A PHENOMENOLOGICAL STUDY OF TEACHERS’ MOTIVATIONS TO USE INSTRUCTIONAL TECHNOLOGY

by

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Liberty University

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

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ABSTRACT

The purpose of this qualitative transcendental phenomenological study was to identify and describe the factors that motivate teachers to integrate instructional technology in a district that has a 1:1 Chromebook program and tech-rich classroom environments. The research questions guiding this study were: How do middle school teachers describe the impact of access to contemporary technology resources on their motivation to integrate technology in their classrooms?; What are middle school teachers’ perceptions of how professional development experiences impact their motivation to integrate technology in the classroom?; How do the lived experiences of middle school teachers impact how they integrate technology in their classrooms? The theories guiding this study were the technology acceptance model (Davis, 1989) as is focused on user acceptance or rejection of new technologies, and the self-determination theory (Deci and Ryan, 1985). The sample consisted of ten participants who are employed in a school district that utilizes a 1:1 Chromebook program and has access to various technologies within the classroom space. Data were collected via interviews, observations, and writing prompts. The data were analyzed in accordance with Moustakas’s (1994) analysis procedures. Findings from this study revealed the factors that teachers found were most influential on their utilization of instructional technology. The researched revealed the importance of high self-efficacy that results from the necessary support from district and school leadership, access to resources, and clear intentions for student achievement and success on teachers’ motivation to integrate technology in their classroom practices.

Keywords: instructional technology, technology integration, teacher motivation, education
Dedication

I dedicate this work to the memory of my father, Christopher A. Stephens. I hope my accomplishments have made you proud.

I dedicate this work to the strength, love, resilience, and sacrifice of my mother, Pamela D. Jones. I am here because you never stopped loving and praying for me. I am me, simply because you ARE.

I dedicate this work to every brown girl who has ever been told you are not enough. I am here to remind you, that you are worthy of every good thing the universe has to offer. Let your light shine brightly in every room they said you didn’t deserve to occupy.
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First giving honor and praise to God. Thank you for your grace as I’ve traveled along this journey.

I would like to especially thank my husband, De’Andre Wilson. Without your love, encouragement, and sacrifice I would not have been able to endure the demands of this program or have the strength to finish. Your words of encouragement have sustained me, and for that I am forever grateful.

To my mother, Pam and my sisters, Moranda and Kierra, thank you for your undying support. Thank you for understanding each time was not available because “I have to write”. I hope I have made you proud.

To my nephew Evan, I hope you see this accomplishment and know that you too can do and be anything you want. The world is yours.

To my tribe: Erin, Shametra, Ashley, Shamica, Natasha, Kaye, and Kristi (my Golden Girls), your support, love, and encouragement throughout the years have meant more than you’ll ever know. I love you all! Courtney and Kendra (My crew), your friendship, love, and words of encouragement have sustained me on many days when I felt like giving up. I’m forever indebted to you. Cherelle, Miyoshi, and Alicia (Tech Girl Magic) you all inspired this entire journey. I’m proud to be to newest “Doc” in the crew. You all are truly phenomenal!

To my work crew, John, Keith, Amanda, Liz, and Shanda thank you for your encouragement, insight, and support.

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ABSTRACT ..................................................................................................................................................... 3

Dedication ...................................................................................................................................................... 4

Acknowledgments .......................................................................................................................................... 5

List of Figures ................................................................................................................................................. 10

List of Abbreviations .................................................................................................................................... 12

CHAPTER ONE: INTRODUCTION ................................................................................................................ 13

Background .................................................................................................................................................... 13

Historical Context ......................................................................................................................................... 14

Social Context ................................................................................................................................................ 16

Theoretical Context ....................................................................................................................................... 17

Situation to Self ............................................................................................................................................... 17

Problem Statement ...................................................................................................................................... 19

Purpose Statement ....................................................................................................................................... 20

Significance of the Study ............................................................................................................................... 21

Empirical Significance ................................................................................................................................. 22

Practical Significance .................................................................................................................................. 23

Research Questions ...................................................................................................................................... 23

Definitions ..................................................................................................................................................... 25

Summary ....................................................................................................................................................... 25
CHAPTER TWO: LITERATURE REVIEW ........................................................................27
  Overview ................................................................................................................27
  Theoretical Framework .............................................................................................27
  Related Literature ...................................................................................................30
  Summary ..................................................................................................................57

CHAPTER THREE: METHODS ....................................................................................58
  Design .....................................................................................................................58
  Setting ....................................................................................................................60

Data Collection ..........................................................................................................64
  Interviews ...............................................................................................................64
  Journaling ...............................................................................................................66
  Observations ..........................................................................................................67

Data Analysis ..............................................................................................................67
  Trustworthiness ......................................................................................................69
    Credibility ............................................................................................................69
    Dependability and Confirmability ......................................................................69
    Transferability .....................................................................................................70
  Ethical Considerations ............................................................................................70

Summary ....................................................................................................................71

CHAPTER FOUR: FINDINGS ......................................................................................72
Overview .................................................................................................................. 72

Participant Summary ................................................................................................. 72

Cassie ......................................................................................................................... 72
Aldis ............................................................................................................................ 73
Christina ...................................................................................................................... 74
Robin ........................................................................................................................... 74
Kelly ............................................................................................................................ 75
Nicole ........................................................................................................................... 75
Michelle ....................................................................................................................... 76
Mary ............................................................................................................................. 77
Regina .......................................................................................................................... 77
Taylor ........................................................................................................................... 78

Results ......................................................................................................................... 79

Theme Development ................................................................................................. 79

Research Question Responses ................................................................................... 105

Summary ..................................................................................................................... 110

CHAPTER FIVE: CONCLUSION ................................................................................ 112

Overview .................................................................................................................... 112

Summary of Findings ................................................................................................. 112

Discussion .................................................................................................................. 118
List of Tables

Table 1. Participant Background Information .................................................................72
Table 2. Themes And Corresponding Horizons .................................................................80
List of Figures

Figure 1. Conceptual Model Of Faculty Motivation For Teaching Best Practices ..................32

Figure 2. Keys To Successful 1:1 Implementation .................................................................49
List of Abbreviations

Self-determination Theory (SDT)
Technology Acceptance Model (TAM)
Professional Development (PD)
Perceived Usefulness (PU)
Perceived Ease of Use (PEU)
Perceived Effectiveness (PE)
International Society for Technology in Education (ISTE)
Science, Technology, Engineering, and Math (STEM)
CHAPTER ONE: INTRODUCTION

Overview

Technology is ever evolving and is almost universally present. The education system also reflects this as schools have begun to purchase more technology and increase expectations for technology integration (McDermott & Gormley, 2016). Access to these technologies alone will not result in student achievement, and teachers must work to intentionally integrate these available tools (Tondeur et al., 2017; Mirzajani et al., 2016).

There are several factors that influence teachers’ reluctance to integrate instructional technology. These factors include educator stress, lack of knowledge of the benefits of instructional technology, limited skills, and lack of confidence in using instructional technology (Mirzajani et al., 2016). This research explores the reasons why teachers choose to implement technology tools in their pedagogical practices. This chapter provides background information, how this study relates to me, statement of the problem, statement of the purpose of this study, the significance of the study, research questions, and relevant definitions to provide the basis of which this study was conducted.

Background

Technology is changing the way students learn and teachers teach. While technology has become an undeniable presence in many K-12 classrooms, researchers are still attempting to determine the factors that lead to successful integration for all students (Tondeur et al., 2017). The way teachers view technology influences how they implement it in their classrooms (Hsu, 2016, Tondeur et al., 2017). Hsu (2016) stated that teachers with high efficacy value the use of instructional technology. According to Mirzajani et al. (2016), although technology acceptance in schools has increased, there have been few major changes in the pedagogy and classroom
activities observed. Consequently, researchers have attempted to understand and explain the limited adaptation of instructional technology.

**Historical Context**

Technology has been a part of education since the 1820s (Cohen, 1987) when the production of school text became widespread. As time progressed, the types of technologies that were available in classrooms also progressed. In the late 1800s the “visual instruction” movement began with the introduction of lantern slides and stereographs (Reiser, 2001). Lantern slides were an early version of a slide projector that projected images that were painted on glass plates (Reiser, 2001). Motion picture projectors were introduced into classrooms in the early 1900s, with the first catalogue of instructional films being published in 1910 (Reiser, 2001). In the latter part of 1910, the public school district in Rochester, New York became the first in the nation to implement films into routine classroom practice (Reiser, 2001). From the 1920s to the 1930s radio and sound recording became an integral part of classroom instruction, thus shifting the “visual instruction” era to the “audiovisual instruction” era (Reiser, 2001). Many believed that the radio would revolutionize education; the National Education Association even proclaimed that radio, television, and films would be “as commonplace as the book and powerful in their effect on learning and teaching” (Reiser, 2001, p. 56). The next innovations for classroom technology were the overhead projector in 1930, headphones in 1950, and videotapes in 1951 (Perdue, 2020). Then in the 1980s, the microcomputer captured the attention of educators (Reiser, 2001). Educators were enthralled by the small and relatively inexpensive machines that performed several of the functions of its larger predecessors (Reiser, 2001). The additions of various technologies began to transform how students were being taught. Dwyer et
al. (1991) stated that technology in the classroom led to increased peer interaction and shifted the teacher’s role to a more constructivist approach.

Today instructional technology has moved far beyond the textbooks of the 1800s and the use of microcomputers of the 1900s. Students now have access to personal devices, touchscreen projectors, and technology tools that can instantly assess their learning. According to Lui et al., (2017), the United States government has spent several billion dollars to improve the technology infrastructure in schools, and thus has increased students’ access to the internet at a significant rate and aims to ensure at least 99% of all students have access. The investment in technology has prompted continued research on classroom technology integration. This research has shown that technology has positive effects on student achievement; however, there has been inconsistent implementation in classrooms around the country (Lui et al., 2017). Although access to technology in classrooms has increased, meaningful implementation of technology in classroom practice has not changed on a large scale (Mirzajani et al., 2016). Technology professional development that teachers receive usually focuses on how technologies work or how to support student learning, and less on how to transform traditional practices to amplify student learning and achievement (Lee, Longhurst, and Campbell, 2017). Bypassing the barriers that limit technology integration by teachers is imperative. According to Ertmer, Addison, Lane, Ross, and Woods (2000), there are both intrinsic and extrinsic barriers to technology implementation; these barriers include lack of planning time and unwillingness to change. Providing teachers with necessary learning opportunities plays a part in changing how technology is integrated into classroom practices (Lee, Longhurst, and Campbell, 2017).
Social Context

The expectations within many school systems have increased regarding technology implementation. For technology to be implemented appropriately, it is imperative to understand teachers’ beliefs about the role of technology in the classroom (Tondeur et al., 2017). As access to classroom technology has increased, the roles that teachers play within the classroom has shifted (Larson & Miller, 2011). The inclusion of technology into the classroom environment forces educators to face “new social, cultural, and pedagogical phenomena, which challenge teachers in terms of their technical ability, knowledge, and expertise” (Levin & Wadmany, 2008, p. 234). Since schools are considered social institutions, as the primary purpose is to prepare students for successful adult lives, classroom effectiveness is paramount. The need for students to not only be proficient in their use of technology tools, such as computers, GPS, and interactive whiteboards, they must also demonstrate the abilities to use those tools to research, evaluate, and communicate information effectively (Larson & Miller, 2011). The job of teachers has shifted to providing more complex learning experiences within technology-rich classrooms (Larson & Miller, 2011).

While the implementation of instructional technology presents a new world of challenges for educators to tackle, many of which could lead students to make valuable contributions globally, there is still a lack of effective use. Levin and Wadmany (2008) argue that many teachers only use technology in ways that fit with their traditional pedagogical approaches and not in ways that necessarily promote student-centered learning. Successful technology integration in in schools is contingent upon providing teachers with adequate training to ensure that they are equipped to plan and implement purposeful learning experiences for students.
Theoretical Context

The theories that provide the basis for this problem are the technology acceptance model (TAM) and the self-determination theory. The technology acceptance model focuses on user acceptance or rejection of technology (Davis, 2019). According to the TAM, “Perceived usefulness (PU) and perceived ease of use (PEoU) are primary motivating factors for accepting and using new technologies” (Lee et al., 2003, p. 51). Understanding why teachers reject or accept new classroom technology plays an integral role in providing support for those teachers at the district and state levels. A study conducted by Teo (2011) using the TAM found that teachers saw computers in the classroom as useful and were motivated to use them for various intrinsic and extrinsic reasons, including the ease of facilitating learning and the effects on students’ achievement. The self-determination theory (Deci & Ryan, 1985), states that optimal learning and growth only occur under conditions that support people’s psychological needs to feel competent, related, and autonomous within their actions. This study adds to the SDT in that it identifies autonomous and controlled factors that lead teachers to use instructional technology. In a study conducted by Sørebo, Halvari, Gulli, and Kristiansen (2009), it was found that teachers who were competent in their use of e-learning were more inclined to use the systems than those who were less confident.

Situation to Self

I have been an educator in the Alabama Public School system for 14 years. During my time as an educator, I have been a classroom teacher and, most recently, an instructional technology coach. These roles have allowed me to have a unique view of the secondary classroom, as both a participant and observer of instructional practice and technology integration. In my role as an instructional technology coach, I encourage teachers to be effective in the
delivery of content and the integration of technology tools. Teachers are tasked with equipping students to be successful in the real world. As technology is implemented in every facet of life, I believe teachers must use technology to teach students to solve problems, collaborate, and share ideas.

Serving in the role of instructional technology coach, I am afforded the opportunity to research, review, and work to implement new educational technology. Within my district, this technology includes interactive projectors, classroom sound systems, touchscreen laptops, and document cameras in each classroom. In addition to those resources, each student in grades 6-10 has access to a 1:1 Chromebook device. For many teachers who are not accustomed to using technology daily and have self-identified as “not tech-savvy,” there is a hesitance to use the provided tools and do so in ways that are relevant and purposeful. I was interested in finding out how teachers what factors, both internal and external, motivate teachers to use classroom technology. It is crucial to understand how these teachers feel about the integration of instructional technology. Understanding the teachers’ motivators will allow administrators and instructional coaches to create and tailor professional development opportunities to the needs of those teachers. As teachers gain efficacy, they will, in turn, be able to use it in ways that will be beneficial to student learning and achievement.

In this study, I worked within a social constructivist framework, as it attempts to understand the world in which the researcher and subjects live and work (Creswell & Poth, 2018). Each of the participants had a different view, and from those views, I constructed meanings through both social and historical contexts (Creswell & Poth, 2018). Additionally, each of the participants was believed to possess a different experience thusly; the research was conducted from an ontological assumption. Ontological assumptions relate to “the nature of
reality and its characteristics” (Creswell & Poth, 2018, p. 20). I had ontological assumptions that each participant had their own reality and consequently I was able to construct themes for this study based on their reality and expressed the ideas of the participants by using their exact words to describe what motivates their integration of instructional technology. According to Croswell and Poth (2018), a researcher who uses the epistemological assumption will try to get close to the participants being studied and relies direct quotes from the participants as evidence from the participants. Therefore, my epistemological assumption was that to gain knowledge the direct use of quotes of the participants was imperative.

All researchers are influenced by their values; however, qualitative researchers identify their values within the study; this is the axiological assumption (Creswell & Poth, 2018). My axiological assumption was that my experience as an educator and technology coach influences my values as related to the motivators that influence teachers’ use of instructional technology, as well as and how those factors can be used to plan and provide quality professional development for teachers.

**Problem Statement**

The adaptation of Common Core Standards played a critical role in the recent surge of instructional technology in the K-12 classroom (Delgado, Wardlow, McKnight, and O’Malley, K., 2015). To aid teachers in the facilitation of these standards, many schools have adopted technological tools into their curriculum and practice (Delgado et al., 2015). While access to technology is essential, access alone cannot ensure that students receive high levels of purposeful technology integration in the classroom (Vongkulluksn, Xie, and Bowman 2018). The problem this research addressed is teachers are not effectively using classroom technology even though access to technology in classrooms has increased (Lee, Longhurst, and Campbell, 2017;
Mirzajani et al., 2016). Despite the increase in access to technology, meaningful implementation of technology in classroom practice has not changed extensively (Lee, Longhurst, and Campbell, 2017; Mirzajani et al., 2016). Failure to address this issue could lead to lack of student preparedness for college and the workforce (Lee, Longhurst, and Campbell, 2017; Mirzajani et al., 2016). Addressing this problem could provide practitioner and professional development providers with the data needed to create professional learning experiences that improve teacher’s technology efficacy and thus increase effective use of instructional technology tools.

It has been shown that teachers’ perceptions of instructional technology impact technology integration levels (Salleh, 2016; Tonduer et al., 2017). Teachers who believe technology is essential to classroom practice are more apt to use those resources to enhance their pedagogical practices effectively (Salleh, 2016). Teachers tend to use technology in a way that aligns with their pedagogical beliefs (Tonduer et al., 2017), and those who do not see the benefits of modern classroom technologies are less likely to use those tools. There have been several studies conducted to highlight the lack of technology integration in classrooms, and the reasons for this lack (Dotong, De Castro, Dolot, and Prenda, 2016) however, little research that includes views on teachers’ motivation to implement instructional technology exists (Mirzajani et al., 2016).

**Purpose Statement**

The purpose of this phenomenological study was to identify and describe the factors that motivate teachers to use instructional technology in a district that has a 1:1 Chromebook program and technology-rich classroom environments. For this study, motivation was generally defined as the reasons one has for acting in a particular manner. The theories that guided this study are the technology acceptance model (Davis, 1989) as is focused on user acceptance or rejection of new technologies, and the self-determination theory (Deci & Ryan, 1985).
The use of technology in the classroom is increasing, and to make classroom technology effective, teachers must commit to proper integration strategies. Access to classroom technology is insufficient. Effective implementation and integration of technology and technology tools are important factors that lead to student success (Lee, Longhurst, and Campbell, 2017). Teacher motivation is essential to classroom effectiveness of any initiative (Han & Yin, 2016). Teacher attitudes towards technology use influence technology integration, and the quality in which that technology is integrated. The attitudes teachers have toward instructional technology influence how and if they use technological resources in the classroom (Vongkulluksn et al., 2018). Since this study focused on teachers’ motivations to integrate instructional technology, Davis’ (1985) theoretical framework the technology acceptance model (TAM) played a role in determining the factors that lead to the acceptance or rejection of classroom technology, while Deci and Ryan’s self-determination theory (1985) played a role in identifying the internal motivators that lead to technology integration.

**Significance of the Study**

This study has the potential to be beneficial for many individuals in the K-12 setting. As technology advances and is interwoven into classroom environments, the expectations for classroom implementation also increase. Identifying the factors that lead teachers to use technology, has the potential to influence who technology is introduced to teachers, thus increasing efficacy and effective use. Teachers must overcome any internal conflicts between their beliefs about technology and the expectations of the school district to ensure technology is being used to transform student learning (Lee, Longhurst, and Campbell, 2017).
Theoretical Significance

This study adds to the technology acceptance model (TAM) in that it identifies factors of classroom technology that teachers deem advantageous or useless. According to the TAM (Davis, 1989), if users believe technology is useful, they are more likely to accept and use that technology (Lee, Cho, Gay, Davidson, & Ingraffea, 2003). Granic and Maagunic (2019) note that the use of TAM in educational research has increased in recent years; this knowledge of technology acceptance or rejection could be essential to understanding the impact of technology on teaching and learning. A study conducted by Scherer et al. (2019) supported the hypothesis that TAM can predict many of the factors that lead to teachers’ rejection or acceptance of technology. Yuen (2008) found that targeting the areas in which teachers in the selected demographic feel they are strongest and weakest regarding technology acceptance could prepare teachers to integrate technology effectively. This study will add to the SDT in that it identifies autonomous and controlled factors that lead teachers to use instructional technology.

Empirical Significance

This study adds to the literature on technology in the K-12 setting by adding awareness to the factors that motivate teachers to implement instructional technology. Orlando (2014) studied the unwillingness of veteran teachers to participate in the integration of technology in schools and found that change fatigue and low efficacy were contributing factors to the lack of use. Hsu (2016) conducted a study of current beliefs and barriers affecting technology integration in the K-6 classroom setting and found that teachers’ beliefs and training changed how or if they implemented technology. These studies did not specifically explore motivational factors and mostly focused on why technology is not correctly implemented. My research aimed to add to
the positive aspect of the topic of technology integration, as it focused on motivational factors that lead to implementation.

**Practical Significance**

This study provides valuable information to instructional technology integrationists and school principals. The study provides an understanding of how teachers feel about increasing expectations of technology use in the classroom, as well as provides insight into their level of efficacy surrounding technology. This data can be used to design and deliver professional development opportunities to this demographic of teachers. It further reiterates that access to technology is not merely enough to transform learning and on a larger scale, it could support the funding of district-level technology coaches to aid teachers in the integration of digital technology (Tondeur et al., 2017).

**Research Questions**

The research questions of this study sought to thoroughly describe the factors that motivate K-12 teachers to implement technology in a school environment that is technology-rich with increasing expectations for digital integration. The questions were developed through the theoretical framework of the technology acceptance model (Davis, 1989) and the self-determination model (Deci & Ryan, 1985).

The following research questions were used to guide this study:

**RQ 1:** How do middle school teachers describe the impact of access to contemporary technology resources on their motivation to integrate technology in their classrooms?

