not interrupting the participant while he/she is answering a question, acknowledging the participant’s answer through gesturing, and asking clarifying questions of the participant when necessary. Interviews continued until saturation appeared to have occurred. Data saturation was used to improve the validity of a qualitative research study (Saunders et al., 2018). Saturation occurs when a thorough amount of rich, detailed data has been collected (Fusch & Ness, 2015). According to Saunders et al., (2018), participant
interviews provide the rich data within qualitative research studies. I utilized participant interviews as the primary method to collect data. Saturation varies between qualitative studies. I achieved data saturation through the interviews with participants. Interviews ended when the information from participants began to repeat and no new themes were generated. I attempted to build a rapport with the participants while seeking a detailed description of their experiences (Patton, 2002).

Standardized Open-Ended Interview Questions:

1. Describe your experience as a teacher.
2. Describe your training (if any) on how to use BYOT in the classroom.
3. What factors contributed to your decision to implement BYOT?
4. Describe the process of transitioning to using BYOT in the classroom.
5. Describe your first experience implementing BYOT in your classroom.
6. Describe a daily lesson implementing BYOT in your classroom.
7. How did your students react to BYOT implementation?
8. Describe how BYOT implementation has been beneficial for you.
9. Describe the barriers you have faced with BYOT implementation.
10. How has BYOT implementation affected your technological knowledge?
11. Describe any limitations that you have noticed while using BYOT.
12. How has BYOT implementation affected students’ learning?
13. Describe how BYOT has been helpful for the students and teachers.
14. Describe how BYOT has been challenging for the students and teachers.
15. How would you describe the interaction between yourself and the students when BYOT is being implemented in the classroom?
16. How would you describe the interaction between the students when BYOT is being implemented in the classroom?

17. How would you describe the interaction between the student and the technological device when BYOT is being implemented in the classroom?

18. Describe how engaged the students are when they are completing work using BYOT in the classroom.

19. Describe some ways in which you share ideas about BYOT with your colleagues?

20. Describe any changes to the classroom environment that you experienced with BYOT implementation.

21. What did you like most about BYOT implementation?

22. What did you like least about BYOT implementation?

23. What question should I have asked that I did not think to ask?

24. What would you add about BYOT implementation that was not covered by these questions?

Question one was a general question which served as an opportunity to build rapport with the participants. “Asking these questions in an open-ended rather than closed manner elicits the respondent’s own categorical worldview” (Patton, 2015, p. 444). This question simply allowed the participant to answer a factual question. Questions two through five sought to discover the participants’ training and interest in implementing BYOT into their classrooms (Davison & Lazaros, 2015; Song et al., 2016). These questions “about what a person does or has done aim to elicit behaviors, experiences, actions and activities that would have been observable had the observer been present” (Patton, 2015, p. 444). Questions six through fifteen focused on BYOT
implementation. These questions were based on the literature that described multiple ways to implement BYOT into classrooms and between colleagues (Evseeva & Solozhenko, 2015; Hwang et al., 2015). Questions sixteen through eighteen focused on how the classroom environment and student interaction was changed when BYOT was implemented. The final question allowed for participant input (Patton, 2015). “In the spirit of open-ended interviewing, it’s important in qualitative interviewing to provide an opportunity for the interviewee to have the final say” (Patton, 2015, p. 470). The final questions also allowed for participants to have the last word during the interview. After each interview, the audio recordings were transcribed. I read each transcribed interview multiple times to gain a greater understanding of the experience. These interview sessions allowed me an opportunity to clarify any participant’s responses. During the interviews, I asked the questions and listen to the participants’ responses. The notes that were taken assisted me in gathering all the information possible from the participants.

Focus Groups

I utilized two focus groups to collect data. Two focus groups of six participants met after the interviews were transcribed and related themes emerge from the interview data. According to Patton (2002), focus groups assists researchers in identifying patterns within the study. The interaction between participants provides rich, thick, descriptions of the experiences with the phenomenon (Patton, 2002).

Focus groups, according to Creswell, (2013) as well as Krueger and Casey, (2014), should consist of six to ten people that have similarities and are willing to share their perspectives about the topic of research. Focus groups were utilized to gather data from the participants while discussing the research topic in a collaborative setting. Information that is gathered using a focus group should use participants that were also part of the interview process.
(Krueger & Casey, 2014). This helps to enhance credibility for the research study.

I conducted two teacher focus groups consisting of a total of six teachers from the elementary school who completed interviews and are willing to participate. I asked willing participants to meet at the selected school for the focus group sessions. These focus group sessions lasted approximately 20 to 40 minutes. I monitored the focus group sessions to ensure all participants were involved in the discussion and not one single participant dominated the conversation (Creswell, 2013; Krueger & Casey, 2014). The focus groups’ questions (see Appendix G) were created by using research questions and literature to ensure validity (Castillo-Montoya, 2016). I audio-recorded and transcribed the focus groups. I analyzed and coded the data to establish common themes as they emerge.

**Observations**

Observation is one method in qualitative research that can provide greater insight into a case study (Yin, 2018). Observations (see Appendix F) were a vital component during the data collection process because the observations assisted in answering the research question, “How do rural elementary school teachers implement BYOT?” Observations allowed me the opportunity to write down the interactions between the teachers and students when the technological devices were being used during an elementary classroom lesson. I was able to watch students and gather data that I could not obtain during a one-on-one teacher interview. I used observations so that I could experience first-hand the interaction between the teacher, the students, and the technological devices. I was a non-participant. I observed the interactions between the teacher and the students, student and student, as well as students working independently as they were utilizing the technology.

Observations allowed researchers to witness the participants’ “interactions in natural
social settings” (Bloomberg & Volpe, 2016, p.155). After obtaining permission from the school’s principal, I worked with the teachers to determine dates and times for the observations. I planned and scheduled twelve teacher observations with the participants and was a non-participant observer. I observed participants in their classrooms. I took observation notes to better understand participants’ perceptions. I took notes during the observations while the teachers interacted with students and technology. I strived to limit disruptions to the school and teachers as much as possible by following the daily schedule of the school. I protected the participants’ anonymities by using pseudonyms. I kept the notes of the observations on a password protected computer. The observations took place at the school of employment for the teachers. I scheduled the observations to accommodate the participants. I used an observation collection form (see Appendix F) to assist me with understanding possible challenges that occurred when gathering rich, thick, descriptive data during an observation. I observed the nature of the implementation of BYOT, the information discussed, and the attitude of the teacher concerning the implementation of BYOT in the classroom. Also, I focused my observations on the teachers’ lessons that utilized the implementation of BYOT in the classroom.

Data Analysis

Data analysis included organizing the data and descriptive coding of the themes that emerged from the data that was collected, and developing interpretation of the data. For this case study, I organized the data collected from interviews, two focus groups, and observations and then coded data into themes. Using multiple data sources was vital in establishing a valid qualitative research study (Yin, 2014). I utilized theoretical propositions to analyze the data (Yin, 2014). I used the research questions to direct the data analysis to identify themes for the data to provide an understanding of the perceptions of rural elementary school teachers
implementing BYOT into an educational setting. I also used the research questions to identify themes and patterns as they developed. Each case was described and analyzed thoroughly. I conducted data analysis on interviews, observations, and two focus groups. I presented the data in both textual and visual forms.

The primary data analysis strategy used was within-case analysis. Within-case analysis seeks to explain what is occurring within the bounded case. “A primary goal of within-case analysis is to describe, understand, and explain what has happened in a single bounded context, the ‘case’ or site” (Miles, Huberman, & Saldaña, 2014, p. 100). In this study, I collected the data through three sources: interviews, two focus groups, and observations. Each interview was audio-taped and transcribed. As I transcribed each audio-tape interview, I listened and looked for initial themes to emerge. I followed Rubin and Rubin’s (2012) transcribing methods, which included making notes when a participant pauses or makes any type of gestures that may have influenced the data that I collected. I read the transcriptions from the interviews and two focus groups multiple times before scheduling the classroom observations. I conducted the classroom observations. During each observation, I took notes on an observation collection form (see Appendix D). When I finished collecting and organizing my data, I began the data analysis process.

Descriptive coding data was the next step in my data analysis (Rubin & Rubin, 2012; Saldaña, 2013). Descriptive coding uses short descriptions for the answers provided from the interviews, two focus group discussions and the notes taken from the observations (Saldaña, 2013). During the first rotation of coding I determined labels for the codes. Identification of individual categories creates solid data analysis (Yin, 2014). During the second rotation of coding, I used the NVivo software to organize and synthesize the data into categories while
retaining the reliability of the data. I continued to review the data as I utilized the NVivo software. Saldaña (2016) stated, “If we are carefully reading and reviewing the data before and as we formally code them, we cannot help but notice a theme or two here and there” (p.25). With the use of NVivo coding, I determined patterns and relationships between the data. Each participants’ data was analyzed individually and then compared to other participants’ data to determine themes. Saldaña (2013) stated “theme is an outcome of coding, categorization, or analytic reflection, not something that is, in itself, coded” (p.14). I continued the data collection and data analysis process until the point of saturation was reached. According to Fusch and Ness (2015) data saturation is reached when “no new themes” emerge (p.1409).

**Individual Interviews**

I audio taped and transcribed each interview. This was done to ensure that I stay immersed in my data. Transcribing my own interview data provided me an opportunity to review and prepare for the next participant interview (Rubin & Rubin, 2012). I followed Rubin and Rubin’s (2012) transcribing methods, which included making notes when a participant paused or made any type of gestures that may influence the data that I collect. Transcribing accurately improved the validity of the data. As advised by Saldaña (2016), I read the transcribed interviews multiple times during and after the coding process I kept the interview transcriptions on a password protected computer.

I then used NVivo to code the data to determine categories and then themes. The information from NVivo then was organized into word tables for easy comparison. After themes and patterns emerged from the software, I read through the data a second time while color coding all emerging themes. I sorted the themes by question and reoccurring themes using a Google spreadsheet. After I finish coding and establishing themes, I interpreted the data to gain a
detailed understanding of the case. “The case study should take the reader into the case situation and experience . . . allowing the reader to understand the case as a unique, holistic entity” (Patton, 2015, p. 538). I presented the data in textual and visual forms.

**Focus Group Interviews**

I audio taped and transcribed the responses of two focus groups of six participants. This was done to ensure that I stayed immersed in my data. A within-case analysis highlighted the similarities and differences in the perspectives of rural elementary teachers implementing BYOT in different rural elementary school classes (Miles et al., 2014). The information gathered from the focus groups was place into NVivo to create categories known as themes. The teacher participants’ responses to each research question was used to inform the categories. I presented the data both textually and visually.

**Observations**

Finally, I utilized an observation collection form (see Appendix F) for note taking and memoing during each classroom observation. Field notes are important when gathering data in a case study (Yin, 2009). The information gathered from the classroom observations was placed into NVivo based on the data observed during the classroom observations. The observed data placed in NVivo was used to create categories. After themes and patterns emerged from the software, I looked through the observation data a second time while color coding all emerging themes. I sorted the themes by question and reoccurring themes in a Google document. The information was organized into a word table for easy comparison. I used narratives and a table to present the data that was collected from the classroom observations in response to the research questions.
Trustworthiness

In this section, I mentioned several of the ways that I added trustworthiness to my qualitative study. Establishing trustworthiness is of the utmost importance in qualitative research (Lincoln & Guba, 1985; Noble & Smith, 2015). “Trustworthiness can be thought of as the ways in which qualitative researchers ensure that credibility, dependability, confirmability, and transferability are evident in their research” (Shenton, 2004, p. 63). Trustworthiness was important to my study, as it provided others the comfort of trust in my findings on the perceptions of rural elementary school teachers on the implementation of BYOT in an educational setting. Trustworthiness for this study was established in multiple ways. Yin’s (2014) validation strategies including triangulation, rich, thick descriptions, and member checking was used to ensure the trustworthiness of this study. Triangulation of the data occurred by using the various methods of data collection: interviews, observations and two focus groups. I used member checks to improve credibility, validity, and transferability (Creswell, 2013). All the data and the transcripts of the data was stored in a locked filing cabinet and password protected computer. I maintained my role as only an observer while working to ensure the study’s results were trustworthy.

Credibility

Credibility was maintained with observations and interview times that lasted less than one hour. Maintaining the same time limits during each interview, focus group, and observation ensures credibility. I used three different methods of data collection: interviews, direct observations, and two focus groups. Utilizing three methods of data collection helped to ensure the credibility of the study (Lincoln & Guba, 1985; Saldaña, 2016). The “overlapping” methods of using interviews and focus groups established dependability and confirmability of the research
I also used member checks to improve credibility (Creswell, 2013). Member checking provided an opportunity for teacher participants to review their responses and make sure that their responses were correctly recorded.

**Expert peer review.** According to Creswell (2013) expert feedback is needed throughout the research study. My chair provided that feedback during my study. This expert review increased the credibility of the research. I had my chair review my interview and focus group questions. I also piloted questions with participants outside of this study to improve understandability. Peer review ensured that any misunderstandings are resolved during the research process (Creswell, 2013).

**Triangulation.** Triangulation is a strategy that helps to identify any inconsistencies within the data that might potentially make the study invalid (Lincoln & Guba, 1986). Triangulation helped the researcher become aware of any contradictions that could be harmful to the study. I used “multiple and different sources, methods, investigators, and theories to provide corroboration evidence” (Creswell, 2013, p. 251). I used triangulation in developing themes from the data that was collected. Triangulation of the data occurred by using the various methods of data collection: interviews, observations and two focus groups.

**Dependability and Confirmability**

Dependability is achieved when a study can be duplicated and provide the same results (Lincoln & Guba, 1985). Dependability was created by utilizing thick descriptive data. I provided rich data through the three data collection methods that were utilized: interviews, focus groups, and classroom observations. The data collection process was followed exactly each time so that the research method could be replicated. Confirmability ensures that a study can be replicated by another research and obtained the same results (Lincoln & Guba, 1986). To ensure
dependability and confirmability in my study, I checked the participants’ data multiple times to ensure the data’s accuracy. Member checking promoted confirmability as well. I will keep all the data that I collected secure for three years after which time the data will be destroyed.

**Member checks.** Member checks also created a willingness in the participants to provide meaningful and thorough input. Member checks allowed participants to feel confident in their participation in the study by viewing their own answers as well as other participants’ answers to the interview questions. The responses were not linked to any specific individual to protect the identity of the speaker. Participants had the opportunity to review the transcribed interviews and focus group information to ensure that my notes were accurate (Yin, 2017). The “overlapping” methods of using interviews and focus groups established dependability and confirmability of the research study (Lincoln & Guba, 1985). I audio record my interviews and focus group discussions to verify the information gathered from participants through member checks.

**Transferability**

Transferability may occur by ensuring that the case study research methods used are completed accurately (Lincoln & Guba, 1985). A study with rich, thick content allowed for a transparent research process, which creates a higher level of transferability (Lincoln & Guba, 1985). According to Creswell thick description is a “means that the researcher provides details when describing a case or when writing about a theme” (p. 252). To ensure transferability, I placed criteria on the participants which included a minimum of five years teaching experience including at least three years of BYOT experience. I also described the number of participants that was needed for this study as well as their demographics. I have provided details of the data collection which was interviews, observations, and two focus groups and the data analysis which
includes thick case description, coding, and with-in case analysis. My focus for this study was how elementary school teachers implement BYOT in their classrooms as well as teacher preparedness and the process of BYOT implementation. I wanted readers of this study to be able to understand how rural elementary school teachers implement BYOT in an educational setting and can replicate this research study. I provided details describing my data collection process so that other researchers could utilize the procedures for a similar study.