Question one was used to understand how teachers view the usefulness of the technology that has been provided for them. The technology acceptance model (Davis, 1989) posits that users are more likely to use technology if they feel it is useful. This question helped me
understand the aspects of the classroom technology that teachers find easy to use, and thus, encourages them to use that technology. The classrooms in the district being studied have updated projectors, sound systems, and 1:1 Chromebooks. Teachers have access to the latest technology, and the responses to this question provide insight into how technology is being integrated by the participating teachers. The responses to this question also provided an idea of teacher self-efficacy. Teachers with high self-efficacy tend to find technology more useful (Joo, Park, and Lim, 2018).

**RQ 2:** What are middle school teachers’ perceptions of how professional development experiences impact their motivation to integrate technology in the classroom?

The second question was developed to gauge the level of self-efficacy that teachers gain from their professional development learning experiences. The answers to this question aided in identifying the areas of professional development experiences that teachers find most useful. Central to the self-determination theory is the notion that social conditions can either nurture or interfere with a person’s development dependent upon whether their psychological needs are met; thus, when those needs are met, the person is motivated to engage with and master content (Power & Goodnough, 2018). According to Paulus et al. (2020), increasing teachers’ efficacy levels in the use of instructional technology impacts their future decisions to integrate technology, thus technology professional development must not only enhance skills but also increase self-efficacy.

**RQ 3:** How do the lived experiences of middle school teachers impact how they integrate technology in their classrooms?

The third question was developed to explore the teachers’ self-efficacy with technology. According to Power and Goodnough (2018), “One of the key postulates from self-determination
theory revolves around the differentiation between autonomous motivation and controlled motivation” (p.279). Understanding how teachers are influenced both personally (autonomous) and professionally (controlled) to use instructional technology will allow for greater insight into why teachers choose to integrate instructional technology.

**Definitions**

1. *1:1*: refers to each student having access to a personal device for learning (Varier et al., 2017).

2. *Motivation*: the reasons one has for acting in a way (Deci & Ryan, 1985).

3. *Professional Development*: the formal and informal learning experiences that teachers engage in throughout their careers that are aimed at positively impacting their classroom instruction and teacher performance (Gaytan & McEwen, 2010).

4. *Technology Integration*: using computers effectively and efficiently in the general content areas to allow students to learn how to apply computer skills in meaningful ways (Dockstader, 1999).

5. *Teacher Efficacy*: teacher’s personal belief in one’s ability to plan instruction and accomplish instructional objectives (Joo, Park, and Lim, 2018, p. 49).

**Summary**

The purpose of this phenomenological study was to identify and describe the factors that motivate teachers to use instructional technology in a district that has a 1:1 Chromebook program and tech-rich classroom environments. Teachers tend to use technology in a way that aligns with their pedagogical beliefs (Tonduer et al., 2017), and those who do not see the benefits of modern classroom technologies are less likely to use those tools. This study is necessary as it aims to add to the limited literature on teacher motivations to implement instructional technology. Identifying
the factors that motivate teachers to implement instructional technology can potentially influence state and district decisions about professional learning and support regarding instructional technology.
CHAPTER TWO: LITERATURE REVIEW

Overview

In recent decades, technology has impacted all aspects of society and culture (Levin & Wadmany, 2005). Advancements in technology have also begun to change education. This review explains the theoretical frameworks that predict technology use and acceptance based on internal and external factors. Additionally, the study explores the benefits and challenges of implementing technology in K-12 classrooms and how teacher efficacy influences the use of various instructional technologies. The review concludes with a summary of what is known about instructional technology use and examines gaps in the literature.

Theoretical Framework

Two theoretical models provide the basis for this study. These theoretical models provide an insight into the behaviors of teachers and their tendencies to integrate technology in the classroom. The first theoretical model is the technology acceptance model (TAM) (Davis, Bagozzi, & Warshaw, 1989). According to Scherer, Siddiq, and Tondeur (2019), measuring user acceptance of technology effectively determines a teacher’s intention for technology integration. Technology acceptance model was derived from the theory of reasoned action (TRA) of Fishbein and Ajzen, which contended that the attitude of a person and the subjective norm impacts a person’s behavioral intention, which affects how a person acts (Schepers & Wetzels, 2007). Davis replaced many of the TRA’s attitude measures with technology measures, ease of use, and perceived usefulness (Bagozzi, Davis and Warshaw, 1992).

The TAM is comprised of basic variables of user motivation, such as perceived ease of use, perceived usefulness, and attitude towards technology, and outcome variables like behavioral intentions and technology use (Scherer, Siddiq, and Tondeur, 2019). According to the
theory, perceived usefulness (PU) and perceived ease of use (PEU) refer to the extent to which a person believes that technology would be easy to use and improve their job or task (Scherer, Siddiq, Tondeur, 2019). Because PE and PEU are the most critical variables that influence technology use, external variables that affect these variables should also be considered (Joo, Park, and Lim, 2018). According to Joo, Park, and Lim (2018), the TAM is a “powerful model that hypothesizes direct and indirect mechanisms leading up to teachers’ technology use” (p. 49). Teachers are inclined to use technology when they ascertain the usefulness and ease of that technology in their teaching practice (Joo, Park, and Lim, 2018).

The TAM has been found to provide a sufficient explanation of user behaviors regarding the use of various technologies in various user groups (Teo, 2011). TAM asserts that “beliefs, attitudes, and intentions are important factors in the adoption of ICT in teaching and learning” (Lawrence & Tar, 2018, p. 85). According to Lawrence and Tar (2018), several indicators have been identified that affect instructional technology acceptance by teachers. Those factors include user satisfaction, system usage, and frequency of use (Lawrence & Tar, 2018).

In addition to the TAM framework, self-determination theory (SDT) was utilized to explain the autonomous and controlled factors that lead teachers to integrate classroom technology. The SDT of Motivation (Deci & Ryan, 2000) is a meta-theory of motivation that focuses on types of motivation, particularly autonomous, controlled, and amotivation (Deci & Ryan, 2008). Within the context of this theory, motivation refers to reasons carrying out an activity (Sorebo et al., 2009). The theory distinguishes between the internal and external aspects of life that encourage or discourage human behaviors (Cullen & Green, 2011). Deci and Ryan (1985) identify two basic types of motivation; intrinsic and extrinsic. Intrinsic motivation is the type of motivation that is ignited by the internal drive to engage in an activity, whereas extrinsic
motivation is built upon the gain of rewards that are external to the activity (Cullen & Green, 2011).

SDT posits that the most influential precursor of motivation is competence and autonomy; however, relatedness also plays an important role (Sorebo et al., 2009). The theory contends that the adaptation of intrinsic motivation relies on the satisfaction of three basic psychological needs for relatedness, competence, and autonomy (Roca & Gagne, 2008). In SDT, relatedness refers to the need to feel connected and supported by important people (people in leadership roles) (Deci & Ryan, 1985). Competence refers to the effectiveness of individuals in their interactions with the environment, and when they perform an activity, this is similar to self-efficacy (Deci & Ryan, 1985). Autonomy refers to an individual’s sense of control and agency (Chen & Jang, 2010). Research has found that a combination of self-efficacy, positive attitude, and desire to integrate technology into their classroom practices are large indicators of future instructional technology integration (Cullen & Greene, 2011).

In a study conducted by Roca and Gagne (2008), they applied the self-determination theory to explain the role motivation plays in the acceptance of e-learning, and found that “users are more willing to continue using IT when they feel autonomous and competent, because these basic needs have influence on their intrinsic and extrinsic motivation, perceived usefulness and perceived playfulness, which in turn affect their intention to continue using the IT” (p. 1597). Additional studies conducted by Falhali and Okada (2018) concluded that SDT determinants could predict PU and PEU, while perceived competence was the most influential factor. Also, of note, PU influences a person’s intentions to continue to use a technology system, which in turn influences the actual usage of the system. SDT shapes the study in that it explores the impact that certain internal factors have on teachers’ implementation of instructional technology.
This study adds to the technology acceptance model in that it identifies factors of classroom technology that teachers deem advantageous or useless. This study will add to the self-determination theory. It explores how it can be applied to the study of educators and their use of instructional technology. This study aimed to identify relationships between internal and external factors and how those factors relate to technology integration by middle school teachers.

**Related Literature**

Technology has changed the way we live and work, and the field of education has not been exempted from this change (Firmin & Greene, 2013). Technology allows people to create, find, and exchange information in ways they have not before (Levin & Wadmany, 2005). Technology has been used in educational settings since the 1920s, when film and radio were incorporated into lessons (Delgado, Wardlow, McKnight, and O’Malley, 2015). Computers began to be used in the classroom in the late 1970s (Bottino, 2019). As a result, schools focused mainly on teaching basic computing skills like elements of computing languages, problem-solving, and algorithm development (Bottino, 2019). As computer hardware and software advanced, the need to learn programming languages decreased, and schools shifted their focus to more transversal use of technology to create classroom environments focused more on teaching curricular disciplines (Bottino, 2019). While technology was more prevalent in classrooms, programs were highly focused on implementing low-level cognitive skills through rote memorization of facts (Delgado et al., 2015).

**Teacher Motivation**

Teachers drive student performance and achievement. Their motivation to perform the job is a “key to quality assurance, quality outcomes or delivery and high standards in the education system” (Gobena, 2018, p. 163). Motivation has been explained as the drive that
propels people to do something (Han & Yin, 2016). Learning what motivates or demotivates teachers may help school leaders make decisions concerning professional development and curriculum (Daniels, 2017).

Self-determination theory asserts that autonomy, competence, and relatedness play a major role in determining a person’s motivation (Deci et al., 1991). In the context of education, understanding the factors that lead teachers to feel autonomous, competent, and connected can assist in creating environments in which teachers are motivated to effectively perform (Daniels, 2017). Research has found that autonomous motivation is linked to positive work outcomes, such as job control and personal accomplishments (Gorozidis & Papaioannou, 2014). SDT is one of the leading perspectives on human motivation and posits that people are “inherently motivated to master their environment” (Stupnisky et al., 2018, p. 16). Research conducted by Stupnisky et al. (2018) investigated how motivation for teaching correlates with the utilization of teachers’ best practices. The results of the study, as shown in Figure 1, suggest that in order to improve teachers’ best practices, activities intended to improve teaching quality should focus more on facilitating autonomous motivation for teaching (Stupnisky et al., 2018).
Figure 1

Conceptual Model of Faculty Motivation for Teaching Best Practices

Basic Psychological Needs
- Autonomy
- Competence
- Relatedness

Motivation
- Autonomous
- Introjected
- External

Teaching Best Practices
- Instructional Clarity
- Higher Order Learning
- Reflective & Integrative
- Collaborative Learning


Teachers experience professional learning in various formats, including formal settings like structured training, observations, or informal arrangements like impromptu conversations with their colleagues (Osman & Warner, 2020). Profession development experiences are supposed to result in a change within teachers and schools; however, the extent to which this change happens is influenced by teacher beliefs, attitudes, and external factors such as school policies and curriculum (Osman & Warner, 2020). Osman and Warner (2020) noted that motivation influences teachers’ implementation of new skills. Teachers’ motivation is the driving force behind what happens once professional development experiences have concluded (Osman & Warner, 2020). Motivated teachers often continue to learn about a given topic or strategy once the formal professional development session has ended and are more likely to integrate new practices into their classrooms (Osman & Warner, 2020).
As education changes, new innovations are introduced into the classroom and to teachers. According to Schellenbach-Zell and Gräsel (2010), school innovations are initiatives implemented to introduce new ideas into schools that are intended to improve the quality of the educational system. The introduction of new technologies and innovations require teachers to learn and apply new skills, and motivation to do so plays a part in the successful implementation (Gorozidis & Papaioannou, 2014). Teachers’ motivation levels influence the spread and integration of school innovations (Schellenbach-Zell & Gräsel, 2010).

New technologies and innovations are often introduced via professional development programs. However, there is no assurance that teachers will be actively engaged in these experiences (Gorozidis & Papaioannou, 2014). While not always engaging, motivated educators tend to understand the importance of lifelong learning (Daniels, 2017). According to Gorozidis and Papaioannou (2014), research has shown that autonomous motivation is strongly related to positive workplace outcomes. Regarding professional learning, autonomous motivation is an integral part of teachers’ optimal functioning and professional growth (Gorozidis & Papaioannou, 2014). The implementation of new innovations requires teachers to make changes in their attitudes, beliefs, and pedagogical content knowledge (Bitan-Friedlander et al., 2004).

**Benefits and Limitations of Instructional Technology**

Researchers have found technology can improve various facets of the learning experience for students; technology can increase student motivation, improve attitudes, engagement, self-confidence, and improve the students’ organizational and study skills (Carver & Todd, 2016). Combined, these factors can improve school attendance and academic achievement (Carver & Todd, 2016). With technology, many opportunities are provided for students to increase their knowledge and engagement in any subject if implemented correctly (Heath, 2016). Educational
technology is used to aid in the creation of a “rich, student-centered learning environment with a wide variety of wonderful opportunities for student-centered learning” (Firmin & Genesi, 2013, p. 1604). Technology has been credited with creating an enlivened learning environment that stimulates learning, provides immediate feedback to students, and allows students to work in flexible groups with their peers (Firmin & Genesi, 2013). Effective technology implementation has the potential to aid students in making connections between the content and problems that exist both in the classroom and within the curriculum (Heath, 2016). The inclusion of these real-life contexts presented with technology can make the classroom come alive for students (Firmin & Genesi, 2013).

The effects of instructional technology not only enhance the learning experiences of students but also enhance teachers’ experiences. In research conducted by McKnight et al. (2016), teachers expressed that technology provides opportunities for educators and learners to become more efficient. Activities such as checking and grading homework become convenient, allow teachers more time to focus on planning and delivering instruction. Furthermore, teachers can use technology to offer students access to a wider range of current resources; this also helps teachers differentiate instruction to meet the needs of all students (McKnight et al., 2016).

Technology has the potential to enhance the experiences of both students and teachers; however, there are limitations and disadvantages. Although teachers are provided with technological resources, the challenge for most teachers entails implementing teaching strategies with the technology in ways that increase student learning and understanding (Firmin & Genesi, 2013). Technology use can come with many unplanned side effects (Firmin & Genesi, 2013), including time issues, faulty infrastructure, declines in students writing skills, and inequitable access (Firmin & Genesi, 2013; Krasulia, 2017; Raja & Nagasubramani, 2018).
Shatri (2020) lists several advantages and disadvantages of using technology in a classroom environment. Among the benefits are (Shatri, 2020):

- Increase in student interests in learning
- Differentiation of education
- Objectivity of control
- Foster the development of creativity in students
- Development of skills needed for an information-based culture
- Fosters decision making skills
- Development of research skills
- Increase in student led work
- Increase in student completed tasks
- Increase in motivation
- Students are more actively involved in the learning process

Among the disadvantages to in-class technology use, Shatri (2020) lists the following:

- Can be a distraction to students
- May cause students to disconnect from peers
- May make academic dishonesty easier
- May expose students to unreliable source of information
- Could make curriculum planning more difficult
- May create privacy issues
- Resources are often limited

While technology presents both benefits and limitations, many schools with proper infrastructure, equipment, support, and trainings have proven that technology integration can be
done successfully in the K-12 learning environment (Shatri, 2020). Effective implementation of
technology can be time-consuming for educators. Teaching students to use technology, as well as
creating instructional resources, can take up more time than implementing traditional teaching
methods ((Firmin & Genesi, 2013; Raja & Nagasubramani, 2018). Another disadvantage of
technology integration in the classroom involves the unreliability associated with poor
infrastructure. Infrastructure affects network connections and inadequate network access for
students and teachers (Firmin & Genesi, 2013; Harrell & Bynum, 2018). If students cannot
connect to the internet or access working devices, the level of technology implementation is
affected (Firmin & Genesi, 2013). Excessive use of technology has the potential to limit
students’ writing skills. Students are more reliant on digital communications than in previous
decades. Consequently, their written communication, grammar, and spelling skills have suffered
(Raja & Nagasubramani, 2018). In addition to these limitations, access to technology greatly
reduces the chances of technology integration in classrooms (Firmin & Genesi, 2013).
According to Francom (2019), access to technology tools and resources is higher in small
educational settings. Therefore, district and state technology leaders should make provisions for
equitable access to technology tools and resources and increase measures to improve students’
technology usage skills (Francome, 2019). If there is inequitable access to technology resources,
it causes a “knowledge divide” that hinders students’ development of 21st century skills (Firmin
& Genesi, 2013).

**Technology Integration in Classrooms**

To be competitive with other nations, the United States is committed to providing
students with the skills and resources necessary to thrive in the digital age (Firmin & Genesi,
2013). The policy brief, Advancing Educational Technology in Teacher Preparation, developed
by the United States Department of Education’s Office of Educational Technology, outlines four guiding principles for preparing teachers to effectively integrate classroom technology (Stokes-Beverly & Simoy, 2016). Guiding principle number one focuses on the importance of active use of technology to “enable learning and teaching through creation, production, and problem-solving: (Stokes-Beverly & Simoy, 2016, p. 10). The fast-changing economy, the development of the global knowledge society, and the integration of technology have made the need for potential employees to acquire skills that are deemed necessary to function in such environments (van Laar et al., 2017). The skills needed to thrive in such a fast-changing environment have been referred to as 21st-century skills. To keep up with this global change, school districts are increasingly endorsing educational standards to promote 21st century skills including collaboration, communication, creativity, digital literacy, and self-directed learning (Varier et al., 2017). Consequently, schools have adapted aggressive technology integration strategies (Varier et al., 2017). In addition to integration of technology, teachers are also being tasked with designing learning experiences that engage students in the use of technology for problem solving, collaboration, and knowledge construction (Koh et al., 2015).

According to Lei and Zhoa (2007), technology use is defined as the “application of technology function to solve practical problems” (p. 285). The goal of technology use in the classroom is to aid in the learning process of students (Lei & Zhao, 2007). In the context of education, technology use assists students with the construction of knowledge, and as integration levels increase, students develop the skill set to increase the use of technology to answer relevant questions and solve real-world problems (Kopcha et al., 2020). The empowerment of today’s learners is contingent upon their familiarity, efficiency, and effective use of technology (Hilton & Canciella, 2018). Students’ empowerment to effectively use technology plays a role in their
acquisition of 21st century skills, and it is the role of teachers to ensure that they are prepared (Raymond, 2016). Thus, technology must be integrated in all areas of the curriculum (Raymond, 2016). The presence of technology does not cause learning to take place; teachers must take time to learn effective implementation (Cullen & Greene, 2011; Firmin & Genesi, 2013). Results of a study conducted by Lei and Zhoa (2007) suggest that the amount of technology used is not important; however, the importance lies in how that technology is integrated.

Kopcha et al. (2020) refer to the classroom as a “dynamic system,” meaning that it is a system whose behavior changes over time and contains many interacting and sometimes conflicting components that must essentially work together to achieve specific goals. In the dynamic system of the classroom, it is suggested that teachers aspire to use technology to achieve a balance among competing factors, such as student needs, school culture, and professional concerns (Kopcha et al., 2020). Classroom culture and its many variables play a role in effective technology integration (Firmin & Genesi, 2013); however, few teachers seem to integrate technology at high levels and understand how certain technology tools contribute to learning goals (Cullen & Greene, 2011). In a 2010 study, Ertmer & Ottenbreit-Leftwich found that despite extensive access to technology and advanced infrastructure to support technology inside and outside of classrooms, high levels of effective technology use have not been achieved in the United States or other nations. According to Hartman et al. (2019), the number of computer devices present in public schools has increased by 363% over the last seven years. Despite the increase, technology use in pedagogical classroom practices mirror passive traditional classroom practices (Hartman et al., 2019).

Technology integration is effective in a classroom when its use enhances the learning process and establishes a more efficient educational experience for students (Cullen & Green,
Harris and Hofer (2011) assert that successful instructional technology integration is contingent upon the combination of content knowledge, content related processes, and the adequate use of technology. Koehler and Mishra (2009) developed the technological pedagogical and content knowledge (TPACK) framework which explains how the intersections of content, pedagogy, and technology should be used by teachers to effectively integrate technology in the classroom. The TPACK framework is informed by four intersections of knowledge:

- pedagogical content knowledge: how to teach specific content-based materials
- technological content knowledge: choosing technologies that best support content-based learning
- technological pedagogical knowledge: how to use technology in teaching
- technological pedagogical content knowledge: how to teach specific content-based materials using technologies that best support content-based learning in ways that are best suited for the students in the course (Harris & Hofer, 2011)

Typically, when technology is used in classrooms, it is not done in ways that support effective student-centered learning (Ertmer & Ottenbreit-Leftwich, 2010). While effective technology integration has yet to reach an optimum level, teachers’ use of technology in their personal and professional lives has increased (Ertmer & Ottenbreit-Leftwich, 2010). In a national survey sponsored by the International Association for the Evaluation of Educational Achievement (IEA), approximately 64% of United States 8th grade teachers reported using technology for work related purposes. While technology use in a professional context has increased, Ertmer and Ottenbreit-Leftwich (2010) contend classroom use of computers still trends toward low-level use. Low-level use includes mainly teacher-centered learning activities, such as using PowerPoint to present lecture materials or using a search engine to information
(Ertmer & Leftwich, 2010). In the previously cited survey, about 50% of 8th grade teachers reported using technology to deliver classroom instruction.

Traditional teaching methods that include lecturing students who are all seated in straight rows are no longer applicable to today’s changing educational model; instead, students must be exposed to technology integration practices that prepare them for a 21st century workplace (Harrell & Bynum, 2018). 21st century skills are described as interpersonal (the ability to collaborate with others) and intrapersonal skills (the ability to self-regulate); these are valuable skills to have to be successful in today’s workplace (Willis et al., 2019). Providing environments that foster 21st century skills and technology proficiency are consistent with the goals of national educational initiatives like Race to the Top and science, technology, engineering, and mathematics (STEM) initiatives (Varier et al., 2017).

In the early 2000s, instructional technology mostly encompassed using computers to present programs like PowerPoint presentations or having students use those internet-connected computers to conduct research (Trust, 2018). In response to those advances in technology and classroom practices, the International Society of Technology in Education (ISTE) developed a set of standards for teachers that focused on “using technology to support student learning and creative thinking, design digital age activities and assessments, model digital work, promote and model digital citizenship, and engage in professional growth and leadership” (Trust, 2018. p.1). These standards sought to connect technology use with different roles and responsibilities within the educational community; there are standards for students, educators, coaches, and education leaders (Crompton, 2014; ISTE, 2016). The second-generation ISTE standards for students are as follows:
1. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

2. Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively to support individual learning and contribute to the learning of others.

3. Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.

4. Critical Thinking, Problem Solving, and Decision Making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools.

5. Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behaviors.

6. Technology operations and concepts: Students demonstrate a sound understanding of technology concepts, systems, and operations. (ISTE, 2007)

As technology has advanced, the use of technology in the classroom has advanced as well. To keep up with the shift in technology, ISTE updated its standards in 2016; this shift sought to change the focus from teaching with technology to using technology to foster classroom environments that encouraged technology use that led to learning, collaboration, and empowerment of students (Trust, 2018). The redesigned ISTE standards were released in 2017 and were designed around the themes of Learner, Leader, Citizen, Collaborator, Designer, Facilitator, and Analyst (ISTE, 2016). According to Trust (2018), the new standards were a combination of several of the old standards, but incorporated aspects of “collaboration, advocacy, digital literacy, media literacy, computational thinking, privacy and student data,
student empowerment, data-based decision making, feedback, and teaching colleagues” (p. 1).

The ISTE standards are as follows:

1. Empowered Learner – Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.

2. Digital Citizen – Students recognize the rights, responsibilities, and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.

3. Knowledge Constructor – Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.

4. Innovative Designer – Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.

5. Computational Thinker – Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

6. Creative Communicator – Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

1. Global Collaborator – Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally. (ISTE, 2016)
The above standards were created to help achieve the goal of preparing students to learn and succeed in an ever-changing technological landscape and aim to empower student centered learning environments (ISTE, 2016).

Fostering student-centered technology use is imperative (Dotong et al., 2016). Practices that align with a student-centered approach encourage curiosity and creativity in students and shifts the role of the teacher to that of a facilitator (Almeida & Lima, 2018). Researchers posit that certain pedagogical approaches are better suited for classroom technology integration than traditional approaches; these approaches include using technology strategies with active engagement, social learning, and real-world application (Lee & Spires, 2009). Students who can effectively use technology have a better chance of receiving and excelling in specific jobs than their peers who lack sufficient technology skills (Harrell & Bynum, 2018).

There are several barriers to innovative classroom practices, and the integration of technology can be affected by cultural, behavioral, technical, and financial aspects (Marcial, 2018). Ertmer (2001) has classified these barriers as either first order (external) or second order (internal) barriers. External barriers are factors such as lack of equipment, the unreliability of equipment, or other infrastructure-related elements (Wachira & Keengwe, 2010). Internal elements are described as organizational culture, teacher beliefs, and attitudes about technology, as well as the openness to change (Wachira & Keengwe, 2010).

To successfully implement technology within a school, the organization must provide educators with the foundation for technology use, a solid infrastructure. Infrastructure includes hardware, software, and various network resources (Voogt et al., 2011). Infrastructure directly affects teachers’ abilities to integrate technology, as it affects Wi-Fi connections and internet access to student and teacher devices (Harrell & Bynum, 2018). In a study conducted by Wachira
and Keengwe (2010), they found that poor infrastructure and unreliability of the technology-led teachers to experience anxiety regarding the use of technology in the classroom. According to Firmin and Genesi (2013), poor infrastructure (including access to technical support) was one of the main barriers to effective technology integration in schools.

As previously stated by Ertmer (2000), teacher beliefs are also a barrier to technology integration in the classroom. Ottenbreit-Leftwich et al. (2010) define teacher beliefs as “tacit, often unconsciously held assumptions about students, classrooms, and the academic material to be taught” (p. 1322). Understanding teacher beliefs about technology use are important because these factors determine whether the teachers will choose to use technology in their instruction (Carver & Todd, 2016). Teachers who have positive attitudes toward technology perceive it as an asset to their teaching practice (Firmin & Genesi, 2013). According to Tondeur et al. (2017), teachers choose to apply technology that aligns with teaching strategies, as well as their existing beliefs about what they consider adequate educational practices. That is to say that computers, tablets, or interactive whiteboards only play a role as it relates to their thoughts regarding teaching and learning (Tondeur et al., 2017). Although teacher beliefs can influence instructional practice, teacher beliefs about technology do not always ensure that technology will be implemented in effective ways (Leftwich et al., 2010).

In 2011 Hutchinson and Reinking conducted a survey of 1441 United States educators and found a profound gap between teachers’ perceptions of the importance of technology integration and their use of related skills (Carver & Todd, 2016). This trend is echoed in a recent survey by the International Association for the Evaluation of Educational Achievement (IEA), in which 86% of 8th grade teachers agree that technology use is important, however, only 50% of those teachers reported regularly integrating technology into instruction. In order to equip
students with what is labeled as 21st century skills, teachers must understand how to use
technology to promote learning that urges students to construct knowledge and make real-world
connections (Ertmer & Ottenbreit-Leftwich, 2010). Due to how rapidly technology changes,
teachers are usually reluctant to adopt technological innovations even when they believe that the
technology may be helpful; this reluctance may be due to lack of knowledge, low self-efficacy,
and existing belief systems (Ertmer & Ottenbreit-Leftwich, 2010). For teachers to make student-
centered decisions regarding technology use, “we must help them expand and elaborate their

1:1 Technology Integration

The implementation of new learning standards has caused several reforms in the field of
education, and technology has been used to facilitate these standards and extend learning outside
of the traditional classroom environment (Delgado et al., 2015). K-12 public schools have
increased student access to computers and the internet with nearly 100% of public schools
having access to these schools (Keengwe, Schnellert, & Mills, 20120). In today’s schools,
teachers are tasked with redefining educational goals, and innovatively integrate technology into
the curriculum (Spektor-Levy & Granot-Gilat, 2012). This change has led to the implementation
of one-to-one laptop initiatives in many schools, providing students with 24/7 access to computer
technology (Spektor-Levy & Granot-Gilat, 2012). One-to-one (1:1) technology integration refers
to each student having access to a personal device for learning (Varier et al., 2017). Although the
increase in 1:1 programs is relatively new, these types of initiatives have been around for
decades (Sauers & McLeod, 2018), and has changed how students learn (Stone & Stone, 2017).
Due to the myriad of assumed benefits of 1:1 program, the number of school districts that are
purchasing laptop devices continues to increase despite high costs (Keengwe, Schnellert, &
Mills, 2012). Despite the costs, school leaders and policymakers continue to advocate for 1:1 laptop initiatives because of the potential to close the “digital divide” for all students (Keengwe, Schnellert, & Mills, 2012).

According to Stone and Stone (2017), there are five primary reasons school districts undertake 1:1 programs:

1. To help students develop 21st century skills
2. To promote greater student engagement
3. To allow students to develop writing skills
4. To encourage deeper student learning through access to multiple viewpoints
5. To facilitate easier integration into daily instruction

The desire to implement 1:1 programs is rooted in the desire to create learning experiences that mimic tasks students will have to perform in their lives beyond k-12 education (Lewis, 2016). The term “digital natives” used by Marc Prensky to describe the generation of students who grew up using and interacting with technology daily (Lewis, 2016). Prensky believed that these digital natives needed instructional methods that incorporated technology in order to increase student engagement.

Research has shown that 1:1 learning programs have “resulted in increased and improved communication and collaboration among educational stakeholders, extended learning opportunities outside the classroom and into real-world contexts” (Lewis, 2016, p. 14). Lewis (2016) examined several studies of 1:1 programs in K-12 settings; among those studies was a case study of a 1:1 program over a three year period. In that study, the researcher found several variances in results; in year one of the program, the results were positive. However, in year two, technical issues interfered with lessons resulting in teachers deviating from their original plans
and ultimately shifting the pedagogical practice from a student-centered approach to a more teacher-centered practice (Lewis, 2016).

The implementation of 1:1 programs has become especially prevalent in middle school environments (Lamb & Weiner, 2018). Technology use plays a large role in the lives of American middle school students (Lamb & Weiner, 2018). Students usually use their phones and tablets to play video games, connect with friends, and watch movies (Lamb & Weiner, 2018). Although they have experience with technology outside of school, those skills usually do not translate to technology use in school (Lamb & Weiner, 2018). Researchers have found that 1:1 programs in middle schools decrease achievement gaps among socioeconomic groups, as well as, increase student engagement (Lamb & Weiner, 2018). 1:1 technology also reduces the influence of distractions of student learning (Lamb & Weiner, 2018).

According to Varier et al. (2017) traditional classroom environments fail to engage students adequately. Engagement happens when students take responsibility for learning, are invested in learning tasks, and see the value of learning (Varier et al., 2017). 1:1 programs have been shown to increase student engagement (Kay & Shellenberg, 219). 1:1 technology integration assists in extending learning beyond the classroom while simultaneously binging real-world resources into the classroom (Varier et al., 2017).

A majority of research on 1:1 programs focus on student achievement and engagement as areas of interest (Lamb & Weiner, 2018). Findings suggest that 1:1 laptop integration increased student engagement, motivation, and independence (Keengwe, Schnellert, & Mills, 2012). 1:1 programs have also been shown to support student-centered learning in which the teacher’s role shifts from the director to the facilitator (Varier et al., 2017). The increase in student independence and self-direction is one reason for the shift (Varier et al., 2017). Varier et al.
(2017) also credit this shift in classroom focus for increased opportunities for teachers to support student learning, provide feedback, and monitor student progress. Research conducted by Sketor-Levy and Granot-Gilat (2012) found that students who were a part of 1:1 technology program outperformed students who were taught in traditional settings. Studies have shown that students in 1:1 technology environments exhibit better understanding, overall communication, and improved technical skills (Kay & Shellenberg, 2019).

A research synthesis reviewed by Lewis (2016) examined the impact of 1:1 programs on teaching practice. These studies indicated that professional development, technical support, and teacher beliefs were essential to 1:1 implementation (Lewis, 2016). A recurrent theme in the literature about 1:1 programs is that the success of such programs hinges upon the teacher professional development, changes to the educational process, robust infrastructure, and adequate administrative support (Lewis, 2016; Stone & Stone, 2017). The success of 1:1 programs relies heavily on the participation and training of teachers (Lewis, 2016; Stone & Stone, 2017). As shown in Figure 2, Stone and Stone (2017) outline the key components for the implementation of a successful 1:1 program. Teachers’ commitment to a 1:1 program is usually contingent upon the availability of professional development, proper technical assistance, and support (Lewis, 2016). To meet the demands of 1:1 programs, many schools and school districts hired additional personnel known as technology facilitators (Lewis, 2016). Technology facilitators have the task of providing teachers with guidance, leadership, and professional development opportunities to increase teacher self-efficacy towards technology implementation (Lewis, 2016).
While there has been much evidence of success of 1:1 programs, not all programs have produced successful results (Keane & Keane, 2017). Several factors have been identified as reasons 1:1 programs fail. Among those factors are insufficient professional development for teachers, inadequate technical support, poorly crafted vision for the program, and inadequate planning (Keane & Keane, 2017). Teachers play a critical role in the successful implementation of a 1:1 device program (Keane & Keane, 2017). Teachers determine how devices are used daily, and the success of a 1:1 program relies heavily on engaged and prepared teachers (Keane & Keane, 2017). Lack of professional development for teachers proved to be an impediment for the effective implementation of a 1:1 program (Keane & Keane, 2017).
Although there are several advantages to 1:1 technology programs, these programs also have limitations. In schools that have implemented 1:1 technology programs, students exhibit many off-task behaviors, including using social media during instructional time, playing games, and accessing resources that are unrelated to school work during inappropriate times (Kay & Shellenberger, 2019). The implementation of 1:1 initiatives also involves a large financial commitment by school systems (Variere et al., 2017). If district leaders hastily implement a 1:1 program without weighing all the risks and implementing the proper infrastructure and devices, school systems risk the possibility of adverse outcomes that limit student engagement and achievement (Variere et al., 2017).

**Teacher Self-Efficacy and Professional Development**

Self-efficacy is the “belief that one’s ability to accomplish desired outcomes, powerfully affects people’s behavior, motivation, and their failure” (Tschannen-Moran & McMaster, 2009). Research has asserted that self-efficacy is a significant factor that influences human achievement in various settings, including education, business, and sports (Bandura, 1997). Without self-efficacy, people do not put forth effort because they do not think they will be successful (Tschannen-Moran & McMaster, 2009). Barton and Dexter (2019) explain that teacher self-efficacy (TSE) is a self-judgment of one’s capabilities to create desired student outcomes in engagement and learning. Teachers’ self-efficacy influences their teacher behaviors; thus, teachers with low self-efficacy tend to have more teaching-related difficulties (Klassen & Chiu, 2010). Not only does teacher self-efficacy impact a teacher’s practice, but it also affects student learning (Yoo, 2016). Efficacious teachers maintain high student engagement levels and provide a higher level of support for struggling students (Yoo, 2016).
Teacher self-efficacy can be defined as a “teacher's personal belief inability to plan instruction and accomplish instructional objectives” (Joo, Park, and Lim, 2018, p. 49). Teacher self-efficacy encompasses a teacher's belief that he or she can complete an instructional task and that that task, when done correctly, will improve student outcomes (Barton & Dexter, 2019). Self-efficacy is one of the most significant factors that affect teacher behaviors (Joo, Park, and Lim, 2018). When teachers have high self-efficacy, they are more likely to use advanced instructional methods (Joo, Park, and Lim, 2018). Teacher self-efficacy relates to teachers’ beliefs about their abilities to plan instruction and fulfill instructional objectives and confidence in their ability to advance student learning (Joo, Park, and Lim, 2018).

Bandura (1997) proposed four primary sources of self-efficacy information: verbal persuasion, vicarious experiences, physiological arousal, and mastery experiences. Verbal persuasion involves the positive verbal endorsement of a teacher's abilities by their colleagues, school leaders, or coaches (Barton & Dexter, 2019). Verbal persuasion, while considered the weakest source of self-efficacy, it is seen as more effective if the provider is perceived as sincere (Barton & Dexter, 2019). Vicarious experiences as a source of self-efficacy involve teachers being able to see their colleagues complete similar instructional tasks; this source of self-efficacy has a positive impact when the teacher can relate to their colleagues' level of expertise and experience (Barton & Dexter, 2019). Physiological arousal as a source of self-efficacy involves a teacher's perceived mental state concerning a task; this is negatively impacted by anxiety (Barton & Dexter, 2019). Lastly, mastery experiences are considered the most impactful of the four sources, occur when teachers experience competency while performing instructional tasks (Barton & Dexter, 2019).
To achieve the type of learning that aligns with 21st century skills, teachers must understand how to use technology in meaningful ways that ultimately help students construct deep connected knowledge that can be applied to real-life situations (Ertmer & Ottenbreit-Leftwich, 2010). To ensure 21st century teaching and learning are taking place in classrooms, it is imperative that teachers gain confidence with using technology in meaningful ways (Zahra Hussaine et al., 2017). TSE is of particular interest to researchers and education leaders because it plays a significant role in teachers' implementation of new strategies (Tschannen-Moran & McMaster, 2009). According to Barton & Dexter (2019), teachers' beliefs and their preparedness to integrate technology have a strong correlation with technology integration in the classroom. This correlation suggests teachers need to be sustained, and not only their ability to effectively use technology in instruction but their self-efficacy via professional learning experiences is an effective strategy for improving effective technology integration in the classroom (Barton & Dexter, 2019).

Teachers with high self-efficacy are more likely to employ innovative instructional practices than teachers with low self-efficacy; they are also more willing to try more creative methods of instruction (Joo, Park, & Lim, 2018) and may not see value in those tools (Harrell & Bynum, 2018). Zee and Koomen (2016) concluded that computer self-efficacy was a determinant in affecting teachers' use of technology; therefore, for teachers to implement technology, they must feel self-efficacious in their use of computers and other forms of technology. Teacher knowledge has a notable impact on the decisions that teachers make regarding instruction, and in order to help change teacher practice, work must be done to expand their knowledge (Ertmer & Ottenbreit-Leftwich, 2010).
To ensure technology is used effectively, school districts should provide teachers with adequate and continuous professional development to ensure they have the knowledge base to operate and integrate available technologies (Firmin & Genesi, 2013). Even though teachers have access to various technologies, the lack of effective professional development (PD) continues to make it difficult for teachers to increase the level of technology integration (Harrell & Bynum, 2018). To increase confidence regarding technology integration teachers, need to learn, plan, collaborate, and be able to engage in professional learning experiences that encourage the development of positive dispositions toward technology use (Wachira & Keengwe, 2010). Additionally, several other factors influence teacher self-efficacy regarding technology integration; those include: "comfort using computers, time to integrate curriculum, instruction, access to the internet at home, teacher training, vicarious experience, and confidence performing computer tasks" (Pan & Franklin, 2011, p. 30).

To use technology effectively and support meaningful student learning, teachers need knowledge of specific ways in which technology can support their content area, as well as pedagogical methods that can facilitate student learning (Ertmer & Ottenbreit-Leftwich, 2010). When teachers gain knowledge of how to use technology to support learning within their specific content area, they can easily adapt that knowledge to their own classroom environments. (Ertmer & Ottenbreit-Leftwich, 2010). The goal of PD is to help teachers understand and apply new constructs to determine their impact on student learning, with the goal of changing teacher practice regarding effective technology integration (Hughes, 2005).

According to Norton et al. (2017), many newly purchased classroom technology goes unused due to a lack of effective professional development. A major drawback of many PD experiences is implementing the "one size fits all" approach to learning (Norton et al., 2017).
This type of learning usually consists of a one-time event that is delivered using traditional teaching methods, that provides little opportunity for practice or reflection, and often spends the majority of the session discussing how the tools work instead of how it can be integrated into instruction (Norton et al., 2017). It has been concluded that by implementing effective modeling of technology integration, technology PD would be more valuable to teachers (Norton et al., 2017). Research supports an administrative-supported and mentor-supported approach to technology PD that is rooted in constructivist and adult learning theory, which also takes teacher beliefs about technology into account in order to effectively support teacher implementation of instructional technology.

In order for professional development experiences to be beneficial, they must be designed effectively (Hughes, 2005; Pan & Franklin, 2011; Yurtseven et al., 2020). According to Hughes (2005), teachers have limited access to quality PD opportunities that offer learning experiences based on pedagogical practices and specific content areas. Pan and Franklin (2011) contend that as teachers spend more time engaged in effective professional development, they are likely to increase their confidence regarding technology use, as well as their willingness to use technology in their classrooms. PD offerings are often one-time, short-term experiences that are focused only on how technology is limited or the affordances of technology; it fails to highlight improved pedagogy and student learning (Yurtseven et al., 2020). Technology professional development should provide opportunities for educators to reflect, explore, and evaluate new technologies to ensure active learning (Yurtseven et al., 2020). Educators should be active learners during PD experiences to ensure the training is effective (Yurtseven et al., 2020). Active participation by educators during PD often includes "observing experts or being observed; reflecting on the own practices; creating new material; preparing for the implementation of a new teaching strategy;
reviewing student work; and presenting material and leading discussions during PD activities” (Yurtseven et al., 2020).

**The Impact of COVID-19 on Instructional Technology**

In early 2020, the spread of the novel coronavirus (COVID-19) forced schools worldwide to close and quickly transition all teaching and learning to a digital environment. As stated by Hodges et al. (2020, p. 1), "well-planned learning experiences are meaningfully different from courses offered online in response to crisis or disaster," such as COVID-19. The shift to online learning provided many challenges for schools and school districts (Clauson et al., 2020). This shift in learning environments exposed the lack of preparedness of teachers to present instruction online, issues with infrastructure, as well as equity, and access to devices needed by students (Clauson et al., 2020). The response to the forced school closures varied based on location, infrastructure, finances, and community needs (Kaden, 2020). The school closures led educators to transition to modes of teaching and learning known as virtual or distance learning (Kaden, 2020). While these models of delivering instruction are not new, many in-service teachers had never taught students via remote methods before the pandemic closures (Kaden, 2020).

To ensure that students were adequately supported during events that forced them to learn in a virtual setting, teachers must be "fluent users of technology" (Trust & Whalen, 2020, p.189). The COVID-19 outbreak exposed the varying degrees to which teachers were equipped to use technology (Trust & Whalen, 2020). A study conducted by Whalen (2020) showed that many of the participants struggled to design quality instruction using technology tools during the pandemic school closures. Prior to the 2020 pandemic school closures, the majority of teachers who participated in the study had never tried any form of online teaching--- online, remote, or blended (Trust & Whalen 2020). The participants were provided, on average, four different
professional learning experiences to support the transition to online learning; however, overall, they felt overwhelmed and unprepared to use online teaching strategies and tools (Trust & Whalen, 2020). The struggles these educators faced were primarily due to a lack of training, preparation, and support, and this, in turn, added additional layers of stress to the distance learning experience (Whalen, 2020). Teachers who were regular users of technology in their instruction practices before the pandemic had an easier transition to online learning than their peers who were simultaneously learning how to use various tools and teaching in a virtual environment (Whalen, 2020).