Rich, thick descriptions. This study provided thorough descriptions of the setting and the participants regarding the implementation of BYOT at a rural Southeastern elementary school in the United States. It was vital to the qualitative analysis process that the descriptions and data were detailed (Patton, 2002). Rich, thick descriptions improved the understanding of the phenomenon being studied. Yin’s (2014) validation strategies include rich, thick descriptions, which were used to ensure the trustworthiness of this study.

Clear boundaries of the study. For transferability to occur the boundaries around the study must be made clear by the researcher. I included descriptions such as of the participants and data collection methods for this study (Cole & Gardner, 1979; Marchionini & Teague, 1987). The bounded system for this study involved 12 teachers with a minimum of five years of teaching experience; from a rural elementary school participated in an interview, observation, and two focus groups.

Ethical Considerations
After IRB permission was granted, I obtained any local approval from the school district, as well as the principal and participants of the school in which the research took place. This study provided the participants with confidentiality using pseudonyms for all involved in the study. Participants were volunteers and also signed an informed consent form (see Appendix E) prior to
participating in the study. Participants were made aware that they may stop participating in the study at any time. I protected data by storing it both in a password-protected computer and locked filing cabinet. Notes collected during observations, interviews, and the focus group discussions remained confidential and locked in a filing cabinet and will be destroyed three years after the study. Focus group discussions and interviews were audio recorded for transcription. After transcription is complete, I destroyed the audio recordings and other data after three years.

**Informed Consent**

Participants understood the purpose of the study through an explanation of the study, as well as an informed consent form (see Appendix E). To ensure confidentiality, I assured participants that no personal information would be disclosed in the study. I disclosed the details of the study with each of the participants and reminded the participants that they were volunteers and free to end their participation in the study at any time. Each participant received a copy of the consent form and a copy of the details of the study.

**Confidentiality**

Pseudonyms were used to protect the privacy of the participants (Yin, 2014). Pseudonyms ensured that participants and the study site were not viewed in a negative way or suffer from negative consequences due to their participation in the study. IRB assisted in creating an ethical and valid case study by providing ethical guidelines for this research study. All research collected was kept on a password protected computer and will be destroyed after three years. Audio-recordings of the interviews were also password protected. Notes collected during observations, interviews, and the focus group discussions will remain confidential and locked in a filing cabinet and destroyed after three years. Coded data will remain stored on a separate password protected computer and locked in a different filing cabinet apart from the raw
data. Focus group discussions and interviews were audio recorded for later transcription and kept in a secure location until transcription took place.

**Summary**

The purpose of this single case study was to understand how teachers at a rural elementary school in the Southeastern United States implemented BYOT within an educational setting. The purpose of this chapter was to describe the methods that was utilized to answer the research questions posed from this research study. After describing a qualitative case study design, I listed the research questions that drove the data analysis. My role as the researcher was discussed as well as how my experience of being a teacher that might impact the research. Next, I discussed the details of the setting in which the study took place as well as information about the participants. This chapter outlined the methods that I used to complete data collection in a qualitative case study which included interviews, observations and two focus groups. These three methods of data collection hopefully provided rich, deep, and thick details for themes to emerge. This chapter also contained information on data analysis including within-case analysis. The details of trustworthiness which included member checks and triangulation was also discussed. I concluded the chapter with an overview of the ethical considerations which included informed consent and confidentiality measures like the use of pseudonyms for participants as well as the use of password protected computers and locked filing cabinets that held the data that I collected for this research study.
CHAPTER FOUR: FINDINGS

Overview

The purpose of this qualitative single case study was to understand how teachers at a rural elementary school in the Southeastern United States implemented BYOT within an educational setting. I provided descriptions of the participants' experiences as rural elementary teachers implementing BYOT in their classrooms. I analyzed the responses from the four methods of data collection: questionnaires, interviews, observations, and two focus groups. I generated themes from the data analysis of the participant questionnaire, interviews, observations, and two focus groups. One central research question and three sub-questions were the focus of the data analysis. The central question that guided this case study was: How do elementary school teachers in the rural Southeastern United States implement BYOT within their classrooms?

Sub-Question 1: How do elementary school teachers perceive their preparedness and access to resources for teaching in a classroom where BYOT had been implemented in the rural Southeastern United States?

Sub-Question 2: How do elementary school teachers from the rural Southeastern United States describe their transition from a traditional classroom to a classroom where they have implemented BYOT?

Sub-Question 3: How do teachers generate and distribute cooperative ideas among colleagues about BYOT?

After I analyzed the data from each data collection method, it became apparent that the responses from the participants resulted in emerging themes. The results of the data analysis
were presented both textually and visually. This chapter concluded with a description of how the themes from the data analyses and an explanation of how the research questions were answered.

**Participants**

I examined the perspectives of 12 elementary grade teachers that had a minimum of five years of teaching experience and a minimum of at least three years of teaching experience implementing BYOT within their classrooms at a rural Southeastern school district in the United States. I obtained Institutional Review Board (IRB) approval before the research study began (see Appendix C). After receiving research site approval (see Appendix D) by the school district before the research study was conducted. I preceded with asking participants to sign a consent form (see Appendix E) before participating in the study. I assigned pseudonyms to all participants to maintain confidentiality. I chose purposeful sampling so that I could choose participants with enough teaching experience to understand the content they taught and had a minimum of at least three years of teaching experience in BYOT implementation. Purposeful selection kept the case study bounded. The boundary was defined within the rural elementary school where BYOT had been implemented.

At my request, the secretary emailed a letter to the teachers (see Appendix A) about the questionnaire with a link to the actual participant questionnaire (see Appendix B) to all prospective participants. I focused the questions on specific demographic information about the participants. I implemented the questionnaire while maintaining participant confidentiality. The participants varied by age, gender, ethnicity, education, teaching experience, number of years taught, and number of years implementing BYOT, which enhanced credibility through random, purposeful selection. All 12 of the participants were observed in their classrooms as part of the data collection process. Of the 12 participants, one was male and eleven were female.
Each participant had at least five years of teaching experience. Two of the participants had five to nine years of teaching experience. Seven of the participants had ten to nineteen years of teaching experience. Finally, three of the participants had 20 plus years of teaching experience. Each participant held a bachelor’s degree. Four of the teacher participants had master’s degrees. A description of each of the participants is provided. I collected the information about each participant from participant questionnaires and the individual interviews. I assigned each participant, the school, and the school district a pseudonym to protect their identities. See Table 1 for a summary of the participants’ background information.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Grade Level</th>
<th>Content Area</th>
<th>Years of Teaching Experience</th>
<th>Years of Experience Implementing BYOT</th>
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<tbody>
<tr>
<td>Alice</td>
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<td>Social Studies</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>Beth</td>
<td>5</td>
<td>Math</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Carrie</td>
<td>5</td>
<td>Math</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Dan</td>
<td>K-5</td>
<td>Art</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Emily</td>
<td>5</td>
<td>English</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Fran</td>
<td>4</td>
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</tr>
<tr>
<td>Grace</td>
<td>K</td>
<td>Self-Contained</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
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</tr>
<tr>
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<td>Lisa</td>
<td>2</td>
<td>Self-Contained</td>
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<td>15</td>
</tr>
</tbody>
</table>
Alice

Alice indicated on her participant questionnaire that she was a fifth-grade social studies teacher from Davey Elementary with 13 years of teaching experience where she taught third to eighth grade. According to the participant questionnaire, she holds a bachelor’s degree in elementary education. During Alice’s interview, she shared that she had always wanted to be a teacher and still enjoys working with children. During her interview, Alice shared that she believed that the use of technology in the classroom helped prepare students for the workforce. She was enthusiastic about the importance of BYOT implementation and the impact it had on students. Alice stated, "I am trying to help students be prepared for jobs in the future." During the focus group session, she shared some of the barriers she faced during the transition to a BYOT classroom which included the students logging into programs and apps. Alice seemed frustrated when she spoke with the group about students’ ability to get into online programs while utilizing BYOT. She elaborated during the focus group session, “They can't log in. If they forget their passwords, they forget their email. Any of those things, of course, slows everything down.” As I was conducting Alice’s classroom observation, students were utilizing the teacher created password cards that also included the students’ usernames. This seemed to alleviate the issue with lost instructional time as students referred to their cards for their login information without asking the teacher for help.

Beth

Beth explained on her questionnaire that she taught math at Davey Elementary; but, she did spend a few years at the middle school level. According to the participant questionnaire, Beth had been a teacher for 10 years. During her interview, she shared that obtaining her college degree was delayed by the birth of her first child, but she did eventually earn her bachelor’s
degree in elementary education. Beth willingly implemented BYOT into the classroom. She thought that the use of technology in the classroom was important because it assisted students that struggled with engagement and motivation. She was adamant about how BYOT affected student learning. During her interview, Beth shared, “I think BYOT had affected student learning by helping kids that typically get off task easier. I think they have more buy-in when they’re sitting in class.” Beth reported meeting weekly with her colleagues during their PLC time about using technology in her classroom. During Beth’s classroom observation, she monitored her students closely as they navigated online learning programs; therefore, there were no issues with off-task student behavior.

Carrie

According to the information on Carrie’s questionnaire, she had a bachelor’s degree in elementary education and had taught math for ten years at Davey Elementary. During our interview, Carrie shared that she had seven siblings and described how she would pretend to be a teacher to her younger sisters when she was a child. She mentioned that she remembered always wanting to teach, and enjoyed working with children. She also revealed that BYOT interested her because she valued the immediate academic feedback she gave and received from students with the implementation of technology. She seemed excited to share that “It's very beneficial because I can see the data on the students and know exactly what those students need.” She revealed that the use of technology in the classroom helped her differentiate learning for her students. Carrie’s feelings about BYOT during the focus group session stayed consistent with the interview. During her focus group session, she stated, “It's helpful because they can work at their levels, and I can give each of them the lessons they need and I can get their data quicker.” As I was conducting Carrie's classroom observation, she utilized BYOT to complete formative assessments to drive
her instruction. The use of BYOT assisted her with differentiation as she adjusted her teaching based on individual student learning needs.

Dan

Dan revealed on his questionnaire that he was an elementary school art teacher at Davey Elementary with seven years of teaching experience. During his interview, he shared that he held a bachelor’s degree in art education and had taught students from kindergarten to fifth grade. Dan also revealed that he started college to earn an art history degree; however, he eventually earned a bachelor’s degree in art education. He stated that he implemented BYOT because he felt like technology allows for an interactive classroom. During his interview, he was excited to talk about how beneficial BYOT implementation is for student engagement. He said, "They live in a very fast-paced time. And if things aren't quick and fast-paced, I feel like they have a tendency to daydream and they don't have the patience to sit and watch things at a slower pace." During his focus group session, Dan mentioned how quick students can access information, which keeps them engaged and moves the lesson along quickly. He stated, "It's made class incredibly fast." Dan also mentioned with his focus group that he did not get to discuss the implementation of BYOT with other art teachers very often as there are not many art teachers in the school district; therefore, he had few opportunities to collaborate on the topic of BYOT implementation. As I was conducting Dan's classroom observation, he allowed students to use BYOT to research different examples of artwork. The learners were engaged as they were provided with a choice of what website they could choose from and explore using their technological device.

Emily

According to Emily’s participant questionnaire, she had a bachelor’s degree in elementary education and was an English teacher at Davey Elementary with eight years of
teaching experience. During her interview, Emily revealed that she had worked at a daycare while she was earning her teaching degree, and she enjoyed sharing her love of reading with elementary school kids. During her interview, Emily stated that she implemented BYOT into the classroom to assist her in what she felt was an engaging learning environment for her students. She spoke enthusiastically about how her weekly collaboration with colleagues provides her with new insights on ways to implement technology in the classroom. She explained, “We do a lot of sharing when it comes to technology.” During her focus group session, Emily reiterated her feelings toward BYOT implementation, “I just think that everyone should be using technology in some form in the classroom.” As I was conducting Emily's classroom observation, she utilized BYOT in center activities. Students worked diligently to complete their work at the centers that did not utilize BYOT to move to the center stations that did utilize BYOT.

**Fran**

Fran explained on her participant questionnaire that she was an elementary school teacher at Davey Elementary with over 20 years’ teaching experience, and she held a bachelor’s degree in elementary and middle grades education. During her interview, Fran revealed she had always wanted to teach school and enjoyed working with students of all ages. During her interview, Fran described why she thought implementing BYOT in her classroom was valuable. "I want to allow kids to be in charge of their learning." She felt that technology was a way to create a learning environment in which students were highly engaged. She joined in during the focus group session when this topic came up. In our focus group, she eagerly shared that, "It's always helpful to use for engagement, a lot of learning can take place." During her focus group session, she also shared that she thought the use of technology in the classroom was important because it assisted students in becoming problem solvers by allowing them to own their learning. During Fran's
classroom observation, she too had created password cards that also included the students' usernames. This alleviated the issue with lost instructional time as students referred to their cards for their login information without asking the teacher for help just as it assisted students in another participant's classroom.

**Grace**

According to the information from Grace’s participant questionnaire, she had a master’s degree with ten years of teaching experience with kindergarten at Davey Elementary school. During her interview, she shared that she enjoyed teaching, and especially loved working with kindergarten students. Grace revealed that as she implemented BYOT in her classroom she was often surprised at how her kindergarten students responded to the used technology in the classroom. Grace laughed during the interview as she recalled how thrilled the students were when she began utilizing technology in her classroom. She said, “They didn’t know what to do they were very excited about it and they all wanted to use it.” During her focus group session, Grace echoed the same thoughts as the other members of the group when it came to barriers faced while implementing BYOT. She seemed exasperated when she mentioned the challenge she faced with reliable Wi-Fi. She stated, “It’s not as reliable as I would want it to be.” Although mentioned as a major barrier for Grace, she did not have any issues with Wi-Fi connectivity while students were utilizing BYOT during her classroom observation.

**Hannah**

Hannah revealed on her questionnaire that she was a math teacher at Davey Elementary with fourteen years’ teaching experience working with both elementary and middle grades. She also shared on her questionnaire that she had a bachelor’s degree in K-8 education and special education. Hannah explained during her interview that she could not remember what attracted
her to teaching, but she is thankful that she entered the profession. During her interview, Hannah revealed that she thought that the use of technology in the classroom assisted students that learn in different ways and at different rates. She pleasingly mentioned how BYOT had helped her with differentiation in her classroom. During our interview, Hannah stated, "You know, especially when you're dealing with kids that are not on grade level, you need things that involve BYOT to sometimes get them to see what you're talking about." She felt that BYOT helped some students understand the curriculum that they might otherwise not comprehend. She also mentioned during the interview that she speaks weekly with colleagues during PLCs about the implementation of technology in her classroom. As I was conducting Hannah’s classroom observation, I observed that she had created a lesson that utilized BYOT to differentiate learning for her students. The students worked confidently as they each used a different program on their technological device.

Izzy

According to Izzy's questionnaire, she was a science teacher at Davey Elementary, and she had a master’s degree in teaching with twenty-three years of teaching experience. During her interview, Izzy shared that she had wanted to be a teacher since she was a young girl, and she enjoyed teaching science to her third-grade students. Izzy stated in our interview that she liked using technology in the classroom because it seemed to motivate the students. She also mentioned in the interview that she spends time weekly, and sometimes daily, collaborating with her colleagues about BYOT. She said, “We probably talk about it more often than I think. We find new ideas or things the kids are doing well on or struggling with. So, probably once at least a week.” Izzy’s classroom observation was similar to that of other participants. She was utilizing BYOT during center rotation. I observed that students were excited to complete the
work at other centers in the rotation so they could get to the station where they would use
technology.