Teaching and learning during the coronavirus pandemic forced many teachers, many of whom had not been properly trained to conduct learning online environments, to provide online instruction to their students. Research shows that effective PD plays a significant role in students' success in remote learning environments (Trikoilis & Papanastasiou, 2020). According to Clausen, Bunter, and Robertson (2020), to successfully make the transition to online learning during the pandemic, teachers must engage in professional learning. Unlike traditional circumstances teachers were accustomed to, the nature of the pandemic now left them isolated in their homes and were left with limited capabilities for attending professional development opportunities geared toward online learning (Trikoilis & Papanastasiou, 2020). Because of these limitations, many educators lacked guidance on how to effectively handle many challenges presented by online teaching and learning (Trikoilis & Papanastasiou, 2020). Districts responded to this issue of teacher preparedness by conducting various professional development experiences for teachers that would temporarily carry them through the remainder of what many are calling COVID teaching (Clauson et al., 2020; Hodges et al., 2020).
Summary

This review of literature set out to explain the role that technology plays in K-12 education and identify how this role impacts teachers' classroom practices. The purpose of this phenomenological study is to identify and describe the factors that motivate teachers to use instructional technology in a district that has a 1:1 Chromebook program and technology-rich classroom environments. The related literature identifies multiple factors that could influence teachers’ technology integration and why the integration of technology is imperative to the development and achievement of students.

According to literature (Ertmer & Ottenbreit-Leftwich, 2010, Tondeur et al., 2017; Wachira & Keengwe, 2010), teacher beliefs surrounding technology play an increased role in the effective implementation of available technology resources, as well as the perceived usefulness are known factors affecting technology integration (Scherer, Siddiq, and Tondeur, 2017). Teacher self-efficacy also plays an integral role in its implementation; highly self-efficacious teachers are more likely to engage in more innovative practices (Ertmer & Ottenbreit-Leftwich, 2010; Joo, Park, and Lim, 2018).

Gauging teacher efficacy and tailoring professional development experiences to promote more effective technology integration is imperative to student success. According to literature (Ertmer & Ottenbreit-Leftwich, 2010; Firmin &Genesi, 2013; Harrell & Bynum, 2018), adequate and ongoing PD is necessary to improve technology integration in schools. This study aims to identify the motivators that cause teachers to use instructional technology in a 1:1 context and potentially benefit K-12 leadership by using the identified factors to aid in the curation of professional development experiences and learning environments that foster effective use of instructional technology.
CHAPTER THREE: METHODS

Overview

As the access to classroom technology increases, it is becoming increasingly important for teachers to implement technology into their pedagogical practices (Tondeur et al., 2017). The purpose of this phenomenological study was to identify and describe the factors that motivate teachers to use instructional technology in a district that has a 1:1 Chromebook program and tech-rich classroom environments. This chapter focuses on the research design, research questions, study setting, participants of the study, procedures, and my role as the researcher. Also, the chapter will outline how data was collected and analyzed during the study. The final sections of the chapter focus on the trustworthiness and ethical considerations of the study.

Design

In this study, I investigated factors that motivate teachers to integrate instructional technology into their pedagogical practices by using a transcendental phenomenological approach to qualitative research. A qualitative research design is used when researchers seek to learn more about the human condition (Roller & Lavrakas, 2015). According to Creswell and Poth (2018), researchers conduct qualitative research to explore an issue that requires a complex understanding. As classrooms continue to be outfitted with educational technology, educational leaders must understand the motivators that drive effective integration by teachers; thus, a qualitative research approach is appropriate for this study.

Phenomenology is the study of the world as people experience it and aims to provide a greater understanding of our daily experiences (van Manen, 1997). The primary intention of phenomenology is to reduce the experiences of individuals with a phenomenon to a “description of the universal essence” (Creswell & Poth, 2018, p. 75). While phenomenology focuses on...
capturing the universal essences and ideas of a phenomenon, it does not deny the realism of the natural world (Moustakas, 1994). I chose a phenomenological approach because this study aims to describe how several people experience a phenomenon, are motivated to use instructional technology, and scale those experiences to a “description of the universal essence” (Creswell & Poth, 2018, p. 75). The research attempted to understand the experiences of the teachers regarding technology use and the internal and external factors that contribute to that use.

Transcendental phenomenology is a philosophical approach in which researchers seek to understand the human condition; this is achieved through the research by setting aside preconceived notions about the phenomenon and allowing the themes to naturally emerge (Sheehan, 2014). This study used a transcendental phenomenological approach as I had to bracket my preconceived judgments about the implementation of instructional technology integration from the experiences that the participants shared. This was achieved through the process of epoche, which in Greek means “refraining from judgment” (Moustakas, 1994). Setting aside the judgment and preconceived notions allows the researcher to view the phenomenon through a lens of naivete (Moustakas, 1994). The research focused less on my interpretations as the researcher but instead on the experiences of the participants (Creswell and Poth, 2018).

**Research Questions**

The following research questions were used to guide this study:

**RQ1:** How do middle school teachers describe the impact of access to contemporary technology resources on their motivation to integrate technology in their classrooms?

**RQ2:** What are middle school teachers' perceptions of how professional development experiences impact their motivation to integrate technology in the classroom?
**RQ3:** How do the lived experiences of middle school teachers impact how they integrate technology in their classrooms?

**Setting**

The research was conducted in a large school district in west Alabama. School District Z system serves approximately 10,000 students and employs more than 700 certified personnel. Sixty-five percent of the district’s students qualify for free or reduced lunch. The school district is under the direction of a superintendent, a deputy superintendent, and a ten-member school board (Fast Facts, 2018). There are 21 schools within the district, including 11 elementary schools, four middle schools, one K-8 school, three high schools, and two program sites dedicated to specialty education. There are roughly 900 professionals in the school district that have teaching certificates, including administrators and instructional personnel. Within this school district, 53% of the teachers have master’s degrees, around 9% have specialist’s degrees, and approximately 5% are National Board-Certified Teachers (NBCT). In 2016, the district employed a strategic plan that aims to increase the use of instructional technology. This plan includes upgrades to digital equipment in each classroom and a 1:1 Chromebook initiative that provides devices for all students in grades 6-12 (Strategic Plan, 2018). In 2016 the district also hired three instructional technology coaches to assist with the integration of the 1:1 initiative at the middle school level. In the following years, four additional coaches were added to serve the elementary school and high school populations and to support the expansion of the 1:1 initiative into grades 9 and 10. The coaches are also responsible for providing professional development to teachers to support the successful integration of instructional technology in the classroom.
Participants

Participants were teachers in grades 6-8 from the following schools within the XYZ City Schools district: A Middle School, B Middle School, and C Middle School. Teachers from each school were sought to participate in this study. Purposeful sampling was used to gain participants who meet the criteria of this study. According to Palinkas et al. (2015), purposeful sampling involves the researcher selecting individuals who have experienced the phenomenon of interest. This sampling method is used to “inform an understanding of the research problem and central phenomenon of the study” (Creswell and Poth, 2018, p. 158). Furthermore, this study employed the use of criterion sampling, in which all individuals meet a specific criterion (Creswell & Poth, 2018). Purposeful sampling is used to identify individuals who can provide an in-depth perspective of the phenomenon because they have experienced it (Palinskas et al., 2013). For the purposes of this study, participants were chosen based on their teaching location, grade levels taught, and the types of technology available in their classrooms, and access to 1:1 technology. This study sought to find teachers who teach grades 6 through 8 (grade levels within the district who participate in the 1:1 initiative) and occupy renovated and outfitted classrooms with updated technology. Each renovated classroom was equipped with an Epson interactive projector, Top Cat microphone and speaker system, HoverCam Solo 8 document camera, and a touch screen Chromebook for teacher use. This is to ensure teachers have access to adequate technology resources and have had an opportunity to form an opinion of the 1:1 initiative and the expectations of technology integration in updated classrooms. A short online survey was administered to teachers to collect participant demographics such as age, gender, teacher credentials, and types of devices they have access to in their classrooms.
Procedures

A request to conduct research was submitted to the district’s data governance team and was approved (Appendix B). Upon district approval, I sought approval from Liberty University’s IRB board. Upon receipt of Liberty University IRB approval (Appendix A), I contacted the principals of each of the schools that met the requirements for my study. During the meetings with the principals, I sought their consent to speak with teachers in the building, explained the premise of my research to them, and answered any questions they had concerning the research and teacher obligations. Once administrative consent was received, I contacted teachers to obtain their consent to participate in the study (Appendix C). Before conducting the research, I piloted the interview questions with a small group of teachers outside of the study to ensure the clarity and wording of the questions.

After teachers had submitted their written consent to participate in the study, I administered an online survey (Appendix D) to collect demographic data on the participants to determine the level of technology use and choose participants accordingly. Once the participants submitted the online survey, I then scheduled an interview with each participant. Interviews were scheduled at a time and location that was convenient for the participant. Interviews were conducted to gain insight into how teachers use technology in the classroom and what motivates them to implement the provided technology. Interviews were transcribed using transcription software.

In addition to the interviews, participants were asked to reflect on the motivating factors of their classroom technology use via a journal prompt. The journal prompts were used to gain greater insight into how and why teachers use classroom technology. Observations of classroom technology use were conducted for each participant to experience the phenomenon in practice.
During the observations, I took notes about the classroom environment and how the teachers interact with the available technology. Using the observation protocol, I took note of the types of technology the teacher and students have access to and how and if those tools were used.

The Researcher’s Role

It is important to understand my role as the researcher in this study. My past experiences and current position as an instructional technology specialist influence this study. My interest in instructional technology integration stems from my time as a classroom teacher, but more so from my current role as an instructional technology coach. As an instructional technology coach, I work closely with district leaders to plan and implement professional learning experiences for teachers intended to enhance their classroom technology integration. Although teachers receive the same learning experiences after returning to their classrooms, I noticed that equipment and skills shared during professional development sessions are implemented to varying degrees. Each teacher has varying expertise in technical experience and pedagogical experience. Because of this position and my background as a secondary teacher, I understand the importance of engaging students and how purposeful technology integration affects student learning.

According to Sutton and Austin (2015), qualitative research requires the researcher to be reflective before and during the research process. Also, during the reflective process, researchers should “not try to simply ignore or avoid their own biases (as this would likely be impossible).” Still, they should acknowledge and articulate them to better inform the reader of the worldviews that shaped that research (Sutton and Austin, 2015, p. 226). I am employed by the district where this study took place; although I am an instructional technology specialist, I have no authority over the participants. As the researcher, I recognize and acknowledge my personal biases. I did
not work with teachers with whom I have personal relationships or associations to avoid bias during the research process. I have no administrative power over the teachers, which allowed them to respond honestly. I also kept a journal of my personal thoughts and reactions to bracket my biases from the research results.

Data Collection

This research employed a transcendental phenomenological approach to research. This research aimed to identify the factors that motivate teachers to implement instructional technology. To begin identifying these factors, I collected data in various forms, including interviews, journaling, and observations.

Interviews

An interview is a social interaction through conversation in which the researcher constructs knowledge based on that interaction (Creswell and Poth, 2018). The interviews with participants focused on three areas of interest: their personal use of and feelings regarding technology, their professional use of and feelings regarding technology, and how they feel technology impacts student learning. The interviews were conducted at a time and place that are convenient for the participants. Participants had the option to participate in the interviews either in-person or online; both options are in observance of Covid-19 protocols. The location for each interview was in a private setting that limits distractions and allows for uninterrupted conversation. The audio of the interviews was recorded by Google Meet software. The following questions were used to gain an understanding of the participants’ experiences.

1. How long have you been in the field of education, and what prompted you to make this career choice?

2. What types of technology do you use in your personal life and why?
3. How do you use technology in your classroom for productivity?

4. How would you describe your skill level regarding technology?

5. What kinds of opportunities, if any, do you provide for your students to use technology?

6. How would you describe the school-wide expectations for classroom technology use?

7. What professional experiences have you had that have prompted you to use a technology tool in your classroom? Describe that experience.

8. What factors influence how you use technology in your classroom?

9. If you do not regularly integrate instructional technology tools (district-provided hardware or web-based tools) in your classroom, what influences this decision?

10. How would you describe the importance of technology use in the classroom?

11. How do you define technology integration as related to your teaching practice?

12. How do students in your classroom utilize instructional technology? Describe an activity that you felt was an exemplar of high quality technology integration.

13. What else do you think is important for me to know about why teachers integrate technology in the classroom?

Question one is intended to create a familiar environment and break the ice between the participant and me. These questions are intended to get the participant to think about education and their uses of technology.

Questions three and four are intended to get participants to think about their efficacy as it relates to technology implementation. Teachers with high levels of efficacy tend to value the use of technology in the classroom, as opposed to those with low efficacy (Hsu, 2016).
Questions five through thirteen address how and why teachers use technology in the classroom. The Technology Acceptance Model focuses on user acceptance or rejection of technology (Davis, 2019); these questions aim to identify what aspects of technology teachers value. According to the TAM, “Perceived usefulness (PU) and perceived ease of use (PEoU) are primary motivating factors for accepting and using new technologies” (Lee et al., 2003). Therefore, if teachers see the usefulness of classroom technology, they should be inclined to implement it. These questions were also formulated to provide answers to research questions one and three.

Journaling

When used as a form of data collection, journaling can enhance the information gathered through interviews (Hayman, Wilkes, and Jackson, 2012). According to Janesick (1998), journaling can also act as an additional dataset intended to refine the researcher’s understanding of the participants. I provided three writing prompts to each of the participants. Each prompt was intended to gain clarity into the factors, such as self-efficacy and professional learning experiences, that could potentially impact why teachers choose to integrate technology in the classroom. High levels of teacher self-efficacy and proficient professional development opportunities are both factors that influence technology integration (Joo, Park, & Lim, 2018; Firmin & Genesi, 2013). Participants were presented with the following writing prompts.

1. Describe a time when you felt most confident about implementing technology in your classroom. Describe a time when you felt frustrated implementing technology in your classroom.

2. Describe how you used technology in your classroom this week. What was the overall student response to this technology integration?
3. Describe a technology-focused professional development experience you have participated in this year. Was the training beneficial? Why or why not?

Observations

Observation is defined as “the systematic description of events, behaviors, and artifacts in the social setting chosen for study” (Kawulich, 2005, p. 2). Creswell and Poth (2018) note the importance of observations stating, “it is the act of noting a phenomenon in the field setting through the five senses” (p. 167). Observations allow the researcher to gain a greater insight into situations that participants described during interviews, as well as situations that the participants may have failed to mention during interviews (Kawulich, 2005). During this study, participants were observed in the classroom setting to gain a better understanding of how they interact with the technology in their classrooms for productivity and student learning. Observations also provided greater insight into the culture of the schools and classroom settings to gauge their effects on teacher efficacy and expectations for technology use. An observation protocol, The Technology Integration Observation Instrument (TIOI) (Appendix E), as described by Creswell and Poth (2018), was used to record both descriptive and reflective notes during the observations. The Technology Integration Observation Instrument (TIOI) (Appendix E) was utilized during observations. The TIOI was developed by Harris et al. (2011) and is a reliable instrument to assess technology integration in observed lessons delivered by teachers.

Data Analysis

To analyze data, I used the procedure described by Moustakas (1994). Phenomenological reduction involves horizontalizing data, grouping themes into clusters, imaginative variation, synthesis, and further organizing those clusters into textual descriptions of the phenomenon (Moustakas, 1994). To ensure I did not apply any preconceived biases to the data analysis
process, I bracketed out my biases as I read the participants’ responses. I then organized and prepared all collected data for analysis. I transcribed all recorded data. All recorded data was transcribed using Otter AI software, all field notes and observation protocols was typed, and participants were asked to review their data for accuracy. After participants reviewed and approved their transcripts, I began the process of reading and coding data to distinguish themes and meanings. A code is “most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data (Saldana, 2013, p.3). While reading, I assigned code to significant words and phrases. I used the In Vivo Coding method that entails using a word or short phrase derived directly from the data; this allowed the data to reflect the perspectives of the participants (Saldana, 2013). This process involved assigning equal value to each relevant statement and is known as horizontalization (Moustakas, 1994).

For the next step of data analysis, I organized the themes that were developed during horizontalization into textural descriptions of the phenomenon (Moustakas, 1994). Themes are “broad units of information that consists of several codes aggregated to form a common idea” (Creswell & Poth, 2018, p. 194). The textural descriptions that emerged were used to describe the context in which the participants experienced the phenomenon. I did this by using direct quotes from the participants as evidence of these experiences. Following this step, I used the process of imaginative variation. Through this process, I formed meanings from the participants’ experiences. Moustakas (1994) states the goal of this process is to describe the fundamental structure of the phenomenon. This process is followed by synthesis; this is the final step in the phenomenological research process, and during this step, I used the data I had collected and organized to provide meaning to the experiences of the participant using both the textural and
structural descriptions of the phenomenon. After data analysis, member checking took place. Member checking involves returning data to participants to allow them to check for accuracy with their experiences (Birt et al., 2016). This method was used as a way to increase the credibility of results (Birt et al., 2016).

**Trustworthiness**

I worked diligently to ensure this study is trustworthy. Connelly (2016) defines trustworthiness as the “degree of confidence in data, interpretation, and methods used to ensure the quality of a study” (p. 435). To establish the trustworthiness of a study, I used the triangulation of data and member checking.

**Credibility**

To show this research as trustworthy, I first established credibility. In this study, the triangulation of data was used. This involves gathering information from multiple data sources to identify a theme or perspective. According to Creswell and Poth (2018), this process increases the reliability of the study because it provides corroborating evidence. In this study, I conducted interviews with participants, observed their teaching practices, and analyzed writing prompts from each participant. In this study, member checking was used to ensure the validity of the participants' experiences. This process involved the researcher soliciting participants’ views regarding the validity of the data that was collected. This is important because it ensures the participants’ stories are being accurately reported in the study (Creswell & Poth, 2018).

**Dependability and Confirmability**

Another way to ensure the trustworthiness of the data is dependability and confirmability. Dependability is the degree to which results findings are dependable and can be replicated (Connelly, 2016). Each participant was asked the same questions and writing prompts and was
also observed using the same observation tool to ensure the process can be duplicated and the data is dependable. Confirmability was maintained by involving an external auditor who is not connected to the study. The auditor examined the findings to confirm that they are supported by data (Creswell & Poth, 2018).

**Transferability**

Transferability refers to the extent to which the research can be applied to other cases (Connelly, 2016). The goal of transferability is for researchers to provide enough detailed descriptions of the research process so that readers can decide if the results can be transferred to other contexts (Hays & Singh, 2011). This was accomplished by providing thick, rich descriptions of the participants and the research process (Korstjens & Moser, 2018). The information in this research will be able to be used to foster additional research efforts. This research will be able to be applied to studies on the implementation of instructional technology in secondary settings, as well as other research about teachers’ usage of technology for productivity. This research could prompt other researchers to deeply explore each of the intrinsic and extrinsic motivators of educators regarding technology use and how the implementation of these factors could be used to shift the culture of technology use within educational organizations.

**Ethical Considerations**

Ethically conducting research is immensely important to me. To maintain the privacy and confidentiality of all participants, the school district, and its administrators, pseudonyms were used to protect their identity. Also, any paper data that was collected during the study is protected in a locked filing system for three years. Any digital data that was collected was stored in a password-protected computer and will be destroyed after three years.
Summary

The implementation of technology is an increasingly important issue in the K-12 setting. As school districts provide more access to technology tools, teachers must create opportunities to use those tools effectively. This research attempted to describe the factors that motivate teachers to implement instructional technology in their classrooms. The study was a qualitative study that employed a transcendental phenomenological approach. Data were collected via interviews, observations, and writing prompts. The data was analyzed in accordance with Moustakas’s (1994) analysis procedures. Care was taken to ensure that the research has credibility, dependability, and transferability. Ethical considerations were taken to protect the identity and information of all involved.
CHAPTER FOUR: FINDINGS

Overview

The purpose of this qualitative transcendental phenomenological study was to identify and describe the factors that motivate teachers to integrate instructional technology in a district that has a 1:1 Chromebook program and tech-rich classroom environments. In this chapter, I provide a descriptive profile of each of the participants and descriptions of the participants’ experiences using instructional technology in the classroom. In this chapter I will report the findings from the interviews, journals, and observations.

Participant Summary

Participants for this study included ten teachers who currently teach in middle school settings in XYZ school district. These teachers participated in one-on-one interviews, classroom observations, and journal writings during the beginning of the 2021-2022 school year. Write a sentence here about Table 1 and was information it provides.

Table 1

<table>
<thead>
<tr>
<th>Participant</th>
<th>Grade Level</th>
<th>Content Area</th>
<th>Years of Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cassie</td>
<td>7</td>
<td>Science</td>
<td>6</td>
</tr>
<tr>
<td>Aldis</td>
<td>6</td>
<td>Social Studies</td>
<td>12</td>
</tr>
<tr>
<td>Christina</td>
<td>7</td>
<td>ELA</td>
<td>12</td>
</tr>
<tr>
<td>Robin</td>
<td>8</td>
<td>Science</td>
<td>8</td>
</tr>
<tr>
<td>Kelly</td>
<td>7 &amp; 8</td>
<td>Math</td>
<td>7</td>
</tr>
<tr>
<td>Nicole</td>
<td>7</td>
<td>Math</td>
<td>4</td>
</tr>
<tr>
<td>Michelle</td>
<td>7 &amp; 8</td>
<td>ELA</td>
<td>8</td>
</tr>
<tr>
<td>Mary</td>
<td>6</td>
<td>ELA</td>
<td>6</td>
</tr>
<tr>
<td>Regina</td>
<td>6,7, &amp; 8</td>
<td>Computer Science</td>
<td>6</td>
</tr>
<tr>
<td>Taylor</td>
<td>8</td>
<td>Math</td>
<td>21</td>
</tr>
</tbody>
</table>

Cassie
Cassie is a middle school science teacher who has been teaching for six years. She chose education as a career because she wanted to positively impact future generations. Cassie self identifies as very tech-savvy. Cassie uses various technology tools daily in her personal life, such as a smartphone and MacBook. She chooses to use these technologies to stay connected to the latest global news and her family. Cassie decides to use tools like Google Calendar, Outlook email, and Google Workspace to maintain productivity in her professional life.

Students primarily use Chromebooks and Google Workspace tools like Google forms in Cassie's class. She provides students opportunities to use interactive quizzes like Kahoot. In addition, she provides opportunities for them to engage with classroom technology like the Epson touchscreen projector. She feels exposure to these tools helps engage students.

Aldis

Aldis is a sixth grade social studies teacher in a middle school. He has been in education for twelve and a half years, having spent two and a half years as a paraprofessional and ten years as a classroom teacher. He did not initially have plans to be a teacher but decided on that route after an inspiring conversation with his former sixth grade teacher. That conversation prompted him to change his area of focus from physical therapy to elementary education.

His personal technology use includes the use of a smartphone, smart television, and various streaming devices. He feels these technologies have become a significant part of his everyday life and is simply a way of modern life. Aldis chooses to use Google Meet to schedule and conduct virtual meetings with colleagues and students’ parents to ensure he is productive in his professional life. Additionally, he uses online calendars to make sure he is organized and keeps track of any upcoming meetings. Aldis self-identifies as an advanced user; he often uses technology to problem solve and regularly integrates technology into his teaching practices. 
also feels he is progressive when it comes to navigating new products and software. In his class, he provides opportunities for students to use technology to create instead of as a means of simply consuming content. He uses the available technology resources to allow students to investigate and lead their own learning because he feels it is a valuable skill to have, given the current state of the world.

**Christina**

Christina is currently an English language arts (ELA) intervention teacher; however, she has spent most of her 12-year teaching career as a core ELA classroom teacher. Her former English teacher inspired her to pursue a career in education. She uses various technology tools in her personal life because they are convenient and user friendly. She expressed that her smartphone, laptop, Echo Dot, and networked printer are often the tools she uses. To remain productive in her professional life, she uses Google Drive to organize and store files. She believes the pandemic has aided her in being more tech-savvy and has forced her to rely on technology to be more productive. Christina provides daily opportunities for her students to use technology. She wants them to become more comfortable with technology to aid in their independence. She integrates student technology use throughout her lessons in various forms such as Google Docs and Pear Deck.

**Robin**

Robin is an eighth grade physical science teacher. Although she has been in the education field for eight years, teaching in a middle school setting was not her first career choice. Before she began teaching eighth grade, she was an instructor at a vocational college. Her experience working in the emergency room in a local hospital led her to the medical assistant program, where she was an instructor for six years.
Robin chooses to use various forms of technology to stay connected to family and friends in her personal life. She also decides to use these tools because they are convenient. These technologies include an iPad, smart phone, and Apple mini home pod. As a self-described intermediate user of technology, she uses various forms of technology for productivity, student engagement, and data tracking. She uses technology to increase her productivity in her classroom by using the Schoology learning management system to assist with lesson planning and data tracking. Additionally, she uses online quiz programs like Quizlet to help with introducing new vocabulary to students.

Kelly

Kelly is a seventh and eighth grade mathematics teacher. Becoming a teacher has always been one of her aspirations; she was only unsure whether to pursue a career in math education or science education. The problem-solving aspect of mathematics eventually won her over, and she has been teaching in that field for seven years. Technology is a part of her daily life, as she uses items like her iPad, iPhone, and Apple watch to “make life easier”. She also uses streaming devices for entertainment.

Kelly uses digital calendars to create to-do lists to aid in classroom productivity to keep herself organized. She also utilizes Excel spreadsheets for lesson plans. She lays out her units of study in her spreadsheets alongside the district pacing guide to keep track of necessary activities and important dates. In addition to using technology for productivity, Kelly allows students to use Google Forms for self-assessments, and she uses that data to plan further instruction.

Nicole

Nicole is a seventh grade math teacher and has been in education for four years. Before becoming a math teacher, Nicole spent two years as a paraprofessional. She comes from a family
of educators, which heavily influenced her decision to become a math teacher. She describes herself as a moderately skilled technology user. She has no issues figuring out how to use technology tools and enjoys learning about new technologies. In her personal life, Nicole uses various tools, including Canva for graphic design and Google Slides for her graduate school assignments.

In her classroom, she remains productive by using Google Sheets to track students’ tests scores and standards mastery; she uses this information to determine which students need interventions and support. She provides various opportunities for students to use technology; she often has her submit answers to assessments via platforms like FlipGrid or by gamifying lessons using Gimkit.

**Michelle**

Michelle is a seventh and eighth grade English Language Arts teacher. She has been teaching for eight years. She decided to become a teacher early in life, as she was inspired to enter the profession by relationships she had cultivated with her former teachers. She describes herself as an advanced technology user who “can’t imagine teaching without it at this point”. In her daily life, she mainly uses technology that aids in connecting her with family or technology used for entertainment; these tools include her cell phone and social media websites. Michelle uses Google Drive with the teachers on her team for productivity purposes. The team of teachers use Google Drive to share files and plan collaboratively when time does not permit them to engage in in-person meetings and conversations. She also utilizes the messaging features in the district provided learning management system to communicate with students and parents about assignments and due dates.
Michelle provides daily opportunities for her students to use technology in her class. Since writing is a large part of her instruction, she uses various tools that help students engage in the writing process. She uses products like Google Docs to edit their narratives together and offer feedback and constructive comments.

Mary

Mary is an English language arts teacher who has been teaching for six years. She currently teaches eighth grade, and she stated that eighth grade is when she began to cultivate her passion for reading and writing. This passion led to her decision to become a teacher. She said that her goal is to instill that same passion into her students. She utilizes her smartphone and laptop to network with others and create in her personal life because these tools make her life easier.

She chooses to organize her electronic files using folders in Google Drive in the classroom. Additionally, she uses Google Calendar to track her appointments and meetings. Mary labels herself as an advanced technology user who is naturally curious about technology and likes to try various technology tools and attend workshops to enhance her skills. She provides her students with opportunities to use technology to research, write, and create products that showcase their mastery. In addition to these opportunities, she teaches students the importance of safe internet habits and digital citizenship.

Regina

Regina is a computer science teacher who teaches grades six through eight. She has been an educator for six years. Her grandmother inspired her to become an educator, as she was also in the profession. Regina stated that she uses various Apple products in her daily life to help keep all of her information in sync. Her iPhone and MacBook are among the tools she frequently uses.
and credits them for making her graphic design and photography hobbies easier. Regina describes herself as an advanced technology user who enjoys teaching herself how to use new tools. In her professional life, Regina says she and her colleagues utilize various Google tools to collaborate and remain productive without being in the same place. Additionally, she provides her students with ample opportunities to use technology in class by employing various robotic tools and coding platforms to teach new skills.

**Taylor**

Taylor has been teaching for 21 years. She began her career as a special education teacher but is currently an 8th grade math teacher. The field of education was a second career Taylor; she began teaching after her professional basketball career ended. She wanted to become a basketball coach, and she stated that teaching was a great way to transition into that role.

Taylor describes her skill level with technology as an intermediate technology user, stating that she can use technology if it is necessary. Taylor’s primary use of technology in her personal life is communication with family. She relies on journals and calendars to keep herself organized in her classroom. She stated that she prefers to use paper and pencil for organizational tasks because they are easier. Although her personal use of technology is minimal, Taylor utilizes various forms of technology with her students to ensure they are engaged with the content she is presenting. Her most used technology tools for instruction are her Interwrite pad, which allows students to make annotations on the projected screen from anywhere in the classroom. The district provided a math e-text suite, Savvas. These tools help keep her students interested in and engaged with the content.
Results

This section details how the research was completed and the results of the study. After one-on-one interviews, classroom observations, and journal entries, I utilized phenomenological reduction to analyze the collected data that resulted in the findings conveyed in this section. The section will close with a summation of Chapter 4.

Theme Development

In this section, I provide the results of the study and the analysis using Moustakas’ (1994) phenomenological reduction. This study was based on three research questions that addressed the factors that led middle school teachers in a 1:1 Chromebook school district to integrate technology. The data analysis produced 35 codes, which were then grouped into 15 subthemes, and further classified into 4 overarching themes.

The study addressed the following research questions: How do middle school teachers describe the impact of access to contemporary technology resources on their motivation to integrate technology in their classrooms?; What are middle school teachers’ perceptions of how professional development experiences impact their motivation to integrate technology in the classroom?; How do the lived experiences of middle school teachers impact how they integrate technology in their classrooms?

The data analysis process began with horizontalization. This process involves assigning equal value to each relevant statement (Moustakas, 1994). Once all interviews, journal responses, and observations were collected, I transcribed the interviews using the Otter.ai software. Each transcription was then reviewed to ensure there were no discrepancies. I began the horizontalization process by reading the transcripts of the interviews and journal entries to become more familiar with the data. While reading the data, I began to hand-code the data and
assign codes to significant words and phrases. The textural descriptions that emerged were used to describe how teachers experienced the phenomenon of motivation as related to the integration of instructional technology. Structural descriptions that emerged describe how teachers were trained to use the available resources that led to technology integration in the classroom. Then a synthesis of meanings was constructed to describe and explain the motivational factors that led the participants to integrate instructional technology. Next, the codes were classified and clustered into themes. The four major themes that are presented in this chapter are (a) access to technology, (b) teacher self-efficacy, (c) student outcomes, and (d) professional development.

Table 2

*Themes and Corresponding Horizons*

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<th>Theme</th>
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<td>1. Access to technology</td>
<td>District provided hardware</td>
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<td>District provided software</td>
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<td>Free v. paid apps</td>
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<td>2. Professional development</td>
<td>District provided support</td>
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<td>Conferences and other PD opportunities</td>
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<td>Colleague collaboration</td>
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<td>3. Teacher self-efficacy</td>
<td>Comfort level using technology</td>
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<td>Value of technology</td>
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<td>Leadership support and expectations</td>
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<td>Effects of the pandemic</td>
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<td>4. Student outcomes</td>
<td>Student engagement</td>
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<td>Future-ready students</td>
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<td>Right tool for the job</td>
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<td>Students as creators</td>
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<td>Teachers as facilitators</td>
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The first theme that emerged identified access to district-provided technology resources as a motivator for the participants to integrate technology into their classroom practices. Data
gathered from the participants determined that district-provided hardware and software were integral to their classroom practices.

**Access to District Provided Technology Resources**

The first theme emerged from the participants discussing how they use the various technologies and webtools that are provided to teachers within the district of study. There are numerous tools that teachers use during the instruction of their content areas. Participants shared how the addition of these resources enhances their practice and how the lack of certain resources hinders their instructional plans.

**District Provided Hardware and Software**

The participants identified various district-provided technology tools that they regularly utilized: 1:1 Chromebook devices, interactive projectors, robotics kits, and Interwrite pads. All of the participants in the study shared that they use both the 1:1 Chromebooks and interactive projectors daily. Cassie described how she used the projector system to increase engagement; she stated, “If they want to come up and we’re maybe presenting they will use my Epson whiteboard in order to present or in order to teacher the class; student teaching”. Cassie explains that incorporating technology in this way is a daily occurrence for her and her students.

I observed how the participants incorporated district-provided hardware into their daily instructional practices during the data collection process. For example, during a classroom observation, Kelly tasked her students with solving equations with variables on both sides. To carry out the lesson, several district-provided resources were utilized. Students were situated into groups, and each student had access to a 1:1 Chromebook device. At the beginning of the class session, students were shown a series of equations on the interactive whiteboard. They were instructed to access a copy of this presentation in the Schoology learning management system.
As students worked through the Google Slides presentation, the teacher monitored their progress and from her district issues Chromebook and provided feedback as needed. Once all students could work through the assigned equations, the teacher used the document camera, HoverCam 8, to demonstrate the correct way to complete each equation. Once this activity was completed, students could practice independently using a template the teacher provided within Google Slides.

Due to the presence of 1:1 Chromebook devices, many participants expressed that devices were used to complete a myriad of tasks throughout the school day. Michelle stated:

Everything we do, we submit it digitally, pretty much at this point; unless a child’s computer is not working or something like that is happening, but everything’s going through Schoology. Now everything is digital at this point. So it’s pretty awesome. And the kids get to use digital devices every day.

Taylor, who admittedly prefers to use paper and pencil in her math classes, contends that the presence of the Interwrite pad aids in the integration of technology in her daily classroom practices:

A time when I felt most confident implementing technology in my classroom was when I began using the Interwrite pad, which allows to access everything on your desktop remotely, as well as, write on the whiteboard from anywhere in the room. It has manipulatives to use during class.

The district provides students and teachers with computers, and several classrooms have been equipped with robotics kits. Regina has access to and incorporates several district-provided robotics kids in her classroom. She implements drones, Spheros, Ozobots, and Makey Makey
kits into her computer science class. In addition to the 1:1 Chromebooks, Regina uses the robotics resources to engage and teach students:

We start really basic because a lot of the kids come to me and they don’t know a lot of basic skills like typing properly. So we use Typing Club on the Chromebooks, then we move along to coding with Tinker; we use Ozobots and Makey Makey as they learn more.

Regina is not alone in her use of unique district provided hardware; Kelly’s math classroom has also been outfitted with a set of TI 84 calculators. Kelly describes how she uses the devices,

TI 84 is the new one for this year, and a lot of it will be used for formative assessment. It also hooks up to the classroom computer like a hotspot so I can see their screens as they move through lessons.

Although all participants expressed the benefits of technology access, they also provided insight into the barriers they experience in the absence of that hardware. Even though the district is a 1:1 Chromebook district, often, students do not consistently bring the devices to school. Six participants expressed that the lack of student devices impedes their daily instructional practice. Both Mary and Nicole expressed their frustration when limited access to 1:1 Chromebooks. Nicole stated, “My main frustration with technology comes from students not having adequate devices to complete the technology assignment”. Mary also shared her frustrations regarding the lack of access to Chromebooks; she stated, “The first time I implemented digital literary stations into English Language Arts caused the most frustration, as I had planned for all students to have access to Chromebooks and have an intermediate understanding of how to navigate the tools”.


Aldis also explained a similar frustration. He explained that his sixth grade students have to spend the first two months of the school year without access to 1:1 devices due to the release of funds to purchase the devices at the start of a new fiscal year, and they have to rely on a shared cart of devices. Aldis stated,

At the beginning of the year, having to wait for the new fiscal year and the new Chromebooks to be purchased it’s been a struggle. It’s going to throw us off because I can teach the old fashioned way, but it’s easier when they have access to the stuff.

Each participant mentioned several district-provided software programs for teaching and learning in their classrooms. The most mentioned tools include Google Suite (Docs, Slides, Forms, Calendar, Sheets, and Meet) and Schoology. Cassie explained her use of Schoology, the district’s learning management system; she stated, “My daily lessons will be on Schoology, so my students go to Schoology to get their assignments for the day”.

Robin also shared that in addition to accessing lesson resources, students use Schoology to keep track of grades.

The participants utilized the various tools in different ways. However, the tools were a common thread amongst the participants. All of the participants mentioned their use of Google Suite products. Mary counts the Google tools amongst her favorites and stated, “I am a fan of Google Suite. I love to incorporate Google Jam Boards. I use Google Slides every day for my instruction”. Furthermore, participants used Google to organize and communicate. Aldis, Cassie, and Nicole shared they use the Google products Calendar and Meet to aid in scheduling meetings and communicating with parents and students.
Value of Professional Development

The value of professional development (PD) emerged as a theme. Each participant provided insight into various PD experiences and how the learning acquired during those sessions translated into classroom practice. The experiences shared by the participants ranged from structured professional development sessions to informal encounters with colleagues.

District-provided support. Seven of the ten study participants shared how their experiences with district-provided PD has impacted their classroom practices. Both Cassie and Aldis shared their experiences being a part of their district’s technology professional learning community. This technology PLC met four times per year and introduced the participants to various technology tools and ways to integrate them into their instructional practices. The technology community participants were then tasked with sharing what they had learned with faculties at their respective schools. Cassie shared the following about her experience:

I was a part of the TCS tech community, where we learn different tech tools to go back and use into the classrooms and to teach our schools faculty how to implement those tech tools in the classroom. And that has definitely increased my knowledge and my usage in using technology in the classroom.

Aldis also found the experience beneficial to his classroom technology integration and provides tools to help increase students’ content knowledge and increase student engagement. Aldis stated,

We have the professional developments through the district and I try to take what I learned there. I guess, one specific thing that really kind of sticks out to me that I kind of love were the Hyperdocs. Going into that PD group and being able to build and use Hyperdocs in my classroom and then show others and see them doing it, it was a very
successful learning experience for me, but it felt good to be able to show that because it was not that it was easy, but it certainly made life a lot easier in a way.

Christina, Michelle, and Taylor were all part of PD sessions that introduced new tools to teachers. The participants’ district has also provided PD that focused on integrating specific technology resources. Christina was her school’s representative at the district’s Powerschool training; she described the experience as follows: “This year, I participated in PowerSchool’s training. The training was beneficial, but I believe it would have been more productive if it was done in smaller sections since this is a new LMS that everyone is required to use daily”.

Taylor participated in a PD that introduced a new digital textbook resource:

The technology training in regards to the new online textbook has been very beneficial. It helped to show how we can utilize the resources that are built to replace a lot of the tasks that we would have to do separately, that were very time consuming. It showed us that it was more than just a book of digital pages; it is very interactive and data driven, which is what drives our instruction.

Michelle participated in a PD that focused on the use of Google Jamboard to increase student engagement:

During that session, we were shown how to use Jam Board to teach and give formative assessments to students. This was beneficial to me as I was able to mimic the lesson that was taught to me and use it in my own classroom. It was practical and effective. I really appreciate PDs that show me how to use technology resources that are available to me with practical, realistic applications for the classroom.

**Conferences and workshops.** Outside of district-provided PD experiences, many participants participated in conferences and workshops offered by local universities and
educational technology organizations. Six of the participants shared their experiences with these learning opportunities. All of them found the experiences to be beneficial and led to an increase in their classroom technology use. Aldis shared the following:

This year, I had the opportunity to present at a statewide conference. I presented on true tech integration in the core classroom. I also presented for the district on this topic. I was able to attend several helpful sessions while participating in these conferences. A very helpful conference was ISTE 2021. I was able to get many questions about tech integration, and new tools answered. I would like to add that attending in person is far superior to virtual attendance!

Mary shared a similar experience:

This summer, I attended a statewide conference. This experience proved to be beneficial because I was able to attend sessions that aligned with integrating technology in an ELA classroom. During this conference, I attended sessions that digitalized choice boards and incorporated social media.

Kelly recalled her experience at a local university that encouraged her to use a new tool:

I attended a PD as part of a grant at the University. We discussed a lot of ways to use the TI 84 as formative assessment, but not just as formative assessment, which we always do, but to also keep track of that information. So it's not just something I'm keeping in my head, like, “Oh, I know a little Johnny here does not understand fractions.” Now I actually have evidence from that TI 84, that this kid is not understanding ordering fractions or operations with fractions. So that's the technology.

Robin was inspired to integrate game-based learning following a session at a local university:
I went to a game based learning workshop at the University. And that opened my eyes up to different technology tools that could be used in the classroom. And that's where my interest was, I guess piqued into it. And so I was interested in learning more about the different technology tools that can be integrated.

**Colleague collaboration.** For Nicole, Kelly, and Taylor working with their respective school-embedded technology coaches led to them integrating technology resources. Informal PD sessions and learning from colleagues also proved beneficial for many of the participants. Nicole stated the following about her experience with the school’s technology coach:

The technology coached helped me make that hyper doc for that one lesson that I did in my first year. So that kind of had me intrigued because I really didn't think or I thought it would be hard to integrate technology into math, you know. I mean, I didn't really I understand any of that.

Kelly also shared her experience with her school’s technology coach; she stated, “The tech coach is really helpful. She helps to brainstorm a lot of ideas and comes up with ways to make it happen”. Taylor’s technology coach hosts PD days that provide teachers with short learning sessions and one-on-one support for planning and implementing technology-rich learning experiences.

Some participants also stated that collaborating with and learning from their teaching colleagues inspires them to implement technology. Nicole noted the following:

I just became more intrigued with keeping technology in my classroom mainly with Cassie right next door, and she does tech with almost everything. So, you know, just having the tech coach and her influences helps me to include technology in my classroom.
Michelle stated the following about collaboration with her colleague:

We are working together to do a unit on the novel, The Boy Who harnessed the wind, for eighth grade, and since they talk about motion and energy in eighth grade, and, of course, the main character and the boy who harnessed the wind, he builds windmill, and well involves a lot of science. And so we're really excited being able to collaborate on that endeavor, because sometimes our planning periods don't match up. But we can still plan together via technology, by commenting on documents and just working together in that way that's really helped us stay organized, because it's all in one, one single document.

**Teacher Self-Efficacy**

The data collected in this study showed that the use of technology in the participants’ personal and professional lives and their attitudes regarding technology impact their self-efficacy as it relates to technology integration in the classroom. Additionally, the stance of school leadership on technology integration affects teachers’ attitudes regarding technology and thus impacts their level of integration.