**Jane**

Jane explained on her participant questionnaire that she was a social studies teacher at Davey Elementary with ten years’ teaching experience and that she held a bachelor’s degree in elementary education. During her interview, she revealed that she went into teaching so she would be on the same schedule as her school-aged children. She also mentioned during the interview that she spoke weekly during PLCs with colleagues about the programs she uses while implementing BYOT in her classroom. She casually stated, “We just share what programs and resources we’re using with one another, that sort of thing.” Jane shared in her interview that she believed the use of BYOT in the classroom motivated and improved student engagement. During the focus group, Jane happily shared, “I feel like the students are more engaged and therefore they’re retaining more knowledge that way.” During her classroom observation, Jane’s students were engaged with the use of BYOT. Her students seemed eager to complete their classroom assignments using BYOT.

**Kay**

According to the information that Kay shared on her participant questionnaire she was a special education teacher for third grade with eleven years of teaching experience. She has worked at Davey Elementary as well as the middle school during her service within the same school district. Kay also indicated on the questionnaire that she had a bachelor’s degree in elementary education and a master’s degree in special education. During her interview, she revealed that she was interested in becoming a teacher because she enjoys working with children and wanted to share her love of reading with them. During her interview, Kay had a serious tone
as she described the importance of implementing BYOT in the classroom, as well as, monitoring students as they used BYOT. Kay shared, “I heavily monitor when students are on devices so they are held accountable for their time and to ensure that they are on task.” During the focus group session, Kay mentioned that she spoke weekly with colleagues about the implementation of technology in her classroom. She stated, “I recently shared information about a new program during our weekly PLC and I will come to their classrooms upon request to assist them.” While I was in Kay’s classroom completing an observation, she utilized BYOT to differentiate her lesson plan. She did this with ease, and both the teacher and students were comfortable using BYOT during the lesson.

**Lisa**

Lisa indicated on her questionnaire that she was a second-grade teacher who worked at Davey Elementary with twenty-seven years of teaching experience and held a master’s degree. During her interview, she revealed that she became a teacher because she said it was a good job for the rural area in which she lived. She was happy to share that BYOT got her students excited to learn. During Lisa's interview, she excitedly explained, "They love the videos and songs and they sing along with them." She felt that this motivated them to learn and remain engaged during the lesson. Although she mentioned during the focus group session that the use of technology can be challenging with the younger students, she thought that it motivated the students to learn. During her classroom observation, Lisa’s students were engaged with the use of BYOT. It was apparent that her students were more focused when they moved to a center where they would be using BYOT.
Results

I interviewed twelve participants, performed twelve classroom observations, and conducted two focus groups consisting of six participants in each focus group. I audiotaped and transcribed each interview and focus group session verbatim. I sent the transcripts to the participants for review and asked the participants to send an email to me with any questions or comments about the transcripts. All data were centered on one of the research questions: How do elementary school teachers in the rural Southeastern United States implement BYOT within their classrooms? How do elementary school teachers perceive their preparedness and access to resources for teaching in a classroom where BYOT had been implemented in rural Southeastern United States? How do elementary school teachers from rural Southeastern United States describe their own transition from a traditional classroom to a classroom where they have implemented BYOT? How do teachers generate and distribute cooperative ideas among colleagues about BYOT? I reviewed data multiple times, and I presented results both textually and visually. These results were established through the development of themes related to each research question and the triangulation of data from interviews, observations, and two focus groups. I coded the data from the experiences teachers had when implementing BYOT into an educational setting. The data was represented both textually and visually in tables.

Theme Development

For this case study, I organized the data collected from interviews, two focus groups, and observations and then coded data into themes. Using multiple data sources was vital in establishing a valid qualitative research study (Yin, 2014). I used the research questions to direct the data analysis to identify themes from the data. This data was used to provide an understanding of the perceptions of rural elementary school teachers implementing BYOT into
an educational setting. I also used the research questions to identify themes and patterns as they developed. Each case was described and analyzed thoroughly. I conducted data analysis on interviews, observations, and two focus groups. I presented the data in both textual and visual forms.

The primary data analysis strategy used was the within-case analysis. The within-case analysis seeks to explain what is occurring within the bounded case (Miles et al., 2014). In this study, I collected the data through three sources: interviews, two focus groups, and observations. I audio-taped and transcribed each interview and focus group session. As I transcribed each audio-tape interview, I listened and looked for initial themes to emerge. I read the transcriptions from the interviews and two focus groups multiple times before scheduling the classroom observations. I then conducted the classroom observations. During each observation, I took notes on an observation collection form (see Appendix D). When I finished collecting and organizing my data, I began the data analysis process.

The next step in my data analysis was descriptive coding which was provided from the interviews, two focus group discussions, and the notes that were taken from the observations. As I read through the interview transcripts, focus group transcripts, and the notes from the observation collection forms themes began to emerge. I highlighted each emerging them with a different color highlighter. From the highlighted interview transcripts, focus group transcripts, and observation collection forms I created a list of codes for each theme in a table format. The identification of individual categories creates solid data analysis (Yin, 2014). During the second rotation of coding, I used the NVivo software to organize and synthesize the data into categories while retaining the reliability of the data. I continued to review the data as I utilized the NVivo software. With the use of NVivo coding, I determined patterns and relationships between the
Each participant's data were analyzed individually and then compared to other participants' data to determine themes. Once the themes were established, I interpreted the data to gain a detailed understanding of the case. The themes that surfaced from the participant responses and classroom observations were: (a) BYOT and differentiation, (b) student engagement and motivation, (c) training, (d) challenges with resources, (e) logging in and passwords (f) misuse of BYOT, (g) preparing students for the future, (h) student interaction, (i) professional learning communities, and (j) sharing digitally. I presented the data in textual and visual forms.

**BYOT and differentiation.** Table 3 lists the codes and frequency of responses associated with the theme of BYOT and differentiation. Five codes tied to the theme of BYOT and differentiation included helping teachers with the incorporation of differentiated lessons, assisting students that are not on grade level, helping all students learn, individualized learning for all students, and allowing students to work on their levels. Similar participant responses about how BYOT helped with differentiation was mentioned 12 times during the individual interview and 4 times during the focus group sessions. The theme BYOT and differentiation developed from codes that were connected with the teacher’s implementation of BYOT into their classrooms. During the interview, Izzy revealed that the implementation of BYOT assisted her with differentiation. She stated, “technology allows students to work on their ability level and it lets me individualize some of the lesson based on what the students are doing.”

Through interviews, focus groups, and classroom observations, the teacher participants in this study explained and demonstrated how they utilized BYOT to differentiate lessons for their students. During the interviews, 12 out of 12 participants mentioned differentiation as a way in which they implemented BYOT in the classroom. During her interview, Fran shared that "students have varying abilities and technology helps us serve our students' different learning
levels." During the two focus group sessions, participants discussed how differentiation assisted them with individualized lesson plans to reach the diverse learning needs of their students. During her focus group, Carrie shared “My students have unique learning needs that require differentiated lesson plans. BYOT helps me do this.” During classroom observations, I observed teachers utilizing centers with the incorporation of BYOT to differentiate learning opportunities for their students. Through focus groups, all participants discussed the use of BYOT to differentiate their lesson plans for students. Beth and Alice discussed how their students read at varying grade levels. Beth explained during the focus group, "I have kids that read from the first-grade level to fifth-grade level. BYOT allows me to assign text on varying levels to best serve all my students."

**Student engagement and motivation.** Table 4 lists the codes and frequency of responses associated with the themes of student engagement and motivation. Three codes connected with these themes included an engaging learning environment, increased instructional time, improves student engagement, and motivation to learn. The code engaging learning environment was the most frequently stated response in the data collected from individual interviews, two focus groups, and classroom observations. Similar terms or responses regarding student engagement and motivation were mentioned 23 times during the individual interviews and focus group sessions. The themes of student engagement and motivation emerged from the codes that relate to the implementation of BYOT in the classroom. Twelve out of twelve teacher participants shared during the individual interviews and focus group sessions that BYOT improved student engagement and motivation in their classrooms. From individual interviews and two focus group sessions, improved student engagement and motivation was evident through the data collected. During the focus group session, the teachers discussed how BYOT improved student
engagement and motivation to learn. Lisa described how her students reacted when they were told they were going to use BYOT during a lesson. She said, “They get so excited and immediately begin to ask what we are going to do with the technology.” Other participants agreed. Fran stated, “My kids can’t wait to use technology, they get so excited!” Finally, it was apparent during the classroom observations that students' engagement and motivation to learn improved with the implementation of BYOT. I observed the delightful faces of students as they learned the lesson’s instruction contained time for BYOT use.

Training. Table 5 lists the codes and frequency of responses associated with the theme training for each participant. Three codes connected with the theme included minimal training, self-training, and not receiving enough training on technology. The theme of training developed from the codes related to the participants' responses regarding the teachers' implementation of BYOT into their classrooms. Ten out of twelve teacher participants shared in the individual interviews that they desired additional training on technology implementation. Similar participant responses about minimal training were mentioned 13 times between the individual interview and focus group sessions. Providing additional opportunities for teachers to learn how to implement BYOT into their classrooms were identified by the participants as a way to improve one of the barriers that the participants faced when implementing BYOT. Dan explained that he had received most of his training in college. He revealed, "I would like more training on technology implementation for my classroom. I don't know much, other than what I was taught to do in college. With technology constantly changing, I think it would be good to have additional training."

In addition to the issue of minimal training, participants shared that they had taught themselves most of what they knew regarding BYOT implementation. Dan stated, “Outside of
college, I have taught myself most everything else that has to do with technology.” The participants also mentioned that they were not receiving enough training to get them up to date with ever-changing technology. Hannah expressed her concern about not being able to maintain her technological knowledge without training. She shared, "I just struggle to keep up with the constant change and without training, I just get to where I struggle to use the technology as often as I think I should.” The teachers felt that with the training they would be confident and willing to use BYOT more often in their classrooms.

Challenges with resources. Table 6 lists the codes and frequency of responses associated with the theme challenges with resources. Three codes connected with the theme included interrupted internet service and unreliable Wi-Fi. Internet connectivity was the most frequently occurring code, appearing 15 times from the individual interviews and focus group sessions. During their interviews, 12 out of 12 teacher participants explained that they had challenges implementing BYOT. The theme challenges with resources developed from the codes connected with the teachers' implementation of BYOT into their classrooms.

Through interviews and focus groups, the teachers explained how important reliable Wi-Fi was to the implementation of BYOT. During the interviews, all participants mentioned internet connectivity as a barrier to the implementation of BYOT in the classroom. Jan revealed that "When my internet goes down I have to regroup and scramble for something to do. I depend on the Wi-Fi to work." During the two focus group sessions, participants discussed how reliable Wi-Fi was necessary to utilize BYOT. Jan expressed, “When the Wi-Fi is sporadic or not working it is very frustrating and ruins my lesson plans.”

Misuse of BYOT. Table 7 lists the codes and frequency of responses associated with the theme, misuse of BYOT. Two codes tied to the theme of misuse of BYOT included students
being off task when utilizing BYOT and monitoring student use of BYOT. The theme misuse of BYOT developed from codes that were connected with the teachers’ implementation of BYOT into their classrooms. Similar terms or responses regarding the misuse of BYOT was mentioned 18 times during the interview and focus group sessions. Through interviews, focus groups, and classroom observations, the teachers explained and demonstrated how the misuse of BYOT impacted their classrooms. During the interviews, participants revealed the misuse of BYOT by their students. Grace shared “I have to monitor my students constantly when they are using technology.” During classroom observations, I did not observe students misusing their technology; however, I did observe teachers walking around the classroom monitoring the use of BYOT to ensure students were on task. Through focus groups, 6 out of 12 participants discussed the misuse of BYOT as well as the need to increase monitoring of students’ use of BYOT. Jan explained, “I walk around the room to make sure that students are doing what they are supposed to. If I don’t one of them will get on a website that they shouldn’t.” I observed teachers monitoring their students by walking around the class throughout the class period.

Logging in and passwords. Table 8 lists the codes and frequency of responses associated with the themes of logging-in and passwords. Three codes tied to the theme of logging-in and passwords included students not remembering passwords and usernames and slowing down the pace of the classroom. The themes of logging-in and passwords developed from codes that were connected with the teachers’ implementation of BYOT into their classrooms. Similar terms or responses regarding students’ inability to log into online programs was mentioned 35 times. Through interviews, focus groups, and classroom observations, the teachers explained and demonstrated how they struggled with students’ logging-in to programs and apps on technology. During the interviews, 11 out of 12 participants mentioned how they felt
about students being unable to navigate online programs and apps regarding the logging-in process. Alice shared that her students struggled each day logging in to programs. She said, “I lose so much time in class just getting each student logged into a program or app.” During the two focus group sessions, participants discussed how frustrated they become when students cannot remember to access programs and apps on their technological devices. Emily mentioned, “There are days when getting students online does not seem worth it because it can take up so much class time.” During classroom observations, I observed teachers utilizing centers with the incorporation of BYOT. Teachers had created a system to alleviate some of the frustration they felt with the accessibility issues students had faced.

**Professional learning communities.** Table 9 lists the codes and frequency of responses associated with the theme of professional learning communities. Two codes tied to the theme of professional learning communities included meeting weekly in PLCs and collaborating with colleagues. During their interviews, 12 out of 12 teacher participants explained that they used PLCs to share and collaborate on how to implement BYOT. The theme of professional learning communities developed from codes that were connected with how teachers generated and shared ideas with their colleagues. Through interviews and focus groups, all 12 of the teacher participants explained how they shared ideas about BYOT implementation utilizing their PLCs. During the interviews, all of the participants mentioned how they shared ideas during their weekly PLC meetings. During her interview, Beth shared, "I speak weekly with the other teachers about lesson plans which include technology use." During the two focus group sessions, participants discussed how meeting weekly assisted them with the implementation of BYOT. During the focus group, Carrie mentioned, “I enjoy the time I get talking with the other
teachers about how they are using technology.” Through focus groups, 7 out of 12 participants discussed the use of PLCs to implement BYOT into their lesson plans.

**Sharing digitally.** Table 10 lists the codes and frequency of responses associated with the theme, sharing digitally. One code mentioned four times tied to the theme of sharing digitally included Facebook and email. During individual interviews, half of the teacher participants mentioned using social media as a way to share and collaborate with their colleagues. The theme sharing digitally developed from codes that were connected with the teachers’ implementation of BYOT into their classrooms. Through interviews and focus groups, the teachers explained how they utilized social media and email to share ideas with their colleagues about BYOT implementation. During the interviews, several participants mentioned how they utilized different ways to generate and share ideas about the BYOT implementation process with other teachers. During her interview, Izzy described in email and social media, “They are so helpful well I am not sure what to do. I can send a quick email or message on Facebook on I can get help.” During the two focus group sessions, participants discussed how sharing with colleagues assisted them with BYOT implementation. Lisa stated, “I like discussing and planning with the other teachers. I get good ideas.”

**Preparing students for the future.** Table 11 lists the codes and frequency of responses associated with the theme, preparing students for the future. Three codes tied to the theme of preparing students for the future included preparing students with the technological skills needed for jobs that require those skills and working in today's technology-driven society. The theme of preparing students for the future developed from codes that were connected with the teachers’ implementation of BYOT into their classrooms. Similar codes were mentioned 34 times from the individual interviews and focus group sessions. Through interviews and focus groups, the
teachers explained how they utilized BYOT to prepare students for working in a digital society. During the interviews and focus group sessions, all the participants mentioned preparing students for the future as one of the main reasons why they willingly implemented BYOT in the classroom. During her interview, Carrie shared that “students need to use technology every day to be prepared to work in the future.”