**Personal Use of Technology.** In this study, seven participants rated themselves as advanced users of technology, while the others identified as intermediate-level users. Each of the participants identified who they engaged with technology in their personal lives and in non-academic contexts within the professional setting. Aldis described his abilities in comparison to his colleagues. He reports, “I feel pretty advanced as far as being able to use technology to solve problems, to integrate into teaching you I feel pretty comfortable with that. I dig into things more than a typical teacher”. Six of the participants expressed that they have gained most of their knowledge and confidence regarding using technology because they set out to learn things on their own. Kelly stated, “I’m probably on the higher end; people normally come to me for their
computers and hooking things up. I think that's only because I'm good at figuring things out. But I wouldn't say I'm an expert”. Christina also shared a similar sentiment:

I guess for the most part, I know what I'm doing. If I don't, I can pretty much figure it out. I know where to go to learn how to use something or make something work. And if I don't I know who to go to in order to help me figure out how to use something with technology.

Regina also shared how her taking time to learn new tools increases her self-efficacy:

I honestly feel confident about implementing technology in my classroom all of the time because I am very technological savvy. I take time to teach myself about technology before utilizing it within my classroom because I like to be able to properly teach my students about the technology and how it is made and how it is properly used.

Each of the participants shared how they utilized technology in their personal lives. The use of technology ranged from personal computers to smartphones to smart televisions. While each participant may use their respective devices for different purposes, they each reported that they use the products daily. Mary stated, “I utilize my smartphone and laptop for networking and creation. I also use them for organization and quick communication. It makes things easier”. Regina also shared how Apple products make her creative endeavors easier. She states,

I choose to use an iPhone and Macbook because I like everything to be synced. I don’t like to lose anything. I also do photography and graphic design in my spare time and its easier for me to do those things on my macbook.

According to the data collected, the convenience of standard technologies has led the participants to use these tools more often and become more comfortable. Christina reported, “I have a wireless printer, and I use that because I can literally print from anything; my tablet, my
computer, my phone, or my laptop. It’s very convenient and user friendly”. Participants in the study also shared that they utilize various technology tools in a professional capacity that is not directly tied to student learning. The participants shared that they have various administrative tasks to complete, and the repeated use of the productivity and organization tools create a higher level of self-efficacy. All of the participants reported the regular use of Google Drive and Google Calendar to aid in the organization of their files and tasks. Aldis shared that being prepared and organized increases his confidence with technology use. He states,

I feel the most confident when I am prepared, links in documents work on students’ devices, videos load appropriately, and students are able to access them with ease. This allows me to facilitate learning. Taking time to organize files beforehand helps with this.

Teacher Attitudes. The data collected in this study also showed that the participants’ attitudes towards technology integration influenced their self-efficacy. Each of the participants in the study was identified as intermediate or advanced technology users; they also expressed that high-quality technology integration in classroom instruction was integral to student success. Kelly, who self-identified as an advanced level technology user, shared the following about her views on technology integration:

I think it's highly important, because of the fact that they can gain more information from the manipulation of the technology. It cuts down on some of that time that we don't really have to begin with, to get all of the standards in. But it still gives them that deep understanding that they need if used correctly. If it's truly integrated, then it's building a deeper understanding of the actual standards. It's not just a placeholder, it enhances the lesson, but also builds that deep understanding.
Robin, an intermediate level technology user, feels her self-efficacy impacts how and when she integrates technology into her classroom practice. She explains:

My comfort level with technology determines if I use the tool. If I've had time to become familiar with the tool myself beforehand, and I feel that it's something that my students at their ability levels can grasp fairly easily, then I'll go ahead and integrate it as soon as possible. But if I think it's something that takes a little time for them to adjust to, I make sure that I'm familiar enough with it, that I can break it down as much as need be. And I'm also ready to troubleshoot any hiccups that might happen along the way.

Aldis, an advanced user of technology, shared that his self-efficacy influences him to incorporate technology tools into his classroom practices. He states,

I guess I really start with what I'm comfortable with and then take what I'm comfortable with and kind of push myself that way. You know, I'm kind of modeling this growth mindset that, you know, give to my kids so we're going to take what you're comfortable with, and now we're going to push it a little bit.

**Leadership Expectations.** The data collected in the study shows that school leadership can play an integral role in the attitudes of the faculty regarding the regular enthusiastic use of technology for student learning. Five participants expressed that their school leadership has clear expectations for high-quality technology integration, thus learning to increase technology use and self-efficacy. Cassie explains that the principals at her school have set clear expectations. She shares,

They make sure you use technology in the classroom. They want to see that we’re using it, and how we’re using it to express the learning target or to complete the learning target of the lesson. They want to see the student’s devices.
Christina also shared a similar experience regarding the leadership expectations at her school. She states,

I mean, they make it very clear that they expect to see students using technology. They do encourage the use of technology because we are one to one, they expect to see it. I believe it's part of your observation, if I'm not mistaken. They want to know that students know what they're doing when they're using their Chromebooks. They don't want it to just be, I don't know, you're just using it to play a game. They want to see it integrated with whatever standard you're using. So if you are writing, that students know how to get on there, and type up a document correctly, without too many directives. So students can show that they know how to use certain programs.

Clear expectations for technology use involve students using the technology for surface level activities like watching videos and for them to be actively creating and collaborating with their peers. Robin explains the level of integration expected by her principal’s as follows:

I believe their expectations are fairly high. They want us to use, they want us to try to integrate technology on a daily basis. And with everything that's going on, I comply with it. The less paper the better. But I think their expectations are fairly high. They want to see the students engaged and collaborating on assignments. So yes, they want to see the student choice. They want to see student created projects and assignments. They want to see the students have as much ownership of their work as possible.

Conversely, five of the ten participants expressed that their school leadership set limited expectations for technology use. As a result, many of their colleagues were not comfortable integrating technology beyond what was expected by their district. Kelly states,
It's expected but it's not pushed yet. They want it to happen. You know, it's in our evaluations one, so it's definitely expected. But as far as making it happen, I don't think there is a lot of push to make it happen.

Regarding minimal expectations for technology use, Taylor shared that her school’s leadership only expects teachers to implement two of their district mandates. She explains,

They want us to put things into Schoology, which is the district’s learning management system, and to use the e-text that we just adopted this year. Well outside of that it's not really much that they require other than that.

Aldis is one of the five participants who feels his school’s leadership does not encourage innovative technology use. As a result, the school does not have a lot of teachers who integrate technology at a high level. He states,

I don't think we have as much admin buy-in as other schools do. I don't think it's valued as much at our school as not near as much as it should be anyway. I feel that you know, if it came from top-down, if it was like a goal, you know, the admin or leadership team or whatever, to incorporate more, or to have more teacher buy into things, the teachers would do it, we have experienced a lot of turnover. And so, I'm hoping that the younger teachers coming in are more fired up about using technology. We, of course, have some teachers that are set in their ways and that don't want to do anything. But I feel that if the admin would buy in more, you know, we have teachers that would run with it and would lead these things and would get everybody else kind of on board. But I think the disconnect is more admin, I think, than teachers.

Nicole shares that she does not feel the leadership at her school make technology integration a priority because they lack self-efficacy. She states,
I would say that they don't talk about it a lot, just in my opinion. From admin, like, it doesn't seem like it's a requirement. I also think that's because maybe a lot of people and admin in particular, aren't proficient with using technology themselves. So I mean, it's kind of hard to tell them, I do some, if you don't even know how to guide them. I feel like if you want to do tech, you have to find somebody at the school that knows what they're doing. And you kind of have to reach out to them. I mean, nobody's really coming to you in the school to like, check to see if you use tech.

**Effects of the Pandemic.** During the 2020-2021 school year, the participants’ district made the shift to virtual learning. During this time, all participants were tasked with teaching online courses. This shift forced many of them to use technology in ways they had not used it before. As a result of this shift, the participants expressed increased self-efficacy regarding technology integration. Cassie identified the transition to virtual learning as a factor for increasing her and her colleagues' use of technology tools. Cassie stated, “I think the pandemic really assisted with the increase of “tech savvy” in some form or fashion because now we are all tech savvy”. Additionally, Cassie shared that the pandemic pushed her to be more innovative in using technology, thus increasing her confidence and efficacy. She explains,

I felt most comfortable implementing technology before the pandemic, but definitely afterwards. During the pandemic, I became frustrated with implementing technology because that was the only means for learning and communication. Therefore, it was necessary to think of more useful, creative, and engaging ways to implement appropriate technology.
Similarly, Nicole shared her experience using new technology tools during her time as a virtual teacher. She explained how her self-efficacy using technology tools impacted her students. She states,

With teaching online, if the tech tool was harder to use, then it was really difficult for me to explain it to students.

The shift to virtual learning during the start of the pandemic also aided Christina in increasing her self-efficacy. She was able to use new tools in new ways to aid in the success of her students. She explains,

A time I felt most confident about implementing technology in my classroom occurred last year. Last year I served as a virtual teacher the entire school year. I felt confident in implementing various spaces on my Schoology pages for virtual students to discover new books, access to HBCU websites, social and emotional check-ins that were completely private, and resources to further their understanding of what was covered in class.

**Student Outcomes**

Intended student outcomes influence how and when teachers use technology in their classrooms. The data collected indicates that teachers take time to plan technology-rich activities that are purposeful and engaging. The data showed that teachers also place digital citizenship at the forefront of their practice to carry out activities in a digital space. Additionally, they aim to prepare their students to be successful in a world driven by technology by incorporating tools and tasks that help students develop 21st-century skills like creativity, communication, and collaboration.

**Purposeful Planning.** According to the data collected in this study, each of the ten participants plans student learning activities to fulfill the academic purpose of student success and
mastery. Usually, the goal falls within the participants' respective courses of study standards or is gathered from students’ assessment data. Aldis explains the value of planning activities that enhance and support student learning instead of using technology simply to use it. He explains,

> Starting with, you know, your goal and what you want your students to learn, and then finding which technologies kind of flow into that. And so it's kind of like, just another, tool out of your teacher toolbox. And you know, having the balance between knowing when to incorporate tech or when not to use it, you know, is important, especially because there’s so much. It is technology integration, using just tools as a resource, not just as a replacement, but as a way to get them outside of themselves and outside of their typical classroom learning environment. And it's really investigating and digging deep into content.

Regina explains that she uses multiple sources to begin the planning process for her computer science classes. This ensures that she satisfies all of the learning requirements for the course. She states,

> So we use the Alabama course of study standards, the 21st century learning standards, and we just started implementing the CCSS college readiness standards, just try to try to incorporate more than the Alabama course of study, because Alabama courses of study just focus kind of more on the computer science side.

Taylor explains that she also uses students’ assessment data to begin the planning process and ensure that all students reach the determined standards and learning targets. She explains,

> Well, if I was giving a CFA (common formative assessment), I could go through the data to see where they are and I could differentiate the instruction based on where they are if you are a four, which means you're ready to move on. So I can put you on a Savvas
lesson. And that's going to walk you through it, show you a video and give you an example. And you can, you know, you can go along, while I can work with a small group at a lower grade level, based on what they score on a different program. And then I had other students working on the same level they need to be on. So I've given three different levels of proficiency in the same classroom at one time.

Once teachers have established their learning targets, they must then plan instruction. Seven of the participants shared that they choose technology tools for their lessons based on the intended outcomes of the lessons. Nicole states,

My main reason as to why pick what tech tool is simply based on the activity that we were doing. And then what tech tool fits best with that, like, if I wanted to take a quiz, obviously, I pick quizziz or a Google form, because that's the best format.

Christina shared how the outcome of this type of planning looks in her classroom:

Students had to use a Google Slides presentation to explain their understanding of a novel that we read and each slide had to have a particular aspect of the novel incorporated into it and students had to provide a short response, a visual response, and a video response. So they’re having to use all different types of technology within one assignment but also showing that they understood what they’d read in the novel.

Cassie also shared her planning process as she is trying to choose the right tools for her learning experiences. She states,

If I want to review a lesson, what tech tool would I use? What type of technology? Do I use our Chromebooks and we would do a Kahoot. Or if I want to take a survey of what the students know, I can do a Google form or Google Sheet, just not just saying all my students are using technology, but my students are using technology to increase their
student engagement and to make sure that they are completing the learning target for that day.

Each participant shared that engaging students in the learning process is a critical component of technology integration. Nicole shared that planning activities that align with her students’ interests are a vital component of student engagement for her. She shared an example of how she used Google Slides to mimic a popular game her students were playing. She states,

What the students are interested in is one big thing. Like, I mean, for example, last year, my students really like this game called among us. So, a lot of the things like I made Google Slides that look like the game. And so we use Google Slides a lot, because it was easy to integrate this game into Google Slides. So I mean, they enjoyed playing the game, because it connected to something that they liked.

Cassie explained that she uses technology tools that pique her students’ curiosity to help keep them engaged. She describes her use of the tool Flippity in her science class:

This week, we use a tech tool known as Flippity. This tool uses google spreadsheets and turns them into an engaging format. For example, we are creating a timeline that leads up to the development of cell theory. Flippity will turn a google spreadsheet into a timeline. The students are engaged and are intrigued on how their work will automatically turn into a creative final product.

During an observation of Robin’s eighth grade science class, students participated in an activity that engaged each of the students. During the activity, students were arranged in groups of two and each of them had a Chromebook device. The learning target called for the students demonstrate their knowledge of Newton’s Laws of Motion. Each group tasked with completing a digital escape room using their knowledge of Newton’s Laws. During the activity each student
was engaged with the game, their partner, and the content. This activity received a score of 18 on the Technology Integration Observation Instrument.

Taylor leverages her classroom technology hardware to help keep students engaged with math content. She uses her Interwrite pad as a scaffolding tool. She states,

And with the Interwrite pad, they love like you have kids that are shy that won't participate. But with that Interwrite pad they don't have to get up in front of the class they can write from their seat and they'll participate more like that so it makes it more engaging and they want to be a part even if they don't want to get up so it kind of reaches all the learning styles or different levels.

At the time of data collection, each participant shared how they had used various contemporary technology tools within their classrooms that week. Each participant had different instructional goals. However, many of them utilized similar tools to ensure students reached the learning target. For example, there were several instances of Google Slides use by the study participants. Mary used the tools to increase vocabulary practice she shares,

This week, students utilized technology for their “Before Activity” and “After Activity.”

On Tuesday, students engaged in a digital word sort activity via Google Slides. For their “After Activity,” they completed a Google form to indicate their level of understanding. Robin used Google Slides to help students organize the guided notes for her science lesson. Christina used Google Slides as a group activity for an upcoming novel study. She explains,

Students were assigned a group project based on certain topics of a novel they were getting ready to start reading. Students used shared Google Docs, Slides as well as breakout rooms to collaborate on their project. Each slide had to have a particular aspect and incorporated them having a short written, visual, or audio response. I was easily able
to monitor every step and provide feedback as they worked. They are using different
types of technology within one assignment, but also showing that they understood what
was read.

During a classroom observation of Cassie’s seventh grade science class, the students
utilized Google Slides as a means of creation and collaboration. The learning target for the day
way: I can compare and contrast prokaryotes and eukaryotes. After the class opener, the students
reviewed relevant vocabulary; they were separated into pairs for the next activity. The students
accessed a Google Slides template known as a Cyber Sandwich and were instructed to read and
annotate a selection of text independently. Afterwards, they entered their findings into their
assigned slides on the Google Slides template. They then discussed with their partner and
completed a digital Venn diagram in their presentations to summarize their shared findings. It
was evident that students were accustomed to using these tools, as there were minimal questions
about the technology. This lesson received a score of 23/24 on the TIOT.

**Future Ready Students.** Six of the participants shared that their focus for the technology
integration was targeted not only to satisfy the state mandated learning objective but also to
prepare students for life outside of K-12 education. Many of them aim to teach students to use
technology and safely navigate spaces by teaching them digital citizenship and digital literacy
skills. When asked about the importance of technology integration in middle school, Robin
shared the following:

I think it's very important. Especially I feel like we're in the age of technology, and the
age of convenience. So it's like, everybody wants instant gratification, they want answers,
right, then they want to be able to do things in a timely manner. So I think it's important
for students to stay competitive in their various fields of study, whatever they plan to do,
as they progress through high school and beyond that they're familiar with these tools, they already know how to use them. And they can apply those to their various careers. They're already know how to manipulate different things and make them useful so that they can become more productive in life.

When asked the same question, Michelle shares a similar sentiment. She states,

I think it's super important, especially if we're going to prepare students for the real world, no matter where they're gonna go in. It's going to be filled with techniques. Even if they go into like a vocational kind of thing, they still are gonna have to use computers no matter what. And so I think is super important, no matter what they go into whether it's, you know, if they go to college or anything else, it's our job to prepare them for the real world. And if they can't use a computer, it's going to harm them in the future.

To prepare her students for the world outside of the classroom, Christina tries to incorporate technology use daily. She explains,

I try to provide an opportunity where we are using technology daily, um, in either one part of the lesson or for the before, during and after. Just because I think it's important to keep putting digital sources in front of them so that they become more comfortable and less teacher dependent on how to use all of these things on the computer because they generally only use technology outside of school for games and social media, so you'd be surprised how many students don't know how to, I don't know, set up a Google document, or even go to their drive find their drive. So I try to put things in front of them as often as possible.
Three of the ten participants expressed the importance of teaching students how to navigate digital spaces safely. This practice is referred to as digital citizenship. Aldis noted the significance of this:

> It's foolish to think we can train kids with analog tools living in a digital world, you know, it's not appropriate anymore to do. So we've got to get our kids ready for the world they live in. Knowing that they're on these devices, and communicating with each other, and, you know, playing games at three in the morning and talking to people from around the world; it's important that we're showing them the correct way to do this. The way to collaborate, to be safe to, be aware of their digital footprint, because they're using already and so use the tools that they're used to using.

Mary noted that before students can use technology in her classroom, she teaches them the basics of digital citizenship. She states,

> I think it's important before I even allow my students to use technology in the classroom is for them to understand how they must conduct themselves in any type of digital space.

Michelle notes the importance of teaching students to be independent learners and safely use technology. She states,

> The world we live in, it's a tech filled world and it's not going to stop. It's just going to become more and more tech filled. And so if we're going to teach them to be successful independent learners and one day scholars and workers then then we have to continue feeding them technology and showing them how to use it appropriately and responsibly.

As students learn to safely navigate digital spaces as a part of their learning experiences, the participants also noted the importance of using technology to develop and enhance their 21st century learning skills. Among these skills are collaboration, communication, and creativity.
Five of the ten participants mentioned these skills during the data collection process. Each of those participants created learning experiences that purposely cultivated these skills in their students. Kelly uses technology to increase student creation in her math class. She states,

So like the three act task, that promote that student thinking that I'm really trying to push for. I've used three act tasks, then Desmos, where they're able to do all of those things. So watch the video, collaborate with their peers share their ideas with their peers on what they believe is happening mathematically, or posing the actual math question that goes along with the video and then looking like after, you know, coming up as ideas, the students might manipulate the model to see if their ideas are correct. And then again, sharing those ideas.

Mary uses technology in her science class to give her student opportunities to collaborate in her science class to give her students opportunities to collaborate. She explains,

With our short story analysis, a particular short story, they had the option of creating a wanted poster, but they were given a choice to choose which tool they will use, whether they will create a using Canva Google Slides they get to decide which tool they will use.

Aldis shares an instance in which he provides students with creative opportunities to communicate their learning. He states,

Giving them as many opportunities to investigate and lead their own learning and create products and things to show mastery, you know, as many different ways as I can. So that's what, you know, I use all the different things in my class, like I said, but you know, it's not one size fits all with my kids. So when one child may want to, you know, create a slideshow or something, or one may want to code, you know, a story on whatever. And
so I try to give them as many, you know, options and variety. And then their choice, of course, to show mastery.

During an observation of Michelle’s seventh grades English Language Arts class, the students used Google Slides as a mode of creation. During this class session, the students defined unknown vocabulary words from chapters one through three of the novel *The Giver*. The teacher used the interactive whiteboard to explain instructions of the activity. Each student was tasked with using Google Slides to create a personal interactive dictionary for each unfamiliar word from the text. They were instructed to use dictionary.com to search for definitions. Each entry into the dictionary included the unfamiliar word, its definition, a synonym, and an image that represented the term. This activity scored a 19 on the TIOI.

**Research Question Responses**

This section addresses the research questions that guided this study. The first question: How do middle school teachers describe the impact of access to contemporary technology resources on their motivation to integrate technology in their classrooms? This question sought to understand how teachers view the usefulness of technology that has been provided to them, and how that access leads to integration. Question two: What are middle school teachers’ perceptions of how professional development experiences impact their motivation to integrate technology in the classroom? This question was developed to gauge the level of self-efficacy that teachers gain from their professional development experiences. Question three: How do the lived experiences of middle school teachers impact how they integrate technology in their classrooms? The third question was developed to explore how the participants’ various interactions with technology impact their self-efficacy and motivation to integrate technology.

**Question One**
The first research question: How do middle school teachers describe the impact of access to contemporary technology resources on their motivation to integrate technology in their classrooms? The first theme that emerged from the first research question identified access to district-provided technology resources as a motivator for the participants to integrate technology into their classroom practices. The participants identified various district-provided technology hardware tools that they utilize regularly; those tools include interactive whiteboards, 1:1 Chromebook devices, and document cameras. All participants reported that they use the 1:1 Chromebooks and interactive projectors daily. Cassie and Taylor explained that they leverage the use of the district provided interactive whiteboards as a means of student engagement. They both shared that they allowed their students to manipulate content via the whiteboards, which is an activity that their students enjoy. The use of the district-provided hardware was also evident during classroom observations as part of the data collection process. During each observation, use of Chromebooks and whiteboards were used. During some instances, the researcher observed the use of document cameras and sound systems. Regina has a unique situation, as she has been provided several robotics kits and uses them to teach her students the basics of computer science. While using the Makey Makey kits, she says that students had a positive response to the lesson and enjoyed using them. This student response prompted her to plan future lessons incorporating that tool.

Conversely, the participants expressed that there is a level of frustration that occurs when technology is not available. Although the district is 1:1, a technology-rich lesson can be derailed when students fail to bring their devices to class. Aldis, Mary, and Nicole all expressed that the lack of available technology impeded their daily instruction practices. Mary refers to this as her “main frustration” with technology.
In addition to hardware, the participants’ district also provides access to various software and web tools. The Google Suite of apps and the Schoology learning management system are among those tools. These tools were the most mentioned tools during data collection. Participants like Aldis, Cassie, and Nicole shared that they use the Google apps in some form daily. Not only did the participants report using Google Drive for productivity, but Robin and Mary shared that they regularly utilize these tools to promote collaboration and creativity during their instruction.

**Question Two**

Research question two: What are middle school teachers’ perceptions of how professional development experiences impact their motivation to integrate technology in the classroom? The value of professional development (PD) emerged as a theme as a result of the second research question. The participants in this study described various professional development (PD) experiences, including district-provided PD, conferences, and informal colleague collaboration. These experiences were meant to enhance the participants’ knowledge of hardware and software products/web tools that support student learning.

Many of the study’s participants reported that they found various types of PD helpful and thus helped increase their self-efficacy when integrating classroom technology. Participants Cassie and Aldis reported they were a part of a district professional learning community. Their participation in this group introduced them to various technology tools and technology integration methods. Aldis shared how the introduction to Hyperdocs during the professional learning community changed how he planned and delivered lessons in his social studies classes. Other participants like Christina, Michelle, and Taylor noted how important district-provided PD was to implementing new digital textbooks and online learning systems. Since these tools were a
part of district-wide mandates, participants shared that these training sessions helped make them more comfortable with implementing the tools.

Participants also shared the benefits of attending conferences and workshops that outside organizations sponsored. Mary, Kelly, and Robin shared that these conference opportunities helped increase their use of instructional technology tools. During a workshop on game-based learning, Robin’s interest was piqued by the use of this instructional method, and as a result, she began to implement the strategy in the science classes.

Participants also discussed the support and learning opportunities provided by colleagues as a valuable means of professional learning. Nicole expressed how the support of the school embedded technology coach and the support from a teacher next door led to her being able to feel more confident integrating technology into her math classes. Additionally, Nicole, Kelly, and Taylor shared that their school technology coaches were an integral part of their efforts to integrate technology into their classrooms.

**Question Three**

The third research question: How do the lived experiences of middle school teachers impact how they integrate technology in their classrooms? The themes *teacher self-efficacy* and *student outcomes* emerged as a result of this research question. The data collected in this study show that the participants’ personal experiences with technology influence their self-efficacy. Furthermore, leadership expectations about technology integration impact professional use of technology, thus influencing self-efficacy. The data also indicates that participants’ teaching experiences during the Covid-19 pandemic influenced teacher self-efficacy. Additionally, the data determined that preparing students for the future and purposefully planning for student success influenced how and when teachers integrate technology.
In this study, seven participants rated themselves as advanced users of technology, while three participants self-identified as intermediate users. All of the participants reported that they are daily users of technology in their everyday lives and often use technology such as smartphones, personal computers, and smart televisions. The convenience of everyday technologies has led the participants to use the tools more frequently and thus gain self-efficacy. Six of the participants stated that they had gained most of their knowledge and confidence regarding technology use from their willingness to learn things independently.

Teacher attitudes towards technology were also shown to impact their self-efficacy. Many participants shared that they felt technology integration is an integral part of student success. Participants Aldis and Kelly shared that they tend to use it more often when they are more confident using a technology tool. According to Aldis, even when he has missteps with using technology in the classroom, he is not afraid to share those mistakes with his students and takes it as an opportunity to model a growth mindset.

Further adding to the enhancement of teachers’ self-efficacy are the expectations imposed upon them by their school’s leadership. The data collected from the participants shows that in schools where leaders set high expectations for technology use by teachers, there is increased high-quality integration of technology. Consequently, in schools where participants noted that their principals did not set clear expectations for high-quality technology integration, they saw less teacher buy-in to the idea of technology integration. Participants like Kelly and Aldis reported that they have to take the initiative to integrate technology. Several participants cited the shift to virtual learning during the 2020-2021 school year as a lived experience that helped increase their use and integration of technology. Both Cassie and Christina shared that being forced to teach in online environments helped to enhance the way they thought about technology
integration and challenged them to be more purposeful in planning technology-rich learning experiences.

Participants also shared that creating lessons that aided in preparing students for the future were integral to their use of high-quality technology integration in their classrooms. Many of the participants stated that they plan lessons according to state-provided courses or study and integrate technology into those lessons to aid their students in meeting the objectives of the lessons. Nicole and Cassie shared they choose technology tools that are the right fit for the lesson; for instance, if they want students to collaborate, they will plan activities that make collaborating with others easy. Student achievement plays a prominent role in how many participants integrate technology. Taylor uses common formative assessment data to put students into groups and then uses the resources that come with her digital textbook to provide supplementary learning opportunities for each student based on their abilities.

Summary
The purpose of this qualitative transcendental phenomenological study was to identify and describe the factors that motivate teachers to integrate instructional technology in a district that has a 1:1 Chromebook program and tech-rich classroom environments. Ten middle school teachers who were currently teaching in classrooms with updated districted provided technology participated in this study. The research questions guiding this study are: How do middle school teachers describe the impact of access to contemporary technology resources on their motivation to integrate technology in their classrooms?; What are middle school teachers’ perceptions of how professional development experiences impact their motivation to integrate technology in the classroom?; How do the lived experiences of middle school teachers impact how they integrate technology in their classrooms? Data collected during this study assisted with the development
of four themes: access to technology, teacher self-efficacy, the value of professional development, and student outcomes. This chapter comprises the findings and data analysis for this study. Descriptions of the data exposed that for teachers to integrate technology at an exemplary level, they must have high self-efficacy that results from the necessary support from their district and school leadership, access to resources, and clear intentions for student achievement and success.
CHAPTER FIVE: CONCLUSION

Overview

The purpose of this qualitative transcendental phenomenological study was to identify and describe the factors that motivate teachers to integrate instructional technology in a district that has a 1:1 Chromebook program and tech-rich classroom environments. Chapter Five begins with a summary of the conclusions derived from the data analysis of this study. The subsequent section will contain a discussion of the research findings and how they relate to the current literature and primary theories of this research. Next, a review of the methodological and practical implications are presented. Finally, the chapter concludes with a discussion of the limitations, delimitations, and recommendations for future research.

Summary of Findings

Analysis of data collected from one-on-one interviews, journal responses, and classroom observations support the development of four themes. These themes were: access to technology, professional development, teacher self-efficacy, and intended student outcomes. These themes correlated to the three research questions. The three research questions were: How do middle school teachers describe the impact of access to contemporary technology resources on their motivation to integrate technology in their classrooms?; What are middle school teachers’ perceptions of how professional development experiences impact their motivation to integrate technology in the classroom?; How do the lived experiences of middle school teachers impact how they integrate technology in their classrooms? The first research question, "How do middle school teachers describe the impact of access to contemporary technology resources on their motivation to integrate technology in the classroom?" was addressed by the first theme. Participants described the benefits of their access to district-provided hardware and software and
the challenges associated with the lack of access to these resources. All participants reported daily use of 1:1 Chromebook devices and interactive whiteboards. The participants expressed that when these resources are not available, it derails the lessons that have been planned and lead to frustration. This claim was also supported by classroom observations in which use of these tools was evident. During observations, three of the participants were observed utilizing other district provided technology; interwrite pads, document cameras, and robotics kits.

Additionally, the participants reported the use of district-provided software. All participants shared that they most often use the Google Suite of Apps (Docs, Slides, Sheets, Forms, Jamboard) and the learning management system Schoology. Participants reported using the Google Suite Apps for both teaching and productivity purposes. These tools were evident in all reported data and observed during every classroom observation during the data collection process. The LMS Schoology was primarily utilized by participants to share learning resources and grades with students. Participants reported that these tools made several of their daily tasks easier.

The second research question was: What are middle school teachers’ perceptions of how professional development experiences impact their motivation to integrate technology in the classroom? The second theme value of professional development addresses this question. The participants in this study described various professional development (PD) experiences, including district-provided PD, conferences, and informal colleague collaboration. Each of the participants shared their experiences with professional development. Each of the PD experiences provided participants with knowledge on a myriad of topics, including web tools, technology integrations methods, and digital textbooks. The participants reported that their participation in
these learning experiences helped to increase their self-efficacy regarding technology integration and use.

Seven of the participants shared the benefits of attending district-sponsored professional development. During a district-sponsored professional learning community (PLC), the participants were introduced to technology tools and implementation methods and were provided with the support necessary to integrate what they had learned into their professional practice. Additionally, those involved in the PLC were tasked with supporting their in-school colleagues’ efforts to integrate the technology they had learned about. Those involved in the PLC stated that their involvement with this learning community improved their instructional practice and changed the way they thought about technology integration. In addition to the PLCs, participants also reported attending district provided professional development that supported the adaptation and implementation of new digital textbooks and the learning management system. Since the use of these tools was also district-mandated, the participants found the learning opportunities to be beneficial to their learning and self-efficacy related to using these resources.

The participants also noted their participation in various conferences and workshops that educational technology organizations and local universities sponsored. Six of the participants shared their experiences with their participation in conferences. They reported that they were inspired to incorporate new technology tools and integration methods after their attendance. Several participants also reported that they look forward to attending yearly conferences. Their participation in these conferences helped increase their confidence in integrating technology in their classrooms.

In addition to district-provided PD and educational technology conferences, participants explained the importance of learning from their in-school colleagues. Four of the participants
shared that their experiences learning from colleagues both encouraged them to use technology and helped increase their confidence in doing so. The participants reported the importance of their school embedded technology coaches. These technology coaches frequently lead PD on technology integration and technology tools and offer one-on-one support with planning and implementation. The participants also shared that the collaboration and support of their teacher colleagues aid in their integration of new tools and encourage them to try new instructional methods.

The third research question was: How do the lived experiences of middle school teachers impact how they integrate technology in their classrooms? The third and fourth themes, teacher self-efficacy and intended student outcomes addressed this question. The data collected in this study show that the participants’ personal experiences with technology influence their self-efficacy. Also, school-level leadership expectations regarding technology integration impact professional use of technology, thus influencing self-efficacy. The data also revealed that participants’ teaching experiences during the Covid-19 pandemic influenced their attitudes about technology integration and impacted their self-efficacy. Additionally, the data determined that preparing students for the future and purposefully planning for student success influenced how and when teachers integrate technology.

The third theme of teacher self-efficacy revealed that teachers’ must have a certain level of comfort using technology tools to have effective integration in their classrooms. The research data exposed that this self-efficacy was increased through the participants' use of technology in both their personal and professional lives and the expectations of their school’s leadership. Each of the participants shared how they use technology in their personal lives. The use of technology ranged from the use of smart phones and smart televisions to the use of personal computers.
These devices were used for communication, entertainment, organization, and creative purposes. Professionally, many participants expressed their regular use of productivity tools like Outlook, Google Calendar, and Google Meet. The reported intended use of these tools were organization, communication, and scheduling.

Seven of the ten participants described themselves as advanced technology users, whereas three identified as intermediate users. Those who identified as advanced users attributed much of their confidence with technology to their ability to troubleshoot issues themselves and their willingness to explore new tools presented to them, whether in personal or professional capacities. One advanced level user reported that they would try it anyway, even when they are not entirely comfortable using a new tool. If it fails, they will use that opportunity to model a growth mindset for the students.

The data collected also showed that the expectations for technology integration by school leaders play a pivotal role in the increase of technology integration. As a result, it helps to increase teacher self-efficacy. Five of the participants reported that their school’s leadership has set clear expectations for high-quality technology integration and expect to see students using technology to engage in rigorous instruction. These participants also reported that due to this requirement by their principals, they are more likely to use technology daily and in more meaningful ways. The five participants whose principals did not encourage technology integration reported that they noticed the lack of technology integration in classes around the school. They also stated that they are not expected to integrate technology outside of district-mandated tools like PowerSchool and Schoology. When school districts around the world made the shift to online learning in response to the Covid-19 pandemic, many teachers were tasked
with adjusting their instructional practices to suit the academic needs of their students' needs and rethink how they used technology to fit those needs.

The fourth theme of intended student outcomes revealed that teachers’ willingness to integrate technology in meaningful ways is also tied to their desires for student engagement and student success. The participants reported that there are several factors to consider when planning lessons. Lessons must first align with state standards, and then those standards are broken down into daily learning targets. To ensure students meet the daily learning targets, teachers must plan engaging learning activities that lead to mastery of the learning objectives. Additionally, when teachers design learning activities that incorporate technology, the participants noted that it is essential that students can navigate digital spaces safely. These measures are taken to aid in the students’ development of 21st-century skills like communication, collaboration, and creativity.

All of the participants shared that they use multiple resources to plan their units and the subsequent activities. All of the participants cited the course of study for their respective subjects as their starting point for planning. These lessons are planned to engage students with the content while also working toward mastery and encouraging the development of skills like collaboration and communication. Seven participants shared that they chose which technology tools and technology integration methods to use based on the intended student outcome. For example, if teachers would like students to learn via collaboration, they would choose a technology resource like Google Slides. If teachers want students to express their mastery of a topic creatively, they may plan a lesson that uses a graphic design tool like Canva. Additionally, participants cited technology as a means to provide additional support for students. One of the participants noted that technology was used to supplement instruction as she worked with students in small groups.
Through the analysis of data, a notable amount of information was derived. I found that the participants integrate technology into their classroom practices when they feel most confident and efficacious. The self-efficacy that leads to integration is gained through access to technology resources, support from leadership, training, and intentions for student success and mastery.

**Discussion**

The following section will discuss the findings of the research as it relates to the theoretical foundations of the study and the empirical literature previously reviewed in Chapter Two. The theoretical literature focuses on the technology acceptance model (TAM) (Davis, Bagozzi, & Warshaw, 1989) and self-determination theory (SDT) (Deci & Ryan, 1985). The empirical literature connects this study to previous research.

**Theoretical Literature**

The theoretical foundation for this study is grounded in the technology acceptance model (TAM) (Davis, Bagozzi, & Warshaw, 1989) and self-determination theory (SDT) (Deci & Ryan, 1985). The technology acceptance model (Davis, Bagozzi, & Warshaw, 1989) is composed of basic components of user motivation; perceived ease of use, perceived usefulness, and attitude towards technology, and outcome variables like behavioral intentions and technology use (Scherer, Siddiq, and Tondeur, 2019). The data collected during this study showed the viability of this theory. Regarding perceived usefulness, participants in the study shared that they employed technology when it was deemed useful to the task; this applied in both professional and personal settings. The technology tools and devices they deemed most useful were used most often. This applied to 1:1 Chromebook devices, interactive projectors, and Google Suite in classroom settings.
Additionally, participants shared that they used the tools they were most comfortable with most often; this supports the value of perceived ease of use in the TAM. Teachers are more willing to use technology when they recognize the usefulness and ease of that technology in their teaching practice (Joo, Park, and Lim, 2018). According to TAM, a person’s attitude toward using technology is impacted by how useful they perceive the tool and how easy they find it to use.

According to the data collected, the participants found that their participation in professional development activities aided in their increased use of technology in their classrooms. The knowledge that participants gained during these PD sessions aided in their perception of the available technology’s usefulness and made the technology easy to use. These actions, in turn, impacted their attitudes towards the use of technology. The participants’ classroom technology's perceived usefulness was also reflected in their purposeful planning of instructional activities. The participants felt that the tools they chose to use were integral to student learning and success. Thus, they made an effort to incorporate them into their practice.

The self-determination theory (SDT) (Deci & Ryan, 1985) is a meta-theory of motivation that focuses on types of motivation, particularly autonomous, controlled, and amotivation (Deci & Ryan, 2008). The theory distinguishes between intrinsic and extrinsic factors that encourage or discourage human behavior. Intrinsic motivation is built upon a person’s internal drive to participate in an activity. In contrast, extrinsic motivation refers to the external factors that lead to a reward for the person (Cullen & Green, 2011).

SDT contends that intrinsic motivation relies on the satisfaction of a person’s psychological needs to maintain relatedness, competence and autonomy (Roca & Gagne, 2008). Relatedness within the context of SDT refers to the need to feel supported by influential people.
Participants in this study shared that they were more inclined to integrate technology into their instructional practices when their schools’ leadership clearly set expectations for this action. Conversely, participants whose school’s leadership did not set high expectations for technology use did not feel their leadership was a factor in implementing technology in their classrooms. Competence in relation to the SDT refers to a person’s effectiveness in their interactions with the environment and when they perform an activity; this is also known as self-efficacy. Participants in this study explained that several factors influenced their competence, such as participation in professional development activities and increased use of technology. The SDT defines autonomy as an individual’s sense of control and agency. Each of the participants in this study explained that they take the time to purposefully plan engaging learning experiences for their students and use technology to support the development of skills they deem useful for the students’ futures. In doing this, the participants maintain autonomy within their classroom practices and how they teach their content.

**Empirical Literature**

Current research shows an increase in technology integration in secondary classrooms. Minimal research specifically focuses on the factors that motivate middle schools teachers to incorporate technology into their instructional practices. This section focuses on the relationship between the literature reviewed in Chapter Two and information revealed in the data analysis of this study.

**Future Ready Students and Student Engagement.** Previous research revealed that teachers drive the performance and achievement of their students. Their motivation to perform at a higher level is key to high-quality outcomes in the education system (Gobena, 2018). Participants in this study were aware that they were preparing students for new and unique
challenges of a changing world. Many of the participants cited the need to prepare students to use technology in college and the workforce as their motivation to integrate technology in classroom practices. Van Laar et al. (2017) noted that the fast-changing economy and the increase of technology on workplaces have presented a need for potential employees to acquire 21st Century skills. To keep up with this change, school districts have increased the available technology in schools and increased their endorsement of educational standards that promote 21st Century skills (Firman & Genesi, 2013; van Laar et al., 2017).

The data collected in this study revealed that teachers’ choice to implement technology in their classrooms is primarily due to their intended student outcomes. Teachers want students to demonstrate mastery of content objectives and standards as outlined in their respective courses of study and develop 21st century skills. Previous research found that today’s learners are empowered by their familiarity, efficiency, and effective use of technology (Hilton & Canciello, 2018). How teachers choose to plan and implement lessons reflects their desire to see students demonstrate the aforementioned skills. Participants in this study also confirmed that although they do not plan lessons with the sole purpose of using technology, the technology they choose to use helps keep students engaged with the content and aids in the development of 21st century skills.

Previous research contends classroom use of technology is often low-level and teacher centered. Researchers have found that traditional teaching methods are no longer relevant to the ways today’s students learn. They must be taught in an environment that encourages the acquisition of 21st century skills (Harrell & Bynum, 2018). Formal observations of the participants in this study found an increase in the level of technology integration. Each of the observed lessons was student-centered and encouraged one of the interpersonal or intrapersonal
21st century skills. As noted by previous research, fostering student-centered use of technology is vital and practices that align with student centered learning encourage curiosity and creativity in students shifts the teacher’s role to classroom facilitator (Dotong et al., 2016; Almeida & Lima, 2018).

**Teacher Preparation and Self-Efficacy.** Previous research shows that to improve teachers’ best practices, the activities intended to improve these practices must focus on fostering autonomous motivation for teaching (Stunisky et al., 2018). Introducing new skills and innovations requires teachers to learn and apply new skills; motivation plays an integral role in this learning and application process (Gorozidis & Papaioannou, 2014). Participants in this study noted that they all had taken part in various forms of professional development that led to their increased knowledge of a variety of resources and the best ways to implement them into their professional practice. Professional development occurs in various formats, including formal structured and informal sessions like conversations and collaborations with colleagues. The participants in this study shared how each of these professional development formats impacted them. Two of the participants who participated in a district-sponsored professional learning community shared how their participation in this professional development experience helped transform how they thought about technology integration and how they integrated technology into their classrooms. Participants also noted how their participation in conferences and workshops aided their increased proficiency with technology, both hardware and software. One participant shared how her involvement in a game-based learning workshop changed how she taught content in the science classroom. This influence was evident during a formal observation of the participant’s class; students were engaged in a digital escape room to aid in their retention of Newton’s of Motion. Additionally, participants shared how informal sessions with colleagues,
like their school’s technology coach and fellow teachers, helped to improve their practice. Previous research shows that a teacher's motivation influences their implementation of new skills once professional development is over (Osman & Warner, 2020).