**Student interaction.** Table 12 lists the codes and frequency of responses associated with the theme, student interaction. Two codes tied to the theme of student interaction included more student buy-in to the lesson and students seemed excited to learn. The theme of student interaction developed from codes that were connected with the teachers’ implementation of BYOT into their classrooms. Similar codes were mentioned 20 times from the individual interviews and focus group sessions. Through interviews, focus groups, and classroom observations, the teachers explained and demonstrated how they utilized BYOT to improve student interaction in their classrooms. During the interviews, 12 out of 12 participants mentioned student interactions as a way in which they implemented BYOT in the classroom. During her interview, Grace mentioned that “students will work together sometimes even better when they get to use a device.” During the two focus group sessions, two participants discussed how student interaction improved with the implementation of BYOT. During the focus group session, Lisa explained that her students’ interaction improved with the use of BYOT. She said, “they don’t try to hide from learning when they are allowed to use technology.” During classroom observations, I observed teachers utilizing centers with the incorporation of BYOT to improve student interaction.
Table 2
Themes and Codes from Participant Interviews, Focus Groups, and Classroom Observations

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Participant Responses</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT/FCG/CO</td>
<td>Helped Differentiate Learning</td>
<td>DL</td>
</tr>
<tr>
<td>INT/FCG</td>
<td>Prepared for jobs in the future</td>
<td>PF</td>
</tr>
<tr>
<td>INT/FCG</td>
<td>Engaging Learning Environment</td>
<td>ELE</td>
</tr>
<tr>
<td>INT/FCG</td>
<td>Minimal training</td>
<td>MT</td>
</tr>
<tr>
<td>INT/FCG</td>
<td>The main barrier is when our internet is down</td>
<td>CR</td>
</tr>
<tr>
<td>INT/FCG/CO</td>
<td>Students can’t log in and they forget their passwords</td>
<td>LP</td>
</tr>
<tr>
<td>INT/FCG</td>
<td>Teachers have to heavily monitor</td>
<td>MU</td>
</tr>
<tr>
<td>INT/FCG/CO</td>
<td>Interactive classroom</td>
<td>SI</td>
</tr>
<tr>
<td>INT/FCG</td>
<td>Meeting weekly in PLCs</td>
<td>PLC</td>
</tr>
<tr>
<td>INT/FCG</td>
<td>Facebook and email</td>
<td>SD</td>
</tr>
</tbody>
</table>

Research Question Responses

This section includes participant responses to the central research question and three sub-questions this study sought to address. Participant responses were utilized to answer the research questions. The themes and codes that emerged from participants’ responses were connected to Rogers’ (2003) diffusion of innovations theory and Bandura’s (1977) social cognitive theory which provided the theoretical framework of this research study and was the focus of the central question, “How do elementary school teachers in the rural Southeastern United States implement BYOT within their classrooms?” and each of the three sub-questions.
<table>
<thead>
<tr>
<th>Data Source</th>
<th>Codes</th>
<th>Frequency</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Interviews</td>
<td>Helped differentiate learning</td>
<td>12</td>
<td>BYOT and differentiation</td>
</tr>
<tr>
<td></td>
<td>Affected student learning by helping kids</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Students work at their levels</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Students are not on grade level</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Individually based instruction</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Focus Groups</td>
<td>Helped differentiate learning</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Affected student learning by helping kids</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Students work at their levels</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Students are not on grade level</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Individually based instruction</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Classroom Observations</td>
<td>Students work at their levels</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>
### Table 4

*Data Source, Codes, and Frequencies for the theme of Student Engagement/Motivation*

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Codes</th>
<th>Frequency</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Interviews</td>
<td>Engaging learning environment</td>
<td>7</td>
<td>Student Engagement/Motivation</td>
</tr>
<tr>
<td></td>
<td>Moves the lesson along quickly</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Helpful to use for engagement</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Focus Groups</td>
<td>Engaging learning environment</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Helpful to use for engagement</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Classroom Observations</td>
<td>Engaging learning environment</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Helpful to use for engagement</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

### Table 5

*Data Source, Codes, and Frequencies for the theme Training*

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Codes</th>
<th>Frequency</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Interview</td>
<td>Minimal training</td>
<td>9</td>
<td>Training</td>
</tr>
<tr>
<td></td>
<td>Most of my training had been self-taught</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>We don’t have enough training</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Focus Group</td>
<td>Minimal training</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>We don’t have enough training</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
### Table 6

*Data Source, Codes, and Frequencies for the theme Challenges with Resources*

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Codes</th>
<th>Frequency</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Interviews</td>
<td>Interrupted internet service</td>
<td>8</td>
<td>Challenges with Resources</td>
</tr>
<tr>
<td></td>
<td>Wi-fi not always reliable</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The main barrier is when our internet is down</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Focus Groups</td>
<td>Interrupted internet service</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wi-fi not always reliable</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The main barrier is when our internet is down</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

### Table 7

*Data Source, Codes, and Frequencies for the theme Misuse of BYOT*

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Codes</th>
<th>Frequency</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Interviews</td>
<td>Off task easier</td>
<td>7</td>
<td>Misuse of BYOT</td>
</tr>
<tr>
<td></td>
<td>Heavily monitor devices</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Focus Groups</td>
<td>Off task easier</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Classroom Observations</td>
<td>Heavily monitor devices</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heavily monitor devices</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>
### Table 8
*Data Source, Codes, and Frequencies for the theme Logging in and Passwords*

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Codes</th>
<th>Frequency</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Interviews</td>
<td>They can’t log-in</td>
<td>12</td>
<td>Logging in and Passwords</td>
</tr>
<tr>
<td></td>
<td>Forget their passwords/email</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slows down class</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Focus Groups</td>
<td>They can’t log-in</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forget their passwords/email</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Classroom Observations</td>
<td>They can’t log-in</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forget their passwords/email</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

### Table 9
*Data Source, Codes, and Frequencies for the theme PLCs*

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Codes</th>
<th>Frequency</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Interviews</td>
<td>Meeting weekly in PLCs</td>
<td>12</td>
<td>Professional Learning Communities</td>
</tr>
<tr>
<td></td>
<td>Collaborating with Colleagues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus Group</td>
<td>Meeting weekly in PLCs</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collaborating with Colleagues</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>
### Table 10
*Data Source, Codes, and Frequencies for the theme Sharing Digitally*

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Codes</th>
<th>Frequency</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Interviews</td>
<td>Facebook and Email</td>
<td>2</td>
<td>Sharing Digitally</td>
</tr>
<tr>
<td>Focus Groups</td>
<td>Facebook and Email</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

### Table 11
*Data Source, Codes, and Frequencies for the theme Preparing Students for the Future*

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Codes</th>
<th>Frequency</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Interviews</td>
<td>Prepared for jobs in</td>
<td>12</td>
<td>Preparing students for the future</td>
</tr>
<tr>
<td></td>
<td>the future</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skills needed for jobs</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Today’s society requires technological knowledge</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Focus Groups</td>
<td>Prepared for jobs in</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the future</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skills needed for jobs</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Today’s society requires technological knowledge</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Data Source</td>
<td>Codes</td>
<td>Frequency</td>
<td>Theme</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------</td>
<td>-----------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Individual Interviews</td>
<td>More buy-in when students are in class</td>
<td>12</td>
<td>Student Interaction</td>
</tr>
<tr>
<td>Focus Groups</td>
<td>Interactive classroom/students are excited</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Classroom Observations</td>
<td>Interactive classroom/students are excited</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

**Central research question.** The central research questions were, “How do elementary school teachers in the rural Southeastern United States implement BYOT within their classrooms?” I chose this as the central focus of the research study to understand how teachers at a rural elementary school in the Southeastern United States implemented BYOT within an educational setting. I used within-case analysis and descriptive coding to categorize and analyze the individual interview responses, the focus group responses, and the classroom observation notes for the central research question. When I analyzed the data, two major themes emerged from participants’ responses: (a) the implementation of BYOT for differentiation and (b) the implementation of BYOT for student engagement and motivation. These two themes emerged in each interview. Differentiation and student engagement as well as motivation was also mentioned in the focus group sessions and made apparent during the observations as teachers implemented BYOT in their classrooms.

Each participant represented different grade levels and content areas; however, their experiences were similar. The participants' interviews provided unique information about their experiences implementing BYOT in the classroom. I listened to the participants describe how
they each implemented BYOT through the use of differentiation, something that the teachers described as extremely challenging due to the diverse student populations that they served. During her interview, Alice explained how BYOT allowed students to "pause what they are listening to allowing them to slow down and reread if they need to" creating a differentiated learning environment. Alice also mentioned that the implementation of BYOT assisted with differentiation by "freeing the teacher up to help if there's another student needing help."

Another similarity from the participants’ responses was that all teachers mentioned how they used BYOT to engage and motivate students in the learning process. All of the participants described how excited and engaged the students were when they were able to use BYOT during a classroom lesson. All participants mentioned how they utilized BYOT for classroom differentiation, student engagement, and motivation to improve student learning. During her interview, Beth explained that with the BYOT implementation the students were, “all staying on task and motivated to stay into whatever we’re doing.”

**BYOT and differentiation.** The idea of differentiation with the implementation of BYOT was a focus of the participants which became one of the themes of this study. Each teacher mentioned that differentiation was made easier with the implementation of BYOT. Hannah spoke during our interview saying, "I think the most beneficial thing is that it allows you to teach a variety of lessons and subjects and grade levels within the confines of one classroom setting. And that is very important when you do have a classroom that's full of different levels of learners that you, you've got to be able to have something that can help you with the instruction process.”

Utilizing BYOT to assist with differentiation for students was a driving force behind its use for the participants. Implementing BYOT in the classroom to help all students achieve success was described by the teachers. Kay shared during her interview that, "As mentioned earlier, dealing
with the intervention setting and varied skill levels, it is extremely beneficial to give my students skill-specific tasks while I can group students based upon ability or work 1:1 with a student."

Kay agreed during the focus group session that BYOT assisted teachers in differentiating for students. Kay specifically discussed how BYOT implementation had positively affected student learning. During our focus group session, Kay explained, "I would say, in my experience, it had enhanced student learning. I also feel like it allows me to utilize every minute of class with no downtime while students are waiting for me to work with another student."

Kay's experiences explained how beneficial BYOT implementation could be when teachers want to differentiate their lessons. Lisa described it well in the individual interview when she said, "To me, it's easier to get the lesson taught to the kids. I think it just easier for them to see it. I think it's a good instructional strategy to use, it helps keep their focus. Also, when they are doing things independently on the computer, it gives them a lot of practice on things that they need to be working on.”

In Kay’s room, during an observation, students were working on a writing task using BYOT. Kay created a writing task in which the students’ assignments were scaffolded to build on the writing skills the students already had and to improve in the areas the students showed deficits. During the teachers’ focus group, Izzy spoke of how BYOT could help teachers differentiate the curriculum for their students. She stated, "They get to do their own thing, and then so much of it is individually based. So, I think that's, that's a really good benefit.”

**Student engagement and motivation.** Data analysis from participants' interviews, focus groups, and classroom observations were used to reveal that BYOT was implemented through student engagement and motivation practices. During her interview, Grace, the participant that taught kindergarten students, described her experience with how the students reacted to BYOT
implementation. She said, "They wanted to get to the iPad, they were motivated by the 
opportunity for sure. So, they wanted to get through the other centers to get to that."

Eleven of the 12 participants discussed during individual interviews and focus group 
sessions, that the students were engaged and motivated by BYOT. During her interview, Carrie 
stated, "I think BYOT gets them excited. They get excited about learning." Carrie also noted that 
students enjoy using BYOT “Their BYOT minded in any way, you know, they all carry phones 
and so they like the technology, they prefer it.” When asked to explain further, she talked about 
observing her students while they used BYOT, “As I watched the students, most of them are 
engaged with it.”

Carrie explained during the focus group session that the classroom environment changes 
with the increase in student engagement. She described the classroom as quieter as the students 
were focused on the task assigned to them. In the focus group session, Fran also mentioned that a 
contributing factor to her decision to implement BYOT was based on how BYOT motivates 
students to learn. Fran felt that her students’ motivation to learn increased with the 
implementation of BYOT. She said, “I think it motivates students.” Fran also mentioned that 
BYOT can get students excited to learn something new, “I think it gets them excited about the 
learning.” In her interview, Hannah described the interaction between the students and BYOT, 
“I think they’re more engaged when they’re using BYOT because it keeps their attention where 
they’re not able to lose focus as easily.” During his interview, Dan explained that BYOT 
implementation helps to maintain students’ attention. During the teachers’ focus group, Dan also 
spoke of how BYOT improved students’ engagement and motivation to learn. He stated, “Well, 
they like to learn a lot better.” In her focus group session, Beth said that the students in her 
classroom “have more buy-in” into what she is teaching them. During her interview, Alice
discussed her experiences in implementing BYOT in her classroom and how student engagement improved. She stated, “I do think that student engagement went up” and “they’re engaged, they’re enjoying what they’re doing.”

Classroom observation notes had details about the implementation of BYOT in the classroom, student engagement, and motivation. Students were engaged when BYOT was implemented into a teacher's lesson plan during all twelve of the classroom observations. During Lisa's, Izzy's, Grace's, and Hannah's classroom observations, I recorded that student engagement and focus were present with the use of BYOT. During student centers and group work, students were motivated and engaged in the task when BYOT was implemented than at other center stations where BYOT was not being utilized. I even observed students as they worked quickly to complete a center station where technology was not being used to get to a center where technology was being used.

**Research question one.** The first research question was, “How do elementary school teachers perceive their preparedness and access to resources for teaching in a classroom where BYOT had been implemented in the rural Southeastern United States?” The purpose of Research Question One was to get an idea of how prepared the teachers felt about implementing BYOT, and whether teachers had access to the resources to implement BYOT into their classrooms. Within-case analysis and descriptive coding were utilized to categorize and analyze the individual interview responses, the focus group responses, and the classroom observations notes for research question one. In response to research question one, the following themes developed: (a) training and (b) challenges with resources. As shown in Tables 5 and 6, the individual interview and focus group responses along with classroom observation notes are presented regarding research question one.
Lack of training and inadequate Wi-Fi were the top two responses to research question one from the individual interviews and focus group sessions. Ten of twelve participants described receiving very little training designed toward preparing teachers to implement BYOT in their classrooms, as well as difficulties they had with reliable Wi-fi. The participants reported limited training regarding the implementation of BYOT. They also complained about the resources available, particularly the Wi-fi. Emily recalled during her interview that she had difficulty implementing BYOT, which she blamed on the lack of reliable Wi-fi. Emily stated, "Well, sometimes the technology doesn't work, you know, with the internet connection with wireless and then there are glitches with any kind of apps that you use sometimes." Unfortunately, the unreliable Wi-fi available to the participants in this study created an environment of frustration for each of them as they implemented BYOT into the classroom. Despite their frustrations with unreliable Wi-Fi, all of the participants voiced their belief in the importance of implementing BYOT and persevered through any of the challenges with resources they encountered along the way.

**Training.** During the individual interviews and focus group sessions, ten out of twelve participants described the need for training for both their students and themselves. Ten of the participants mentioned they had received little training for the implementation of BYOT, and they each had a desire for additional training. The participants’ explained that the district provided occasional training at the beginning of each school year or during a professional development day; however, they mentioned the need for additional training days. According to ten participants, BYOT training needed to occur both before and after the teacher preparation programs in college. Fran explained in her interview that she had a small amount of training while in college. “I have had a couple of courses in technology usage, in my coursework.” Dan
responded with a similar statement during his interview, “I learned everything that I know as far as BYOT in college, but I’ve picked up a lot more outside of college and by figuring things on my own.” Carrie’s interview answers were similar to Fran’s and Dan’s responses. She also received “minimal training” on BYOT while in college.

When Kay was asked to describe her training during the interview, she mentioned her training in college, as well as the training the school district had provided. “My school district had provided some training. Most of my training had been self-taught.” During her interview, Lisa said that she had a similar experience. She noted that she had to learn how to implement BYOT on her own, and she did not feel like educators were properly trained to implement BYOT. During the focus group session, Lisa stated, “I had to explore some on my own” and “sometimes I feel that we don’t have enough training.” Emily and Beth explained during their interviews that they had never really had BYOT implementation training. During her interview, Alice mentioned the need for additional training. She said, “There is a need for more training for teachers.” She went on to say that she did not think that “the teachers get enough training for them to fully implement the use of technology in the classroom.”

During an observation in Lisa’s room, she was able to implement BYOT without any issues. Therefore, it seemed that she was well trained in what she was using. This was also the case for the other five classrooms in which I observed. The participants all seemed comfortable with the BYOT that was being utilized in their classrooms. Training did not appear to be a barrier during classroom observations.

**Challenges with resources.** While the participants implemented BYOT, 12 out of 12 participants described having challenges doing so. All of the participants found that one of their biggest challenges during BYOT implementation was the inconsistency of the Wi-Fi connection.
During her interview, Beth mentioned that the "hardest part would just be to have the internet not interrupted with service". While Grace found the implementation of BYOT beneficial, she also found the use of BYOT can be challenging without a dependable Wi-Fi connection. During her interview, Grace mentioned that what she liked least about BYOT implementation is the Wi-Fi is "not always reliable." Carrie also described the Wi-Fi as a barrier while implementing BYOT during her interview. Carrie stated, "when the Wi-fi is down, it was probably the biggest problem. Or if it's slow, they can't log in." During Kay's interview, she explained that she also found a "main barrier is when our internet is down since the majority of my programs are web-based."

The frustration with non-working Wi-fi was mentioned by Lisa as well. She stated, “sometimes the internet is down or not working.” During our interview, Hannah mentioned, “Well, I think the big limitation that I’ve encountered had been internet access. If the internet goes down for whatever reason, it kind of shuts down a whole lot of the ability that the classroom had to function appropriately because you do utilize technology so much.” Dan also seemed frustrated when he mentioned how vital the dependability of internet access is to the implementation of BYOT. During Dan’s interview he expressed, “when the internet goes down, that’s all that kills my class completely because I rely on BYOT to the point of where if I cannot use technology, the class pretty much comes to a standstill.” During one of the two focus group interviews by participants, the difficulty of the Wi-fi becoming unavailable was discussed. At the time of the classroom observations, the Wi-fi was working properly; therefore, this barrier to implementation was not an issue that I observed.

**Research question two.** The second research question was, “How do elementary school teachers from the rural Southeastern United States describe their transition from a traditional
This question was developed to understand teachers' experiences transitioning to utilizing BYOT in their classrooms. For this question, I wanted to know how teachers dealt with any benefits or challenges they encountered while changing from a traditional classroom to a classroom that utilized BYOT. I wanted to understand what influenced their choice to push through any challenges they encountered, and what benefits made the transition worth the participants' effort to continue with the implementation of BYOT. I used within-case analysis and descriptive coding to categorize and analyze the individual interview responses, the focus group responses, and the classroom observation notes in response to research question two. In response to research question two, the following themes developed: (a) logging in and passwords, (b) misuse of BYOT, (c) preparing students for the future, and (d) student interaction. Tables 7, 8, 11, and 12 show the interview and focus group responses, as well as the results from the observation notes regarding research question two.

Half of the participants shared that the transition from a traditional classroom to a classroom where BYOT had been implemented was difficult at first, but was necessary to prepare their students for college and beyond. The other six participants had been teaching fewer years and did not share a difficult transition. The challenges that each participant faced varied slightly; however, the similarities of the challenges outweighed the differences. Eleven of the twelve participants mentioned that the students often needed a reminder of login and password information when using BYOT for websites or apps. This process in the transition seemed especially frustrating to the teachers, as well as time-consuming. Carrie stated that one of the “biggest problems” she had while transitioning to using BYOT is if “they can’t log in.” Once they established routines and time-saving techniques for the challenges of student login and
remembering password information, the transition from a traditional classroom to a classroom where BYOT was implemented improved, and participants spoke of how much time was being saved by using BYOT.

An additional challenge the participants faced while transitioning to BYOT implementation was that of supervising students while they used BYOT in the classroom. Balancing their time between teaching and facilitating was difficult as teachers navigated the freedom that BYOT implementation can allow. Ensuring that their students remained focused on technology while not misusing it, proves to be a difficult task. Kay mentioned during her focus group session that she “heavily monitors when students are on devices so they are held accountable for their time and to ensure that they are on task” and that it’s “sometimes a task to monitor all students while on technology.” This often led participants to change up their classroom environment to a student-led classroom rather than a teacher-centered classroom. This evolution required students to own their learning which required students to self-monitor and remain on task while using technology.

One of the benefits that the participants echoed was how with the implementation of BYOT, their students would be better prepared to work in a society based on technology. The participants agreed that it was their duty to have students utilizing technology in the classroom so that they would be as technologically savvy as possible upon leaving their classroom. The participants' belief that they were preparing students for society guided them through any challenges they faced while transitioning from a traditional classroom to a classroom where BYOT was being implemented. An additional benefit during the transition process noticed by the participants was the improvement of student interaction. Participants reported that the use of BYOT improved student interaction. During a focus group discussion, Carrie discussed the
importance of allowing students to use technology in the classroom as it prepares them for the workforce. When the group was asked about the benefits of BYOT implementation, Carrie stated, “In today's society, that's what they need to know how to use.”

**Logging-in and passwords.** The participants in this study complained about students being unable to remember their log-in and password information. Twelve out of twelve participants mentioned this as a serious challenge and frustration for them. Alice described the transition to BYOT as a task that required her to reteach students how to login to whatever app or program the students were asked to use. She explained, "I feel like sometimes we just have to refresh and remind them how to do things because they don't get it on a daily basis." She went on to say, “Just having to repeat on a regular basis how to use it” and “it takes away from classroom time whenever you have to refresh constantly.” Emily said that trying to get all the students logged into a program can be a challenge due to the time that it can take away from instruction. She stated, “Using BYOT can be challenging for teachers because it takes them away from everyone else at that time.” She also mentioned that it is “a struggle just because it goes back to not understanding how to use it or how to simply log in to an email account. Um, sometimes it can be frustrating, but then once we get past those issues, you know, it's a great time."

Lisa talked about the struggle that she faced while transitioning to the implementation of BYOT from a traditional classroom. She recounted the process, “At the beginning when the kids had to learn how to use the technology, just getting them used to how to log in, where to go, what to do.” Grace and Carrie mentioned during their focus group session how students need assistance while using BYOT. Grace discussed how technologically savvy students may help students that struggle with logging in and utilizing programs that were being used in the
classroom. She said, “There are students who get it right away. Some students have to have additional guidance. Really, it just kind of, kind of, depends on the kid and how much technology they’ve experienced.” During her interview, Beth said that the initial transition to BYOT was riddled with failure in her classroom due to confusion with student login ids and passwords; however, once she found a system that resolved the issue, she enjoyed utilizing BYOT. She recalled the experience as, “At first it was kind of like an epic fail like they all and we, they made a different login and no one could remember their passwords. And I had to like kind of sit back and think, what can I do to make this a lot more fluid?” Izzy also found that students needed to be familiarized with how to use BYOT to get into an app or website. She said, "Just getting them what I call tech-savvy as far as getting in and getting into the programs" can be difficult. She also recalled that at the beginning of each new school year she had to go back through the training process with the new group of students. She stated, “I always forget at the beginning of the year, the time and the patience it takes getting them used to and being comfortable and confident in the process of what they’re doing.”

During the focus group discussions, Kay spoke of the challenge it is to get students to log in and remember their passwords to use BYOT in the classroom. She discussed her solution to the problem, “I put their usernames and passwords on the back of a card that I've made and it's like a password thing and I had them all on a ring and it had their name and their username and password to every link that I use on the front.” Based on the data collected, the issue with students remembering their logins and passwords appears to be a major barrier to implementation for teachers, as well as a source of frustration. I did observe students utilizing teacher made username and password cards to alleviate any issues utilizing BYOT in the classroom.
**Misuse of BYOT.** Ten of twelve participants in this study agreed that the misuse of BYOT while transitioning from a traditional classroom can be a challenge. During the interviews, when asked to describe any limitations they have noticed while students were using their technology, Fran said, “I think I’m limited on the monitoring, you kind of have to have some boundaries set for them. That’s a limitation because you know, the internet, you think of it, man worldwide, you know, access to anything. So that’s hard because their phones might not have boundaries set.” Dan also found that he had to be vigilant when monitoring students’ use of BYOT to ensure that they remained on task and used the technology appropriately. He stated, "I'm all for BYOT, but it's hard to govern that many people at once and to know that they're not doing, if they're not on something they're not supposed to be on. So, keeping them on track and task is difficult. If there was a way to shut social media down completely when they come into school that would be a huge thing because then they don't have a choice." Kay mentioned during the focus group that she also feels the need to remain aware of what her students are doing when they are using BYOT to make sure that learning is taking place.

I did not observe any misuse of BYOT during the classroom observations. The participants did not mention the misuse of BYOT during either of the two focus group sessions; however, during individual interview sessions, the misuse of BYOT was mentioned. I did observe the participants struggling to monitor students while they were utilizing BYOT. Ensuring that students were on task and completing their work was also observed.

**Preparing students for the future.** 12 out of 12 participants voiced that using BYOT implementation in the classroom required thinking about their students’ futures and how the importance of this is a reason they transitioned from a traditional classroom to a classroom that implemented BYOT. It seemed that some of the participants had viewed the implementation of
BYOT in the classroom as a significant method of teaching while preparing students for a digital society. Most of my participants agreed that BYOT is meant to prepare students for their future endeavors. Dan stated in his interview, "I just think that everybody needs to be at the forefront of BYOT and rely on it. Because that's the future and we're not going backward. We’re only going forward, so you might as well get on board with it now instead of getting caught behind.” When Dan first began using BYOT he thought, “It was like going from a campfire to an electric heater as far as advanced goes”. He also stated that “as the years went, technology became more available and better”.

During his focus group session, Dan said that he was familiar with technology and comfortable implementing BYOT in his classroom, but to prepare students for the future, he believed that he must continue to improve his teaching practices. Dan stated, “The fast-paced world that we now live in, the ways that I was taught to teach are becoming obsolete.” He was adamant about the need of implementing BYOT and preparing his students for a digital society “I think there will always be an importance for knowing traditional methods, but knowing how to do it digitally is the future.” During her interview, Beth described that BYOT implementation as “frustrating if a kid doesn’t understand the technology or they don’t understand the buttons, they don’t understand maybe the word, but I feel like it’s important because I do feel like in the jobs when they become older, this is what they need to know”. She felt that understanding how to use technology was vital to the success of each students’ life. Beth explained, “They need to know how to use technology whether they’re working as a doctor or if they’re working at a McDonald’s they need to know what buttons mean and not to be scared of the computer and to feel confident and comfortable and maybe we’ll open up more job opportunities for them because they are able to work with technology”. Emily spoke of implementing BYOT to prepare
students for their future. During her interview, she explained that “technology is what the world is today and it’s something that they need and have to have” and “they need to know those skills and so many jobs require it”.

During her interview, Izzy was asked what factors contributed to her decision to use BYOT in the classroom, she said, “they need to be able to use computers” and “just the day and age we live in and going forward furthering their education.” Izzy went on to explain, “having a daughter in college and another daughter in high school doing dual enrollment classes, they’ve got to know how to operate a laptop and turn in their assignments and that kind of thing.” During her interview, Grace said she felt very strongly about the implementation of BYOT in the classroom and the impact that it can have on student preparation. She stated, “I think with the world that we live in, that its, um, the most important thing that we can do for our kids is to train them on technology because they’re going to be using technology for the rest of their lives.” She continued saying, “The devices that they’re going to need their entire lives or that they’re going to be using their entire lives should be used. I think that’s a lot more beneficial than, um, you know, just looking up definitions in a book.” Alice mentioned in her interview that she thought that “we do live in a society that technology is super important and it should be something that is readily available to our kids now.” Observation data seemed to suggest that the implementation of BYOT was taking place daily in all of the classrooms that were observed. Various devices were used in each classroom. The activities that were used while implementing BYOT were building skills that would assist in teaching students how to utilize technology for future use.

**Student interaction.** One of the identified themes emerging from the data about student interaction became abundant with the transition to the implementation of BYOT. The participants shared how the transition from a traditional classroom to a classroom that utilizes
BYOT provided them with an improved way for students to interact with one another. The student interaction with the use of BYOT was mentioned by 12 out of 12 of the participants during individual interviews. Emily mentioned during her interview how she believed that BYOT had "greatly enhanced student learning" and the students "laugh with each other." Kay and Fran also noticed that student interaction was improved with the transition from a traditional classroom to a classroom where BYOT had been implemented. During her focus group session, Kay described the interaction between the students when BYOT was being implemented, "I see students interacting well with technology and devices in my classroom. Typically, my students with behavior challenges respond well and work hard when utilizing technology" and "students respond very well when working together with technology." Alice noticed that her students interacted often with the implementation of BYOT. During her interview, She stated, "I think the biggest thing was that the students did interact more” with the use of BYOT.

When Dan was asked about the interaction between students, he replied that he found students collaborate better with the use of BYOT. During his interview, Dan said, "I feel like they develop more of a discussion" and "there's more of a conversation generated between themselves." Grace noticed that students were willing to help one another while using BYOT which builds a relationship between the students. While in a focus group she said, "I mean a lot of times they help each other even when they're not using technology." During our interview, Hannah was positive with her description of student-to-student interaction with the implementation of BYOT. She stated, "I think you can have really good, meaningful group discussions utilizing BYOT. I think it enhances the discussion."

During all of the classroom observations, I did find that student interaction was increased with the use of BYOT. Students wanted to show one another what they had accomplished while
using technology. I found that this interaction was not always encouraged by the teacher. Although student interaction was due to discussing material that was on topic, the teacher was not pleased with the side conversations. During the two focus group sessions, participants mentioned different activities in which they implemented BYOT to improve student interaction which for the most part involved game-based learning. Beth said, “It's not just math, it's like more of a game. But they're still learning math. So, they want to do it. But, sometimes they don't realize they're doing reading and math or science or social studies. They just want to do the game.”

**Research question three.** The third research question was, “How do teachers generate and distribute cooperative ideas among colleagues about BYOT?” This question was developed to understand how teachers collaborated about the implementation of BYOT in their classrooms. For this question, I wanted to know how teachers shared ideas about BYOT implementation. I wanted to understand what methods the participants used to create and communicate the ways in which they implemented BYOT. Within-case analysis and descriptive coding were implemented to categorize and analyze the individual interview responses, the focus group responses, and the classroom observations notes in response to research question three. All of the participants shared how they discuss ideas and collaborate with their colleagues. Each participant shared similarities when they spoke of how they communicated with other teachers about the implementation of BYOT. Participants discussed using (a) professional learning communities (PLCs) as well as (b) sharing digitally through email and social media with other teachers about BYOT.

**PLCs.** The focus of this research was on rural elementary school teachers. The final themes were determined from the data gathered on how the participants shared ideas with their
colleagues about BYOT. Participants revealed that the use of PLCs was a common way to collaborate with one another about BYOT implementation. In this school district, PLCs are a required time for teachers to share with one another. Kay stated, “We collaborate officially once a week during PLC’s. Some of the participants had more PLC time than others; however, each participant had PLC time in common. During the two focus group discussions, the participants revealed how they shared ideas and collaborated about the implementation of BYOT during their weekly PLCs. Most participants had PLCs with their grade level colleagues, while a few had them with content-specific teachers. Only one of the participants disclosed that he did not have an opportunity to share with his colleagues weekly.

**Sharing digitally.** The other 11 participants conveyed that they spoke with their colleagues weekly and few even mentioned that they communicated daily with other teachers via email or social media about the implementation of BYOT. Dan explained during his interview, He mentioned that he does not meet often with the other art teachers to share ideas as they work in different schools so the use of social media was a useful tool to utilize for collaboration.

Alice and Jane revealed during their focus group that they collaborate with their colleagues via email. During our interview, Kay was asked how often she collaborates with her co-workers on BYOT implementation in lessons. Kay stated, “we collaborate daily via email about lessons and how we will implement BYOT.” During her interview, Carrie shared that she spoke with her colleagues “all the time” utilizing email. Hannah gave a similar response in her interview. She stated, “Well, with my colleagues using BYOT had been constant collaboration, because you’re always trying to challenge each other with what new options are available out there. You have to have constant collaboration to know what works and what doesn’t work.”
During the two focus group discussions, the participants discussed how they shared ideas and collaborated about the implementation of BYOT. Jane stated, "I've created a group on Facebook and my colleagues are good about putting research things on there. She comes across like, you know, how to help your students be better or just, you know, things like that. We'll put it on there and you know, that's kind of helpful."

Summary

Chapter Four described the results of the data collection that sought to understand how teachers at a rural elementary school in the Southeastern United States implemented BYOT. After reviewing the data, the central research question and three sub-questions were answered using data from individual interviews, two focus group sessions, and the classroom observations. The three research questions supported the central research question, “How do elementary school teachers in the rural Southeastern United States implement BYOT within their classrooms?” Ten themes emerged during the data analysis: (a) BYOT and differentiation, (b) student engagement and motivation, (c) training, (d) challenges with resources, (e) logging in and passwords (f) misuse of BYOT, (g) preparing students for the future, (h) student interaction, (i) professional learning communities, (j) sharing digitally. These themes provided insight for rural elementary school teachers who want to implement BYOT into their classrooms. The data offers understanding into how to implement BYOT in a rural elementary school. Through analyzing the information given by 12 participants from a rural elementary school, teachers who had implemented BYOT in their classrooms were encouraged by the many benefits that they had experienced. They also felt that the challenges they faced may have been frustrating at times, but they can continue to implement BYOT because of the positive impact it had on the classroom environment. Participants experienced many benefits from BYOT implementation. They
mentioned the ability to differentiate for students, an increase in student engagement and motivation, preparing students for the future, and an increase in student interaction. Participants also had barriers to BYOT implementation. Participants mentioned training, challenges with resources (particularly Wi-Fi), students logging in and knowing their passwords, and misuse of BYOT as the main barriers to BYOT implementation.

While examining the theme of BYOT and differentiation, participants discussed how BYOT implementation had provided them with a successful way to differentiate content for their students. This success shows how valuable BYOT may be in the classroom. The second theme focused on student engagement and motivation. Participants discussed how the implementation of BYOT improved student engagement and motivation. Participants reported that students were engaged in the lesson and motivated to complete their assignments. The third theme, training, provided an insight into how the participants described the lack of training that they received on the implementation of technology into their classrooms. Teachers were training themselves as they went while learning the best strategies to implement BYOT into the curriculum. Another theme, challenges with resources, was used to reveal one of the barriers of BYOT implementation in the classroom. Participants reported having multiple issues with Wi-fi reliability. The next theme, logging in and passwords, discussed the struggle teachers had while attempting to get students logged into BYOT to use in the classroom. Because students could not remember their usernames and passwords, teachers wasted instructional time trying to get every student into the program or app they needed to use to complete the assignment. Participants realized they needed to create a method to streamline this process so that it was less of a barrier to BYOT implementation in the classroom. The sixth theme, misuse of BYOT, was an ever-present issue within the classroom. Participants had to remain vigilant to ensure students were
utilizing the technology appropriately and remaining on task so that learning was taking place. The next theme, preparing students for the future, was part of the transition process from a traditional classroom to a classroom that implemented BYOT. The participants felt that they had a responsibility in preparing students to work in a digital society. Because the teachers know how interwoven technology is in their students’ lives, they felt strongly that the transition they made from a traditional classroom to a classroom that implements BYOT was vital to the future success of their students. The eighth theme, student interaction, was increased after the transition to a classroom where BYOT had been implemented. Participants described the improvement in student interaction with the utilization of BYOT. Finally, the last two themes discussed professional learning communities and how teachers share ideas digitally. Participants reflected on their use of PLCs to share and collaborate with their colleagues about new ideas for BYOT in the classroom, as well as how they shared ideas via email and through social media.

The results, data analysis, and experiences of the participants’ implementation of BYOT at a rural elementary school are described in Chapter Four. The data was used to reveal that although the participants encountered challenges to BYOT implementation, the participants were still successful utilizing BYOT in their classrooms to prepare students to work with technology in the future. Participants shared similarities of the BYOT implementation process into their classrooms and although they had challenges with resources and misuse of BYOT by students, participants felt confident with the implementation of BYOT into their classrooms. Participants also felt certain that by transitioning to a BYOT classroom, they were preparing students to work in a digital society.
CHAPTER FIVE: CONCLUSION

Overview

The purpose of this qualitative single case study was to understand how teachers at a rural elementary school in the Southeastern United States implemented BYOT within an educational setting. Twelve participants from a rural elementary school in the Southeastern U.S. participated in this study. All of the participants had at least five years of teaching experience. Two of the participants had five to nine years of teaching experience. Seven of the participants had ten to nineteen years of teaching experience. Finally, three of the participants had 20 plus years of teaching experience. Each participant held a bachelor’s degree. Four of the teacher participants had master’s degrees. All teachers participated in the individual interviews and focus group sessions. All 12 participants were involved in the classroom observation portion of the data collection process. All the data were analyzed using within-case analysis and descriptive coding. This chapter begins with a summary of the findings as pertinent to the nine identified themes, relevant literature, Rogers’ (2003) diffusion of innovations theory, and Bandura’s (1977) social cognitive theory. The last two of which guided this study. A description and discussion of limitations are given and recommendations for future research are provided.

Summary of Findings

Using the analysis of the participants’ responses during the individual interviews, two focus group sessions, and classroom observations, nine themes were identified about how teachers at a rural elementary school in the Southeastern United States implemented BYOT within an educational setting. These themes are as followed: a) BYOT and differentiation, (b) student engagement and motivation, (c) training, (d) challenges with resources, (e) logging in and passwords (f) misuse of BYOT, (g) preparing students for the future, (h) student interaction,
(i) professional learning communities and (j) sharing digitally. Although participants had different degrees, taught different grades, and had varying years’ teaching experience, similarities emerged from the data. Additionally, the research questions guiding this study were influenced by Rogers’ (2003) diffusion of innovations theory and Bandura’s (1977) social cognitive theory.

The central question guiding this case study was: How do elementary school teachers in the rural Southeastern United States implement BYOT within their classrooms? All participants revealed unique insight into how they implemented BYOT within their classrooms. From the analysis of individual interviews, two focus groups, and classroom observations, two themes emerged that assist in addressing the central question. The two themes that emerged were: the implementation of BYOT for differentiation and (b) the implementation of BYOT for student engagement and motivation.

Bandura (1977) stated that individuals learn new ideas by watching others. The teachers shared that through observation of their students’ behavior when implementing BYOT they learned to utilize BYOT to improve student engagement and motivation. One participant, Grace, mentioned that she took note of the change that the implementation of BYOT had on other teachers’ center time and she was willing to do the same to improve her classroom environment. Additionally, the participants took the same approach and began to implement BYOT into their classrooms through centers as well as other activities.

The first sub-question for the study was, How do elementary school teachers perceive their preparedness and access to resources for teaching in a classroom where BYOT has been implemented in the rural Southeastern United States? According to research, teachers report receiving very little training on implementing technology into the classroom (McGarr & Ó
Gallchóir, 2020; Sen & Ay, 2017). For the participants in this study, being prepared to implement BYOT into the classroom as well as having on-going training focused on BYOT implementation was a barrier to implementation. Several research studies supported the need for on-going technology training to ensure successful classroom implementation (Bakir, 2016; Kim, et al., 2017; Wright, 2017; Xie et al., 2017). All of the participants discussed receiving limited training regarding BYOT implementation which left them feeling apprehensive about implementing technology in their classrooms. Beth, Carrie, Dan, Emily, Fran, Kay, and Lisa all spoke about the need for additional training in order to implement BYOT successfully in their classrooms.

The second sub-question for the study was, “How do elementary school teachers from the rural Southeastern United States describe their own transition from a traditional classroom to a classroom where they have implemented BYOT?” According to research, the transition from a traditional classroom to a classroom where BYOT had been implemented can be challenging but important to prepare students to work in the 21st century (Swallows, 2017; Swart, 2017). Teachers today are pressured to prepare students with the technological skills to work in a digital society (Kayalar, 2016; Swallows, 2017). The participants in this study felt that the transition from a traditional classroom to a classroom where BYOT had been implemented had benefits as well as challenges. Participants believed that BYOT implementation assisted them in preparing students to use technology in both a college and career setting. Several research studies support the transition from a traditional classroom to a classroom in which technology has been implemented to assist in preparing students to work with technology (Kayalar, 2016; Patrick & Sturgis, 2015; Swallows, 2017;). The participants in this study also revealed that student interaction was a benefit from the implementation of BYOT. According to research, student
interaction increases with the implementation of technology in the classroom (Krishnan et al., 2018). The participants reported two challenges during BYOT implementation. They revealed that students are unable to log-in to programs and apps because they cannot remember their passwords and the misuse of BYOT.

The third sub-question for the study was, “How do teachers generate and distribute cooperative ideas among colleagues about BYOT?” This question addressed how teachers share ideas with one another about the ways they implemented BYOT into their classrooms. Generating and distributing ideas among their colleagues about BYOT occurred in multiple ways. Teachers mentioned using PLC time as well as email and social media sites to gather and share ways to utilize BYOT in their classrooms. Teachers share ideas with one another to improve their lessons using technology (Pierce & Cleary, 2016). Collaboration assists teachers when implementing new strategies and ideas (Bandura, 2001; Rogers, 2003).

**Discussion**

The purpose of this qualitative single case study was to understand how teachers at a rural elementary school in the Southeastern United States implemented BYOT within an educational setting. This study’s findings focused on how teachers at a rural elementary school implemented BYOT in the classroom. The research included individual interviews, focus group interviews, and classroom observations. I audio-taped and transcribed the individual interviews and focus group interviews. With-in case analysis and descriptive coding were used to analyze the data. As the data was reviewed, themes emerged from the analysis of data. The results were represented both textually and visually in tables.
Theoretical

The purpose of Rogers’ (2003) diffusion of innovations theory was to examine how ideas were shared through diverse groups of people. The participants in this research study implemented and shared ideas about BYOT into their classrooms. I used the diffusion of innovations theory to guide this research, and I focused on elementary teachers’ perspectives on the implementation of BYOT in the classroom. This study supported Rogers’ (2003) diffusion of innovations theory to assist in understanding possible barriers to technology implementation in a rural elementary school classroom setting. I also used Rogers’ DOI theory to understand what changes BYOT implementation has had in a rural elementary school classroom setting.

The diffusion of innovations theory represents what happened when a new idea was implemented into a social construct. Rogers (2003) used the diffusion of innovations theory to explain how individuals share ideas through groups of people. The diffusion of innovations theory connects to the implementation of BYOT in the classroom through the teachers’ preparedness and access to technological resources and how the teachers generated and distributed cooperative ideas among their colleagues. The participants discussed their training, challenges with resources, and how they shared ideas with colleagues about BYOT implementation through their responses to the interview and focus group questions.

While ten out of twelve participants described receiving very little training designed toward preparing teachers to implement BYOT in their classrooms, the participants were willing to implement BYOT into their classrooms. Participants expressed the need for additional BYOT implementation training and how much of what they knew about BYOT implementation they had learned in college courses or had taught themselves. The participants’ responses to the interview and focus group questions supported the literature found about the importance of
training for technology implementation to be successful (Bakir, 2016; Kim et al., 2017; Wright, 2017; Xie, et al., 2017). Twelve out of 12 participants in this study revealed that unreliable Wi-Fi was a barrier that they faced implementing BYOT. Researchers stated that reliable Wi-Fi was essential for BYOT implementation (Smadi et al., 2020). Eleven of the 12 participants mentioned that they met weekly in PLCs to share ideas with their colleagues about BYOT implementation. The results of this single case study correlated with Rogers’ (2003) diffusions of innovations theory. Rogers (1995) explained that individuals adopt innovations in three ways: personal research, interaction with other individuals, and change agents. Adoption of innovation is a process. The teachers in this single case study relied on their own research of BYOT, as well as the interactions with colleagues and other individuals that were willing to implement BYOT in their classrooms first before the participants began implementing BYOT themselves.

The purpose of Bandura’s (1977) social cognitive theory was used to describe how individuals learn using observation and modeling. The participants in this research study implemented and shared ideas about BYOT into their classrooms. I utilized Bandura’s social cognitive theory to understand how and why BYOT implementation impacted the rural elementary classroom learning environment. This study supported Bandura’s (1977) social cognitive theory in understanding how teachers shared their ideas on how they implemented BYOT into their classrooms with colleagues. The participants in this single case study agreed that as they became familiar with BYOT, or observed other teachers that had implemented BYOT into their classrooms, they were able to utilize the technology with improved confidence. Teachers' confidence in implementing technology in the classroom is essential to their willingness to share their knowledge about BYOT implementation with colleagues (Kayalar, 2016).
Social cognitive theory examined how individuals learn and accept new ideas from observing and modeling others’ actions. Bandura (1977) used social cognitive theory to explain how individuals choose to learn new ideas by watching others. The social cognitive theory connected to the implementation of BYOT in the classroom via the teacher’s generation and distribution of cooperative ideas among their colleagues. The participants discussed how they shared ideas with colleagues about BYOT implementation through their responses to the interview and focus group questions.

Twelve out of twelve participants described collaborating with their colleagues through either PLCs or social media. Participants expressed the need for time with colleagues to discuss methods for BYOT implementation. The participants’ responses to the interview and focus group questions supported the literature found about the importance of collaboration for BYOT implementation (Brown & Hocutt, 2015; Evseeva & Solozhenko, 2015; Kearney et al., 2015; Pierce & Cleary, 2016; Turvey & Hayler, 2017). Twelve out of twelve participants in this study revealed that PLCs and social media were useful for sharing ideas about BYOT implementation with colleagues. Eleven of the 12 participants mentioned that they met weekly in PLCs to share ideas with their colleagues about BYOT implementation. Researchers have found that collaboration between teachers was important and that technology used as a tool in the classroom improved collaboration between teachers (Holmes et al., 2015; Reychav & Wu, 2015). The results of this single case study correlated with Bandura’s (1977) social cognitive theory. Bandura (1977) explained that individuals learn through observation and social interaction. Teachers in this single case study relied on social interaction with colleagues for support for the implementation of BYOT.
Empirical

In a study completed by Urban and Falvo (2016), the researchers found that technology helped students learn new concepts. All participants in this study indicated that student learning was improved with the implementation of BYOT. Today’s students have diverse learning needs (Swanson et al., 2020; Wan, 2017). Researchers indicated that BYOT assisted teachers with differentiation (Swanson et al., 2020). One participant in this study discussed that her students all learned at different grade levels. All of the 12 participants in this study indicated that BYOT implementation helped them differentiate the curriculum in their classrooms. According to a participant in this study, the ability to differentiate using BYOT maximized instructional time because students could work at their own levels versus students completing assignments that are too advanced; therefore, taking the entire class period to complete the assignment. Participants described using BYOT to assign work at varying grade levels through the use of online programs. One participant revealed that she used BYOT as a quick way to assign work using online learning programs that meet the diverse learning needs of each student in the classroom. She described how the online programs can determine particular learning deficits for each student which then pinpointed gaps and prescribed the precise assignment the student needed to close their individual learning gaps. This assisted them with differentiating for multiple students simultaneously, which according to the participants’ responses saved time for the teachers and students.

Researchers found that differentiation may mean more planning time for teachers (Maeng, 2017). According to Maeng (2017) technology was vital in the teacher's planning and implementation of a differentiated curriculum. Studies have also shown that BYOT is utilized by teachers to differentiate lessons for students (Alsaeed, 2017; Braisel et al., 2016; Cabus et al.,
According to participants in this study, the use of differentiated lessons helped students of all learning abilities feel successful.

Technology is used to engage and motivate students to learn (Li, 2017). Technology has been shown to improve student engagement within the classroom (Baszuk & Heath, 2020; Carver, 2016; Collins & Halverson, 2018; Compton & Almpanis, 2018; Dana & Yendol-Hoppey, 2020; Maher & Twining, 2017; Plass et al., 2015). The research suggested that student engagement, motivation, and learning increased with the implementation of technology (Bond, et al., 2020; Carver, 2016; Dana & Yendol-Hoppey, 2020; Downes & Bishop, 2015; Hsieh et al., 2015; Kim & Downey, 2016; Zimlich, 2015). According to Muis et al., (2015), implementation of technology into the elementary school classroom setting improved student engagement. According to participants in this study, the implementation of BYOT assisted them in creating an engaging and motivating learning environment. Witecki and Nonnecke (2015) found that students that used technology remained engaged while the students that did not have technology did not remain engaged in the lesson. Another participant added that the classroom environment changes with the implementation of BYOT. She described how students engage with one another in conversations about the assignment. She mentioned that students seem less interested and unmotivated to learn. One participant discussed that her kindergarten students get excited and begin to ask her questions about the lesson when they realize that they will be utilizing technology to complete their assignments. She described how their excitement to learn using BYOT resulted in increased student engagement. She also explained that student engagement and motivation increased with BYOT.

Technology implementation has been reported to overwhelm teachers (Ruggiero & Mong, 2015). The research suggested that the use of technology implementation is related to how
comfortable individuals are with utilizing technology (Kena et al., 2015). Current researchers discussed the idea that training is necessary in order for teachers to implement BYOT (Bakir, 2016; Kim et al., 2017; Smadi et al., 2020; Wright, 2017; Xie et al., 2017). Teachers desire training to feel more at ease when implementing technology and using technology on a regular basis (Braisel et al., 2016; Dolan, 2016; Ruggiero & Mong, 2015; Sen & Ay, 2017; Tallvid, 2016; Urban & Falvo, 2016). The participants of this study reported limited training regarding the implementation of BYOT. Ten of twelve participants described receiving very little training designed toward preparing teachers to implement BYOT in their classrooms. According to ten participants, BYOT training needed to occur both before and after the teacher preparation programs in college. One participant explained during her interview that she had a small amount of training while in college. Two other participants explained that they had training in college as well as training that the school district had provided. Other participants expressed the need for additional training. The results of this study have shown that BYOT training is needed to assist teachers with BYOT implementation.

While training for BYOT implementation has been found to help teachers (Bakir, 2016; Kim et al., 2017; Wright, 2017; Xie et al., 2017) the participants in this study also struggled with resources, particularly reliable Wi-Fi needed for BYOT implementation. The research suggested that adequate Wi-Fi was necessary for the implementation of technology in the classroom (Smadi et al., 2020). Strong internet connectivity supports the implementation of BYOT (Smadi et al., 2020). While the participants implemented BYOT, 12 out of 12 participants described having challenges doing so. All of the participants found that one of their biggest challenges during BYOT implementation was the inconsistency of the Wi-Fi connection. One participant mentioned that the internet service was a barrier to BYOT implementation in her classroom.
Another participant, Carrie, also described the Wi-Fi as a barrier while implementing BYOT. All participants mentioned their frustration with non-reliable Wi-fi.

Research conducted on BYOT implementation suggested that utilizing technology in the classroom, despite the challenges, prepares students to work in a digital society (Davison & Lazaros, 2015; Song et al., 2016; Zhao, 2015). Eleven of the twelve participants mentioned that a big challenge for them was their students often needed assistance with their login and password information when using BYOT for websites or apps. One participant stated that the process of logging into online programs and apps could be time-consuming. Two other participants suggested that students that know how to login can assist other students with their login information. Even though students struggle to use technology at times, they acquire skills needed to work in a digital society (Patrick & Sturgis, 2015; Shmatko, 2016; Swallows, 2017). Allowing students to utilize their own technology in the classroom, despite struggling to login or remember their passwords, creates an opportunity for them to enhance their technical knowledge, which prepares them for the workforce (Kilinc et al., 2016).

The research suggested that students sometimes utilize technology inappropriately in the classroom (Attia et al., 2017). Ten of the twelve participants stated that the misuse of BYOT could be difficult. Teachers often have to use instructional time to redirect students’ attention when utilizing technology in the classroom (Kay et al., 2017). O'Bannon and Thomas (2015) also found that teachers felt overwhelmed with supervising students while they utilized technology. Participants in this study shared that the use of online monitoring tools as well as physically monitoring the students alleviated some of the stress associated with the constant supervision of the students as they utilized BYOT. Participants in this study found that monitoring BYOT was a challenging task. Another participant found that he had to constantly monitor his students’ use
of BYOT so that his students remained on task and using their devices responsibly. In another study by Attia et al. (2017), researchers found that the distractions from technology implementation could be reduced by creating classroom policies and rules. One participant described having to set expectations for her students to ensure that they use technology for learning. She described having little to no issues with the misuse of BYOT once she established her classroom rules and expectations regarding the use of technology. When rules are established and followed, technology use may be beneficial (Iftakhar, 2016).

The research suggested that preparing students for a digital society was important (Patrick & Sturgis, 2015; Swallows, 2017). Leinonen et al. (2016) stated that society has a growing interest in the use of technology within the classroom. All of the participants expressed that using BYOT implementation in the classroom required thinking about their students’ futures and how the importance of this is a reason they transitioned from a traditional classroom to a classroom that implemented BYOT. Research has determined that today’s educators must help students with technological skills (Davison & Lazaros, 2015; Halili et al., 2019; Song et al., 2016; Zhao, 2015). One participant stated that he thought BYOT was important and that teachers should rely on its use in the classroom to prepare students for the future. Another participant described how developing technological skills in her students is important and prepares them to work in multiple fields. BYOT implementation increases the technological skills students need to obtain jobs (Kayalar, 2016; Patrick & Sturgis, 2015; Swallows, 2017). All of the participants echoed this thought and shared that the use of BYOT in the classroom prepared their students for college and beyond.

Current literature focused on technology implementation suggested that technology improved student interaction in the classroom (Bickle & Rucker, 2018). An identified theme that
emerged from the data was how student interaction improved with the implementation of BYOT. Technology increased student-to-student interaction (Bickle & Rucker, 2018). Researchers suggested that utilizing technology in the classroom could improve student interactions (von Davier et al., 2017). The participants in this study shared how BYOT increased student interaction when compared with a traditional classroom setting in which BYOT had not been implemented. One participant shared that her students began to share and learn together to improve enthusiasm with the use of BYOT. Two other participants noticed their students’ interaction improved when they implementation BYOT. Additionally, other participants described students worked well together during challenging assignments when they utilized BYOT. Some participants discussed how student conversations improved. One participant recognized that student interactions improved with the use of BYOT during game-based learning.

Researchers indicated that collaboration between teachers was beneficial and important (Evseeva & Solozhenko, 2015; Kearney et al., 2015; Moon, 2018; Pierce & Cleary, 2016; Turvey & Hayler, 2017). Teachers often share with one another to improve lessons for their students. Collaborating with colleagues and sharing ideas can assist others that are unsure about implementing a new idea (Bandura, 2001; Rogers, 2003). Participants in this study revealed that they shared ideas with their colleagues and BYOT implementation through PLCs, social media, and email. Research has shown that teacher collaboration improves a classroom learning environment (Owen, 2015). According to Moon (2018), when teachers collaborate about technology, student learning can improve. All 12 participants discussed how the use of PLCs was required by the school district and had become a way to collaborate weekly about BYOT implementation with one another. Only one participant shared that he did not get to collaborate
weekly with his PLC group. He mentioned that he was the only teacher in his building that taught art, so he shared digitally with colleagues more often than he shared via PLCs. Three other participants revealed that they collaborated through email as well as weekly during their PLCs. Other participants mentioned using social media to share ideas about BYOT implementation with colleagues. Brown and Hocutt (2015) found that technology has helped teachers collaborate with one another. This collaboration has improved student learning outcomes (Owen, 2015).

**Implications**

The purpose of this qualitative single case study was to understand how teachers at a rural elementary school in the Southeastern United States implemented BYOT within an educational setting. Examining how rural elementary school teachers implemented BYOT into their classrooms provided valuable information for teachers, students, and stakeholders for the implementation of BYOT. The findings of this research have theoretical, empirical, and practical implications to consider.

**Theoretical**

Theoretical implications are made up of the two theories used in this study. These theories were Rogers’ (2003) diffusion of innovations theory and Bandura’s (1977) social cognitive theory. This research study provided an understanding of how rural elementary school teachers implemented BYOT in their classrooms. This research study added insight into Rogers’ diffusion of innovations theory. Rogers believed innovations were implemented through a multi-step adoption process. Rogers (1995) argued that individuals adopted innovations through personal research, interaction with other individuals, and change agents. Participants explained their willingness to implement BYOT. They desired training, valued advice from colleagues, and
taught themselves how to utilize BYOT and the programs and applications that helped their students learn. Through these methods of BYOT implementation, participants worked together to implement BYOT, use self-teaching methods, acquired technological skills, and a willingness to implement BYOT into their classrooms. The participants’ commitment to learn about the technology and seek advice and technological knowledge from their colleagues, supported Rogers’ (2003) diffusion of innovations theory as the participants implemented BYOT into their classrooms.

Participants uncovered how they had implemented BYOT into their classrooms. The teachers continually shared that they spoke with colleagues weekly to gain knowledge of how to implement BYOT in their classrooms. The participants explained how they learned from other teachers about ways they could implement BYOT into their lessons. They would utilize PLC time to discuss methods of implementation and as their colleagues discussed the implementation of BYOT, they learned from one another. They would also observe their students using BYOT to identify useful methods of implementation and possible adjustments to other methods. This research study adds to Bandura’s concept of observational learning and provides insight on social cognitive theory through the participants’ social interaction while sharing with their colleagues how they implemented BYOT in their classrooms. The participants' actions aligned with the SCT theory. Teachers utilized SCT to implement BYOT as they learned new information regarding BYOT from colleagues and observing their students utilizing BYOT in the classroom.

**Empirical**

Researchers addressed the implementation of BYOT in middle and high schools (Song et al., 2016; Song & Wen, 2018); however, few studies focused on the implementation of BYOT in
rural elementary schools (McLean, 2016; Pollock & Al-Bataineh, 2018). Teachers are expected to utilize technology to assist students in building technological skills. Students must have the technological knowledge to be prepared for college and career (Swallows, 2017). Teachers play an important role in preparing students to work in a digital workplace (Davison & Lazaros, 2015; Song et al., 2016; Zhao, 2015). Although there is abundant research on technology implementation at the high school and middle school level, there is little research about technology implementation at the elementary school level (Davison & Lazaros, 2015; Song et al., 2016). My research study has revealed how participants successfully applied differentiation strategies while implementing BYOT at the elementary school level.

My study contributes to the literature on BYOT implementation through the experiences of the participants. This research study uncovered how rural elementary teachers implemented BYOT for the purpose of improving student engagement and motivation. Participants discussed how student engagement and motivation improved with the use of technology in the classroom. Participants discussed how they observed their students’ motivation to learn and excitement about learning increased with the use of BYOT. Current research also indicates that teachers want training on BYOT implementation (Bakir, 2016; Kim et al., 2017; Wright, 2017; Xie et al., 2017). Participants in this research study also stated their desire and need for training on the use of BYOT in the classroom. This study contributed to the current understanding of how teachers lack training on BYOT implementation and want more training on the subject. Ten out of 12 participants wanted more training for technology implementation. They believed that an increase in training would help them feel more confident in utilizing BYOT in the classroom more often and in new ways. Participants also expressed that the technological knowledge they did have originated from what they had learned in college or what they had acquired with teaching
experience. The data in this study was used to indicate that this research correlated with the literature available on technology training for teachers.

As teachers implement BYOT, they are becoming aware of the resources available to them. Adequate, reliable resources are important for teachers to successfully implement BYOT (Smadi et al., 2020). This study also added to existing research that participants revealed that a major barrier for BYOT implementation is unreliable Wi-Fi. Based on this research study, the BYOT implementation process involves teaching students how to utilize their technology to learn. Eleven of the twelve participants revealed that the instructional time was lost trying to assist students attempting to log onto websites and apps via BYOT. However, participants explained that they created ways to alleviate the issue. Teachers could apply what the participants in this study learned about the issues of logging in and accessing student passwords to save lost instructional time.

The participants in this study shared how rural elementary teachers implemented BYOT for the purpose of improving student interaction. Beth mentioned how student interaction increased with BYOT implementation especially during game-based learning. According to research, game-based learning has shown to improve student interaction (Hebert et al., 2018; Sung et al., 2018). Although student engagement increased with the implementation of BYOT, the participants found that they had to monitor students closely to ensure that they were on task.

Participants in this study revealed how rural elementary teachers shared ideas and strategies to implement BYOT in their classrooms. Research finds that teacher collaboration is essential to the BYOT implementation process (Kearney et al., 2015; Turvey & Hayler, 2017). The participants reported meeting weekly during their assigned PLC time to collaborate and share ideas about how to implement BYOT in their classrooms. The participants also revealed
that they utilized email and social media to share ideas and strategies regarding BYOT implementation. Teachers that are planning to implement BYOT may find the results of this study helpful regarding teacher collaboration.

**Practical**

This research study focused on four research questions. The results of this study suggested that rural elementary school teachers share similar experiences implementing BYOT into their classrooms as determined by the common themes that emerged from the data analysis. In order to prepare students to work in a digital workforce, it is vital to understand how rural elementary school teachers implement BYOT in their classrooms. The findings in this single qualitative case study have practical implications for teachers, students, and other stakeholders in the rural educational setting. The twelve teacher participants in this study provided insight into their experiences implementing BYOT into their classrooms.

**Teachers.** All of the participants were rural elementary classroom teachers. They all taught educational levels between kindergarten and 5th grades. This research study provided an understanding of how rural elementary school teachers implemented BYOT in the classroom. Teachers shared how they learned and shared ideas by working with their colleagues. The participants in this study did not allow the lack of training or the lack of technological knowledge to prevent them from implementing BYOT in their classrooms. This is an important consideration for teachers that may be thinking of implementing BYOT in their classrooms. Participants expressed that training was vital to the implementation of BYOT. Elementary school teachers that want to implement BYOT into their classrooms could gain knowledge about the implementation process from reading this research study. They may also gain information about the purpose of implementing BYOT into their curriculum. Teachers could also learn how to
share ideas with their colleagues about implementing BYOT in their classrooms. The teachers in this study shared how valuable their weekly PLC meetings and communication via email and social media were to the implementation of BYOT. Teachers that read this research may determine that the method of collaboration that the teachers in this study utilized would be beneficial to duplicate in their own efforts to implement BYOT. BYOT training is vital for BYOT implementation in the classroom (Bakir, 2016; Kim et al., 2017; Wright, 2017; Xie et al., 2017).

**Students.** The participants in this study revealed that BYOT implementation by rural elementary school teachers improved student engagement and motivation. Participants discussed how their students were engaged and motivated to learn with the implementation of BYOT. The participants explained that their students’ engagement and motivation seemed to improve with the implementation of BYOT. Students may benefit from the findings of this study as more teachers and schools determine that the implementation of BYOT and other technology may improve students’ learning experiences and therefore better prepare them for college and career (Swallows, 2017; Swart, 2017). This study could lead to an increase in the use of BYOT in the classroom which could create an engaging classroom environment that may increase students’ motivation to learn. This study could increase differentiation in the classroom which could improve student learning outcomes.

**Stakeholders.** Parents, school board members, county commissioners, and the director of schools were considered stakeholders for this study. Stakeholders make decisions about how funding is distributed and utilized. For teachers to implement BYOT they need resources like reliable Wi-Fi. It is vital that stakeholders understand the importance of technology implementation and the resources needed in an educational setting. Stakeholders may benefit
from this research because it could provide the information needed to make decisions based on funding for educational programs and technology. Stakeholders may also gain insight into what is needed to support students and teachers as BYOT is implemented into classrooms.

Administrators and instructional coaches. The participants in this study revealed that a barrier to BYOT implementation for rural elementary school teachers was training. Participants discussed how their need for additional training was necessary for the implementation of BYOT. The participants explained that additional training would be beneficial as they utilized new programs and apps with BYOT. Administrators and instructional coaches may benefit from the findings of this study. It was determined that teachers desired additional training on the use of BYOT in the classroom. Administrators and instructional coaches often lead and organize professional development and training, so with this knowledge they could properly plan for the training that teachers desire. This study could lead to an increase in training with the use of BYOT in the classroom which could assist teachers with implementation in their classrooms.

Delimitations and Limitations

Delimitations

According to Mauch and Birch (1993), a delimitation is "controlled by the researcher" (p.103). Researchers may use delimitations to ensure that the participants meet the criteria required to participate in their study. I used delimitations to ensure that the participants for my research study had met the criteria to participate. Multiple delimitations were employed to guide this research study.

I chose a single case study design to understand how teachers at a rural elementary school in the Southeastern United States implemented BYOT within an educational setting which was a delimitation of the study. This design allowed me to gain detailed information about BYOT
implementation. Another delimitation was selecting the school district for this study as the district had utilized BYOT implementation. As I planned this study, I had to include participants who had taught for at least five years and had implemented BYOT in their classrooms for at least three years. Even though some teachers in the school had implemented BYOT, they had only done so for fewer than three years. Another delimitation was the type of data collection utilized during my research. I used classroom observations, individual interviews, and two focus groups for data collection. The interview and focus group transcripts were analyzed along with the classroom observation notes. While interviews, focus groups, and classroom observations provided useful data, I would also have liked to have had access to teacher lesson plans to use for a document analysis, which would have provided additional insight into how teachers plan for the implementation of BYOT in their classrooms.

Limitations

"A limitation is a factor that may or will affect the study in an important way but is not under the control of the researcher" (Mauch & Birch, 1993, p.103). One limitation was that the focus of this study was on a single elementary school in the Southeast. This study’s results could look different in an urban elementary school setting. The participant sampling was not diverse as it consisted almost entirely of Caucasian females. If the sampling had been diverse, the results of this study could appear different. Also, the teachers that agreed to participate in the study all willingly implemented technology into their classrooms as they all agreed that it was important to utilize technology in order to prepare students for a global society. Other limitations included researcher bias. Due to my position in a school system, I used journaling and memoing to limit my bias. I also allowed participants to review transcripts from the interviews and focus groups to be confident in their responses as well as other participants’ responses. Using purposeful-
criterion sampling provided a detailed experience of the phenomenon; however, the small sample of participants limited generalization (Patton, 2015). The study included 12 participants who were rural elementary school teachers with varying backgrounds. However, other teachers in the same rural elementary school may have given different experiences implementing BYOT in the classroom. Additionally, because this study focused on rural elementary school teachers in the southeast, other elementary teachers from other areas or school districts may provide a different perspective.

**Recommendations for Future Research**

The purpose of this qualitative single case study was to understand how teachers at a rural elementary school in the Southeastern United States implemented BYOT within an educational setting. Even though this study focused on elementary school teachers in one school district located in the southeast, further research may focus on other elementary schools in other rural and urban areas or school districts. How teachers implement BYOT into their classrooms may vary depending on the teachers’ curriculum, grade level, or years of teaching experience. Teachers that teach computer, band, or physical education classes might utilize BYOT differently than the teachers in this study as the participants in this study taught math, ELA, science, history, and art. Teachers that teach 6th grade may utilize BYOT differently than the participants in this study as they only served students in grades kindergarten through fifth grade. Thus, teachers in other educational settings may have different experiences. Participants in this study had five years of teaching experience with at least three years of teaching experience implementing BYOT into their classrooms. Teachers that have fewer or more years of teaching experience may implement BYOT differently than the participants in this research study.
Further single qualitative case studies should be utilized to examine how other rural elementary school teachers implement BYOT into their classrooms and the training experiences of pre-service teachers could also be explored to determine the preparedness of teachers to implement BYOT into the classroom. This research may give insight into the challenges and benefits of implementing BYOT into the elementary school educational setting. Rural elementary school leaders were not included in this study. To duplicate this study, rural elementary school leaders could provide their insights into how they implement BYOT into their school building. The findings in this study connect school leaders to the implementation of BYOT in an educational setting. The participants in this study mentioned the need for additional training and professional development on BYOT implementation. School leaders would be the organizers of training sessions and professional development for teachers at their school buildings; therefore, the participants’ responses could be insightful for school leaders.

**Summary**

The purpose of this qualitative single case study was to understand how teachers at a rural elementary school in the Southeastern United States implemented BYOT within an educational setting. The focus of this study was the participants’ experiences as rural elementary teachers implementing BYOT in their classrooms. The central question guiding this case study was: How do elementary school teachers in the rural Southeastern United States implement BYOT within their classrooms? The sub-questions focused on factors that contribute to teacher preparation, the transition from a traditional classroom to a classroom that implements BYOT, and how the participants shared ideas about implementation with one another. Results from analysis of the data were used to identify nine themes: BYOT and differentiation, (b) student engagement and motivation, (c) training, (d) challenges with resources, (e) logging in and
passwords (f) misuse of BYOT, (g) preparing students for the future, (h) student interaction, (i) professional learning communities and (j) sharing digitally. After the analysis of the data collected from interviews, focus groups, and classroom observations, it was clear that participants from this study were devoted to preparing students to work in a digital society. Future research should focus on other elementary schools in other rural and urban areas or school districts.
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APPENDIX A: PARTICIPANT EMAIL LETTER

Dear Teacher:

As a graduate student in the School of Education at Liberty University, I am conducting research as part of the requirements for a doctorate degree. The purpose of my research was to understand how teachers at a rural elementary school in the Southeastern United States implement BYOT within an educational setting, and I am writing to invite you to participate in my study.

Participant Criteria:

If you are 18 years of age or older, are an elementary school teacher, have at least 5 years of teaching experience and 3 years of experience implementing BYOT into your classroom and are willing to participate in this research study you are asked to complete an online questionnaire. It should take approximately 5 minutes for you to complete the questionnaire. Your participation will remain confidential.

To participate, please review the consent form which contains additional information about my research via the link at the bottom of this letter. Once you have reviewed and signed the consent form you will directed to complete a participant questionnaire.

Sincerely,

Lori Riley
APPENDIX B: ONLINE PARTICIPANT QUESTIONNAIRE

1. How many years have you been an educator?

2. How many years have you implemented BYOT into your classroom?

3. What grade level do you teach?

4. What degrees or certifications do you hold?

5. Did you willingly implement BYOT in your classroom or was it mandated?

6. What BYOT initiatives have been used by your school?

7. How often do you collaborate with your co-workers on technology implementation in lessons?
October 25, 2019

Lori Riley  IRB Exemption 3944.102519: Rural Tennessee Elementary School Teachers’ Experiences in Implementing Bring Your Own Technology

Dear Lori Riley,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under exemption category 46.101(b)(2), which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:101(b):

(2) Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if . . . the following criteria is met:

(iii) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by §46.111(a)(7).

Please note that this exemption only applies to your current research
application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued exemption status. You may report these changes by submitting a change in protocol form or a new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption or need assistance in determining whether possible changes to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,

G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
Research Ethics Office

Liberty University | Training Champions for Christ since 1971
APPENDIX D: SCHOOL DISTRICT SITE APPROVAL LETTER TO CONDUCT RESEARCH STUDY

APPROVAL OF RESEARCH

The proposed research entitled: RURAL TENNESSEE ELEMENTARY SCHOOL TEACHERS’ EXPERIENCES IN IMPLEMENTING BRING YOUR OWN TECHNOLOGY

To be performed by (Name of Researcher): Lori Riley

*This proposal has been received by the Research Review Committee of [redacted] and:

---This proposal has been APPROVED / DISAPPROVED (circle one) as meeting required criteria
---This form should be forwarded to the PRINCIPAL(s) / DIRECTOR OF SCHOOLS (circle one)

Research Committee Chair Signature: [redacted] Date: 4/7/19

If specific school(s) or department(s) involvement in research is necessary, the approval of administrators (principals/department heads) is required. After having obtained the approval of the Research Review Committee (see above), the researcher must next obtain the approval of any administrator whose school will be directly involved. Please note, however, that preliminary approval by the Research Committee does not guarantee school administrative approval.

Principal: [AGREE / DISAGREE (circle) that our school will participate in this research study. I also understand that of given my approval, I will abide by school’s policies. (If multiple schools are needed, see next page.)

Principal’s Signature: [redacted] Date: 8/7/19

Department Chair’s Signature: [redacted] Date: [if needed]

Director of Schools: I support the decision of the Research Review Committee and the Principal(s) of the participating school(s).

Director of Schools Signature: [redacted] Date: 8/7/19
PRINCIPAL:

I AGREE/DISAGREE (circle) that our school will participate in this research study. I also understand that of given my approval, this research will be conducted in accordance with [Redacted] County School System’s policies.

Principal’s Signature: [Redacted] Date: 3/15/19
Department Chair’s Signature: [Redacted] Date:
(if needed)

PRINCIPAL:

I AGREE/DISAGREE (circle) that our school will participate in this research study. I also understand that of given my approval, this research will be conducted in accordance with [Redacted] County School System’s policies.

Principal’s Signature: [Redacted] Date:
Department Chair’s Signature: [Redacted] Date:
(if needed)

PRINCIPAL:

I AGREE/DISAGREE (circle) that our school will participate in this research study. I also understand that of given my approval, this research will be conducted in accordance with [Redacted] County School System’s policies.

Principal’s Signature: [Redacted] Date:
Department Chair’s Signature: [Redacted] Date:
(if needed)
APPENDIX E: CONSENT FORM

RURAL TENNESSEE ELEMENTARY SCHOOL TEACHERS’ EXPERIENCES IN IMPLEMENTING BRING YOUR OWN TECHNOLOGY
Lori A. Riley
Liberty University
School of Education

You are invited to be in a research study about rural Tennessee elementary school teachers’ experiences in implementing bring your own technology. You were selected as a possible participant because you are over the age of 18 and are certified to teach in grades 1-5 in the state of Tennessee and have taught for a minimum of five years after completing your teacher preparation program. Please read this form and ask any questions you may have before agreeing to be in the study.

Lori Riley, a doctoral candidate in the School of Education at Liberty University, is conducting this study.

Background Information: The purpose of this single case study was to understand how teachers at a rural elementary school in the Southeastern United States implement BYOT in an educational setting.

Procedures: If you agree to be in this study, I would ask you to do the following things:
1. Interview, lasting 20-40 minutes. Audio Recorded
2. Observation during one class period.
3. Focus group, lasting 20-40 minutes. Audio Recorded

Risks: The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

Benefits: Participants should not expect to receive a direct benefit from taking part in this study. This study may benefit local school districts in its ability to help implement BYOT in an elementary school setting.

Compensation: Participants will not be compensated for participating in this study.

Confidentiality: The records of this study were kept private. In any sort of report, I might publish, I will not include any information that will make it possible to identify a subject. Research records were stored securely, and only the researcher will have access to the records. I may share the data I collect from you for use in future research studies or with other researchers; if I share the data that I collect about you, I will remove any information that could identify you, if applicable, before I share the data.

- Participants was assigned a pseudonym. I will conduct the interviews in a location where others will not easily overhear the conversation.
Data was stored on a password locked computer and may be used in future presentations. After three years, all electronic records will be deleted. Interviews were recorded and transcribed. Recordings were stored on a password locked computer for three years and then erased. Only the researcher will have access to these recordings.

**Voluntary Nature of the Study:** Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with Liberty University or your school. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

**How to Withdraw from the Study:** If you choose to withdraw from the study, please contact the researcher at the email address/phone number included in the next paragraph. Should you choose to withdraw, data collected from you was destroyed immediately and will not be included in this study.

**Contacts and Questions:** The researcher conducting this study is Lori A. Riley. You may ask any questions you have now. If you have questions later, you are encouraged to contact her at [email address]. You may also contact the researcher’s chair at [email address].

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Institutional Review Board at [email address].

**Please notify the researcher if you would like a copy of this information for your records.**

**Statement of Consent:** I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

(Note: Do not agree to participate unless IRB approval information with current dates has been added to this document.)

☐ The researcher has my permission to audio-record me as part of my participation in this study.

<table>
<thead>
<tr>
<th>Signature of Participant</th>
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<th>Signature of Investigator</th>
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APPENDIX F: OBSERVATION COLLECTION FORM

Participants were observed one time in their classroom. A focus on details will provide a thick description for analysis. I was observing how students interact with the technological devices that they are using, the interaction between the student and the teacher, and the interaction between students in a classroom where BYOT is being implemented. I reflected after each observation and I completed memoing of the data. Like the observation document that Yocum (2015) suggests, this form was used to collect data during each observation.

Title of Study:

Observation:

Start Time:

End Time:

Description:
Memoing:

Reflection
Focus Group Question 1:
Please give your description of how you utilize BYOT in the classroom.

Focus Group Question 2:
Please describe how you plan for BYOT in the classroom.

Focus Group Question 3:
What benefits, if any have you encountered with BYOT in the classroom?

Focus Group Question 4:
What challenges, if any, have you had to endure with BYOT in the classroom?

Focus Group Question 5:
What resources do you find most helpful with BYOT in the classroom?

Focus Group Question 6:
Do you have anything you would like to add to the discussion that you left out during our interview or that you feel important to share with the group?
APPENDIX H: INTERVIEW PROMPTS

1. Describe your experience as a teacher.
2. Describe your training (if any) on how to use BYOT in the classroom.
3. What factors contributed to your decision to implement BYOT?
4. Describe the process of transitioning to using BYOT in the classroom.
5. Describe your first experience implementing BYOT in your classroom.
6. Describe a daily lesson implementing BYOT in your classroom.
7. How did your students react to BYOT implementation?
8. Describe how BYOT implementation has been beneficial for you.
9. Describe the barriers you have faced with BYOT implementation.
10. How has BYOT implementation affected your technological knowledge?
11. Describe any limitations that you have noticed while using BYOT.
12. How has BYOT implementation affected students’ learning?
13. Describe how BYOT has been helpful for the students and teachers.
14. Describe how BYOT has been challenging for the students and teachers.
15. How would you describe the interaction between yourself and the students when BYOT is implemented in the classroom?
16. How would you describe the interaction between the students when BYOT is being implemented in the classroom?
17. How would you describe the interaction between the student and the technological device when BYOT is being implemented in the classroom?
18. Describe how engaged the students are when they are completing work using BYOT in the classroom.
19. Can you describe some ways in which you share ideas about BYOT with your colleagues?

20. Describe any changes to the classroom environment that you experienced with BYOT implementation.

21. What did you like most about BYOT implementation?

22. What did you like least about BYOT implementation?

23. What question should I have asked that I did not think to ask?

24. What would you add about BYOT implementation that was not covered by these questions?