Previous research defined teacher self-efficacy as one’s self-judgment of their capabilities to create desired student outcomes with learning experience (Barton & Dexter, 2019). There are four primary sources of self-efficacy: verbal persuasion, vicarious experiences, physiological arousal and mastery experiences (Bandura, 1997). Evidence of the impact of verbal persuasion was evident in participants who noted that they were encouraged to try new technology tools after working one-on-one with their school’s technology coaches. Participants stated that technology coaches were a source of encouragement during their training and planning sessions. In the instance of vicarious experiences, one of the participants shared that she was inspired to integrate specific technology tools and integration methods because she observed the teacher next door to her doing so regularly. Physiological arousal as a source of self-efficacy refers to a teacher’s perceived mental state (Barton & Dexter, 2019). Participants in this study shared instances when they felt most confident integrating technology into their classrooms; one participant shared that she always feels confident integrating technology because she is exceptionally technologically savvy. Lastly, mastery experiences considered the most impactful source of self-efficacy, occur when teachers feel competent while performing an instructional task (Barton & Dexter, 2019). All of the participants in this study shared examples of their technology integration. Many of them shared how they repeatedly used specific tools in various ways because they knew how to use them and saw their benefits. For example, Aldis shared that after learning to create and use Hyperdocs during a PD session, he incorporated the tool into each lesson he taught.
Benefits and Limitations of Classroom Technology. Research suggests that technology can improve several parts of the learning experience for students. Technology can increase student motivation, improve attitudes, engagement, self-confidence, and improve study skills (Carver & Todd, 2016). With the integration of technology, teachers can provide many opportunities for students to increase their knowledge of and engagement with the content (Heath, 2016). Additionally, technology can be used to enhance the experiences of teachers. Research shows that technology provides teachers with more efficient opportunities while performing activities checking and grading assignments (McKnight et al., 2016). Participants in this study work in classrooms that have been outfitted with various state of the art technology tools including, interactive whiteboards, sound systems with microphones, document cameras, and Chromebooks. The participants shared that their access to the contemporary technology tools aided in their integration of technology in that it was used as a tool to encourage student engagement. Additionally, the participants shared that their access to tools like Google Suite and Schoology assisted with their ability to efficiently communicate with colleagues and parents, organize teaching materials and files, and input and check students' grades. This adds to previous literature by providing additional proof that access to technology enables teachers and students to be efficient and productive.

There has been an increase in the implementation of 1:1 laptop programs within the middle school environment (Lamb & Weiner, 2018). Research suggests that the integration of 1:1 programs increased student engagement, motivation, and independence (Keengwe, Schellert, & Mills, 2012). The participants of this study reported that they utilized 1:1 Chromebooks daily during their classroom instruction. The 1:1 Chromebooks proved to be an integral part of the technology integration and learning experiences that the participants planned. Research suggests
that the success of 1:1 programs is contingent upon several factors, including teacher professional development, changes in the educational process, and adequate administrative support (Lewis, 2016; Stone & Stone, 2017). Data collected during this study also suggest that professional development, purposeful planning, and leadership expectations play a role in the success of a 1:1 Chromebook program.

Several participants also noted that while access to 1:1 devices is a large part of their instructional practices, the program has its limitations. Research has identified several factors that led to the failure of a 1:1 program; listed among those factors was inadequate access to devices and faulty infrastructure (Keane & Keane, 2017). Several participants in this study also indicated that their most frustrating moments while integrating technology involved the lack of student devices and faulty Wi-Fi connections.

**Implications**

The participants in this study described the factors that encouraged their technology use in their middle school classrooms. The participants revealed that their choices regarding technology integration are influenced by their desire to prepare their students to be successful in a world powered by technology. The participants’ self-efficacy to use technology was contingent upon their access to resources, district and school-level support, and intended student outcomes. The following section addresses the theoretical, empirical, and practical implications of this study.

**Theoretical**

Theoretical implications of this study are grounded in the technology acceptance model (TAM) (Davis, Bagozzi, & Warshaw, 1989) and self-determination theory (SDT) (Deci & Ryan, 1985). The current research study contributed to these frameworks by adding information about
why middle school teachers choose to adapt and integrate technology. The data collected showed that the acceptance of new technologies coupled with the intrinsic and extrinsic factors necessary for motivation played an integral role in teachers’ motivations to integrate technology.

**Technology Acceptance Model.** This study contributed to the technology acceptance model (Davis, Bagozzi, & Warshaw, 1989). It sought to describe the factors that led to teachers choosing to accept and integrate available technologies. The foundation of the technology acceptance model focuses on the perceived usefulness (PU) and perceived ease of use (PEoU) of technology as the motivating factors for accepting and using new technologies (Lee et al., 2003). Participants in this study shared that they were more willing to use the available technology once they saw how it could be helpful to their practice. This usefulness was often revealed during professional development experiences and through planning purposeful and engaging learning experiences for students. Additionally, the participants’ participation in various professional development experiences aided perceived ease of use.

**Self-Determination Theory.** The self-determination theory (Deci & Ryan, 1985) is a meta-theory of motivation that focuses on types of motivation, particularly autonomous, controlled, and amotivation (Deci & Ryan, 2008). This theory distinguishes between intrinsic and extrinsic factors that motivate a person to complete a task. The participants in this study shared factors that influenced their technology use: student outcomes, leadership expectations, and access to technology. Each of these elements had a bearing on the participants' self-efficacy, thus supporting the idea that a person’s competence and need for autonomy influence both teachers' intrinsic and extrinsic motivation in relation to technology integration.
Empirical

Technology Integration in Middle School. Much research exists about the topic of technology integration in K-12 schools (Firmin & Genesi, 2013; Stokes-Beverly & Simoy, 2016; van Laar et al., 2017). However, a lack of research focuses specifically on integrating technology in the middle school environment. This study added to the literature by shining a light on the middle school experience, the types of learning experiences middle school teachers plan for their students and how they use those experiences to integrate technology. This study allowed participants to share the factors influencing their use of technology in the classroom, including their desire to see students succeed. This supports the claims shared by researchers that state classroom instruction should include activities that support the development of 21st century skills. Participants discussed how they intentionally plan activities that allow students to collaborate and communicate with their peers and create and engage in self-guided inquiry. Each of those activities aids in developing 21st century skills which have proven to be an integral part of finding success in the workplace. Participants discussed that although their intentions were not always directly related to technology use, technology-enhanced the lessons and helped students acquire 21st Century skills.

Motivation to Integrate Technology. This study adds to the literature on technology in the K-12 setting by adding awareness to the factors that motivate teachers to implement instructional technology. Participants shared that they are often motivated to use technology when they feel they can confidently perform their intended tasks effectively using the provided technology. They shared that professional experiences, both formal and informal, led to an increase in their self-efficacy related to technology use. Previous research states that most new school initiatives and innovations are introduced to teachers during professional development
sessions (Gorozidis & Papaioannou, 2014). The study participants shared how professional development sessions influenced them to integrate technology. Many of the participants shared that their most influential sessions took place in small groups, such as PLCs or one-on-one sessions with technology coaches or other knowledgeable colleagues. Another notable factor of the professional development sessions that aided in teacher motivation were those that were ongoing, like PLCs. Participants noted these professional development sessions as motivators to try new technology tools. This study adds to the literature surrounding teacher professional development and the literature about teachers’ motivation to integrate technology.

**Practical**

There are several practical implications of this study. The research gives valuable insight to those who are invested in the increased use of technology in middle school classrooms. These individuals include policymakers, Administrators, teachers, and instructional technology integrationists. The practical implications concern how teachers can improve their use of technology, the importance of providing and maintaining professional learning experiences that support teachers in their use of technology in the classroom, technology to consider that teachers find most useful and effective in the classroom. The implications are directed towards these groups because they are the groups who have the power to plan, implement, and support teachers’ use of technology, purchase technology and use technology.

**Policymakers.** Policymakers refer to superintendents and school district personnel responsible for creating and funding district initiatives concerning technology. Adequate technology access is integral to sustained high-quality technology integration in classrooms. Policymakers must understand the importance of providing teachers with a sufficient amount of hardware to carry out district initiatives and the importance of access to web tools and software
that assist teachers in their daily integration of technology. To maintain a successful 1:1 device program, policymakers must understand the importance of teacher professional development, a reliable and robust infrastructure, changes to the education process, and administrative support (Lewis, 2016). Participants in this study noted the frustrations that occur when there is a lack in any of the aforementioned elements. They noted that the absence of one of these elements disrupts the high-quality integration of technology.

**Administrators.** This study revealed several factors that motivate teachers to integrate technology into their classroom practices; among them were the expectations of school leadership. Five of the ten participants shared that their school’s administrators have clear expectations for high-quality technology integration. Those participants noted that because the administrators expect this to be a part of classroom instruction, they make an effort to integrate technology regularly. Conversely, the participants whose school leadership did not set clear expectations for technology integration noted that they noticed a lack of high-quality integration in their schools. School leadership’s expectations of technology integration could also lead to access to high-quality technology-focused professional development opportunities, including increased colleague collaboration. School administrators should consider this as they plan professional development opportunities for teachers at the beginning of the school year and ongoing support throughout the school year.

**Teachers.** This research provides evidence of teachers successfully integrating technology into middle school classrooms. It also details how they use their available resources to support student achievement. All of the participants were middle school teachers in schools that have access to technology resources and 1:1 Chromebooks. The information provided in this
study offers other teachers ideas of how to increase their motivation related to technology integration and ideas for implementing technology.

**Technology Integrationists.** The role of technology integrationists is to provide support, leadership, and professional development opportunities for the teachers they serve (Lewis, 2016). To help meet the demands of 1:1 programs and the increased use of technology in classrooms, many schools and school districts have hired technology integrationists (Lewis, 2016). Many of the participants in this study noted the benefits of working with their school’s technology coaches, who acted in the capacity of integrationists. The participants indicated that the technology coaches provided one-on-one support to plan, model, and teach the use of various technology tools. This support was reported as a factor that helped teachers feel more confident in integrating technology. Technology integrationists can look to this study to examine the benefits of their presence within schools and consider the data as they are planning professional development sessions and teacher-focused support for the school year.

**Delimitations and Limitations**

For this qualitative study, there were delimitations and limitations. Delimitations are intentional decisions made to limit a study. Limitations are factors beyond the researcher’s control that are potential weaknesses of the study.

**Delimitations**

This study had several delimitations. The first delimitation was how the participants were chosen. I used purposeful sampling to select the participants for this study. Participants were selected from middle schools within the district that had been teaching for at least one year. All participants were required to teach in a classroom that had undergone renovations by the district and had been outfitted with upgraded technology that included an interactive whiteboard,
document camera, sound system, and touchscreen Chromebook. Participants also had to have a history of technology integration. Additionally, each participant had to teach students who had access to 1:1 Chromebooks. These criteria eliminated teachers at the elementary and high school levels and teachers who did not have upgraded technology in their classrooms. Teachers who were new to the teaching profession were also eliminated from participating in the study. This investigation focused on teachers in one school district in Alabama, which delimited the population of this study. There is a possibility that teachers' experiences in other districts would yield different results.

Limitations

There were several limitations to this study. The first limitation was research bias. The focus of this study was motivators for technology integration. Part of the bias from this study stems from my role as an instructional technology specialist within the district used for this study. Although I made an effort to set aside my biases (Moustakas, 1994), these factors influenced how I interpreted the data. Being aware of my biases helped me to engage in self-reflection.

Another limitation stemmed from the ongoing Covid-19 pandemic beginning in March of 2020. Due to increased teacher stress and anxiety resulting from the pandemic, teachers were hesitant to commit to the study. Due to health precautions, all interviews were conducted via Google Meet instead of in person. This resulted in the study only having 10 participants instead of the recommended 12 participants.

Another limitation of this study was the sample of participants. There was only one male teacher within the sample. Also, only one social studies and computer science teacher was
represented among the sample. The sample of participants did not include any arts or electives teachers.

**Recommendations for Future Research**

The purpose of this phenomenological study is to identify and describe the factors that motivate teachers to use instructional technology in a district that has a 1:1 Chromebook program and technology-rich classroom environments. I set out to understand how factors like access to technology and professional development influence teachers' self-efficacy in relation to their choice to incorporate technology in their classroom practices. While this research helped fill in the gaps of the empirical research regarding teacher motivation in middle school, replicating this study in a high school or elementary environment could provide a broader description of the phenomenon. Also, expanding this study to districts that do not have access to 1:1 devices or district-provided software access could provide a different perspective on technology integration in middle schools. Additionally, conducting research that includes the viewpoints of school administrators and students could add to the broader picture of the phenomenon.

Another possible iteration of this research would include novice teachers in the study. This could provide insight into their intrinsic motivation to integrate technology and the skills they have gained from their preservice education, and what factors of that education they have chosen to apply to their practice. This study could also provide a closer look at how the attitudes and beliefs of veteran teachers impact the practices of those who are new to the profession.

A final recommendation for future research would be to study the effects of the global pandemic and the shifts to virtual learning on teachers’ level of technology integration. The study could focus on motivations to integrate technology, as well as, explore the level of technology integration that is taking place during learning experiences. The TPACK framework
could be used to gauge technology integration. Teachers’ attitudes towards technology integration could be compared to the level of technology integration.

**Summary**

The technology acceptance model (TAM) (Davis, Bagozzi, & Warshaw, 1989) and self-determination theory (SDT) (Deci & Ryan, 1985) provided the theoretical framework for this study as I sought to describe the factors that motivate middle school students to integrate technology in their classrooms. My goal was to explain how the various district provided resources and support, coupled with teachers’ internal motivators, influence their willingness to integrate technology at a high level. After analysis of the data, four themes emerged. These themes were: access to technology, professional development, teacher self-efficacy, and intended student outcomes.

Participants revealed how their personal and professional uses of technology and their attitudes toward technology impact their confidence when integrating technology. Additionally, participants shared their experiences participating in various professional development sessions led to them feeling more confident and prepared to use new and existing technology tools with their students. Participants also revealed their desire to see their students succeed in a technologically advanced environment led to their planning of high-quality lessons that used technology to help students develop 21st-century skills.

Ultimately, the data revealed that teachers tend to integrate technology into their classroom practices when they feel most confident and efficacious. The self-efficacy that leads to integration is gained through access to technology resources, support from leadership, training, and intentions for student success and mastery. Some recommendations derived from this study include the need for teachers to receive well-developed ongoing professional development,
support from schools and district leadership, and access to adequate working technology to increase teachers’ motivation to integrate technology into their learning experiences. This targeted support will allow teachers to plan activities for students that will increase the acquisition of 21st Century Skills.
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doi:10.3102/0034654315626801
July 21, 2021
Re: IRB Exemption - IRB-FY20-21-1020 A PHENOMENOLOGICAL STUDY OF TEACHERS’ MOTIVATIONS TO USE INSTRUCTIONAL TECHNOLOGY

Dear Aishia Daffin, Daniel Baer:
The Liberty University Institutional Review Board (IRB) 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 the following exemption category, which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46: 101(b):
Category 2.(iii). 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 at least one of the following criteria is met:
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 require

If you have any questions about this exemption or need assistance in determining whether possible modifications 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
APPENDIX B: SITE APPROVAL

APPRAISAL TO PROCEED WITH RESEARCH, GRANT, SURVEY OR DISSERTATION STUDIES WITHIN THE

<table>
<thead>
<tr>
<th>Applicant Name(s)</th>
<th>Aishia Daffin</th>
<th>Date of Submission</th>
<th>2/22/2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Title</td>
<td>A Phenomenological Study of Teachers’ Motivations to Use Instructional Technology</td>
<td></td>
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1. **IRB APPROVAL** If the study requires prior consent from participating institution, please provide that information. If approved, formal IRB approval must be provided before official approval will be granted.

2. **Methodology/Abstract** (explaining study) Survey or other instrument for quantitative study (ATTACH)

3. **Consent form, memorandum, etc.** Consent form, explanation, etc. that clearly states participant does NOT have to participate in study (strictly voluntary) (ATTACH)

If a specific school is selected principal verification is required (email, letter, etc. - please attach)

Data Governance Committee Approval

Please make sure your research includes the following information on checklist below to help expedite faster you may note page location:

- Human Research Protection Component - How are you protecting your human subjects? Page Appendix C
- Clear description of data to be collected - Is it for Adults, Administrators, Teachers/Instructional Employees, Parents, Students, Other: Describe Page Appendix C
- Study timeline Page Appendix C
- End use of the data - Will it end when your study is completed? Page Appendix C
- Data Security Encryption and password protection - How will you secure the data? Page Appendix C
- Physical data security - Where will you house the data? Page Appendix C
- Data Maintenance and Destruction Page Appendix C
  - How long will the data be kept?
  - What will the data destruction process include?

Submit Research Proposal to:

Deputy Superintendent for Teaching & Learning via email at [email protected] OR Executive Administrative Assistant, Tuscaloosa City Board of Education, Attention: [email protected] OR via mail to:

For additional information, contact us at:

UNEDITED 26-FEB-2021

Revised 11/2020
APPENDIX C: CONSENT FORM FOR PARTICIPANTS

CONSENT FORM

A PHENOMENONLOGICAL STUDY OF FACTORS THAT MOTIVATE TEACHERS TO IMPLEMENT INSTRUCTIONAL TECHNOLOGY

Aishia N. Daffin

Liberty University

School of Education

You are invited to be in a research study of the factors that motivate teachers to use instructional technology. You were selected as a possible participant because you are a certified secondary education teacher currently teaching in a renovated classroom with students who have access to 1:1 Chromebook. Please read this form and ask any questions you may have before agreeing to be in the study.

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

**Background Information:** The purpose of this study is to describe factors that motivate teachers to implement instructional technology.

**Procedures:** If you agree to be in this study, I would ask you to do the following things:

1. Participate in a semi-structured interview. This process will take approximately 35 minutes and will be recorded.
2. Allow the researcher to observer your current classroom practices. This process will take approximately 35 minutes and will be recorded.
3. Respond to journal prompts about your encounters with instructional technology.
**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.

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

**Confidentiality:** The records of this study will be kept private. Research records will be stored securely, and only the researcher will have access to the records.

- Participants will be assigned a pseudonym. I will conduct the interviews in a location where others will not easily overhear the conversation.

- Data will be stored on a password locked computer and may be used in future presentations. After three years, all electronic records will be deleted.

- Interviews will be recorded and transcribed. Recordings will be 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 or not to participate will not affect your current or future relations with Liberty University. 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, will be destroyed immediately and will not be included in this study.
Contacts and Questions: The researcher conducting this study is Aishia Daffin. You may ask any questions you have now. If you have questions later, you are encouraged to contact her at adaффin2@liberty.edu. You may also contact the researcher’s faculty chair.

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, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at irb@liberty.edu.

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.

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

______________________________________________________________________________

Signature of Participant ________________________________

Date______________________________________________________________________________

Signature of Investigator ________________________________

Date______________________________________________________________________________
APPENDIX D: INTERVIEW QUESTIONS FOR PARTICIPANTS

1. How long have you been in the field of education, and what prompted you to make this career choice?

2. How do you use technology in your classroom for your own productivity?

3. What kinds of opportunities, if any, do you provide for your students to use technology?

4. How would you describe the school-wide expectations for classroom technology use?

5. What professional experiences have you had, if any, that have prompted you to use a technology tool in your classroom?

6. How would you describe your skill level regarding technology? Does this impact how or if you use technology in your classroom?

7. What factors influence how you use the technology in your classroom?

8. If you do not use a technology tool in your classroom, what factors lead to this decision?

9. Do you feel technology use in the classroom is important? Why or why not?

10. What else do you think is important for me to know about why teachers use technology in the classroom?
## Technology Integration Observation Instrument

Observer ______________________ Teacher ______________________ Date _______

Grade Level(s) ____________________ Subject Area(s) ____________________

Primary Learning Goals ____________________

**Directions:**

We have tried to key the components of this instrument to different aspects of teachers’ knowledge for technology integration. Please note, however, that the instrument is **not designed to assess this knowledge directly**. It is designed to focus upon the use of technology integration knowledge in observable teaching. Please record the key curriculum topics addressed, instructional strategies/learning activities observed, and digital and non-digital technologies used by the teacher and/or students in the lesson.

<table>
<thead>
<tr>
<th>Curriculum Topic</th>
<th>Key Instructional Strategies/Learning Activities</th>
<th>Digital &amp; Non-Digital Technologies</th>
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</thead>
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</tbody>
</table>

What, if anything, do you know about influences upon what you have observed in this lesson? Examples might include students’ learning needs, preferences, and challenges; access to technologies; cultural, language and/or socioeconomic factors.

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1. Computer-based (e.g., software, Web-based resources, video or audio recorder, document camera, calculator)
2. Not computer-based (e.g., overhead projector, textbook, whiteboard, pen/pencil/marker)
Technology Integration Observation Instrument

Directions: Referring to the notes you made on the previous page, including your responses to the question about influences, please complete the following rubric, considering the lesson as a whole.

<table>
<thead>
<tr>
<th></th>
<th>4</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td><strong>Curriculum Goals &amp; Technologies</strong></td>
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<td>(Matching technology to curriculum)</td>
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<td>Technologies used in the lesson are</td>
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<tr>
<td>strongly aligned with one or more</td>
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<td>strategies)</td>
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<td>and instructional strategies.</td>
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<td><strong>“Fit”</strong></td>
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<td>and technology all together)</td>
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<td>and technology fit together strongly within the lesson.</td>
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<td>and technology fit together within</td>
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(over, please)

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*Adapted from:
<table>
<thead>
<tr>
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<td>Instructional use of technologies is</td>
<td>Instructional use of technologies is</td>
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<td>minimally effective in the observed lesson.</td>
<td>ineffective in the observed lesson.</td>
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<td>Technology Logistics</td>
<td>Teachers and/or students operate technologies very well</td>
<td>Teachers and/or students operate technologies well in the</td>
<td>Teachers and/or students operate technologies adequately in the</td>
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<td>in the observed lesson.</td>
<td>observed lesson.</td>
<td>observed lesson.</td>
<td>observed lesson.</td>
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<td>effectively)</td>
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Comments: