

TEACHER PERCEPTIONS OF TECHNOLOGY INTEGRATION IN THE  
CLASSROOM AFTER PARTICIPATION IN PROFESSIONAL DEVELOPMENT

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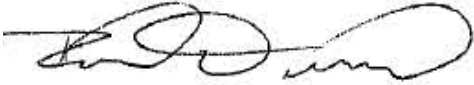
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TEACHER PERCEPTIONS OF TECHNOLOGY INTEGRATION IN THE  
CLASSROOM AFTER PARTICIPATION IN PROFESSIONAL DEVELOPMENT

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TEACHER PERCEPTIONS OF TECHNOLOGY INTEGRATION IN THE  
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A Dissertation  
Presented to  
The Faculty of the Graduate Education Department  
Southwest Baptist University

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In Partial Fulfillment  
of the Requirements for the Degree

Doctor of Education

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By

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December 2021

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## **ABSTRACT**

The purpose of this basic qualitative study was to explore teacher perceptions of the complexities that lead to a lack of technology integration in the classroom despite having access to resources and having received professional development for technology integration. This study explored teacher perceptions of the barriers to integrating technology, and teacher perceptions of technology integration after having received professional development for technology integration. The participants in this study were teachers in southwest Missouri that were in one-to-one school districts, had been provided professional development for technology integration, and had the expectation to integrate technology in their classrooms. Through the qualitative process, this study identified teacher perceptions of the barriers that influence technology integration, and explanations for what can be done by districts and schools to overcome those barriers. This study also identified teacher perceptions about technology integration after having received professional development for technology integration, and the influences of that professional development on their levels of efficacy. Districts and schools can positively influence the technology integration for student learning in their classrooms by being cognizant of their teacher's perceptions of technology integration.

# CHAPTER ONE

## INTRODUCTION

### **Introduction**

Technology integration in schools is regularly regarded as one of the most complex and challenging initiatives that schools face. Students in the United States and throughout the world are growing up in a time when the Internet, portable computing devices, and mobile electronic devices are at their fingertips. Technology is more readily available to students than at any point in the history of education. Technologies have changed the way we live, work, communicate, and learn (Li et al. 2015, Ryan 2015). Access to technology in schools has been steadily expanding in the last 20 years, and teachers in the educational setting is experiencing an increase in technology demands (Li et al., 2015). Technology is continuously changing, and it is predicted that the contemporary student will never know a world without access to the Internet and technology tools (Harrell & Bynum, 2018). Research supports accessibility of technology as a key factor for instructional utilization of technology in the classroom (Reich, 2021).

The use of technologies in the classroom ushers in a new era, and offers a set of tools that support and enhance many existing educational approaches (Gilakjani, 2013). Throughout the generally brief time, in terms of the history of public education, that computers have been readily accessible in schools, they have frequently been acknowledged for their potential to support an open, creative learning environment in which students can think and develop their own learning at higher levels than previously attainable (Carstens, Mallon, Bataineh, & Al-Bataineh, 2021). Many schools have the

expectation of teachers to create engaging, relevant, and personalized learning through the integration of technology.

Technology integration is one of the highest priority initiatives in many school districts throughout the world (Koster, Volman, & Kuiper, 2017). The demand for the integration of technology into curriculum and instructional processes is growing, and this practice is perceived to be a complex and arduous system-wide initiative (Leite & Lagstedt, 2021). To add complexity to the issue, many diverse definitions for technology integration exist (Keengwe & Onchwari, 2020). However, the definition from the 2002 edition of *International Society for Technology in Education*, has been widely accepted:

Curriculum integration with the use of technology involves the infusion of technology as a tool to enhance the learning in a content area or multidisciplinary setting. Technology enables students to learn in ways not previously possible. Effective integration of technology is achieved when students are able to select technology tools to help them obtain information in a timely manner, analyze and synthesize the information, and present it professionally. The technology should become an integral part of how the classroom functions-as accessible as all other classroom tools (p. 3).

Although technologies have become more accessible to teachers and students, the integration of these technologies has not occurred at the rate at which school leaders would have hoped. The campaign for technology integration and innovation in the classroom is prevalent, but in actuality, today's teachers comprise a diverse group with differing degrees of proficiency when it comes to effectively integrating technology in

their classrooms (Rodrigues, 2020). A survey conducted in 2010 by The Richard W. Riley College of Education and Leadership at Walden University discovered that although early career digital native teachers, born after 1980, are proficient users of technology in their personal lives, they are not more likely to utilize technology in their classrooms when compared to veteran teachers. The findings of this survey are consistent with another study conducted by Wilson, Hall, & Mulder (2020), which concluded that although new career teachers' technology skills have improved, those enhanced skills do not correlate to transforming and augmenting their curriculum with technology integration.

There is a gap in digital native teachers' technology skills and effective technology integration in the classroom (Li et al., 2015). A substantial amount of academic dialogue surrounds the issue of students' academic requirements for technology use and involvement with technology-enhanced learning, and this conversation is impacted by the concept of digital natives (Prensky, 2001). Digital natives are described as the millennial generation, socially connected, digitally literate, having strengths in multitasking and collaboration, and valuing immediacy (Li et al., 2015). Digital natives are believed to live in a pervasive digital environment, and are native speakers of the digital language (Prensky, 2001). Prensky, proposed that younger individuals have distinctive behaviors that are productive for their education, such as the need for increased speed in learning, nonlinear processing, and social learning. Prensky also noted that younger individuals have the need to collaborate, the ability to multitask, and the ability to use technological knowledge and skills to increase their learning (Prensky,

2001). However, when digital natives enter the classroom as teachers, their skills and distinctive behaviors do not result in increased technology integration. (Li et al., 2015; Sarkar, Ford, & Monzo, 2017). Another study (X. Liu & Li, 2018) indicates that digital native pre-service teachers show discrepancies between their professional and personal technology adoptions. It would seem that teachers who are digital natives might be more inclined to integrate technology into their classroom, but a study by Li, Wang, & Lie (2021) found that technology is still lacking in digital native teacher classrooms. Effective technology integration in school hinges on teachers' pedagogical skills and beliefs as well as their efficacy in utilizing technologies for the purposes of teaching and learning, not just social media or organization as digital natives frequently use technology in their lives (Chand, Deshmukh, & Shukla, 2020).

Professional development programs are one of the key determinants in the success of integrating technology in schools. Conventional models of technology integration suggest that changing teachers' perceptions of the value of technology and equipping them with relevant technological skills is a function of professional development (Ryan & Bagley, 2015). According to Lawless and Pellegrino (2007), the lack of technology integration by teachers may be due to a lack of effective professional preparation, or professional development programs. Schools struggle to establish high-quality professional development programs aimed at effectively integrating technology into pedagogical practices (Ryan & Bagley, 2015). The dilemma is that the professional development programs instituted are not necessarily driven by best practices that have been identified through formal, scientific study (Koh, 2019; Lawless & Pellegrino, 2007).

Despite the push by school officials to increase and improve technology integration in the classroom, there has been significant resistance from teachers due to the failure to align professional development to the unique challenges that teachers face when integrating technology into the classroom (Mills, Ketelhut, & Gong, 2019). Traditional technology-related professional development has been ineffective in increasing the integration of technology in the present-day classroom (Mills, Ketelhut, & Gong, 2019). In many cases teachers have received the resources and professional development, but have failed to follow through with integration of technology in the classroom. This study seeks to understand teacher perceptions about the complexities of technology integration.

A long history of research points to self-efficacy as a known predictor of behavior, and more recently as a predictor of practicing teachers' technology integration (Bandura, 1997, 2002). Teachers with higher technology self-efficacy beliefs have confidence in their abilities to effectively use technology in their classroom (Gilakjani, 2013). Those with lower computer self-efficacy beliefs are more easily discouraged and experience anxiety when working with computer technology, which causes them to be less likely to use computer technology when they face difficulties (Gilakjani, 2013; Scherer & Teo, 2019). Teachers' self-efficacy for technology integration is a factor that contributes to the level of technology integration in the classroom (Awofala, Akinoso, & Fatade, 2017). For technology to be effectively integrated into the classroom, teachers must have the self-efficacy required and be trained through effective professional development (Cheng, Lu, Xie, & Vongulluksn, 2020).

## **Problem Statement**

Technology has changed the world in which people live. Technology is more accessible, more affordable, and more prevalent than ever before. Technology influences all aspects of human lives. However, the use of technology in the classroom has not kept up with the technology use that occurs outside of schools (Swallow, 2017). Although many school districts have provided students with devices, often times in a one-to-one environment, and despite providing professional development for teachers, as well as access to resources, many teachers still do not effectively implement technology in their classrooms (Tondeur, van Braak, Ertmer, & Ottenbreit-Leftwich, 2017). This study seeks to explore teacher perceptions about why a lack of technology integration exists. In general, educators are comfortable using technology for personal use or for developing instructional materials, but integrating technology into instruction presents complex problems (Li et al., 2015). The use of technology in school is often limited to learning games, drill and practice, or occasional word processing, with a lack of sufficient technology integration to increase student achievement (Darling-Hammond, Hylar, & Gardner, 2017; Grosser, 2017). With the change in the educational landscape due to technology, teachers are no longer just trying to provide information to students and assess how much of that information was retained, today's teachers need to develop students who can critically think, actively problem solve, program, code, and collaborate (Casanova, Huet, Garcia, & Pessoa, 2020).

One aspect to be considered when thinking about technology integration in the classroom is the influence of professional development on teachers' self-efficacy for

integrating technology, which allows schools to provide trainings that could have an impression on changing both teaching methods and students learning (Gilakjani, 2013). There has been research on the topics of self-efficacy, technology integration, and professional development, but information on the influence of professional development on teacher-self efficacy for technology integration is limited (Tschannen-Moran & McMaster, 2009). Through the qualitative process, this study seeks to fill this gap in the research by understanding the reasons teachers are still not comfortable integrating technology in the classroom despite having the resources and professional development to do so. The lack of technology integration by teachers in the educational settings may be linked to a lack of effective professional preparation, or professional development programs (Lawless & Pellegrino, 2007).

Teachers' use of computer technology use can be influenced by teacher professional development in technology (Gilakjani, 2013). Professional development provided to teachers for technology integration positively influences classroom practice. For this influence to be felt, teacher efficacy must be increased by providing the opportunity to learn and practice new instructional strategies in order to improve student learning (Skoretz, 2011). The purpose of this basic qualitative study was to explore teacher perceptions of the complexities that lead to a lack of technology integration in the classroom despite having access to resources and having received professional development for technology integration.

### **Rationale for the Study**

The rapid advancement of technology in the world today, along with the need to

create 21<sup>st</sup>-century learners, creates an educational environment in which teachers are called upon to integrate technology in the classroom setting (Yu, 2013). The uncertainty of emerging technologies makes it increasingly difficult for teachers to develop a level of expertise that allows them to incorporate technology in their classroom with fidelity (Seward & Nguyen, 2019). As the rate of new technology developments increases, the time it takes for technologies to become outdated decreases. This rapid change in technology results in a constant need for teachers to upgrade their skills or knowledge in the area of integrating those technologies for student learning. During the short time that computers have been accessible in educational settings, they have been identified for their potential to support an open-ended, creatively charged learning environment in which students can create new learning at higher levels (Carstens et al., 2021). Teachers are used to mastering content, and since technology constantly changes and evolves, technology cannot truly be mastered. It is evident that, due to the ceaselessly changing technologies, schools are challenged to provide learning for students that prepares them for a future that we do not know or understand (Carstens et al., 2021). Many school districts and school administrations are trying to keep up with changing technologies by providing students with devices in a one-to-one setting, and sometimes providing teachers with professional development as well as other resources (Yu, 2013). School districts provide various types of professional development in varying degrees of quality for technology integration. However, for a multitude of reasons, many teachers are still not integrating technology into their classrooms (Tschannen-Moran & McMaster, 2009).

Schools and school districts are more accountable to state and federal education

oversight than ever before, and while school districts are accountable for many things, the learning outcomes of their students are the top priority. Federal, state, and local educational stakeholders are investing large amounts of resources in the professional development of the teachers within their schools. Due to the technology revolution underway in K-12 classrooms, school districts and school boards are moving to adopt a new style of instruction focused on technology integration (Harrell & Bynum, 2018). In an attempt to develop educators who are empowered to integrate instructional technologies into teaching practices, while using sound methodologies to deliver high-quality content area instruction, and adapt instruction to effectively address the learning process of diverse student populations, many schools provide technology-related professional development (Lawless & Pellegrino, 2007).

The campaign to integrate technology and innovation in the classroom is prevalent in the education systems today (Birisci & Kul, 2019). Recognizing the need for a strong infrastructure, the U.S. Department of Education allocated nearly seven hundred million dollars in 2004 to “facilitate the comprehensive and integrated use of educational technology into instruction and curricula to improve teaching and student achievement” (Heath, 2017; Lawless & Pellegrino, 2007, p. 577). To succeed, in technology integration, learning must be supported by a strong foundation in technology, particularly in the area of network infrastructure (*Build the 21<sup>st</sup> Century Classroom*, 2018). Whether determining to upgrade technology infrastructure or allocating funding for professional development for staff to integrate technology in the classroom, it is important that school districts believe that their cost will increase the integration of technology in the classroom

to improve learning.

It is generally believed that to effectively use technology in the classroom, teachers must first believe that they are capable of integrating technology in a way that supports instruction (Barton, Brown, & Chiu, 2020). Professional development is the means by which teachers improve their practice, and high-quality professional development has been shown to enhance teacher self-efficacy (Bates & Morgan, 2018; Lawless & Pellegrino, 2007). This study examined and described the influences on the integration of technology in the classroom. Current students are exposed to technology in almost all aspects of their daily lives, and it is evident that technology has a profound impact on their personalities, attitudes, and even their approaches to learning (Yu, 2013). It is important that teachers learn to integrate technology into their classrooms if schools are going to keep pace with students who accept technology as a normal and important part of their lives (Yu, 2013). This study was necessary because school districts have the need to develop understanding of teacher perceptions about integrating technology in the classroom. Exploring the influence of professional development on the integration of technology will allow schools to improve instruction through the use of technology (Xie, Kim, Cheng, & Luthy, 2017). This study was timely due to the ever-changing technology-related skills that students need to have to be successful members of the community and workforce. As technology use continues to increase in society, educators must prepare for technology use to increase within the classroom (Gilakjani, 2013, Simsek & Yazar, 2019).

## **Research Questions**

The purpose of this basic qualitative study was to explore teacher perceptions of the complexities that lead to a lack of technology integration in the classroom despite having access to resources and having received professional development for technology integration. The following research questions were investigated:

RQ 1. What are teacher perceptions about the challenges of technology integration in the classroom?

RQ 2. What are teacher perceptions about technology integration after receiving professional development?

These questions were designed as a tool to guide the study, and to construct meaning of the elements that influence technology integration in the classroom.

## **Theoretical Framework**

Educational theory and best practice for integrating technology in the classroom intersects with technology integration in the classroom for student learning. The lack of technology integration in public school classrooms is rooted in many complex emotions, perceptions, beliefs, attitudes, and actions. The complexity of Bandura's (1986) social cognitive theory (SCT) served as a basis for understanding some of the intricacies present in this study. Bandura puts forth two sets of expectations as the primary forces guiding behavior. Bandura called the first set of expectations self-efficacy, or the belief about one's ability to perform a given behavior. Self-efficacy, an essential component of social cognitive theory, refers to individuals' "judgement of their capabilities to organize and execute courses of action required to attain designated types of performance" (Bandura,

1986, p. 391). Self-efficacy influences choices about which behaviors to perform, the effort and persistence exerted in the face of obstacles, and the mastery of those behaviors. Adoption and use of technology are more likely when teachers have the skills required, as well as confidence in using those skills, to successfully integrate technology in the classroom (Backfisch, Lachner, Sturmer, & Scheiter, 2021). Self-efficacy beliefs may affect how knowledge and skills are acquired, and those with higher skill levels may then develop stronger self-efficacy beliefs (Bakar, Maat, & Rosli, 2020).

An increasing amount of empirical evidence corroborates Bandura's (1977) theory that teachers' self-efficacy beliefs are related to the effort they devote to teaching, the objectives they set, their persistence when things are difficult, and their resilience in the face of impediments (Tschannen-Moran & McMaster, 2009). Technologies are rapidly changing, and technologies become outdated very quickly. Schools have responded to this rapid change in technologies by providing access to technology, and providing professional development about technology integration. Due to its frequent changes, technology cannot truly be mastered. The field of teaching has historically been a place where teachers master content, and technology is not a content that can be mastered. Teachers will only invest in integrating technology in the classrooms if they feel efficacious and have the belief that the integration of technology will have an impact on student learning (Skoretz, 2011).

Bandura's second set of expectations relates to outcomes. Outcome expectation is the extent to which a behavior, once successfully performed, is believed to be linked to valued outcomes (Bandura, 1986). Individuals are more likely to perform behaviors they

believe will result in valued outcomes than those they do not see as having valuable outcomes. Educational researchers have begun to examine the beliefs that influence teachers' overall decisions to integrate technology into classroom lessons and activities (Wilson, 2021). To date, the primary focus of social cognitive theory has been on teachers' self-efficacy, or personal perception of their abilities to work effectively with technology. If a teacher believes a behavior will not have an impact, it is unlikely that time, effort, and resources will be invested into the behavior (Bandura, 2002). Based on Bandura's theory, teachers will invest time, effort, and resources in proportion to this judgment (Bandura, 1997). Efficacy is task and context specific (Bandura, 1997), thus it is imperative to investigate teacher perceptions of the elements that influence technology integration in the classroom. Due to the fact that the process of integrating technology into the classroom is arduous, complex, and fraught with unique setbacks, the belief that the effort required to do so is worthwhile is significant to its success. So, it corresponds that if a teacher believes that the integration of technology will be beneficial, then he or she will extend the time and effort required to learn to do so in their classroom.

Traditional classroom structures are usually taught using transmission or objectivism theory. The transmission theory of learning is derived from the teacher as the primary disseminator of all information and learning. Students are provided the information from the teacher and memorize it to reproduce the information as the artifact of their learning. Traditional theoretical belief is visualized by the original, teacher-led classroom where the teacher teaches and the student listens, with very little communication or collaboration from or between the students (Stephens, 2012).

Constructivism theory of learning is a contrasting view of the transmission theory or objectivism theory of learning. Constructivism is commonly thought to be the best way for students to learn, comprehend, and retain information (Tackett, 2014). In a constructivist classroom, students are given information in a problem-based format (Stephens, 2012). According to the constructivist view, learners create knowledge as a result of their interactions with the environment, building on existing knowledge and depending upon the relevance of the content or instructional activity in their own lives (Harrell & Bynum, 2018). From the sociocultural perspective, technology provides the platform, and new ideas for how to use technology (Hilton & Canciello, 2018).

Studies have shown that effective technology integration is most common among teachers with constructivist pedagogy techniques. Teachers continuing to utilize transmission style pedagogy do not effectively utilize technology in their classes (Stephens, 2012; D'Aprile, 2017). Researchers who have investigated the relationship between teachers' beliefs and student-driven learning have identified a common pattern of results: teachers with constructivist beliefs tended to use technology to support student-centered curriculum; those with traditional beliefs used computers to support a more teacher-driven curriculum (Moon, Francom, & Wold, 2021; Uzorka, Ajiji, Osigwe, & Ben, 2021). Increased access to technology may not change the existing traditional classroom teaching styles, especially for faculty who cling to well-known teaching pedagogies (Chand et al., 2020). Thus, simply increasing access to technology would not be enough to increase access to technology for students without shifting teachers' pedagogical beliefs.

In summary, it is important to understand how these theories influence technology integration. It is important to recognize the impact of the expectation for teachers to integrate technology has on teacher self-efficacy. Social cognitive theory also helps to understand that teachers will put forth the amount of effort that is consistent with their beliefs about the positive impact of technology integration in the classroom. It is also important to recognize that pedagogical beliefs impact the willingness and ability to integrate technology. Teachers who hold to a traditional teacher-centered style may be more reluctant to integrate technology than teachers who hold a more constructivist student-centered approach. Together these theories may help us understand the various issues that influence the integration of technology in the classroom.

### **Limitations and Delimitations**

According to Gay, Mills, and Airasian (2009), limitations are the limits the researcher finds that may affect research methodology and outcomes. In any study, the researcher cannot control all factors related to the participants or variables. Thus, the research study had both limitations and delimitations.

This study included the following limitations:

1. This study was limited by honesty and clarity from participants while being interviewed.
2. This study was limited by participant's answered interview questions about self- perceptions.
3. This study does not define the grade levels taught or experience of participants.

4. Teacher quality, pedagogical beliefs, types of professional development received, technology available to staff, and the level of proficiency in the use of technology are factors that were not controlled in this study.
5. The schools' size, location, and demographics were not considered.

Delimitations are the boundaries that the researcher sets forth. This study included the following delimitations:

1. This study was delimited geographically to schools in Southwest Missouri that provided technology integration professional development.
2. This study was delimited to survey responses and interview answers provided by experts.
3. This study was delimited to teachers in grades 6-12.
4. The results of this study were based on teacher perception.

### **Assumptions**

This study included the following assumptions:

1. The participants in this study were a cross-section of the total population of teachers.
2. Participants were honest with their interview responses.

### **Design Controls**

The study used a basic qualitative method design to approach the complex and dynamic study of the intricacies of technology integration in the classroom. Participants were granted anonymity, confidentiality, and the option to refuse, skip any question, or discontinue participation at any time. The goal was to have a cross-section of teachers

with various school district demographics. Qualitative research methods were used to gain insights into how purposefully selected focus participants constructed their understanding of the elements that influence their self-efficacy, and the level of technology integration in their classrooms. Interviews are interactions in which the researcher acquires information from participants (Gay et al., 2009). The researcher's role at the time of the study was an administrator in a school that functioned as a one-to-one school district. Researcher bias is a factor to consider when conducting a study. The researcher set aside personal opinion and judgment, and based the study on research on the topic of teacher perceptions of the issues that influence the integration of technology in classrooms. This study met the criteria of validity in qualitative research which requires the constant and careful attention to the way the data was collected. Following this process increased the validity of the study (Merriam & Tisdell, 2016).

The researcher eliminated his building from the study to guard against bias. Through data collection from teachers in the field, and careful analysis of the qualitative data provided through interviews, the study met criteria for the control of personal bias.

### **Definition of Key Terms**

In-service teachers - In-service teachers are practicing teachers who have graduated from a teacher education program and are therefore licensed (Ryan & Bagley, 2015).

Level of Technology Integration - The term refers to a framework designed to measure classroom technology use. The framework focuses on the use of technology as a tool within the context of the student-centered classroom with an emphasis on higher

order thinking (Guskey, 2000, p. 16).

One-to-One Technology- A district was considered a one-to-one school district if the it provided students with their own device, Chromebook, laptop, or tablet.

Self-Efficacy for Technology Integration - The belief in one's capability to integrate technology effectively in teaching and learning (Bandura, 1997, p. 2).

Preservice teachers - Preservice teachers are postsecondary-level students who are pursuing the teaching career through a teacher education program (Ryan & Bagley, 2015).

Professional Development - "Those processes and activities designed to enhance the professional knowledge, skills, and attitudes of educators so that they might, in turn, improve the learning of students" (Guskey, 2000, p.16).

Technology Integration - The use of technology to enhance and support the educational environment, teacher instruction, and student learning (Van Allen & Zygouris-Coe, 2020).

## **Summary**

The purpose of this basic qualitative study was to explore teacher perceptions of the complexities that lead to a lack of technology integration in the classroom. This chapter introduced the necessity of the study, explained the rationale, and provided an overview of the study. This study gathered the perception of teachers by collecting qualitative data through interviews.

Chapter Two of this paper will provide a thematic review of the existing literature relevant to the research. The literature review will cover teacher self-efficacy,

technology integration, elements that influence technology integration, teacher perceptions of technology integration, professional development for technology integration, effective professional development, and professional development for technology integration. Chapter Three will discuss the methodology of the study, which includes the participants, selection and sampling, research setting, research design, instrumentation, and data analysis. Chapter Four will provide a presentation of the research findings. Chapter Five will contain a summary of the study, discussion, significance, implications of the findings on the education community, and recommendations for future studies.

## CHAPTER TWO

### REVIEW OF RELATED LITERATURE

#### Introduction

The purpose of this chapter is to provide a review of relevant literature on the issues that influence technology integration in the classroom. Technology is an undeniable presence in the world in which we live. In today's culture, it is very difficult to find a child of any age that is not plugged into some type of technology such as mobile phones, iPods, iPads, television on demand, and other resources that appear to be limitless (Harrell & Bynum, 2018). Quickly evolving technology has not only changed the way we live, work, and communicate, but has also revolutionized the possibilities for the educational system (Li et al., 2015). The integration of technology in education, as a global phenomenon, has become one of the top priorities on the education reform agenda (McClure & Pilgrim, 2020). Technology integrated learning and teaching has become increasingly prevalent, with high-tech learning environments, such as mobile technology, social media, smart classrooms and other technology integrated techniques (Rudhumbu, Dzivu, & Plessis, 2021). The use of technology in education opens new areas of knowledge and offers the potential to change some of the existing educational approaches. Technology is an essential life skill in the workforce, and students who are technologically savvy often have a better chance of getting a job and excelling in their careers (Harrell & Bynum, 2018). As technology use continues to increase in society, teachers are encouraged to also prepare for the use of technology within the classroom in order to better prepare students for their futures in a technology-driven world (Joo, Park,

Lim, 2018). However, the task of integrating technology into classroom instruction in a meaningful and state-of-the-art way remains challenging (Burch & Mohammed, 2019).

According to Harrell and Bynum (2018), it is impossible not to pay attention to the significant impact of technology when discussing instruction, education, and training issues. In general, educators are comfortable using technology for personal use or for developing instructional materials, but it is much more difficult to integrate technology into instruction (Li et al., 2015). One of the issues that influences teachers' computer technology use is teacher professional development in the area of technology (Cheng & Xie, 2018). The lack of technology integration by teachers may be due to a lack of effective professional preparation, or professional development programs (Lawless & Pellegrino, 2007). Research shows that professional development provided to teachers for technology integration positively influences classroom practice. For this impact to be felt, teachers must be given the opportunity to learn and practice new instructional strategies in order to improve student learning (Akinci, 2017; Skoretz, 2011). Lawless and Pellegrino (2007) concluded that teachers who participated in technology integration professional development reported greater confidence in using technology and improved abilities for integrating technology in classrooms. Effective professional development for technology integration is vital for classroom implementation.

Teacher self-efficacy is another factor that influences technology integration in the classroom. Albert Bandura (1997) described perceived self-efficacy as the belief in one's capability to organize and execute the courses of action required to produce given attainments. A long history of self-efficacy research points to self-efficacy as a predictor

of behavior (Bandura, 1986, 1997, 2002), and more recently as a predictor of teachers' technology integration (Caner & Aydin, 2021; Gilakjani, 2013). Unfortunately, the opportunity for students to consistently use technology in their classrooms is sometimes compromised due to numerous factors, including teacher self-efficacy for technology integration (Petko, Prasse, & Cantieni, 2018). Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, E., & Sendurur, P., (2012) found that although the understanding of technology is important, that understanding alone is not sufficient to cause technology integration for student learning to occur. Ertmer et al, also found that teachers must feel confident in utilizing their knowledge and understanding of technology as an educational tool to facilitate student learning.

This review of literature is organized into seven main sections. The section headings are teacher self-efficacy, technology integration, elements that influence technology integration, teacher perceptions of technology integration, professional development for technology, effective professional development, and professional development and teacher self-efficacy. The purpose of this basic qualitative study was to explore teacher perceptions of the complexities that lead to a lack of technology integration in the classroom.

### **Teacher Self-Efficacy**

An important factor to be explored in this body of research is teacher self-efficacy. Educators today experience unprecedented challenges in the classroom that have the potential to profoundly impact perceptions of personal and professional success (Birisci & Kul, 2019). The self-efficacy of teachers has been linked to their behavior in

the classroom and the implementation of instructional change (Guskey, 2000). Without self-efficacy, teachers will not expend energy in endeavors because they sense that their efforts would be unsuccessful (Tschannen-Moran & McMaster, 2009). Teachers' self-efficacy is a form of motivation, and is henceforth related to a person's intention and persistence to engage in specific behaviors that may be influenced by factors in the environment, such as resources, peer influence, and administrative supports (Bandura, 1986, 1997). Researchers have confirmed the relationship between teacher self-efficacy and intention to use technology (Ross & Bruce, 2007). Self-efficacy, in terms of the teacher as a facilitator of student achievement, is the "belief in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 2). Teacher efficacy influences behavior through cognitive processes and goal setting, motivational processes and attributions for success and failure, affective processes that control negative feelings, and selection processes (Bandura, 1997). Teachers who believe that they will be successful set higher goals for themselves and their students, try harder to achieve their goals, and persist through obstacles more than teachers who are not sure of their success (Ross & Bruce, 2007). Teachers who believe they will fail avoid expending effort because failure after trying hard threatens self-esteem (Ross & Bruce, 2007). Self-efficacy beliefs influence thoughts and emotions that enable goal-oriented actions in circumstances where teachers believe they can exercise some control (Tschannen-Moran & McMaster, 2009). Researchers have suggested that self-efficacy beliefs, relating to computer use as well as technology integration in teaching, influence a teacher's ability to create classrooms that integrate technology in

meaningful ways (Simsek & Yazar, 2019). In the instructional technology context, it is not enough to use technology in the classroom; teachers must believe that they are proficient at integrating technology in their teaching to increase student learning (Chand et al., 2020).

Bandura (1997) hypothesized that educators make conclusions about their self-efficacy based on the verbal encouragement others perceive to be important, the success or failure of a mentor or model teacher, the perceptions of experiences in teaching, and the level of emotional and physiological stimulation experienced in anticipation of during the actual practice of teaching. These beliefs are specific to teaching contexts. Therefore, teachers form personal opinions about their capabilities in light of the requirements on a particular teaching task (Tschannen-Moran & McMaster, 2009).

Verbal persuasion involves verbal contribution from others, such as administrators, department leaders, and fellow teachers, that functions to strengthen a teacher's belief that he or she possess the ability to achieve a desired level of performance (Tschannen-Moran & McMaster, 2009). Bandura (1997) stated that "it is easier to sustain a sense of efficacy, especially in times of difficulty, if significant others express faith in one's capabilities than if they convey doubts" (p. 101). Verbal persuasion may be inadequate to create a lasting increase in self-efficacy, but it can lead to personal changes if the positive review promotes a bolstered effort in the development of skills that successively lead to a stronger sense of efficacy (Tschannen-Moran & McMaster, 2009).

Another source of self-efficacy is ascertained by observing someone else

successfully performing the feat that the person is contemplating. Because education lacks absolute methods of assessing sufficiency, educators must appraise their abilities in relation to the performance of others (Bandura, 1997). The closer the assumed similarity between the educator and the observed person, the more persuasive the belief that the educator possesses the ability to conquer comparable feats (Tschannen-Moran & McMaster, 2009). Teachers actively seek mentor or model teachers who have mastered the competencies to which they aspire.

The most significant source of efficacy is the experience created by personal mastery, due to the fact that experience provides the most authentic confirmation that a teacher can master whatever it takes to be successful (Bandura, 1997). Success breeds a belief in a teacher's self-efficacy, particularly when the success is achieved early in learning and with minimal difficulty (Tschannen-Moran & McMaster, 2009). When teachers experience failure that cannot be attributed to events out of their control, or a lack of effort, this experience is likely to have adverse effects on self-efficacy beliefs (Tschannen-Moran & McMaster, 2009). An educator's self-efficacy is a dynamic paradigm that is cyclical in nature. The successful performance of new tasks or learning leads to new mastery experiences, which in turn serve as a new basis for self-efficacy that either confirms or disturbs a teacher's existing self-efficacy beliefs (Tschannen-Moran & McMaster, 2009).

As teachers judge their own abilities, they rely partially on information communicated by physiological and emotional states (Bandura, 1997). A teacher's level of excitement, whether comprehended as positive or negative, can have an influence on

self-efficacy beliefs (Tschannen-Moran & McMaster, 2009). Moderate levels of excitement, when comprehended as a challenge, can enhance performance by focusing energy and attention on the endeavor, whereas high levels of excitement or anxiety comprehended as a threat could hinder a teacher from making the best use of skills and abilities (Tschannen-Moran & McMaster, 2009).

### **Technology Integration**

Another important factor to be considered is what literature is available for the topic of technology integration in schools. School districts are investing more time, money, and energy in technology. Integrating technology into classroom instruction has shown an increase in student motivation, learning efficacy, curiosity, and creativity (Silva, Silva, & Bilessimo, 2020). When used effectively, technology integration can contribute to how educators teach and how students learn (Atabek, 2020). As a result, politicians, researchers, educators, parents, and students are exploring the best ways to integrate technology into classrooms to enhance the state of teaching and learning (Kao, Wu, Chang, Chien, Mou, 2020). Although technology has become more readily available in schools, the use of it has continued to be criticized because of some factors, such as teachers' infrequent use of technology and the utilization of technology for knowledge transmission rather than the construction of knowledge (F. I. Karatas, Tunc, Yilmaz, & Karaci, 2017). With the swift advancement of technology, it has become increasingly important that teachers integrate technology in the classroom setting as both a teaching and learning tool (Yu, 2013). It is therefore imperative that teachers expand and broaden their understanding of subject knowledge prescribed by curriculum, and how

they develop their knowledge of how to integrate technology within their curriculum (Voogt & McKenney, 2017). While the appeal to integrate technology and to be innovative in classrooms is prevalent, the reality is that current educators represent a diverse cohort with varying levels of facility when it comes to the effective implementation of technology tools (Rodrigues, 2020). The integration of technology is more than using computers to access information. Technology integration offers tools that students can use to construct new learning (Yu, 2013). Learning with technology takes place when students use technology as a tool that enables them to research, create, organize, and demonstrate their learning in significant ways (Yu, 2013). Teachers frequently use technology to perform noninstructional tasks such as communicating with colleagues and keeping records.

Other concerns include the questions of whether or not technology integration impacts student learning, and whether or not technology integration can positively influence student learning (Darling-Hammond et al., 2017). Research has indicated that use of technology in schools is limited to learning games, academic practice, and occasional word processing with very little integration of technology, and shows that schools have not done an acceptable job of integrating technology to increase student achievement (Darling-Hammond et al., 2017; Montgomery, 2017). Although technology is widely available, teachers employing curriculum, technological, and pedagogical expertise effectively for the benefit of student learning is often lacking in today's classrooms (Hamutoglu & Basarmak, 2020). Sadik (2021) states that the technology divide still exists within teaching itself, within preparation for integrating technology in

teaching, and the implementation of technology at different levels of student learning.

Appropriate use of technology goes beyond providing access to technology for teachers (F. Liu, Ritzhaupt, Dawson, & Barron, 2017). Teachers must learn how to integrate technologies into the actual teaching and learning experiences to enhance student performance and learning (Harrell & Bynum, 2018). According to Hamutoglu and Basarmak (2020), technology integration aims to provide students with the knowledge and skills that will empower them to be successful in their future as informed members of society. Since the access to technology in schools is here to stay, it is necessary that there is a shift in pedagogical approaches (Chand et al., 2020). Keeping the traditional pedagogies and methods of teaching while adding new technology will not enhance the quality of learning (Alqurashi, Gokbel, & Carbonara, 2017). Content and pedagogical knowledge are regularly noted as precursors to effectively implementing technology, and there is a belief that good teachers should be able to use technology in a sound pedagogical way (Barton & Dexter, 2020). The ongoing and effective use of technology in schools for teaching and learning provides opportunities for students to develop technology skills, and enhances curriculum delivery by providing engaging and relevant technology tools to support curriculum and learning (Casanova et al., 2020). Teachers' beliefs about conventional teaching techniques ingrained in their current pedagogy are reflected in their sparse use of new technologies, even though there has been a significant increase in the availability of those technologies (Tondeur et al., 2017). Increased availability of technologies may not change the traditional teaching styles used by faculties who adhere to a traditional style of pedagogy, and who resist the adoption of

new teaching styles (Belt & Lowenthal, 2020). Accordingly, using technology effectively requires the adoption of new pedagogy as well as a commitment to pursue and expand the use of new teaching methodologies (Sailin & Mahmor, 2018). This idea relates to the constructivist theory that proposes that teachers with constructivist beliefs tend to use technology to support student-centered curriculum (Uzorka et al., 2021).

Technology integration in schools is regularly regarded as one of the most complex and challenging initiatives that schools face. In particular, due to the rapid emergence of information and communication technologies, there is often no prior pedagogical knowledge about how to effectively use these emerging technologies in the classroom to impact student learning (Li et al., 2015). Despite great potential and increasing accessibility of technology in schools, teachers are usually portrayed as reluctant and skeptical technology users (Ertmer & Hruskocy, 1999; Taimalu & Luik 2019). Seifu and Wang (2020) highlighted changes in teaching with technology implementation. This study sought to show that the educational community's investment in technology had been worthwhile. The data, however revealed that insufficient authentic implementation of technology had taken place in the instructional practices of teachers. Few teachers are willing to fully explore technology within their classrooms, and technology integration in classrooms is still relatively low (Chand et al., 2020). Teachers are reluctant to give up their teacher-centered and teacher-led classroom routines (Bardakci, Karakose, Alkis, Alkan, 2021), and embrace a student-centered constructivist mentality (Wang, L., 2019).

## **Elements That Influence Technology Integration**

In the section the researcher will examine the body of literature on the elements that influence technology integration in schools. Researchers that have examined teacher mindsets about the implementation of new instructional strategies or practices have recurrently found teachers' self-efficacy to be among the most prevailing influences on receptiveness of change (Ertmer, 1999; Gilakjani, 2013; Ross & Bruce, 2007; Tschannen-Moran & McMaster, 2009). Teachers' hesitancy around technology has become a prominent issue in education as the responsibility for effective technology integration inevitably falls upon individual teachers (Dinc, 2019; Saxena, 2017). The high uncertainty of evolving technologies makes it very difficult for teachers to cultivate the level of expertise needed to integrate technology in the classroom (Yu, 2013). The lack of integration could be attributed to many factors. In 1999, Ertmer distinguished between two types of barriers that impacted teachers' use and integration of technology in the classroom. The barriers were separated into two categories. First-order barriers, defined by Ertmer, were those that were external to the teacher and included resources, training, and support. Second-order barriers comprised those that were internal to the teacher and included teachers' confidence or self-efficacy and beliefs about how students learned, as well as the perceived value of technology to the teaching and learning process. Underlying second-order barriers were thought to be the greater challenge (Durff, 2017; Ertmer, 1999; Teo, Huang, & Hoi, 2017). The 1999 study completed by Ertmer laid the groundwork for continued research in the area of technology integration, and the barriers that influenced the work of technology integration.

In 2007, Hew and Brush completed a detailed analysis of the integration barriers that had been documented in the literature over the last 10 years (1995-2006). They identified six categories of barriers: four that were comprised of first-order barriers (e.g., resources, institution, subject culture, and assessment) and two that comprised second-order barrier (e.g., teacher attitudes and beliefs, and knowledge and skills). Hew and Brush analyzed 48 empirical studies and identified the three most frequently cited barriers impacting technology integration: (a) resources, (b) teachers' knowledge and skills, and (c) teachers' attitudes and beliefs. The study completed by Hew and Brush provided a framework for school districts to begin to address the issues influencing the integration of technology integration in the classroom.

External barriers to technology integration in the classroom are considered to be out of the teacher's control, such as the amount of computer hardware available or the type of professional development that is offered for the teacher (Ryan & Bagley, 2015; Durff & Carter, 2019). A considerable barrier to technology integration in classrooms is the quickly changing nature of technology. Teachers are often fearful of integrating technology in their classrooms because technology rapidly changes (Ertmer et al., 2012). Another important external barrier to technology integration involves the overwhelming quantity of tools available in the school setting. There are also external barriers to technology integration, including out-of-date hardware and software, as well as technology-related problems such as system crashes and insufficient technology support (Hamutoglu & Basarmak, 2020). The amount of support that teachers receive from the school may be a factor that influences technology integration (Liu, X. & Li, 2018). In the

Project Tomorrow's (2017) study, the K-12 teachers indicated that the integration of digital contents and technologies in their instructional practices required more planning time, more technological support from the school, and more professional development opportunities. Both preservice and in-service teachers struggle with institutional barriers to technology integration, which include limited or inadequate professional development and a lack of ongoing support (X., Liu, & Li, 2018).

While external barriers to technology integration are part of the problem, they do not represent the whole picture (Ryan & Bagley, 2015; Miglani & Burch, 2019).

According to Ertmer (1999), "even if every first-order [external] barrier was removed, teachers would not automatically use technology to achieve the kind of meaningful outcomes advocated" (p. 51). Improving teachers' attitudes towards computers is a major challenge when trying to create technology-enhanced learning environments (Kao et al, 2020). Negative attitudes toward computers are related to a lack of self-confidence, anxiety, and a history of difficulty using computers or technology in the classroom (Erkran & Kim, 2017). The more positive the teacher's belief, the more technology utilization occurs in the classroom for student learning (Kao et al., 2020). Ertmer et al (2012) studied 12 teachers who were award-winning technology users. These teachers' internal beliefs regarding attitude, usefulness, and technology knowledge all positively impacted teachers' use of student-centered technology integration.

Teachers' fear and anxiety surrounding the implementation of technology in their classrooms are linked to teacher self-efficacy in using technology (Ertmer et al., 2012; Vongkulluksn, Xie, & Bowman, 2018). Ertmer (1999) described self-efficacy, which can

influence the feeling of fear and anxiety, as one of the second-order or internal barriers that influenced technology integration, and identified it as the greatest challenge to integrating technology in the classroom. It is vital that educational leaders and scholars take note of teachers' self-efficacy, due to its effect on teachers' implementation of new strategies, skills, and learning that they receive through professional development (Raphael & Mtebe, 2017; Tschannen-Moran & McMaster, 2009).

### **Teacher Perceptions of Technology Integration**

Another important factor to examine in the existing body of literature is teacher perceptions of technology integration. The classroom teacher plays a major role in the management of learning in classrooms, efforts should be taken for equipping teachers to use new technologies in classrooms (Edannur & Marie, 2017). A critical component in meeting teachers' technology needs is responding to teacher perceptions or beliefs toward using technologies in teaching (Edannur & Marie, 2017). Teachers' perception on the effectiveness of blending technology in classrooms may influence its use and in turn improve the effectiveness and frequency of the integration of technology (Edannur & Marie, 2017). Edannur and Marie (2017) conducted a study on understanding teacher perceptions of master students of education on technology integration. This study proposed a paradigm shift by adapting teaching approaches to integrate technology and discussed different ways of integrating technology with face-to-face instruction. The results of the study showed that students exhibited positive perceptions of technology integration after integrating technology in classrooms. Sailin and Mahmor (2018) conducted a study to analyze in-service teachers' perceptions toward integrating

technology in instructional design by providing training to integrate technology. A questionnaire was used to understand in-service teachers' perceptions toward integrating technology in instructional design. The findings showed that there was a significant difference in teacher perceptions toward integrating technology, especially in the group that were trained in integrating technology in classrooms.

Research has suggested that properly prepared preservice and in-service teachers are more likely to utilize technology in their classroom than are under-prepared preservice and in-service teachers (Spaulding, 2013; Coats, 2018; Ottenbreit-Leftwich, Liao, Sadik, & Ertmer, 2018). Based on this premise, it would appear that if teachers are indeed more prepared to integrate technology, then this would have a positive effect on teachers' perceptions of the benefits of technology and teachers' own abilities to use technology in instruction (Spaulding, 2013; Batane & Ngwako, 2017). If teachers perceive themselves as prepared by professional development to integrate technology and perceive technology integration to be beneficial to the learning process for students, then they would be more likely to integrate technology (Spaulding, 2013; Instefjord & Munthe, 2017).

Research has shown that the need to feel prepared to participate in professional development for technology integration as a critical aspect of achieving effective technology integration practices among pre-service and in-service teachers (Spaulding, 2013; Mulder, 2017). The responsibility of properly preparing pre-service teachers to integrate technology falls on teacher preparation programs (Spaulding, 2013). In-service teachers must have positive attitudes toward the benefits of technology integration in the

classroom to attempt to integrate technology effectively and frequently (Edannur & Marie, 2017; Kim, Xie, & Cheng, 2017; Spaulding, 2013). While the use of professional development, workshops, and seminars is successful in preparing in-service teachers to integrate technology, researchers have learned that it is equally important to identify the perceptions and beliefs that many in-service teachers have toward technology integration (Edannur & Marie, 2017). Spaulding (2013) supported the importance of understanding teacher perceptions about technology integration, especially the negative perceptions that may hinder technology integration efforts.

In a 2017 national survey of digital trends in K-12 education by Project Tomorrow, half of the school principals and two thirds of the school districts identified technology leaders considered “motivating teachers to change their traditional instructional practices to use technology more meaningfully with students” (p.2) their greatest challenge in promoting technology integration. Research indicates that there is a connection between teacher-self efficacy and teacher perceptions of technology (Han, Shin, & Ko, 2017; Ma & Cavanagh, 2018), and technopedagogical education competence levels of teachers (F. I. Karatas & Aslan-Tutak, 2017). The ideas and competences of teachers about technology integrated education is an important factor for the success of the implementation of technology in schools (I. Karatas et al., 2017). There is historical insight about teaching practice, that it requires intensive and extensive effort to change, sometimes due to strong teacher perceptions of educational change, which runs up against a popular and familiar myth that classroom teaching and learning have remained unchanged for 100 years or more (Watters, Anderson, Neuschatz, & Katrowitz, 2018).

Dorn (2018) asserts that the “institutional and cultural dynamics of schooling” have produced both perennial teaching practices as well as spaces for educators to experiment, create, and implement new ideas that have an impact on their perceptions of the work. This means that each year, millions of teachers work and tens of millions of students learn in classrooms that are complex composites of change and continuity (Tocci, Ryan, & Pigott, 2019). Our schools are an ensemble of historical developments and contemporary innovations that profoundly shape what occurs in classrooms by impacting teacher perceptions of teaching and learning with technology (Tocci et al., 2019). Similar to the past, future educators will likely see significant changes in teacher and student demographics (Tocci et al., 2019), evolutions in academic content, the introduction of new instructional tools and technologies, and a proliferation of learning spaces. These changes will continue to influence teacher perceptions of technology integration, and its’ place in the educational system.

Despite increasing access to technology in schools, teachers are usually portrayed as hesitant users (Harrell & Bynum, 2018). Of all the many individuals involved with education, no other stakeholder experiences the daily details of technology integration like teachers (Lawrence, Al-Bataineh, & Hatch, 2018). These experiences influence teacher perceptions of technology use in classrooms. In many cases, educator opinions and attitudes have helped to form, implement, and maintain school policy and practice regarding technology integration (Lawrence et al., 2018). Lawrence et al also found that teachers perceive the effort needed to learn the new technology, and the practicality or value of its significant as a consideration as to whether they use it or not.

Researchers anticipate some degree of educator frustration with off-task students, and data collected regarding teacher perceptions about off-task behaviors due to devices must be analyzed with consideration of the educational spillover from even non-educational technology use by teachers (Lawrence et al., 2018). Frustration experienced by teachers could have negative implications for teacher perceptions of technology integration in the classroom. Teachers may also perceive technology integration negatively due to the amount of time it takes to integrate into the curriculum through additional training and planning (Harrell & Bynum, 2018). Technology integration requires preparation, classroom management practices, and demands attention that is not normally spent in those areas (Harrell & Bynum, 2018).

It is known that teacher attitudes and self-efficacy toward technology are likely to impact their use (Baturay, Gokcearslan, & Ke, 2017; Lawless & Pellegrino, 2007). Shahbazi (2020) explored the concept of teacher mindsets toward technology suggests that individuals who understand their abilities as fixed are more likely to avoid challenges, whereas teachers who understand their abilities as having the potential for growth are more likely to become willing to take risks. It is likely that teacher sensemaking is informed by mindset, to some degree, and that this might help to explain variability in teacher sensemaking in the face of uniformity of practice (Gherardi, 2017).

### **Professional Development for Technology Integration**

In this section the researcher examines the body of literature for professional development for technology integration in schools. Professional development has been identified as one of the most critical elements that influences teachers' integration of

technology in classrooms (Lawless & Pellegrino, 2007; Bowman, Vongkulluksn, Jiang, & Xie, 2020; Kopcha, Neumann, Ottenbreit-Leftwich, & Pittman, 2020). A recent study found that professional development for technology integration was the second most common type of professional development provided to teachers (Rotermund, DeRocje, & Ottem, 2017). Teachers' computer technology use can be influenced by professional development in computer technology integration (Gilakjani, 2013). Studies have recognized that professional development boosts teachers' beliefs of self-efficacy on the subject of the integration and application of technology for practical classroom instruction (Bowman et al., 2020). It is therefore necessary that teacher professional development include both skill development for teachers and an improvement of content knowledge in order to prepare and equip teachers for the changes required to successfully integrate technology (Van As, 2018). In the professional development setting, exposure to new knowledge and teaching strategies may evoke excitement in the form of interest or curiosity (Tschannen-Moran & McMaster, 2009). Initial professional development opportunities can cause nervous anticipation for teachers, especially if teachers are to be observed and evaluated (Tschannen-Moran & McMaster, 2009). If the teachers are trying out new strategies in a supportive environment where encouragement and assistance are available it can help to reduce the fear of trying new strategies in a room full of students (Tschannen-Moran & McMaster, 2009).

Effective use of technology does not necessarily happen because the technology is available to teachers. Both knowledge of the technology and opportunity for practice using technology for instructional purposes are necessary for successful implementation

(Chand et al., 2020). Professional development is a useful tool to provide teachers with the knowledge and practice they need. If teachers are to be prepared to infuse essential 21<sup>st</sup>-century knowledge and skills into curriculum, professional development in technology integration is critical (Van As, 2018).

While widespread access to information and communication technology (ICT) has resulted in mounting importance of digital technologies for professional practice, the reality is that preservice and in-service educator professional development programs have been unable to maintain pace with methodological changes from the swift development of ICT (Sadik, 2021). Traditional forms of professional development for technology integration have been incapable of improving the technology integration in the classrooms of contemporary schools (Ryan & Bagley, 2015). Schools struggle with the establishment of high-quality professional development plans geared toward effective integration of instructional technology into teaching practices (Ryan & Bagley, 2015). Unfortunately, the manner in which professional development is delivered is often not effective. The problem is that the professional development activities usually implemented are not necessarily guided by best practices found through formal, scientific research (Lawless & Pellegrino, 2007). Many professional development initiatives include a one-time or lengthy lecture approach without follow-up or support (Bowman et al., 2020). Traditional workshops are also not effective or useful in assisting teachers to learn to integrate computer technology into their daily practice (Gilakjani, 2013). Although experts seem to agree on the requirements for success, the reality is that many professional development programs are not effective (Harrell & Bynum, 2018).

Teachers will only invest in integrating technology in the classrooms if they feel efficacious and have the belief that the integration of technology will have an impact on student learning. Both of these perceptions are impacted by professional development (Skoretz, 2011).

### **Effective Professional Development**

The existing literature for effective professional development is examined in this section. Professional development to support teachers' effective technology integration needs to be restructured (Gumbo, 2020). One primary way technology-related professional development can be improved is by creating ongoing learning opportunities for teachers (Ryan & Bagley, 2015). Creating ongoing, continuous professional development gives teachers the support they need to promote mastery of skills, while also providing time for individual teachers to change their beliefs toward technology and pedagogy (Er & Kim, 2017). Even with adequate technology access, effective professional development remains a reason that makes it difficult to increase the level of integration of technology in the classroom (Harrell & Bynum, 2018). Little is understood about what these experiences might look like for teachers during implementation of technology-integrated professional development (Uslu, 2017). Research indicates that simply providing teachers with professional development opportunities related to using technology does not translate into higher levels of integration in the classroom (Harrell & Bynum, 2018). The most effective professional development opportunities are long term and embedded in day-to-day practice, which provides opportunities for higher order thinking and application (Lawless & Pellegrino, 2007). Quality professional

development for integrating technology must support school goals in the context of curricular needs, because the highest quality teacher products result from professional development including modeling instruction, technology utilization, connection to practice, and inquiry-based learning (Lawless & Pellegrino, 2007). Because both ability and worth beliefs are important factors for technology integration, educational technology professional development should focus on fostering these positive characteristics (Bowman et al., 2020).

The relationship between the deepening of educator knowledge about higher levels of student learning and academic achievement has created a renewed interest among researchers and educational leaders in improving the quality of the evidence about professional development for in-service teachers (Hickson, 2017). The efficiency of professional development impacts the acceptance and integration of technology in classroom practice (Lawless & Pellegrino, 2007). Lawless and Pellegrino (2007) revealed that professional development improved pedagogy for teachers, and also improved practice in using educational technology. Evidence from other studies has suggested that the more teachers participate in effective professional development, the more teachers incorporate technology into classroom instruction (Lawless & Pellegrino, 2007). There is a belief that effective professional development will improve teachers' self-efficacy beliefs and affect how knowledge and skills are acquired, and those with higher skill levels may then develop stronger self-efficacy beliefs (Schroeder, 2019).

### **Professional Development and Teacher Self-Efficacy**

The researcher examines the body of literature for professional development and

teacher self-efficacy. It is vital that scholars and school leaders give consideration to teachers' self-efficacy and the role it plays in teachers' implementation of new strategies provided through professional development (Tschannen-Moran & McMaster, 2009). In his model of teacher change, Guskey (2000) hypothesized that most instructional improvement programs falter because they do not consider what motivates teachers to participate in professional development and the process by which change in teachers normally takes place. Relevant professional development programs can improve teachers' confidence about their teaching technique in addition to improving their instructional practice (Bates & Morgan, 2018). Ross and Bruce (2007) conducted a quantitative study using a professional development program that improved teachers' content knowledge and confidence level about their teaching practice. Ross and Bruce designed a professional development program to increase teacher efficacy for technology integration. The professional development addressed four sources of teacher efficacy, each of which is addressed in social cognitive theory. The four items were (a) mastery experience, (b) vicarious experiences, (c) social persuasion, and (d) physiological and affective states. Ross and Bruce found that teachers receiving effective professional development outperformed the control group on three measures of teacher efficacy. Effective professional development that focuses on the four sources of efficacy has a positive effect on teachers' self-efficacy (Skoretz, 2011).

In creating professional development opportunities that support technology integration in the classroom, it is vital to consider teachers' attitudes, prior experiences, and self-efficacy with technology (Taimalu & Luik, 2019). Professional development

can change teachers' attitudes and sense of efficacy while using technology (J. R. Young, J. Young, Hamilton, & Pratt, 2019). Research has clearly indicated training teachers to use technology lowers anxiety and increases efficacy while improving skills (Young et al., 2019). The level of teachers' efficacy when integrating technology is related to individual teacher's beliefs in the teaching methods and design principles, rather than computer technology itself. Due to the rapid change in technology there is a continuous need for teachers to increase their skills or knowledge in the area of integrating those technologies for student learning. Teacher professional development should not only focus on how to utilize specific instructional tools, but also on the importance of teaching methods, content, and context (Harrell & Bynum, 2018).

It is vital that professional development models emphasize various sources of teacher self-efficacy. In education, teachers often receive verbal persuasion in the form of professional development activities that provide new knowledge about a new strategy as well as influential claims of the strategy's usefulness. This type of professional development has minimal effect on teachers' self-efficacy due to the fact that it allows for very little input from the teachers learning the new strategy or skill (Mustafa & Pacarizi, 2021). In professional development experiences where teachers watch a successful teaching interchange, the teacher is more likely to see the teaching task as ascertainable (Tschannen-Moran & McMaster, 2009). If professional development is restricted to only viewing the strategy or skill, its effectiveness may be limited in increasing the skill of the viewer. However, the actual use of the new strategy or skill by the teacher has been shown to increase teacher self-efficacy (Ross & Bruce, 2007). In the professional

development framework, exposure to new strategies or knowledge may evoke excitement in the forms of interest or curiosity by teachers. Initial professional development experiences may cause nervousness or anxiety for teachers, particularly if the teacher will be observed and evaluated (Tschannen-Moran & McMaster, 2009). However, by actively participating in the new strategy in an environment that is perceived to be a supportive workshop setting where praise and assistance are provided can help to reduce the trepidation of trying the skill or strategy in a classroom (Tschannen-Moran & McMaster, 2009).

### **Summary**

This chapter provided a thematic review of the existing literature relevant to the research. The literature review covered teacher self-efficacy, technology integration, elements that influence technology integration, teacher perceptions of technology integration, professional development for technology integration, effective professional development, and professional development for technology integration. This study seeks to fill the gap in the research by understanding the reasons teachers are not comfortable integrating technology in the classroom despite having the resources and professional development to do so. The studies in this literature review were relevant to the research topic.

Chapter Three will describe the procedures and methodology for this mixed methods study. The participants in the study were identified, and the selection and sampling information was provided. The research setting and study design were identified. Survey instruments were used to gather quantitative data. The researcher then

purposefully chose participants using the quantitative data as a guide. Those participants completed an interview process to provide qualitative data. The plan for analyzing the data was then outlined. Chapter Four will provide a clear presentation of the findings. Chapter Five will contain a summary of the study, discussion, significance, implications of the findings on the education community, and recommendations for future studies.

## CHAPTER THREE

### RESEARCH DESIGN AND METHODOLOGY

#### **Introduction**

The purpose of this basic qualitative study was to explore teacher perceptions of the complexities that lead to a lack of technology integration in the classroom. Although many school districts have provided students with devices, often times in a one-to-one environment, and despite providing professional development for teachers, as well as access to resources, many teachers still do not effectively implement technology in their classrooms (Bowman et al., 2020). Technology integration in schools has continued to be regarded as a very complex and difficult initiative for schools to undertake. Due to the swift evolution of technologies, there is often very little prior pedagogical understanding about how teachers should utilize these technologies to enhance student learning (Li et al., 2015). Despite the potential of integrating technology, teachers are still reticent to integrate within their classrooms. Due to the many interwoven challenges of integrating technology in teaching, it is difficult for teachers to successfully implement and sustain this process.

This basic qualitative study explored teacher perceptions of the elements that influence the integration of technology in their classrooms. When studying perceptions, Merriam and Tisdell (2016) stated that researchers who conduct a basic qualitative study should pay attention to “(a) how people interpret their experiences, (b) how they construct their worlds, and (c) what meaning they attribute to their experiences” (p. 24). The proposed research used a qualitative design, which, according to Gay et al. (2009), is

the collection, analysis, and interpretation of narrative data into a particular area of interest.

This chapter will present the process utilized and the methodology for this basic qualitative study. This chapter will provide a detailed description of the components of the research process by explaining the participants, research setting, research design, instrumentation, interviews, and data analysis. A basic qualitative methodology was utilized as the design of this study.

### **Research Questions**

Throughout this basic qualitative study, the researcher explored teacher perceptions of the complexities that lead to a lack of technology integration in the classroom despite having access to resources and having received professional development for technology integration. The following research questions were investigated:

RQ 1. What are teacher perceptions about the challenges of technology integration in the classroom?

RQ 2. What are teacher perceptions about technology integration after receiving professional development?

These questions were designed as a tool to guide the study, and to construct meaning of the elements that influence technology integration in the classroom

### **Participants**

The purpose of the survey was to gather teacher perceptions of the issues that influence technology integration in the classroom. The participants in this study were

teachers in southwest Missouri that were in one-to-one school districts, had been provided professional development for technology integration, and whose schools had the expectation that teachers integrate technology in their classes. A district was considered a one-to-one school district if it provided students with their own device, Chromebook, laptop, or tablet. The participants were teachers at any grade level or content area working in a district that met the criteria for participation in the study. If the school districts met the requirements, and the district agreed to be involved in the study, the district was asked to respond with the names of the schools in their district and the number of teachers (see Appendix A). The principals from the schools that met the criteria were asked to identify classroom teachers to participate in the study. The teachers that were recommended by the principal were contacted and a request for participation was made. The requests for participation are located in Appendix B and Appendix C. Semi-structured group interviews were conducted. Group interviews were conducted to encourage more interaction among teachers, with comments from participants promoting additional thoughts and responses from other participants.

Interviewees remained anonymous throughout the study through the use of a coding system. In accordance with the guidelines of Southwest Baptist University regarding the protection of human participants, a request for review was submitted to the Research Review Board (RRB) for approval to interview the appropriate participants for this study. Upon receiving RRB approval, participant recruitment and data collection began. Participant consent was given through participation in the interview process.

There were no known risks to participants in this study. All participants were

kept confidential and were able to remove themselves from this study at any point.

Answers from interview questions were kept secured on a password-protected device.

Participant names were not used in this study.

### **Research Setting**

The research setting for this study consisted of school districts in the southwestern region of the state of Missouri. This geographic location was chosen due to the need for access by the researcher. This region was chosen to offer an analysis of the perceived influence of teacher perceptions of the elements that influence technology integration in their classrooms in southwest Missouri. To increase convenience for participants, multiple options for dates and times to complete interviews were offered. Schools were selected from the southwest region of Missouri that had a positive reputation for integrating technology. Respondents that met qualifications were contacted and were given the option to complete the interview in person. Most qualitative research requires physically meeting face-to-face with participants to complete interviews (Merriam & Tisdell, 2016).

### **Research Design**

A basic qualitative study is designed for the researcher to examine the research setting in depth, and to have a keen understanding about a situation, as well as the perceptions of the participants (Gay et al., 2009; Merriam & Tisdell, 2016). Merriam and Tisdell (2016) stated that in a basic qualitative research design, data collection can include interviews, observations, and supporting documents. The research is inductive and comparative, and throughout the research themes or categories begin to emerge. In a

basic qualitative study, it is the job of the researcher to “understand how people make sense of their lives and experiences” (Merriam & Tisdell, 2016, p. 25).

School districts were identified as possible participants based on having a positive reputation for technology integration, and if they used a one-to-one approach. If the school districts met the requirements, and the district agreed to be involved in the study, the district was asked to respond with the names of the schools in their district and the number of teachers (see Appendix A). The principals from the schools that met the criteria were asked to identify classroom teachers to participate in the study. Principals were asked to identify a cross-section of teachers, no matter the grade level, number of years of experience, or content. The teachers that were recommended by the principal were contacted and a request for participation was made. The requests for participation are located in Appendix B and Appendix C. Semi-structured group interviews were conducted. Group interviews of five teachers each from three Missouri secondary schools were conducted to encourage more interaction among teachers, and with comments from participants promoting additional thoughts and responses from other participants. The interview protocol was designed based on this study's literature review and emerging themes, and this study's research questions. The selected participants were interviewed about their perceptions of the issues that influenced technology integration in the classroom. The average interview time was 43 minutes long. All interviews were recorded and transcribed.

School districts in southwest Missouri, as determined by the Missouri Department of Elementary and Secondary Education database, were contacted to be a part of this

study. These school districts were chosen because they provided a diverse sample population and access to the researcher. The goal was to have a cross-section of teachers with various school district demographics. To determine school districts that met the criteria to be in the study, districts were sent a short questionnaire to determine district consent to participate in the study, whether or not students had access to technology that was provided by the school district, and district expectations for integration of technology in their classrooms. After school districts were determined to have met the qualifications, one-to-one school districts with the expectation that teachers integrate technology in their classes (see Appendix A), the associated school administrators were sent a letter with details of the study (see Appendix B), and were asked to identify teachers in their buildings that integrated technology, at varying degrees, in their classrooms. Prior to starting the interview participants were provided an explanatory letter that stated that they had the right to not participate in the study, that they could opt out at any time, and that their responses were confidential.

The timeline to determine participation in this study was 6 weeks. After school districts were sent the e-mail questionnaire to determine their willingness to participate in the study, 2 weeks were allowed to receive results (see Appendix A). After 2 weeks passed without a response, a follow-up e-mail was sent to school districts (see Appendix A). After another 2 weeks, a phone call was made to the district. After 6 weeks, districts that failed to return the questionnaire were deemed to be uninterested, unqualified, or unwilling to participate in the study. The districts that responded to the questionnaire were sent the informational letter, and the school administrators were contacted (see

Appendix B). The participants chosen to be included in the interview process were selected from those that voluntarily provided contact information, and who met the criteria established in this study. Teacher responses were not connected to a class or content area. The total time between contacting districts to data collection was 3 months.

Data triangulation occurred in order to ensure reliability and validity through peer reviews. The validity of this study was addressed by examining the data through various lenses of data analysis. The researcher utilized member check as a form of triangulation, as well as collecting demographic information. Triangulation substantiated an interpretation or clarified different meanings with the interviewee (Merriam & Tisdell, 2016). Audio recordings were listened to multiple times and transcripts were reviewed by the researcher and participants for clarification of specific points. Review of recordings and transcripts provided instances to triangulate information among interviewees. Transcripts were reviewed by the participants, who were asked for a confirmation of accuracy. Questions were edited based on feedback from peers. The data analysis included noting patterns and themes, counting frequency of codes, and making contrasts and comparisons (Merriam & Tisdell, 2016).

### **Instrumentation**

Stake (2010) described qualitative research as assuming “that knowledge is constructed rather than just discovered” (p. 99). This study was designed to construct meaning through the examination of teacher perceptions of the elements that influenced technology integration in their classroom, and the level at which they integrated technology. Interviews provided the major source of data.

If the school districts met the requirements, and the district agreed to be involved in the study, the district was asked to respond with the names of the schools in their district and the number of teachers (see Appendix A). The principals from the schools that met the criteria were asked to identify classroom teachers to participate in the study. The teachers that were recommended by the principal were contacted and a request for participation was made. The requests for participation are located in Appendix B and Appendix C. Semi-structured interviews were conducted.

The following steps were taken to conduct the interviews: (a) identify the interviewees based on principal recommendation, and request that they participate in the group interview process; (b) use adequate recording procedures when conducting one-on-one interviews; (c) design and use an interview protocol; (d) determine the location for conducting the interviews whether in person; (e) obtain consent from the interviewees to participate in the study; and (f) during the interview, remain on task to the questions and complete the interview within the time limit set forth, be respectful and courteous, and offer few to no questions and advice (Creswell, 2013). The interviews were audio recorded and responses were transcribed and analyzed. Data from the interviews were collected and used to answer the research question.

The interview consisted of nine questions designed by the researcher. Five of the nine questions had follow-up questions to be used as needed. The instrument was designed to collect responses that would answer the research questions put forth in this study. The instrument contained 4 demographic questions, 1 general technology environment question, 5 questions about teacher perceptions following professional

development, 2 questions about perceptions of barriers to technology integration, and 1 question seeking additional information or further thoughts. The questions were piloted with teachers in other school districts that were not a part of the study, but met the criteria for participation. Feedback was given on the questions asked, and modifications were made. The researcher estimated that interviews would last approximately 45 minutes, and that participants would engage more due to the small group format.

### **Interviews**

Interviews were conducted with personnel from the schools who had consented to be a part of the study and met the criteria for participation. The researcher made the assumption that the information provided by the teachers would be informative to the study. The interview data that were collected consisted of audio recordings and transcriptions. The semi-structured group interviews took place over a 3-month time period. All interviews were transcribed through the use of a transcription service. The interviews included a group of no more than five teachers who were identified by their principal, and met the criteria established for participation. According to Creswell (2013), group interviews were an efficient use of resources and a means of adding valuable insight into the interpretation of a common or interactive event. The interview questions were guided by the overarching research question as well as review of the literature. The semi-structured group interviews probed for teacher perceptions of the issues that influenced the integration of technology in classrooms. The questions were piloted with teachers in other school districts that were not a part of the study, but met the criteria for participation. Feedback was given on the questions asked, and modifications

were made. After the semi-structured group interviews were conducted, coding of the qualitative data took place. The process of analyzing the data started after the first interview and continued simultaneous of the remaining interviews. Coding included a process of referencing words or short phrases throughout all interviews. This process allowed the researcher to determine patterns and construct meaning from the interviews (Gay et al., 2009).

### **Data Analysis**

Gay et al. (2009) stated that “qualitative researchers collect descriptive, non-numerical data to gain insights into the phenomena of interest. The data collection is largely determined by the nature of the problem” (p. 366). Stake (2010) stated “the qualitative researcher concentrates on an instance, trying to pull it apart and put it back together again to make more meaningful analysis and synthesis in direct interpretation” (p. 75). By interviewing teachers to gain insight into their perceptions of the elements that influence technology integration in the classroom, the researcher gained a greater perspective. Interviews were audio recorded, and transcribed by a transcription service. Recording the interviews reduced the risk of the researcher’s bias or opinion (Gay et al., 2009). The analysis of the data occurred simultaneously with the data collection. Data triangulation was achieved by examining the data through various lenses of data analysis, to ensure a complete picture was being represented, and cross-checking throughout the study (Gay et al., 2009). Data were analyzed through the use of key words or phrases for common categories or patterns. Interview transcripts were sent to the participants of the study with the opportunity to clarify previous statements, offer additional comments, and

to provide triangulation of the data. If the participants responded with clarifications or additional comments the researcher made adjustments to the transcribed interview.

The researcher conducted semi-structured group interviews with participants, and those interviews were transcribed. According to Merriam and Tisdell (2016), it is appropriate for the researcher in a semi-structured interview process to review the initial interview transcripts and begin the coding process. Merriam and Tisdell also stated that during a qualitative study the “preferred way to analyze data is to do it simultaneously with the data collection” (p. 197). The researcher captured tentative themes and categories based on initial transcripts to interviews. The researcher made minor, non-substantive changes to the interview process and interview questions based on the results of the first semi-structured group interview (Merriam & Tisdell, 2016). The second semi-structured group interview was conducted, and the researcher followed the same procedure of identifying key words and phrases, making comments in the margins, and comparing these results with data from the first interview, which informed the remainder of the semi-structured group interviews. This process continued throughout the future rounds of interviews.

The procedure of open coding guided the analytical procedures in order for the researcher to code major themes and categories (Merriam & Tisdell, 2016). The process of open coding, also known as category construction, allows the researcher to turn broad concepts into meaningful data. The basic research questions were utilized to analyze information to develop codes and themes related to identifying and investigating the issues that influence the integration of technology in the classroom. Descriptive coding

included key words or phrases and assisted the researcher in categorizing the recurring phrases that were stated in multiple interviews by multiple participants (Merriam & Tisdell, 2016).

After themes emerged, a tree model was used to assist in summarizing the categories in the interview process (Merriam & Tisdell, 2016). Open and axial coding were used as the notes were organized into a table connected to the themes that emerged. Merriam and Tisdell (2016) describe axial coding as “linking action-interaction within a framework of sub-concepts that gives meaning and enables it to explain what interactions are occurring, and why and what consequences real or anticipated are happening because of the action-interaction” (p. 156). Key phrases and themes were sorted into categories. Merriam and Tisdell (2016) stated that researchers are to “create file folders, each labeled with a category name” (p. 209). The researcher named each category by using the exact words of the participants.

The researcher took the challenge of presenting valid and reliable data very seriously. Careful examination of each interview occurred. Each of the interviews was first read in their entirety with overall themes summarized by the researcher. Each interview was then reviewed individually with a reading of the question followed by the response while notes were paraphrased. New themes emerged through this process, and the notes were written into the printed interview. Finally, all handwritten notes were typed. This process transpired to ensure that both surface-level responses and the underlying richness of the answers were viewed multiple times and in multiple formats. With all the notes now merged, paraphrases could be analyzed in order to begin

identifying themes (Merriam & Tisdell, 2016).

### **Summary**

The main objective of this study was to identify and investigate the elements that influence the integration of technology in the classroom. This chapter presented the processes utilized and the methodology for this qualitative study. The participants in the study were identified, and the research setting, research design, instrumentation, interviews, and data analysis were explained. Multiple layers of coding were used in the data analysis. The notes were organized into categories, which were narrowed by frequency of occurrence (Gay et al., 2009). In Chapter Four, the data obtained from the semi-structured group interviews are analyzed. In Chapter Five, after the data have been analyzed, recommendations for further research based on the analysis of the data will be made, as well as, a summary of the study, discussion, significance, and implications of the findings on the educational community.

## CHAPTER FOUR

### ANALYSIS OF THE DATA

#### **Introduction**

Chapter Four presents the results of the interview data gathered, the goal of which was to explore teacher perceptions of the complexities that lead to a lack of technology integration in the classroom despite having access to resources and having received professional development for technology integration. This study explored teacher perceptions of the elements that influence the integration of technology in their classrooms. Through the qualitative process, this study sought to fill this gap in the research by understanding the reasons teachers are still not comfortable integrating technology in the classroom, despite having the resources and professional development to do so. The researcher conducted interviews with 15 teachers from three sites in a group format. The teachers that participated in the study were identified by the building principal at each of the three school sites. The school principal chose teachers to participate in this study at their discretion, and based upon their willingness to participate. This chapter embodies the participants' responses in the interviews to examine their perceptions of the elements that influence the integration of technology in their classrooms.

The research was theoretically grounded in Bandura's (1986) social cognitive theory, served as a basis for understanding some of the intricacies present in this study. Bandura called a set of expectations self-efficacy, or the belief about one's ability to perform a given behavior. Self-efficacy, an essential component of social cognitive

theory, refers to individuals' "...judgement of their capabilities to organize and execute courses of action required to attain designated types of performance" (Bandura, 1986, p. 391). An increasing amount of empirical evidence corroborates Bandura's (1977) theory that teachers' self-efficacy beliefs are related to the effort they devote to teaching, based on their objectives, their persistence when things are difficult, and their resilience in the face of impediments (Tschannen-Moran & McMaster, 2009). To date, the primary focus of social cognitive theory has been on teachers' self-efficacy, or personal perception of their abilities to work effectively with technology. If a teacher believes a behavior will not have an impact, it is unlikely that time, effort, and resources will be invested into the behavior (Bandura, 2002). Based on Bandura's (1997) theory, teachers will invest time, effort, and resources in proportion to this judgment (Bandura, 1997). Efficacy is task and context specific (Bandura, 1997), thus it is imperative to investigate teacher perceptions of the elements that influence technology integration in the classroom.

This study was also grounded in the constructivism theory of learning. Constructivism is commonly thought to be the best way for students to learn, comprehend, and retain information (Tackett, 2014). In a constructivist classroom, students are given information in a problem-based format (Stephens, 2012). According to the constructivist view, learners create knowledge as a result of their interactions with the environment, building on existing knowledge and depending upon the relevance of the content or instructional activity in their own lives (Harrell & Bynum, 2018). From the sociocultural perspective, technology provides the platform and the tools to engage via numerous medias with other individuals and groups beyond the immediate reach of

the learner (Uzorka et al., 2021). Increased access to technology may not change the existing traditional classroom teaching styles, especially for faculty who cling to well-known teaching pedagogies (Chand et al., 2020). Thus, simply increasing access to technology would not be enough to increase access to technology for students without shifting teachers' pedagogical beliefs.

The interviews for this study were conducted during the COVID-19 pandemic. In an effort to ensure the health and safety of the researcher and participants all interviews were conducted virtually using Zoom. Due to the fact that the study was designed to explore teacher perceptions of the elements that influence the integration of technology in their classrooms the interviews and resulting data are as valid and reliable as they would have been had they been done in person. The analysis of the data is separated into four sections. The first section identifies the participants of the study. Participants included five teachers from three schools in Southwest Missouri. The second section describes the process used to verify the methods and the trustworthiness of the research. The third section explores the themes and subthemes that developed from the interviews and the researcher's observations. The fourth section discusses the research questions.

There were two research questions for this basic qualitative study:

RQ 1. What are teacher perceptions about the challenges of technology integration in the classroom?

RQ 2. What are teacher perceptions about technology integration after receiving professional development?

## **Participants**

The participants in this study were teachers in Southwest Missouri that were in one-to-one school districts, had been provided professional development for technology integration, and had the expectation that teachers integrate technology in their classes. A district was considered a one-to-one school district if it provided students with their own devices, Chromebook, laptop, or tablet. The participants were teachers at any grade level or content area working in a district that met the criteria for participation in the study. If the school districts met the requirements, and the district agreed to be involved in the study, the district was asked to respond with the names of the schools that would participate. The principals from the schools that met the criteria were asked to identify classroom teachers to participate in the study. The teachers that were recommended by the principal were contacted and a request for participation was made. The requests for participation are located in Appendix B and Appendix C. Semi-structured group interviews were conducted using the Zoom platform. Group interviews with five teachers were conducted to encourage more interaction among teachers, with comments from participants promoting additional thoughts and responses from other participants.

The school participants were identified as School A, School B, and School C. The teacher participants were identified as T1-T15. School A teachers were identified as T1, T2, T3, T4, and T5. School B teachers were identified as T6, T7, T8, T9, and T10. School C teachers were identified as T11, T12, T13, T14, and T15. There were no known risks to participants in this study. All participants were kept confidential and were able to remove themselves from this study at any point. Answers from interview questions were

kept secured on a password-protected device. Participant names were not used in this study. This information is represented in Table 1.

Table 1

*Record of Participants*

School A	School B	School C
T1	T6	T11
T2	T7	T12
T3	T8	T13
T4	T9	T14
T5	T10	T15

**School A.** School A was a Missouri public high school with between 750 and 1,000 students in Grades 9 through 12. The predominant racial and ethnic composition of the school was 85-90% White, with between 45 and 50% of students eligible for free and reduced priced meals. School A had an average student-to-teacher ratio of 1:21. The principal recommended five teachers to participate in the study. The teachers identified were the following: an English Language Arts teacher with 21-plus years of experience was identified as T1 in the study, a Speech and Theater teacher with 11-20 years of experience was identified as T2 in the study, a Biology teacher with 11-20 years of experience was identified as T3 in the study, a Library Media Specialist and Composition teacher with 6-10 years of experience was identified as T4 in the study, and a Social Studies teacher with 21-plus years of experience was identified as T5 in the study. While reviewing field notes taken during the interview with School A, the researcher noted that this group of teachers were very eager to share their feelings and perceptions. It was noticeable that they had a strong sense of community, and believed in the work that they

were doing with their integration of technology. The teachers from School A had a strong sense of collaboration and trust among their staff.

**School B.** School B was a Missouri public high school with between 750 and 1,000 students in Grades 10 through 12. The predominant racial and ethnic composition of the school was 85-90% White, with 25-30% of students eligible for free and reduced priced meals. School B had an average student-to-teacher ratio of 1:22. The principal recommended five teachers to participate in the study. The teachers identified were these: a Math teacher with 21-plus years of experience was identified as T6 in the study, an Algebra and Geometry teacher with 21-plus years of experience was identified as T7 in the study, a Math and Algebra teacher with 11-20 years of experience was identified as T8 in the study, an Algebra teacher with 11-20 years of experience was identified as T9 in the study, and an Instructional Coach with 11-20 years of experience was identified as T10 in the study. While reviewing field notes from School B, the researcher noted that this group of teachers was slightly more reluctant to share their perceptions of technology integration at their site. It was noticeable that this group of teachers had good rapport with one another, and very strong content knowledge. The teachers from School B shared their perceptions of technology use specific to their content, and less generally about their school or district.

**School C.** School C was a Missouri public middle school with between 1,000 and 1,250 students in Grades 6 through 8. The predominant racial and ethnic composition of the school was 85-90% White, with 35-40% of students eligible for free and reduced priced meals. School C had an average student-to-teacher ratio of 1:19. The principal

recommended five teachers to participate in the study. The teachers identified were the following: an English Language Arts teacher with 11-20 years of experience was identified as T11 in the study, a Social Studies teacher with 1-5 years of experience was identified as T12 in the study, a Math teacher with 1-5 years of experience was identified as T13 in the study, a Social Studies teacher with 11-20 years of experience was identified as T14 in the study, and a Physical Education teacher with 11-20 years of experience was identified as T15 in the study. While reviewing field notes from School C, the researcher noted that this group of teachers was very collegial. This group of teachers seemed to focus on their district expectations, and their translation of those expectations to their individual classrooms. The teachers from School C provided responses that were succinct.

### **Verification/Trustworthiness**

A basic qualitative study approach was used for this study. Data collection occurred through interviews, the review of interview transcripts, member checks, and the researcher's field notes (Merriam & Tisdell, 2016). Data collection using these methods was designed to allow participants to share the story of their perceptions, experiences, practices, and beliefs in regard to professional learning's influence on technology integration in their classroom (Merriam & Tisdell, 2016). Interviews permitted the researcher to understand participants' perceptions and experiences in regard to professional learning's influence of how they felt about technology integration (Merriam & Tisdell, 2016).

Credibility, validity, and reliability are crucial components for crafting a

consistent analysis of the data. In qualitative research, this process is driven by a constant and coherent handling of the interview data (Merriam & Tisdell, 2016). It is suggested to collect data through multiple methods in order to adequately communicate findings (Creswell, 2013). This process allows the researcher to establish for the reader how various viewpoints and approaches were used to examine and portray the findings (Merriam & Tisdell, 2016). This basic qualitative study confirmed trustworthiness by applying triangulation, member checking, clarifying researcher bias, and rich narrative.

**Triangulation.** The researcher used triangulation of data to evaluate and better understand the themes that developed throughout the course of the study. Data collection occurred through interviews, the review of the interview transcripts, member checks, and the researcher's field notes (Merriam & Tisdell, 2016). The researcher maintained a notebook with notes, speculations, and intuitions throughout the interview process. This study met the criteria of validity in qualitative research which requires the constant and careful attention to the way the data was collected. Following this process increased the validity of the study (Merriam & Tisdell, 2016).

Interviews were conducted with five teachers from three different secondary schools in Southwest Missouri. The interviews were conducted as a group, and were scheduled at a time that was convenient for the participants. The interviews were conducted using Zoom, and recorded with the knowledge of the participants. The interviews and transcripts allowed the researcher to detect themes that emerged. The themes emerged from field notes the researcher took during and following the interviews along with review of the interview transcripts. The researcher identified themes and sub-

themes from the interview transcripts by multiple thorough readings of the data. The purpose of this basic qualitative study was to explore teacher perceptions of the complexities that lead to a lack of technology integration in the classroom despite having access to resources and having received professional development for technology integration.

**Member check.** Member checking offered participants the opportunity to review the interview transcript and make any changes, additions, or clarification to their statements. Each interview was digitally recorded using the recording feature in Zoom. The digital recordings were uploaded to Rev.com and converted into transcripts. Copies of the transcripts were emailed to each participant to ensure the accuracy of their responses. Participants were allowed to make any additions or deletions, or provide clarification or additional explanation to their interview responses. Upon completion of member checking, only four requests were made to modify the original transcript. All four of the requests were to correct the identified speaker providing a response to an interview question. Those modifications were made to the appropriate transcript.

**Peer review.** Peer reviews were conducted to increase the internal validity of this study (Merriam & Tisdell, 2016). The peer review process was comprised of a dissertation committee that included a graduate education professor, a psychology professor with a background in education and research, and an associate provost. One of the dissertation committee members served as the researcher's advisor. The advisor regularly monitored progress of the research and collaborated with other dissertation committee members to seek feedback and input. The dissertation committee examined

the research questions, theoretical framework, literature review, and the methodology for the study. The review process allowed the researcher to take feedback and input from the committee to focus the research questions, cultivate the literature review to reflect the research question's purpose, and determine a suitable methodology for the research.

**Clarifying bias.** In qualitative research, it is imperative to clarify bias in order to monitor the researcher's biases so it can be made clear how they may be influencing the data (Merriam & Tisdell, 2016). The researcher was employed as a high school principal in the state of Missouri during this study. Through the researcher's professional relationships, he knew one of the teacher participants. This previous relationship could have inadvertently impacted the participant's ability to answer questions with their true viewpoints. The researcher was aware of this potential bias and was mindful to adhere to the interview protocol as a result of this prior relationship.

### **Data Analysis Procedures**

Creswell (2013) maintained that qualitative research is a process comprised of data collection, data analysis, and report writing, which are interrelated and occur concurrently. Researchers learn by doing and use analytic processes that develop as the research occurs (Creswell, 2013). The Data Analysis Spiral approach recommended by Creswell (2013) permits the researcher to move in analytic circles as opposed to a set linear approach. This process allows for multiple aspects of analysis to transpire (Creswell, 2013).

The Data Analysis Spiral approach starts with data management that occurs as the researcher organizes the data into files manually or electronically. Researchers read the

transcripts in depth to comprehend the data in its entirety before separating the data into parts. Codes and categories are created to develop themes and subthemes, which aid in interpreting the data (Creswell, 2013). Once the data are interpreted, they are presented in text, narrative, tables, or figures. These strategies allow for the data to be examined in a visual context (Creswell, 2013).

### **Coding Procedures and Theme Development**

The researcher completed small group interviews at three schools. The interviews included a group of five teachers at each site. All interviews were completed using the Zoom platform and were recorded using that system. The interviews were provided to Rev.com and transcripts were created. Once transcripts were received member checks were completed. The researcher analyzed each interview transcript through multiple readings and notetaking strategies. Descriptive coding included key words or phrases and assisted the researcher in categorizing the recurring phrases that were stated in multiple interviews by multiple participants (Merriam & Tisdell, 2016). Key phrases and themes were sorted into categories. Merriam and Tisdell (2016) stated that researchers are to “create file folders, each labeled with a category name” (p. 209). The researcher named each category by coding the responses of the participants. Each interview was then reviewed individually with a reading of the question followed by the response while notes were paraphrased. New themes emerged through this process, and the notes were written into the printed interview. Finally, all handwritten notes were typed. This process transpired to ensure that both surface-level responses and the underlying richness of the answers were viewed multiple times and in multiple formats. With all the notes

now merged, paraphrases could be analyzed in order to begin identifying themes (Merriam & Tisdell, 2016).

The researcher annotated and highlighted text within the transcripts, throughout several readings, and discovered commonly identified words and phrases. The text was moved to a document, and a key word assigned to each phrase. This process was completed for each transcript. The researcher began to identify themes based on responses of participants. Once this process was completed, the researcher identified the key words and phrases that were assigned to text most frequently. The researcher identified 17 key words or phrases from the three interview transcripts. The 17 key words or phrases were used to illustrate the data and were categorized together to establish patterns, which helped identify five major themes.

When the five major themes were determined the researcher examined the interview transcripts again to identify overlap in themes. Table 2 identifies the 17 coded words or phrases associated with the identified themes from the interview transcripts. The table demonstrates the frequency of the identified words or phrases and shows the overlap of those words within multiple themes. The researcher identified five major themes, which were developed from 17 coded words.

Table 2

*Record of Coded Information*

Coded words/phrases	Record of occurrence	Theme
Benefit to Learning	57	Educational Contribution
Relevance	39	
Time	31	
Timing	7	

Improved Skill	3	
Time	39	
Do-it	18	Implementation
Overwhelmed	23	
Timing	8	
Collaboration	28	
In-House Professional Development	17	Collegiality
Outside Professional Development	3	
Confidence	32	
Confidence	32	
Belief/Comfort	4	Efficacy
Collaboration	20	
System	32	
Differentiated/Choice	8	Process/Processes
Technology Issues/Use	19	
Students	21	

Table 2 lists each of the 17 coded words and phrases to display how the researcher sorted them into categories. The categories were examined for connections to generate the themes presented by the participants. The 17 key words and phrases depict the data holistically and were organized together to portray connections and similarities within each theme. Some of the key words and phrases corresponded to multiple themes, and were present throughout the transcripts. While the researcher analyzed the transcripts some of the key words and phrases were found to be evident within and throughout the interviews.

The first theme, educational contribution, had five key words and phrases associated with it: (a) benefit to learning, (b) relevance, (c) time, (d) timing, and (e) improved skill. The second theme, implementation, had four key words and phrases associated with it: (a) time, (b) do-it, (c) timing, and (d) overwhelmed. The third theme,

collegiality, had four key words or phrases associated with it: (a) collaboration, (b) in-house professional development, (c) outside professional development, and (d) confidence. The fourth theme, efficacy, had three key words or phrases associated with it: (a) confidence, (b) belief/comfort, and (c) collaboration. The fifth theme, process/processes, had four key words or phrases associated with it: (a) system, (b) differentiated/choice, (c) technology issue/use, and (d) students.

### **Analysis of Theme 1: Educational Contribution**

The first major theme that was identified from the transcripts was educational contribution. Educational contribution had five key words and phrases associated with it: (a) benefit to learning, (b) relevance, (c) time, (d) timing, and (e) improved skill (see Table 3).

Table 3

#### *Record of Coded Information: Educational Contribution*

Coded words/phrases	Record of occurrence	Theme
Benefit to Learning	57	Educational Contribution
Relevance	39	
Time	31	
Timing	7	
Improved Skill	3	

Table 3 identifies the major theme of educational contribution and the number of participants' responses that were coded as benefit to learning, relevance, timing, and improved skill. Each of the three transcripts had responses that were from all of the key words or phrases in Table 3 that interrelated with the theme educational contribution.

The key words and phrases were used to identify the major theme.

The major theme of educational contribution was identified in various ways. One of the ways was how the professional development for technology integration directly impacted the teaching and learning process. Teacher 11 stated,

I can say that the professional development has totally changed the way that I teach. I'm doing a lot more inquiry, a lot more cooperative learning. The students are going deeper into the materials because of the technology training. I can kind of see where before technology, I was essentially, read this story. Answer these questions. Write this paper. Where now I can go a little bit deeper? The students are doing the research. There's inquiry built within. So, I can definitely see how the technology training has totally changed, just not how the students learn, but also what they're learning and how deep they're going into the subject.

Teacher 13 added,

I see a lot of the students facilitating their own learning, which has completely changed the way I teach. They are the ones investigating. The level of critical thinking and problem solving has increased...we've gone through training, which is project-based learning, all technology-based. That has completely changed the way my classroom runs.

Participants also reported that technology professional development for implementation in the classroom allows teachers to change the way that they teach. Technology allows for teachers to be facilitators of learning. "The technology shifts the learning. It helps us as teachers shift the learning onto the students and gives us so

many more opportunities to just mix up how we do things” (T12).

Participants also communicated that utilizing technology in their classrooms was made much easier when they did not have to determine when and how to integrate it into their teaching. Teacher 8 made the observation, “I found that the teachers that seem to use it the most often are the ones where it's already integrated into the resources they have.” Teacher 15 said, “Anything I've used that's new... it's not how do I use the tool but where in my content do I use it effectively.”

Another way that the theme Educational Contribution was identified was when the professional development for technology integration was delivered in a way that caused teachers to have to determine if the challenges of implementation were worth the time or effort of implementation. Teacher 4 noted, “...sometimes when I get back into the classroom, is when I realize that it's not as relevant, this is not what I thought it was going to be.” Teacher 2 added,

A lot of times, you'll go through something ... is this going to benefit my class? If the answer is yes, then I'll take it back, and then I'll play with it. But, if I'm going through a professional development, and I'm like, this is not going to help me at all, then I may not spend the time required in class.

Participants communicated that after learning something new during technology professional development, the process of implementing the technology in the classroom had to be weighed against the need to cover their curriculum. Teacher 2 shared,

Sometimes the upfront time that it takes, if it's something brand new for the

students...and I know that half these kids, I'm going to have to spend some one-on-one time with, just getting them started on whatever we're doing. Sometimes that's a barrier where I'm like, is it really worth it? Can I just do it a different way, so we can get into the lesson quicker?

Teacher 5 agreed with this sentiment: “Now you're taking away time from your typical curriculum lessons, to teach them how to do something with technology, so that they could do it.” Teacher 8 stated,

Just the fact that getting it out, getting the kids' laptops out or the Chromebooks out. Making sure they're all charged up. Making sure everybody has theirs. And just weighing the pros and the cons. Do I have time to mess with that today? Teachers won't use it because they don't want to give up the time that it takes to get it all out and get it going just for a few bells and whistles that it might give the kids.

Participants also shared their concerns about the purpose of using the technology learned in professional development. “I am always weighing the technology integration against, am I doing this for the sake of having technology, or am I doing this for the sake of learning?” (T12)

Educational Contribution, as a theme, was also associated with teacher perceptions of the relevance of the training to their work in their classrooms, and how the training was delivered, using terms like “purposeful” (T7, T9, T12), “focused,” (T1) and “well-received” (T7). Teacher 12 shared,

The training that just kind of shows us a bunch of tools are great...there has to

be one those tools that just clicks in my head that I can see a way that I know how to use it. It's just if I don't have a good idea of how to actually use it, it doesn't end up being as useful for me. Some of those trainings, I'm just getting shot-gunned with tech tools and different things and hoping that one of them is useful to me.

Teacher 9 agreed with this line of thinking: "...I enjoy learning something if it's applicable. It's important whenever you do some kind of technology professional development, about being purposeful." Teacher 7 added,

If the training is very focused on a specific agenda for our school district, and would benefit the learning of our students, it is more well received.

If it's purposeful, I'm sitting in there feeling like my time is valued and I enjoy learning something if it's applicable. I really love it when it's presented by a teacher who's used it or found something to be useful about it and how it can directly be immediately placed into my classroom purposefully.

Teacher 12 communicated, "...Some of them are promoting technology in the classroom and justifying its uses, and other things are just, here's some stuff you can use or here's something that the district is using."

Teachers identified that the time required to utilize technology in the classroom and the timing of when the training is provided also impacts the technologies benefit to learning. Teacher 2 stated, "I think for me, the problem is trying to stop and think...what from this can I actually use, and then how do I find the time to really dig in, and make it useful?" Teacher 4 stated, "...I'm teaching them

this tech tool, while we're also trying to learn the actual content, or standards that we're addressing.” Teacher 10 stated,

Teachers like to see how those things are used in the classroom and not have to try to figure it out on their own...it takes way too long to try to sit there and figure this stuff out on your own...What did I just learn here? How am I going to be able to incorporate it? Or even do I have the time to incorporate it?

Teacher 1 stated, “The distance between the time we learn something, and the time that it might be actually applicable in the classroom is a challenge.” Teacher 12 commented, “Part of that's a timing thing too. We learn something in the summer and it really is a tool that lends itself to a really good method, then it will drastically change my instruction.” Teacher 11 added,

It varies on the timing of the training. So, if it's in the middle of the year and I'm in the middle of a unit, I might not drastically change a unit...if it's a really easy tool that I could implement that would replace something that I already have planned, there's times that I'll go ahead and implement that. A lot of the implementation, especially if it's kind of bigger ideas and bigger philosophy items, if they're done in the summertime and I have my team to brainstorm and...we should change our unit because of this, and it is more effective.

Teacher 15 agreed with this thinking:

It might be a little bit extra work for me to now create something with this new tool versus something that I already have created. Just always keeping the

students in mind, is this going to help them, or am I doing this so I can check it off a box and say, I used this new tool. How is the information, this technology is giving me, going to benefit them by me having it?

The major theme, educational contribution, was wrapped up in several key words or phrases. Those key words or phrases which were woven into the responses of the teachers. The responses of the teachers shared perspectives of benefit to learning, relevance, time, timing, and the improved skill. Each of the key words and phrases was identified by teacher participants as impacting technology integration for the educational contribution.

### **Analysis of Theme 2: Implementation**

The second major theme that was identified from the transcripts was Implementation. Through multiple readings of the transcripts, four key words or phrases were identified to align with the theme. Those key words and phrases were (a) time, (b) do-it, (c) timing, and (d) overwhelmed (see Table 4).

Table 4

#### *Record of Coded Information: Implementation*

Coded words/phrases	Record of occurrence	Theme
Time	39	Implementation
Do-it	18	
Timing	8	
Overwhelmed	23	

Table 4 identifies the major theme of Implementation and the number of participants' responses that were coded as time, do-it, overwhelmed, and timing. Each of

the three transcripts had responses that were from all of the key words or phrases in Table 4 that were interrelated within the theme Implementation. The key words and phrases were used to identify the major theme.

Theme 2, implementation, was identified from responses by participants that described their use of technology in their classroom after receiving professional development for technology use. Participants described that time was a factor in their ability to implement technology in the classroom: “I'm going to have to spend a lot of time figuring out how to use it” (T1). Teacher 5 agreed,

...the biggest barrier is time, both time in learning it, because you will learn something really quick, and then you've got to play with it. You've got to designate some time to use it, to figure out how it works. And then, the time for you to teach the kids how to use it. Now you're taking away time from your typical curriculum lessons, to teach them how to do something, so that they could do it. And so, just time in general can be a major barrier to overcome.

Participants agreed that time to implement technology in the classroom is something that they have to balance. “...if we have time, that's the key” (T7). Teacher 6 agreed with this idea: “It takes time. Again, it's a lot to gather and try to implement.”

Teachers communicated that other tasks dominate their time, Teacher 11 shared,

If the training is done during the school day or even during the school year, even if it's a really good training, I get back into my class, I have to get this done, and this done, and this done in my classroom. I'm not necessarily

focused on integrating the technology. Sometimes even if the training is absolutely amazing, I can still go to my to-do list instead of how to implement that technology. That to-do list at times can be fairly daunting.

Participants communicated that they try to take what they learn and implement it in their classrooms, as time allows. Teacher 15 stated,

I usually try to pick one thing from, if it was just an hour of PD...pick one thing. Then I don't necessarily try to incorporate it right away. The next opportunity that I can, I go back to something that we learned.

Teacher 13 agreed, "I have those one or two nuggets that I'm really excited about that I want to try in my classroom. I think the other piece is just processing that with my teaching..."

Another factor that influences technology integration after professional development is teachers having time to practice with the technology. Teachers referred to this as "time to play" (T5). Teacher 2 added, "It doesn't feel like we have the time to really dig in, like I would want to ... I want to spend some time thinking about it, and playing with it before I roll it out into the classroom." "It is important to just make sure you try something before you have the kids do it" (T9). Teacher 14 agreed,

...I think that being able to utilize the tool and being taught that in our professional development opportunities is good. I think that there's so many more pieces to it that we're not shown that we've got to just discover.

Teacher 5 summed up the need to practice with the technology:

And that's why it's so important to play with it, figure it out, and work it all out, work the kinks out. I think it the professional development for technology gives me some new ideas, and maybe things that I could employ in my classroom ...again, just using it, just playing with it, just figuring out how it all works.

Participants also communicated that the timing of the training is also a factor in technology implementation in the classroom. Teacher 11 stated,

It varies on the timing the training. So, if it's in the middle of the year and I'm in the middle of a unit, I might not drastically change a unit. Now, if it's a really easy tool that I could implement that would replace something that I already have planned, there's times that I'll go ahead and implement that. A lot of the implementation, especially if it's kind of bigger ideas and bigger philosophy items, if they're done in the summertime...it is more effective.

Teacher 12 shared, “Part of that's a timing thing too. We learn something in the summer and if it really is a tool that lends itself to a really good method, then it will drastically change my instruction.” Teachers also shared, “If you don't have that ahead of time, you're also making those adjustments on the fly. And that's probably one of the frustrations is to change your curriculum” (T6). Teachers communicated that summer is a good time to receive professional development for technology integration. “I'm going to have to spend a lot of time figuring out how to use it, and I need the summer to do it” (T1). Teachers communicated that the time of the school year when they receive professional development impacts them: “...doing it early on,

before a lot gets going, I think, is nice just so we have time to play with it...which I wouldn't normally do in the middle of the school year” (T2). Teachers also communicated that the timeliness of professional development is important: “...distance between the time we learn about technology use, and the time that it might be actually applicable in the classroom impacts whether I will do it or not” (T1).

Teachers communicated that the sense of feeling overwhelmed can come from the professional development itself. “Sometimes it's overwhelming, especially if we've got too much information, to where I can't remember what the actual first step was” (T1). “...maybe just more frustrating, because it's another login, another app, another add-on...exposure to different tech things can be really overwhelming and frustrating sometimes” (T4). “I feel like it's always quick, like they're trying to get as much information as they can in a short amount of time, teach us as many things, little bits and pieces in a short amount of time...” (T15).

Participants shared that the sense of feeling overwhelmed can also come from the actual technology: “...sometimes it has been overwhelming to me...I get too distracted by how cool the end result is, and I forget how to actually start it. So, sometimes overwhelming” (T1). “Sometimes I feel a little overwhelmed, if it's something brand new, and a lot of times, it's just the terminology, sometimes it's something I haven't ever heard before” (T3). “I think it's intimidating sometimes whenever you're just getting started. I almost always sit through a session and then have to go to a friend, ...now, what did they say? You know, step by step...I'm afraid

to just push buttons and see what happens” (T9). “All the bells and whistles all look good during the meeting” (T5).

Teachers communicated that feeling overwhelmed also came from their lack of time to prepare or practice with the technology. Teacher 8 communicated, ...time I have to digest the material...I don't like being thrown into PD a week before classes start with the expectation and maybe the excitement that I get from seeing it, but the frustration of not having time to implement or digest...it sits on my table until next summer in which time my enthusiasm is lackluster. And I've forgotten a lot of the tips and the training.

Teacher 11 stated,

I get really excited, because I see the opportunities that the technology can provide my instruction. Then I get a little bit overwhelmed because I start thinking, I have to do all these changes. Sometimes even if the training is absolutely amazing, I can still go to my to-do list instead of how to implement that technology. That to-do list at times can be fairly daunting.

The major theme, implementation, was identified by several key words or phrases. Those key words and phrases were interlaced into the responses of the teachers. The responses of the teachers shared perspectives of time, do-it, timing, and overwhelmed. Each of the key words and phrases were identified by teacher participants as influencing the implementation of technology after receiving professional development.

### Analysis of Theme 3: Collegiality

The third major theme that was identified from the transcripts was Collegiality. Through multiple readings of the transcripts, four key words or phrases were identified to align with the theme. Those key words and phrases were (a) collaboration, (b) in-house professional development, (c) outside professional development, and (d) confidence (see Table 5).

Table 5

#### *Record of Coded Information: Collegiality*

Coded words/phrases	Record of occurrence	Theme
Collaboration	28	Collegiality
In-House Professional Development	17	
Outside Professional Development	3	
Confidence	32	

Table 5 identifies the major theme of Collegiality and the number of participants' responses that were coded as collaboration, in-house professional development, outside professional development, and confidence. Each of the three transcripts had responses that were from all of the key words or phrases in Table 5 that were interrelated within the theme Collegiality. The key words and phrases were used to identify the major theme.

Participants described the influence of collegiality on technology integration in their classrooms after receiving professional development. Teachers shared their perceptions of collaboration with peers, both in the same content and other contents,

and the influence it had when integrating technology. Teacher 11 stated,

A lot of the implementation, especially if it's kind of bigger ideas and bigger philosophy items, if I have my team to brainstorm and...decide, is this how we should change our unit because of our technology training...it is more effective.

“There are people in the building that I know specifically I can go to for help with technology, specifically for this, and that's very beneficial” (T1). Teachers shared that they utilized peers for support with technology after professional development.

“We are extremely comfortable asking questions, because we all know each other, we all like each other...so it's really nice to have those different levels, and several experts in the building to help with these different technology platforms” (T3). “One-on-one help, a group of teachers I can go to that can guide me through whatever it is” (T1). Teacher 7 stated,

...if I have a team to work with, that really helps me. Because, I can bounce ideas off of them to see what they think...we're able to discuss what we learned, implement it together, work together to design what we just learned. I also really like the collaboration component after professional development, working through the challenges or excitement of implementing something new.

Teacher 10 stated,

There always seems to be one person on the team that will just take it and fly with it. ...they'll be able to help the other people on the team. And so, that's

one of the things that I think is neat about new technology and being in those professional learning community groups is that you always have that one person that's like the go-to person.

Teacher 4 shared, "...we know one another well enough to help one another create, like...you know that assignment that you do, if you use this tool, you can make it even better."

Teachers shared that sometimes they learn more from informal time collaborating with peers than they do formal professional development. "Informal professional development of just learning from people. But, the actual formal trainings, I don't know that I leave feeling proficient necessarily, it's just like a refresher, or...I don't know that I'm actually learning the tool in those times" (T4).

Teacher 5 summed up the sentiment of teachers collaborating, and working together to integrate technology effectively:

I enjoy those times when I just figured out this part of the technology. If you click this...Okay, try this. This might be able to do what you want...just brainstorming like...I want to use it to be able to accomplish this. Do you know how to do that? Someone else is like, No, but I have used it to do this thing...could you maybe manipulate that? Well, let's click around. So, when all of our heads are together, trying to figure out one aspect of a giant tool, those are the times that I'm more apt to go right back to my classroom, and integrate it quickly.

Participants shared their feelings about receiving in-house professional

development from their peers. “I really love it when it's presented by a teacher who's used it or found something to be useful about it, and how it can directly be immediately placed into my classroom purposefully” (T7). Teacher 15 shared,

I've never left a training and wanted to use a tool and not had questions for whoever put on that training. I feel like in our school, any training I've ever gone to, people have been very open to reach out to me and I always have them. If it has failed, like [T14] mentioned, going back to that person, and asking, ... what can we do better?

Participants shared that they appreciate having the presenters of in-house professional development in their building, after the training has ended. Teacher 4 shared,

I love having in-house-led professional development, because then I can call someone else and say... I'm trying to do this lesson right now. It's blowing up in my face. Can this tool even do what I am trying to make it do? I really, really value having the in-house element, so that when you hit those roadblocks in the middle of a class, or a lesson, you can call, and creatively overcome that together.

Participants shared that they rely on the collaboration with their peers during and after in-house professional development. Teacher 5 stated, “...the in-house professional development is really nice, you are able to turn to your neighbor...can you help me out here?” “In-house professional development is the most helpful for me, because then we can just sit there, and feed off each other. I can ask a question and I don't feel like...what does this do? ...so that is the best time for us, for me” (T3). “I think it's

intimidating sometimes whenever you're just getting started. I almost always sit through a session and then have to go to a friend...and ask what did they say? You know, step by step” (T9).

Conversely, participants shared their perceptions of outside professional development for technology integration:

...people outside, they're going to try to sell you the tool, and sell you the app, and convince you that, yeah, it can do exactly what you're trying to do. But come to find out, no, it can't. It can't. Then you can't get off the phone” (T4).

“Yeah, I'm generally not a big fan of formal outside professional development. Just because I might get exposed to something new, but a lot of times I don't feel like I will learn that much” (T2). Teacher 4 shared, “I have to go to a lot of outside trainings for different tech tools, like conferences and things. And I hate those.”

When describing outside professional development teachers also shared their perceptions of the presentations themselves: “It depends on if they did a good job presenting” (T9). Teacher 8 stated, “...the outside technology professional development is never, in my opinion, delivered with pedagogy...it's kind of interesting that it comes across as a new toy, a new tool. And, sometimes teachers see it as a distraction in their classroom.”

Participants shared their perceptions of the impact of collegiality on their confidence to integrate technology in their classrooms after receiving professional development. Teacher 4 stated,

Sometimes on the actual professional development moments, I don't feel as

great about my teaching with technology, until I get to work with everyone again...it is really helpful to have people to go to, and to know who those people are.

“There are times where I do feel a little more confident after leaving a professional development day than before, but, to me again, it's that one-on-one time with colleagues, just playing with it, just figuring out how to use it” (T5). “I think it helps the confidence level...when I see somebody else doing it and then they get really excited about it. I think, wow, well maybe this is something I should try, too” (T10). “I always feel...just fine afterwards. Not because I'm a techie, but because I know that I have techies in my department that I can go to that are very close by if I have a question” (T7). “There's not a culture in our district of so-and-so who are the lords of technology, and all technology that gets used gets passed down from them. We all work together to figure it out” (T12). Teacher 6 summed up the feeling of improved confidence with technology because of a collegial environment:

It is also nice to have a teacher forum or group of peers where we can go to and get the help that we need in case we do get stuck while implementing the technology; it boosts my confidence when trying new things.

The major theme, collegiality, was identified by several key words or phrases. Those key words and phrases were woven into the responses of the teachers. The responses of the teachers shared perceptions of the influence of collaboration, in-house professional development, outside professional development, and confidence on their integration of technology after receiving professional development. Each of

the key words and phrases were identified by teacher participants' responses to the interview questions.

**Analysis of Theme 4: Efficacy**

The fourth major theme that was identified from the transcripts was efficacy. Through multiple readings of the transcripts, three key words or phrases were identified to align with the theme. Those key words and phrases were (a) confidence, (b) belief/comfort, and (c) collaboration (see Table 6).

Table 6

*Record of Coded Information: Efficacy*

Coded words/phrases	Record of occurrence	Theme
Confidence	32	Efficacy
Belief/Comfort	4	
Collaboration	20	

Table 6 identifies the major theme of efficacy and the number of participants' responses that were coded as confidence, belief/comfort, and collaboration. Each of the three transcripts had responses that were from all of the key words or phrases in Table 6 that were interrelated within the theme Collegiality. The key words and phrases were used to identify the major theme.

Participants communicated the influence that their confidence in technology integration had on their actual integration in the classroom. There were some participants that communicated that their confidence in technology use was positively impacted by their professional development for technology integration. Teacher 6 stated,

Our technology professional development has definitely provided me a lot more confidence in my teaching, the way I present material. Because of the tools that were accessible to me as well as to my students...I felt like it made me a better teacher. And, it increased my ability.

“I think it helps the confidence level, for sure. When I see somebody else's doing it and then they get really excited about it...this is something I should try, too” (T10).

“There are times where I do feel a little more confident after leaving a professional development day than before” (T5). “I feel, most of the time, confident going back into the classroom, and playing with it, and learning more on my own” (T3). Teacher 11 added,

They can give us tools...they can tell us how to use the tools, and I can develop confidence...but I can also give them feedback on...this is the way that it was instructed on how to use it, but I've used it this way in my classroom and it's been very effective. I just think the philosophy of that risk taking has helped me develop confidence.

Participants also communicated that technology professional development either did not positively impact their confidence or had no impact on their confidence to integrate technology in their classroom. “I don't know that professional development has improved my self-confidence” (T1). “I don't think it makes me more confident, certainly. I just know what works in my room, and what I can do, and if I don't know something, I usually figure it out eventually” (T3). Teacher 4 stated,

I can fall prey to the comparison game. So sometimes, especially when we

have the leveled professional development days...I won't necessarily feel like I'm an advanced person. I don't have the self-efficacy that I want to have with tech...then once I get away from everyone else...I know what I'm doing in my classroom is working. Sometimes on the actual professional development moments, I don't feel as great about my teaching with technology.

Teacher 1 added,

I don't know that professional development has improved my confidence levels. I have sat through some where I'm just sitting there, observing somebody else. And then I literally...walk out, and that does not help my self-confidence at all. It will depend on the level of dive in, in the actual meeting that we have, and how much I actually am in it, while I'm being trained on it. I'm not very much of an audio learner, I'm a doer learner. So, it depends, as far as the specific training, the impact on my self-confidence.

Participants discussed how their comfort level with technology influenced the integration of technology in their classrooms. "My perception doesn't change after professional development, because I've always viewed technology as more a supplemental aspect, or thing to use" (T2). "...just in having comfort to jump in, I think will improve my skills...without that confidence to jump in, to feel like I can actually do it, then my skills aren't going to get better" (T10). "When you do it the first time, after learning, it's clunky and it's awkward...just going back to that saying being comfortable, being uncomfortable. Because, that's how it always was for me. I was very uncomfortable at first" (T8). Teacher 12 stated,

I think it's hard to change someone's teaching philosophy within the span of a meeting or a training. I think a teacher's view on technology in the classroom tends to reflect more on their philosophy on teaching or their attitude towards teaching...after a training, my views on technologies don't change. As a newer teacher, what I know about teaching is what this current district has taught me or told me that they wanted their teachers to be. I go into those meetings with the philosophy that integrating technology in a classroom is good for student learning. Luckily, our professional development days don't do anything to promote any other ideologies.

Teachers shared that their beliefs and mindset about technology integration influence their level of self-efficacy. "I'm pretty open-minded, so I go in with an open mind. I think I leave just as open-minded" (T13). Teacher 14 shared,

I think what's helped me develop some confidence in utilizing technology is failing. There's been a handful of activities that I've spent a lot of time creating for my students, and I have 200 students a day. I've had...a handful of those lessons have just flopped on me ... that's helped me establish some confidence in creating good lessons, just having that ability to fail successfully with technology. I'm afraid some people, they try something new and they fail at it. Then that doesn't give them the confidence to try anything else new.

Teacher 15 added,

I'm pretty open-minded to technology and I see the value in it. So, I feel I look forward to our trainings, even though sometimes it can be a lot of information.

I always see it as a positive, even if I only use one thing from it. I walk in pretty open-minded, and I always take something away from it. I don't feel like my mindset changes, but I think that's because I go in with a pretty decent mindset.

“Just having that ability to fail successfully as I'm trying to implement technology... that's what helps me gain confidence is having the ability to fail” (T14).

Teachers shared that collaboration with their peers also influences their efficacy levels, as well as their integration of technology in their classrooms. Teacher 7 communicated,

I always feel...just fine after professional development for technology integration. Not because I'm a techie, but because I know that I have techies in my department that I can go to that are very close by if I have a question.

Teacher 3 shared, “I am extremely comfortable asking questions, because we all know each other, we all like each other, and that makes me more likely to try something in my classroom.” Teacher 15 stated,

I need things technology related...answered by other teachers, and that is what builds my confidence to continue going on. Maybe I'm not confident whenever I ask the question, but by the end of our conversation about it, then I'm confident in being able to go through with the lesson. If it has failed, like [T14] mentioned, going back to that person, okay, what can we do better?

“Helping others has also given me confidence ... and getting feedback from each other ... Those are all parts of professional development, but we're all a part of it,

which definitely gives us all confidence” (T13). Teacher 10 added,

I've come to realize is that there are so many different comfort levels with technology, especially with teachers when they're using it. And, some teachers are just rocking and rolling and they can do pretty much whatever. And then, there's other teachers that just really just want you to sit down next to them. And they just want you to walk them through step by step. That helps everyone gain confidence.

“Working with other teachers on technology integration has definitely provided me a lot more confidence in my teaching, the way I present material...and, it has increased my ability level” (T6).

The major theme, efficacy, was identified by three key words or phrases. Those key words and phrases were woven into the responses of the teachers. The responses of the teachers shared their insights of the influence of their confidence, comfort level and beliefs about technology, and collaboration on their self-efficacy for integration of technology after receiving professional development. Each of the key words and phrases was identified by teacher participants' responses to the interview questions.

#### **Analysis of Theme 5: Process/Processes**

The major theme, process/processes, was identified by four key words or phrases. Those key words and phrases, which were intertwined within the responses of the teachers. The responses of the teachers shared their insights of the influence of the (a) system, (b) differentiation/choice in learning format, (c) technology issues/use,

(d) and their students on their integration of technology after receiving professional development (see Table 7). Each of the key words and phrases was identified by teacher participants' responses to the interview questions.

Table 7

*Record of Coded Information: Process/Processes*

Coded words/phrases	Record of occurrence	Theme
System	32	Process/Processes
Differentiated/Choice	8	
Technology Issues/Use	19	
Students	21	

Table 7 identifies the major theme of process/processes and the number of participants' responses that were coded as system, differentiated/choice, technology issues/use, and students. Each of the three transcripts had responses that were from all of the key words or phrases in Table 7 that were interrelated within the theme Process/Processes. The key words and phrases were used to identify the major theme.

Theme 5, Process/Processes, was identified based on responses by participants that described systems in place in their district, school, or classroom that impacted their integration of technology in their classrooms. One of the systems identified was the teacher's perceptions of the districts beliefs about technology integration, or the way the district presented professional development about technology integration. "This is my sixth year at School C. I've done technology training every year with them. So, I feel like the message has been very consistent" (T11). "I typically leave

the meetings with an appreciation that they're attempting to give us tools to grow in the ways that they're asking us to grow” (T12). Teacher 1 communicated,

Our professional development is very focused on a specific agenda for our school district...would benefit the learning of our students...we actually as a district, in my opinion, have gotten better about some of our professional development technology training...we bring our Chromebooks in there, and we are actually doing whatever it is they're leading us through.

Teacher 12 stated,

For me it depends on what the focus of the training is. Some of them are promoting technology in the classroom and justifying its uses, and other things are just, here's some stuff you can use, or, here's something that the district is using. The training that just kind of shows us a bunch of tools are great. However, personally, there has to be one of those tools that just clicks in my head that I can see a way that I know how to use it. Some teachers are being asked to use technology for the first time...everyone's wanting to meet those different blended learning goals, but then also there's trainings where they're just trying to give us the tools to do what they're asking us to do. I typically feel...it sounds silly to say, grateful. I leave them appreciative.

Participants also communicated that the district philosophy on the integration of technology, and the way the professional development is provided, has increased the teachers' efficacy level when they attempt to integrate technology. Teacher 11 stated,

I think it goes back to a district philosophy where they actually encourage us to take risks. So, I feel very confident that I can implement or try to implement anything that they give me, because I know they don't expect perfection the first go around. They can give us tools and they can tell us how to use the tools and I can develop confidence, but I can also give them feedback on ... the way that it was instructed on how to use it, but I've used it this way in my classroom and it's been very effective. I just think the philosophy of that risk taking has helped me develop confidence.

Teacher 14 added,

I think what's helped me develop some confidence in utilizing technology is failing. There's been a handful of activities that I've spent a lot of time creating for my students, and I have 200 students a day. I've had...a handful of those lessons have just flopped on me. So, that's helped me establish some confidence in creating good lessons, just having that ability to fail successfully with it. Just having that ability to fail successfully as I'm trying to implement technology. Like I said, that's what helps me gain confidence is having the ability to fail.

Teachers shared that leveled professional development, or professional development that was differentiated based on teacher needs, ability levels, or comfort levels, also impacted their engagement and learning. "I've sat through...quite a few professional development trainings on technology...Our school has done a really good job of offering a variety of choices on our professional development days" (T1).

“... so, it's really nice to have those different levels, and several experts in the building with these different platforms” (T3). “As long as you get in the right spot, it's a positive feeling, I think, with the professional development and technology”

(T2). Teacher 4 stated,

I can fall prey to the comparison game. So sometimes, especially when we have the leveled professional development days...I won't necessarily feel like I'm an advanced person with a tool. But, then when I read the descriptors ... okay, I guess I'm advanced.

Teacher 2 added,

...clearly, some people just need a little more time spent on explaining things, and I don't mean that as a knock at all. Just they're not as proficient with technology. So, I do think having multiple staged options of where you're at, on your own comfort level, is a big benefit.

Participants shared that technology issues influenced their integration of technology in their classrooms. Teachers shared the processes that their schools have in place to support teachers with technology issues and technology use. “ Our school has a system in place to help kids that are having tech problems, either through their own fault, or not their own fault” (T2). Teacher 1 added,

I have a number of students that their Chromebooks have either died, or they didn't bring it, and no one has asked them about it all day long...so last block, I'll have four or five kids, and by then it's too late to check anything out.

Teacher 4 stated,

Just knowing how to use the pieces, or the technology well ... It's not as bad anymore, but just connectivity issues, or just tech problems, that once that happens, if my entire lesson is banking on a tech tool, and then we can't use it, then that panic sets in. Just those glitchy things that you don't really think about in the training, because it sounds so good while you're learning it.

Teacher 2 stated,

I've tried to plan ahead. So, I have a whole lot of extension cords in my classroom, so if kids are like, oh, I can't do anything. My Chromebook's dead ... well, I've got the solution for you. No problem. I'll plug them in, and I've learned some basic maintenance, if they're like, hey, the tech lady isn't here. Well, let me see your Chromebook. Maybe I can fix it for you.

“Well, what resources website's functioning correctly, not overloading, wi-fi staying on and not going out” (T6). Teacher 13 stated,

Teaching sixth grade, our students are all under the age of 13. So, we'll go to these type trainings and we'll get all these great ideas and we'll be super excited. Then we look at the age restrictions... That's a huge barrier for us trying to get creative on ways that we can still use new tools but that they meet the requirements so that we're following the law. Another barrier would be the amount of time it takes to get a student who's new to the...to get a Chromebook in their hand and get their paperwork signed so that they can be using that Chromebook. There's a lot of assignments where we'll get a new kid in the middle of a unit. They might be there for a week before they get to join a group or before they really get to

participate in what's going on...if we were doing without tech, then people would more easily be able to jump into whatever we were doing without the legal requirements of them having the Chromebook signed off on.

Another factor that teachers discussed in technology use is consistency in technology use across classes and grade levels. “If you're a one-to-one school, things are constantly going to be changing with technology” (T7). “...after the fact of the professional development, it's really important that we stick with it...we stick with that throughout the year. That's our goal to improve...with our teams, just consistency with it” (T10). Teacher 9 stated,

I...struggled a little bit with. We were one application for a long time and then we decided we wanted to become another application school. Everybody was back and forth. And so, then we went to virtual learning. We had kind of stuff all over the place. So, I think if I was starting one-to-one at a school, I would pick one platform. And then, teachers can use whatever they want within that platform. But, it would be really nice if every teacher used the same platform.

Teacher 4 shared,

...a complexity is the lack of uniformity of use. So, like this app, for example, ...but then a different building might, well, we like this app, and another one's like, well, we like this app. And so, it's good that kids can have the ability to navigate different tools. But, then I feel like they don't really ever get proficient in any of them. Another frustrating thing for students is...you post things in assignments, and this teacher posted them in modules, and I don't know where to

look, and you use your homepage different.

“... You’ve got some people using this platform and some people using this platform, and some people using this platform. And, I think the poor parents...” (T8). Teacher 7 communicated,

If you want to be on the forefront of technology and things are just constantly changing, which is really hard when teachers pour in so much of their heart and time into developing things for it to change the very next year.

Participants shared their perceptions of the impact of technology on students, teachers, and learning. Teachers described the influence of technology and their beliefs about technology integration. They shared the realization that they are teaching humans. Teacher 1 stated,

At least in my classes, I'm going to say I had a 90% rebellion rate. They were like, we do not want to read on the computer screen nonstop. And so, a complexity with tech I think...where we are, and where we are future headed. But, I don't know that that is 100% technology. I'm not sure that that is where we need to be. I think that we are going to find, 10 years, 20 years, 30 years from now, that we, in going too far technology driven, we have taken away elements that we now need to add back into our society, and into our educational system. The soft skills again, that we have lost...there are some complexities in trying to figure out how much technology to use in the classroom, how to integrate that with students, and yet at the same time, still recognize that we are human, and we are not AI, and we need to not act like it. Having a computer in their hands nonstop is a very large

distraction. And so, one barrier is just the students.

Teacher 4 stated,

We've given them the world, and they carry it around in their pocket, but we maybe haven't taught them how to deal with that, because we don't really know how to deal with that. It's just moving so quickly that we're learning as we go, too.

“I think you also lose control. I mean, you kind of have to monitor what sites they're on and what they're doing exactly” (T6). “It kind of falls back a little bit on students, making sure everything is charged, their Chromebook's working...having students engaged, having students do the work. Sometimes that can be a barrier too” (T11).

Teacher 13 added,

To me a big complexity is just learning styles in general for kids. There are some kids that don't like the computer and they don't like typing. They're not good at it. So, some of them have that fixed mindset of, this is too hard. I don't want to learn this way. Trying to meet their needs but also still integrate the technology in a way that it's effective.

The major theme, process/processes, was identified by four key words or phrases. Those key words and phrases were interwoven into the responses of the teachers. The teacher shared their insights of the influence of systems in their district, schools, and classrooms; differentiated and choice in their professional development, technology issues, and use; and students' impact on their self-efficacy for integration of technology after receiving professional development. Each of the key words and

phrases was identified by teacher participants' responses to the interview questions.

### **Summary**

Chapter Four presents the results of the interview data gathered, the goal of which was to explore teacher perceptions of the complexities that lead to a lack of technology integration in the classroom despite having access to resources and having received professional development for technology integration. Chapter Four contained the findings of the study and an analysis of the transcribed text including interview quotes from participants in the study. Data collection occurred through interviews, the review of the interview transcripts, member checks, and the researcher's field notes (Merriam & Tisdell, 2016). The researcher analyzed each interview transcript through multiple readings and notetaking strategies. Tables were shared to easily identify key words and phrases, and to identify the major themes associated with those key words and phrases. The themes were used to explain the data holistically. The researcher used triangulation of data to evaluate and better understand the themes that developed throughout the course of the study. Through these procedures five major themes emerged: (a) educational contribution, (b) implementation, (c) collegiality, (d) efficacy, and (e) process/processes.

Chapter Five contains a brief summary of the problem along with a discussion of the limitations of the study and the researcher's opinions on the findings of the study based on the analysis of the transcribed interview data. Chapter Five concludes with a review of findings of the study, recommendations for educators in the field, and suggestions for further research, followed by a summary of the chapter.

## CHAPTER FIVE

### CONCLUSIONS AND RECOMMENDATIONS

#### Introduction

The purpose of this basic qualitative study was to explore teacher perceptions of the complexities that lead to a lack of technology integration in the classroom despite having access to resources and having received professional development for technology integration. This study explored teacher perceptions of the elements that influence the integration of technology in their classrooms. The participants in this study were teachers in Southwest Missouri that were in one-to-one school districts who had been provided professional development for technology integration, and whose schools had the expectation that teachers integrate technology in their classes. A district was considered a one-to-one school district if it provided students with their own device, Chromebook, laptop, or tablet. The participants were secondary teachers, Grades 6-12, and in any content area working in a district that met the criteria for participation in the study. If the school districts met the requirements, and the district agreed to be involved in the study, the district was asked to respond with the names of the schools that would participate. The principals from the schools that met the criteria were asked to identify classroom teachers to participate in the study. Group interviews with five teachers within each school were conducted to encourage more interaction among teachers, with comments from participants promoting additional thoughts and responses from other participants.

The research was theoretically grounded in Bandura's (1986) social cognitive theory, which served as a basis for understanding some of the intricacies present in this

study. Efficacy is task and context specific (Bandura, 1997), thus it was imperative to investigate teacher perceptions of the elements that influenced technology integration in the classroom. This study was also grounded in the constructivism theory of learning. Constructivism is commonly thought to be the best way for individuals to learn, comprehend, and retain information (Tackett, 2014). According to the constructivist view, learners create knowledge as a result of their interactions with the environment, building on existing knowledge and depending upon the relevance of the content or instructional activity in their own lives (Harrell & Bynum, 2018). Thus, simply increasing access to technology would not be enough to increase access to technology for students without shifting teachers' pedagogical beliefs.

Chapter Five includes a concise summary of the problem while examining the limitations and delimitations of the study. The researcher discusses how triangulation was used to analyze the data, and provides a description of the research methods applied throughout the study. Additionally, implications for educational practice are considered, and recommendations for future research are provided. Following Chapter Five, a list of references is provided along with appendices including used throughout the study.

### **Research Questions**

There were two research questions for this basic qualitative study:

RQ 1. What are teacher perceptions about the challenges of technology integration in the classroom?

RQ 2. What are teacher perceptions about technology integration after receiving professional development?

## **Limitations and Delimitations**

According to Gay et al., (2009), limitations are the limits the researcher finds that may affect research methodology and outcomes. In any study, the researcher cannot control all factors related to the participants or variables. The researcher's objective was to obtain usable data related to teacher perceptions of the complexities that lead to a lack of technology integration in the classroom despite having access to resources and having received professional development for technology integration. The researcher made efforts to reduce the effects of external factors through delimitations associated with the study. Within this basic qualitative study, the following limitations and delimitations were identified:

This study included the following limitations:

1. This study was limited by honesty and clarity from participants while being interviewed.
2. This study was limited by how participants' answered interview questions about self-perceptions.
3. This study did not define the grade levels taught or experience of participants.
4. Teacher quality, pedagogical beliefs, types of professional development received, technology available to staff, and the level of proficiency in the use of technology were factors that were not controlled in this study.
5. The schools' size, locations, and demographics were not considered.

Delimitations are the boundaries that the researcher sets forth. This study

included the following delimitations:

1. This study was delimited geographically to schools in Southwest Missouri that provided technology integration professional development.
2. This study was delimited to survey responses and interview answers provided by experts.
3. This study was delimited to secondary teachers in Grades 6-12.
4. The results of this study were based on teacher perception.

### **Summary of Methods**

The participants in this study were teachers in Southwest Missouri that were in one-to-one school districts, had been provided professional development for technology integration, and whose schools had the expectation that teachers integrate technology in their classes. A district was considered a one-to-one school district if it provided students with their own device, Chromebook, laptop, or tablet. The participants were teachers at any grade level or content area working in a district that met the criteria for participation in the study. If the school districts met the requirements, and the district agreed to be involved in the study, the district was asked to respond with the names of the schools that would participate. The principals from the schools that met the criteria were asked to identify classroom teachers to participate in the study. The teachers that were recommended by the principal were contacted and a request for participation was made. The requests for participation are located in Appendix B and Appendix C. Semi-structured group interviews were conducted using the Zoom platform. Group interviews with five teachers were conducted to encourage more interaction among teachers, with

comments from participants promoting additional thoughts and responses from other participants.

All interviews were completed using the Zoom platform, and were recorded using that system. The interviews were provided to Rev.com and transcripts were created. Once transcripts were received member checks were completed. The researcher analyzed each interview transcript through multiple readings and notetaking strategies. Descriptive coding included key words or phrases and assisted the researcher in categorizing the recurring phrases that were stated in multiple interviews by multiple participants (Merriam & Tisdell, 2016). Key phrases and themes were sorted into categories. Merriam and Tisdell (2016) stated that researchers are to “create file folders, each labeled with a category name” (p. 209). The researcher named each category by coding the responses of the participants. Each interview was then reviewed individually with a reading of the question followed by the response while notes were paraphrased. New themes emerged through this process and the notes were written into the printed interview. The researcher annotated and highlighted text within the transcripts, throughout several readings, and discovered commonly identified words and phrases were discovered. The text was moved to a document, and a key word assigned to each phrase. This process was completed for each transcript. The researcher began to identify themes based on responses of participants. Once this process was completed, the researcher identified the key words and phrases that were assigned to text most frequently. The researcher identified 17 key words or phrases from the three interview transcripts. The 17 key words or phrases were used to illustrate the data and were

categorized together to establish patterns, which helped identify five major themes.

The researcher used triangulation of data to evaluate and better understand the themes that developed throughout the course of the study. Data collection occurred through interviews, the review of the interview transcripts, member checks, and the researcher's field notes (Merriam & Tisdell, 2016). The researcher maintained a notebook with notes, speculations, and intuitions throughout the interview process. Following this process increased the validity and minimized researcher bias in the study.

Member checking offered participants the opportunity to review the interview transcript and make any changes, additions, or clarification to their statements. Each interview was digitally recorded using the recording feature in Zoom. The digital recordings were uploaded to Rev.com and converted into transcripts. Copies of the transcripts were emailed to each participant to ensure the accuracy of their responses. Upon completion of member checking, four requests were made to modify the original transcript. All four of the requests involved a correction of an identified speaker providing a response to an interview question. Modifications were made to the appropriate transcript.

Peer reviews were conducted to increase the internal validity of this study (Merriam & Tisdell, 2016). The peer review process was comprised of a dissertation committee that included two graduate education professors and an associate provost. One of the dissertation committee members served as the researcher's advisor. The advisor regularly monitored progress of the research and collaborated with other dissertation committee members to seek feedback and input. The review process allowed

the researcher to take feedback and input from the committee to focus the research questions, cultivate the literature review to reflect the research question's purpose, and determine a suitable methodology for the research.

### **Summary of Findings**

The researcher was able to establish meaningful conclusions based on interviews conducted with small group interviews with five teachers from three school sites. Interviews conducted with each group of teachers revealed 17 key words or phrases and five major themes. The key words and phrases were woven throughout responses in all nine of the interview questions and were also interwoven throughout each of the five themes. This study established teacher perceptions of the complexities that influence technology integration in the classroom while having access to resources and having received professional development for technology integration.

**Research Question 1.** Research question 1 asked, "What are teacher perceptions about the challenges of technology integration in the classroom?" As the data from each interview were analyzed, and themes were developed, the researcher found that all five major themes revealed teacher perceptions that responded to Research Question 1. From Research Question 1, the researcher concluded that all five major themes- educational contribution, implementation, collegiality, efficacy, and process/processes- influenced teacher perceptions about the challenges of technology integration in the classroom.

The theme, educational contribution, played a significant role in teacher perceptions about the challenges of technology integration in the classroom. Teachers discussed that if they do not see or clearly understand how the integration of technology

in their classrooms will benefit student learning, they are reluctant to do so. They shared that understanding the positive impact on student learning is a challenge when determining whether or not to integrate technology into their teaching. Teachers shared that integrating technology in their classroom is easier when they do not have to determine how to integrate it into their curriculum. They communicated that it is more difficult and time consuming to integrate technology if it is not already built into their curriculum. Teachers communicated that it is difficult to determine where to integrate technology in their teaching. They shared that it is a challenge to integrate technology when they believe that the tool or the professional development is not relevant to their classroom or content. Teachers also shared that the time it takes to implement technology limits the amount of time they have to teach the content they are required to cover in their curriculum. They discussed that the timing of the professional development is, at times, a challenge in the follow-through of technology integration. Teachers described receiving training during the school year, and having to edit or change their curriculum to fit the new tool or technology into their teaching.

Teacher perceptions about the challenges of integrating technology were also evident in Theme 2 implementation. Teachers shared that time is a challenge when implementing technology in their classrooms. Teachers identified that the time it takes to learn the technology tool, practice with it, determine how to use it or where it fits in their curriculum, and the time that it takes to teach students how to use the tool are all barriers for integration of technology. They shared that the time it takes to teach students how to use the technology tool can take away from the teaching and learning of their required

curriculum. Teachers shared that the feeling of being overwhelmed can be a barrier to the integration of technology. They shared that the feeling of being overwhelmed can come from the number of things that they are asked to do or teach, from the technology itself, and from the lack of time to complete all the required tasks.

Throughout Theme 3, teachers identified collegiality and collaboration with teaching peers as a way to overcome barriers when integrating technology in their teaching. Teachers shared that having the ability to collaborate with their teaching peers helped them overcome barriers for integrating technology. Teachers shared that when they were provided time to plan and collaborate with their teaching teams they were able to identify when and how to integrate technology in their classrooms. Teachers also shared that they were more likely to attempt to integrate technology when they knew that other teachers in their buildings were experts or had used technology in their content with success. Participants communicated that they valued learning from teachers in their building, and that in-house professional development positively impacted the likelihood that they integrate technology in their classrooms. Teachers also shared that they were less likely to integrate technology when they received professional development from outside of their schools.

Theme 4, efficacy, was identified as having influence on teacher perceptions of the challenges for integrating technology in their classrooms. Teachers shared that their confidence in integrating technology was positively impacted by their professional development. The increase in confidence made it more likely that they would integrate technology. Conversely, some participants shared that they did not have improved

confidence in integrating technology after professional development. They communicated that, at times, the professional development caused them to feel less confident in integrating technology. Those feelings led to less technology integration in their classrooms. Teachers shared that their comfort level with technology can be a barrier for integration. They described being uncomfortable with when and how to integrate technology in their classrooms. Teachers shared that collaborating with their peers about technology integration improved their confidence and led to them being more likely to integrate technology.

Theme 5, process/processes, was identified as having influence on teacher perceptions of the challenges for integrating technology in their classrooms. Teachers identified that their district or school's beliefs about technology integration influenced their perceptions about the barriers of integration. They shared that when the professional development is focused and intentional, it helps to remove barriers for integration. They shared that if they are just provided tools or applications, they are less likely to see the relevance, which in turn creates a barrier for integration. Teachers communicated that when they received leveled or differentiated professional development, at the level of their ability, they were more likely to attempt to integrate technology. Thus, teacher perceptions were that differentiated professional development removes barriers for professional development.

Teachers shared that technology issues were a barrier to integration in their teaching. Some of those technology issues were devices not being charged, students not bringing devices to class, a lack of internet access, or website issues. Teachers also

communicated the age of their students was a barrier for integrating technology. They shared that some of the websites or applications require students to be age 13 or older. Another barrier was high mobility of students, or the processes in place to get new students access to devices when they arrived. They shared that there were several processes and paperwork required for students to receive access to devices and internet at school. These processes can be time consuming, and be a barrier to integration. Teachers described that consistency in technology use across a district or between schools can also be a barrier. They shared that if tools, applications, or platforms change frequently it can be a barrier. Teachers shared that having students with multiple learning styles in their classes can be a barrier for technology use. There are students who do not learn well using technology, which causes the teacher to have to prepare multiple methods outside technology to meet student needs when they attempt to integrate technology into their teaching.

**Research Question 2.** Research Question 2 asked, “What are teacher perceptions about technology integration after receiving professional development?” As the data from each interview were analyzed and themes were developed, the researcher found that all five major themes revealed teacher perceptions that responded to Research Question 2. From Research Question 2, the researcher concluded that all five major themes- educational contribution, implementation, collegiality, efficacy, and process/processes- influenced teacher perceptions about the technology integration in their classrooms after receiving professional development.

Theme 1, educational contribution, was identified as having influence on teacher

perceptions about technology integration after receiving professional development. Some of the participants shared that professional development for technology integration had a dramatic impact on the teaching and learning process. Teachers shared that it impacted their philosophy about teaching. Teachers stated that technology allowed them to facilitate learning differently and provided students the ability to go deeper into their learning. Teachers expressed that when the professional development was intentional about where in the curriculum to integrate, it improved the way that they felt about integrating technology. Teachers indicated that when the professional development was relevant to their content or classroom it was more beneficial. Participants communicated that if the professional development was purposeful they were more likely to attempt to integrate their learning with technology in their classrooms. Teachers shared that professional development for technology integration that focused on improved student learning positively impacted their feelings about integrating. Participants communicated that seeing the relevance of the professional development to their classrooms and to student learning was vital. Teachers revealed that if they can understand, during the professional development, how and when to integrate technology in their classroom and the benefit to student learning, they felt more likely to utilize their learning to integrate technology.

Theme 2, implementation, also provided insight into perceptions about technology integration after receiving professional development. Teachers indicated that the time it takes for them, after professional development, to learn to use the technology effectively also impacts the integration of technology in their classrooms. Teachers

described learning a tool, application, or platform during professional development, and then having to dedicate a significant amount of time outside of the professional development to determine how and when to utilize their learning in their teaching. Teachers communicated using their personal time to make the determination about how and when to integrate technology. Participants communicated that the timing of when they receive professional development impacts their perceptions about integrating technology. Teachers stated that if they receive professional development during the school day, or during busy times of the school year, they are less likely to integrate their learning. Participants shared that they might use a piece of their learning or part of a tool, application, or platform, but struggle to integrate technology if they receive the professional development when they do not have time to plan how to utilize their learning. Teachers also shared that professional development for technology integration can be overwhelming, or cause them to feel overwhelmed. If they receive too much information or feel they don't have enough time to process their learning, and the technology itself is overwhelming or just another thing they have to do, then they are less likely to attempt to integrate in their classrooms.

Theme 3, collegiality, was identified as having influence on teacher perceptions about technology integration after receiving professional development. Teachers shared that having the ability to collaborate with their peers, both in the same content and other contents, after receiving professional development for technology integration influenced the likelihood of integration. Teachers shared that knowing staff in their building that they could go to and ask questions or receive support from after professional

development was important. They shared that the discussions with colleagues after professional development for technology integration, and the collaboration about how to best utilize their learning, influenced the integration in their classroom. Teachers shared that receiving professional learning led by teachers in their building positively impacted their feelings about integrating technology, and knowing that a teacher in their school had successfully utilized new technology made them feel more positive about the professional development. They also shared that knowing they could go to that staff member for support was beneficial. Teachers shared that if the presentation during the professional development was done using quality pedagogy, they felt more positively about integrating the technology. Teachers shared that they had fewer positive feelings after having received professional development from outside sources. Teachers also shared that, if they were provided time to collaborate with colleagues, process their learning, and plan with peers after professional development, it had a more positive impact on them.

Theme 4, efficacy, also provided insight into perceptions about technology integration after receiving professional development. Some participants shared that their confidence in integrating technology in their classrooms was positively impacted by receiving professional development for integration. Teachers shared learning from others that have been successful with technology integration impacted their confidence in integrating technology in their classrooms. Participants also communicated that technology professional development either did not positively impact their confidence or had no impact on their confidence to integrate technology in their classrooms. Teachers shared that they usually felt more comfortable integrating technology after receiving

professional development. Teachers described feeling more comfortable practicing with the tool, application, or platform after professional development. That feeling of comfort led to teachers being more likely to attempt to integrate technology in the classroom. Participants shared that their beliefs or mindset about technology integration after professional development influenced the likelihood that they would integrate in their classrooms. Teachers communicated that if the professional development caused them to feel it is ok for the integration to not be immediately successful, and to recognize that it might be hard at first, then they were more confident to try it. Teachers shared that if they have time provided after professional development to collaborate and plan with their colleagues after their learning, then they feel more positively about the professional development. The time to process and plan with peers had a very positive impact on participants.

Theme 5, processes/process, was identified as having influence on teacher perceptions about technology integration after receiving professional development. Teachers shared that their perceptions of their district or school's beliefs about technology integration that are evident during professional development impacts their perceptions about technology integration. If the district or school message about technology integration was consistent, and evident in the professional development, it positively impacted their feelings toward integration. Teachers communicated that if the professional development was organized and focused on an agenda, then they felt positively after their learning. Teachers shared that if the professional development encouraged them to take risks, they were more likely to attempt to integrate technology in

their classrooms. Teachers communicated that when they received leveled or differentiated professional development, at the level of their ability, they were more likely to attempt to integrate technology. Thus, teacher perceptions were more positive after leveled or differentiated trainings. District and school processes for messaging about technology integration, access, and professional development have a significant impact on teacher perceptions of the barriers to technology integration and their perceptions about technology integration after receiving professional development.

## **Discussion**

The researcher interviewed 15 teachers in groups of five at three secondary schools in Southwest Missouri. Data collection occurred through interviews, the review of interview transcripts, member checks, and the researcher's field notes. Credibility, validity, and reliability are crucial components for crafting reliable qualitative research (Merriam & Tisdell, 2016). This basic qualitative study confirmed trustworthiness by applying triangulation, member checking, clarifying researcher bias, and rich narrative. The purpose of the interview sessions with the groups of participants was to gather significant conclusions and evaluate themes about teacher perceptions about the barriers for integrating technology in their classrooms. Additionally, the researcher sought to gather conclusions and evaluate themes about teacher perceptions for technology integration after receiving professional development for technology integration. Interviews with the three groups of five teachers revealed five major themes regarding teacher perceptions of the barriers to technology integration and their perceptions about technology integration after receiving professional development: (a) educational

contribution, (b) implementation, (c) collegiality, (d) efficacy, and (e) process/processes. This study recognized the importance of teacher perceptions about the barriers for technology integration and teacher perceptions about technology integration after receiving professional development on actual technology integration in classrooms.

The research was theoretically grounded in Bandura's (1986) social cognitive theory, which served as a basis for understanding some of the intricacies present in this study. The researcher interpreted the data from this study through the lens of Bandura's social cognitive theory. The link to this theoretical foundation supports the trustworthiness of the researcher, and created a deeper level of meaning and understanding for the research. Bandura called a set of expectations self-efficacy, or the belief about one's ability to perform a given behavior. Self-efficacy, an essential component of social cognitive theory, refers to individuals' "...judgement of their capabilities to organize and execute courses of action required to attain designated types of performance" (Bandura, 1986, p. 391). An increasing amount of evidence corroborates Bandura's (1977) theory that teachers' self-efficacy beliefs are related to the effort they devote to teaching, based on their objectives, their persistence when things are difficult, and their resilience in the face of impediments (Tschannen-Moran & McMaster, 2009). If a teacher believes a behavior will not have an impact, it is unlikely that time, effort, and resources will be invested into the behavior (Bandura, 2002). Based on Bandura's theory, teachers will invest time, effort, and resources in proportion to this judgment (Bandura, 1997). Efficacy is task and context specific (Bandura, 1997), thus it is imperative to investigate teacher perceptions of the elements that influence technology

integration in the classroom.

Participants emphasized that their confidence and efficacy levels influenced their perceptions of the barriers to integrating technology in their classrooms, and their perceptions of technology integration after having received professional development. Teachers described the barriers integrating technology, recognizing their belief, comfort, confidence, and efficacy levels as barriers. Teachers also communicated the impact of professional development on their efficacy levels, as well as their likelihood to integrate technology. Teachers communicated that their perceptions directly impacted their time, effort, and resources they invested into technology integration in their classrooms. Thus, this research is consistent with Bandura's research.

The second theoretical framework in which this study was grounded in is constructivism theory of learning. The researcher deciphered the data from this study through the lens of the constructivism theory of learning. The connection to this theoretical underpinning supports the trustworthiness of the researcher, and shaped a more profound level of significance and comprehension of the research. Constructivism is commonly thought to be the best way for learners to learn, comprehend, and retain information (Tackett, 2014). According to the constructivist view, learners create knowledge as a result of their interactions with the environment, building on existing knowledge and depending upon the relevance of the content or instructional activity in their own lives (Harrell & Bynum, 2018). Thus, simply increasing access to technology would not be enough to increase access to technology for students without shifting teachers' pedagogical beliefs.

Participants shared that the professional development they received for technology integration had an impact on their teaching practices. Teachers communicated that the format and delivery of the professional learning impacted their confidence and efficacy levels. Teachers revealed that they were more likely to integrate technology in their classrooms when their professional development was relevant to their content and classrooms. They shared that it was beneficial when they provided time to process their learning, collaborate with their colleagues, and practice with the tools, applications, and platforms taught during professional development. Participants explained that the professional development for technology integration can help to remove barriers to integration in the classroom. Thus, this research is consistent with social cognitive theory.

This study occurred during the COVID-19 pandemic. The pandemic forced teachers to adapt quickly as they strived to design learning environments that would support students to be academically successful. The interviews included in this study occurred via the Zoom platform, and teachers from the schools were teaching remotely. The COVID-19 pandemic required teacher participants to teach in a fully remote environment, either synchronously or asynchronously, which they had not experienced before. The research for this study occurred as teachers were thrust into these new teaching environments. Although teachers were teaching remotely, and in a new environment, that as a topic did not surface regularly in the interview responses. This change in teaching practices, and the increased requirement of virtual teaching, could have caused teachers to feel overwhelmed. However, teachers did not directly

communicate that they felt overwhelmed due to the circumstances of the COVID-19 pandemic during the interview process. The fact that the impact of the COVID-19 pandemic did not surface in participant responses shows that the teachers believed they were capable of and had the resources to execute the courses of action required to achieve teaching remotely. Teachers self-efficacy, an essential component in social cognitive theory, aligned with Bandura, in that they could persevere and persist in the face of obstacles, and could successfully navigate teaching during the COVID-19 pandemic.

Included in this study was a literature review that included seven main sections. The seven main sections were teacher self-efficacy, technology integration, elements that influence technology integration, teacher perceptions of technology integration, professional development for technology integration, effective professional development, and professional development and teacher self-efficacy. The findings of this study correspond with the existing body of research. One connection to the existing research is the influence of teacher efficacy on technology integration in the classroom. Teachers are more likely to integrate technology in their classroom when they feel efficacious to do so. The researcher found a correlation to efficacy in the data of this study. Another connection from this study to the existing research was the influence of professional development on teacher self-efficacy. The data from this study support the existing research. The researcher found that professional development has the potential to have a positive influence on teacher efficacy. Overall, this study deepened the current research by guiding a methodical and organized examination of how teacher perceptions of the barriers that impact technology integration in their classrooms and how teacher

perceptions of technology integration were influenced after receiving professional development.

The results of the study revealed five major themes and connected teacher perceptions to practice. The findings of this study, revealed by the major themes, provide valuable insight into teacher perceptions about the barriers that exist for integrating technology in their classrooms and about technology integration after having received professional development. This study helped to fill the gap in research about why technology integration is lacking in classrooms despite having the resources to integrate technology and the professional development to integrate technology into the content and curriculum.

Understanding the contribution to the educational process is a major factor in determining how and when to integrate technology. Teachers need to understand the ways that integrating technology in the classroom will benefit the learning of their students. They also have to balance the time it takes to learn the tools, applications, and platforms, and the time it takes for students to learn to use the technology with the time it takes from being able to teach their content and curriculum. The time during the school year that teachers receive professional development for technology integration is also a major factor when teachers determine if they will integrate the technology in their classrooms. Teachers also need time to process their learning and collaborate with their colleagues after receiving professional development for technology integration. Teachers must overcome the feeling of being overwhelmed, caused by their perceived lack of time to process their learning, the technology tools, apps, and platforms, and the integration of

the technology within their curriculum. Collegiality within schools and districts is another factor that influences teacher perceptions about technology integration. Teachers value collaboration with their colleagues, and learning from their colleagues through in-house professional development. Teachers shared that they have improved confidence after receiving professional development for technology integration when the professional development is relevant to their course or content, is delivered with quality pedagogical techniques, and they are provided time to process their learning with their colleagues. Teachers communicated that processes in their school or district can be both a barrier and a benefit when they are working to integrate technology in their classrooms.

While there were limitations to this study, the findings from this study are relevant to larger populations and environments where schools are one-to-one, have technology resources for their staff and students, and provide professional development for teachers about integrating technology in their content and classrooms. The findings of this study are consistent with Bandura's social cognitive theory (1997) and the constructivism theory of learning. The findings from this study are generalizable across school districts and regions where these factors are in place. The teacher perceptions that surfaced in this study are pertinent to school districts and buildings who want to increase the implementation of technology by teachers after providing professional development for integration.

### **Educational Implications**

The educational implications of this research were explicitly linked to the research questions that directed the study. Through the qualitative process, this study

sought to fill this gap in the research by understanding the reasons teachers are still not comfortable integrating technology in the classroom despite having the resources and professional development to do so. This study was necessary because school districts have the need to develop understanding of teacher perceptions about integrating technology in the classroom. Exploring the influence of professional development on the integration of technology will allow schools to improve instruction through the use of technology (Xie et al., 2017). This study was timely due to the ever-changing technology-related skills that students need to have to be successful members of the community and workforce. The purpose of this basic qualitative study was to explore teacher perceptions of the complexities that lead to a lack of technology integration in the classroom despite having access to resources and having received professional development for technology integration. Accordingly, participants communicated their perceptions of the barriers to technology integration as well as their perceptions of technology integration in their content or classrooms after having received professional development for technology integration.

The first major theme identified through interviews was educational contribution. This theme is associated with teachers' perceptions of the barriers for technology integration and their perceptions for technology integration after receiving professional development for technology integration in their classrooms. Districts and schools should be aware of the way their teachers feel about technology integration, and their feelings toward professional development for technology integration. Educational leaders should understand that teachers perceive there to be barriers for technology integration. If

teachers do not clearly understand how technology integration in their classrooms will benefit student learning, they will be reluctant to do so. When schools prepare the rollout of technology learning for their teachers, they should be planning to communicate how and when teachers can easily implement the technology within their curriculum. Districts and schools should also be aware of the time that it takes for teachers to process the technology learning, allow time for teachers to process their learning, and time for teachers to collaborate with their peers. The timing, during the school year, of the professional development for technology integration should also be considered by the district or school.

The second major theme identified in this research was implementation. This theme is associated with teachers' perceptions of the barriers to technology integration and their perceptions of technology integration after receiving professional development for technology integration in their classrooms. Districts and schools should be mindful of teachers' feelings that time is a challenge when integrating technology in their classrooms. Teachers identified that the time it takes to learn the technology tool, practice with it, or where it fits in their curriculum, and the time that it takes to teach students how to use the tool are barriers for integration of technology. These perceptions about time can cause teachers to feel overwhelmed. It is vital to be aware that if the professional development provides too much information, if teachers feel like it is just another thing that they have to do, the technology itself is overwhelming, or if teachers do not feel like they have enough time to process their learning, then they are less likely to attempt to integrate in their classrooms.

Throughout Theme 3, teachers identified collegiality and collaboration with colleagues as a way to overcome barriers when integrating technology in their teaching. The responses in Theme 3, collegiality, clearly align with the Constructivism theory of learning. Districts and schools should be cognizant of building a culture of collegiality when seeking to integrate technology into their curriculums, and should provide time for teachers to plan and collaborate with their teaching teams to identify when and how to integrate technology in their classrooms. Teachers are more likely to attempt to integrate technology when they know that other teachers in their buildings are experts, or have used technology in their content with success. Teachers value learning from others in their building, and in-house professional development positively impacts the likelihood that they integrate technology in their classrooms. Districts and schools should consider providing professional development led by teacher experts in their schools. It is important that teachers have the opportunity collaborate with their peers, both in the same content and other contents, after receiving professional development for technology integration influenced the likelihood of integration. Teachers value knowing staff in their building that they can ask questions of, or receive support from, after professional development for technology integration. Professional development should be organized in a way that integrates these findings, and meets their teachers' need to process and collaborate with their colleagues after receiving the professional development for technology integration.

The fourth major theme identified in this research was efficacy. This theme is associated with teachers' perceptions of the barriers for technology integration and their perceptions for technology integration after receiving professional development for

technology integration in their classrooms. Participant responses associated with Theme 4, efficacy, align with Bandura's social cognitive theory (1997). Teachers' confidence in integrating technology is positively impacted by their professional development. The increase in confidence made it more likely that they would integrate technology. Conversely, some participants shared that they did not have improved confidence in integrating technology after professional development. Those feelings led to less technology integration in their classrooms. Districts and schools should be aware that there will be staff who feel more confident, and staff that feel less confident after receiving professional development for technology integration. Schools can plan additional layers of support for those staff that feel less confident. Teachers shared that their comfort level with technology can be a barrier for integration, and described being uncomfortable with when and how to integrate technology in their classrooms caused them to choose not to integrate technology in their classroom. Schools can address this concern by building the tools, applications, and platforms for technology integration into their curriculum and pacing guides. Collaborating with peers about technology integration improved teacher confidence, and will lead to them being more likely to integrate technology. Districts and schools should provide time for teachers to process their learning with colleagues, and plan how to integrate the technology in their classrooms after providing professional development for technology integration. This process allows for teachers to increase their level of efficacy through reflection and collaboration, and builds a sense of collegiality.

Throughout Theme 5, school and district processes were identified that processes

as both a barrier and a support in integrating technology in the classroom. Teachers identified that their district or school's beliefs about technology integration influenced their perceptions about the barriers of integration. Districts and schools should be aware of the message that they are communicating about their beliefs regarding technology integration in the classroom, and should be very intentional in their communication plan to teachers. Teachers communicated that when the professional development is focused and intentional, it helps to remove barriers for integration, and if just provided tools or applications, they are less likely to see the relevance, which creates a barrier for integration. Schools can influence this feeling by providing relevant and intentional professional learning for technology integration. Leveled or differentiated professional development, at the level of their ability, creates an environment where teachers are more likely to attempt to integrate technology. Thus, teacher perceptions were that differentiated professional development removes barriers for professional development. Technology issues are a barrier to integration in teaching. Some of those technology issues are devices not being charged, students not bringing devices to class, a lack of internet access, or website issues. Efforts should be focused to provide quality infrastructure beforehand when requiring teachers to integrate technology into their curriculums. When there are several processes and paperwork required for students to receive access to devices and internet at school, it creates a barrier to technology integration. Schools should examine their processes for student devices to create efficiency. It is important that consistency in technology use across a district or between schools can also be a barrier. If tools, applications, or platforms change frequently it

leads to reduced integration. Schools and districts should create a long-term plan for technology integration, and maintain consistent focus on expectations and what tools, applications, and platforms they utilize. When the district or school message about technology integration is consistent, and evident in the professional development, it positively impacts feelings toward integration.

Overall, it is imperative that districts and schools consider teacher perceptions about the barriers for technology integration as well as their perceptions about technology integration in their classrooms after receiving professional development. The understanding of these perceptions will help districts and schools create a more successful technology integration plan as they move toward new or additional technology and enhanced teaching and learning environments. Inclusively, conclusions and recommendations from this study should assist districts and schools in developing and supporting teachers as they integrate technology in their classrooms for student learning.

### **Recommendations for Future Research**

The researcher limited this study to 15 participants from three secondary schools in the southwestern region of Missouri that were in one-to-one school districts, had been provided professional development for technology integration, and whose schools had the expectation that teachers integrate technology in their classes. Schools were selected from the southwest region of Missouri that had a positive reputation for integrating technology. However, future research should consider widening the school participant pool and increasing the number of teacher participants with representation throughout the country. Also, additional research would be valuable regarding teacher perceptions from

different size school districts, both larger districts and smaller districts. That research could include the level of support provided by districts for technology integration. Thus, continued research could examine the level of influence on teacher perceptions who work in districts that have personnel who provide instructional support for technology integration.

The researcher also recommends future studies examine teacher perceptions of the barriers that influence technology integration and teacher perceptions of technology integration after having received professional development at the elementary school level. Results of this study explored secondary school, Grades 6-12, educator perspectives. However, elementary school teachers might have different perspectives regarding barriers to technology integration and perceptions of technology integration after receiving professional development for technology integration.

Furthermore, the researcher recommends future research regarding the type of professional development provided by schools to teachers for technology integration in the classroom. The researcher did not consider types of professional development in this study. Different types of professional development might have a dramatic influence on teacher perceptions of technology integration, and could also influence the perceived barriers to technology integration in the classroom.

Lastly, the researcher recommends research be done on what teacher perceptions of what technology integration should look like in their classrooms and across contents. The researcher suggests studies to explore teachers' understanding of the intricacies of having curriculum guide the process and technology support the process of technology

integration in their classrooms. Research on teacher perceptions of technology integration in their specific classrooms and contents, and their beliefs about the benefit to student learning would benefit schools as they begin or continue technology integration initiatives.

### **Summary**

The purpose of this basic qualitative study was to explore teacher perceptions of the complexities that lead to a lack of technology integration in the classroom despite having access to resources and having received professional development for technology integration. The purpose of the study was fulfilled by expanding existing research, and providing a methodical and organized examination of teacher perceptions of the barriers that impact technology integration in their classrooms as well as how teacher perceptions of technology integration were influenced after receiving professional development. This study included two research questions. The first research question asked, “What are teacher perceptions about the challenges of technology integration in the classroom?” The second research question inquired, “What are teacher perceptions about technology integration after receiving professional development?” Guiding the study were two bodies of research that served as theoretical frameworks for the study. First, Bandura’s (1986) social cognitive theory served as a basis for understanding some of the intricacies present in this study. Efficacy is task and context specific (Bandura, 1997), thus it is imperative to investigate teacher perceptions of the elements that influence technology integration in the classroom. Second was the constructivism theory of learning. Constructivism is commonly thought to be the best way for individuals to learn,

comprehend, and retain information (Tackett, 2014). According to the constructivist view, learners create knowledge as a result of their interactions with the environment, building on existing knowledge and depending upon the relevance of the content or instructional activity in their own lives (Harrell & Bynum, 2018).

Through the qualitative process, this study sought to fill this gap in the research by understanding the reasons teachers are still not comfortable integrating technology in the classroom despite having the resources and professional development to do so. Fifteen teachers participated in the study from three secondary schools in Southwestern Missouri. Participants were interviewed in small groups of five so that the researcher could examine their perceptions of the barriers that influence technology integration, and their perceptions of technology integration after having received professional development for technology integration. While professional development for technology integration has been studied, the review of transcripts in this study uncovered that teachers prefer embedded professional development, provided by colleagues at their school sites. In-house professional development had a dramatic impact on teachers' willingness to attempt to integrate technology in their classrooms.

This study recognized that barriers exist that inhibit teachers from integrating technology in their classrooms. The barriers that exist are both systemic and infrastructure related as well as the emotional responses from teachers when tasked with integrating technology. This study uncovered that schools and districts can unintentionally contribute to teachers' perceptions of barriers to technology integration through inconsistently messaging the purpose or expectations of technology integration in

the classroom. This study identified teacher perceptions about the barriers in place, and examined the feelings that teachers experience before, during, and after integrating technology in their classrooms. The perspectives of teachers about the systemic barriers to technology integration are an important factor to be considered when schools and districts prepare for technology integration programs.

This study also explored teacher perceptions about technology integration after receiving professional development for technology integration. Teacher perceptions, in these circumstances, range from feeling efficacious to being overwhelmed to the point of frustration and inaction. This study also revealed that teachers find it essential to be provided time to collaborate with colleagues, informally, after receiving professional development for technology integration. This need for collaboration, and the sense of collegiality that is developed through collaboration, stands out as necessary for teachers to overcome the obstacles to technology integration in the classroom. Teacher perceptions about technology integration after having received professional development for technology integration should be examined and supported to increase the likelihood of a school or district technology initiative having a successful outcome.

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## APPENDIX A

### Superintendent Questionnaire and Teacher Interview Questions

#### Superintendent Questionnaire:

1. Is your school district a one-to-one school district? A district is considered a one-to-one school district if the district provided students with their own device, Chromebook, laptop, or tablet.
2. Have teachers in your school district participated in professional development on the topic of technology integration in the classroom?
3. Is there an expectation in your school district that teachers integrate technology in the classroom?
4. If you responded “yes” to Questions 1-3, and are willing to participate in the study, please provide building principal names and contact information.

#### Teacher Demographic Questions:

1. Years of teaching experience: 1-5, 6-10, 11-20, 21+
2. Educational background (Degree): Bachelors, Masters, Masters +30, Doctorate
3. What content and grade level do you teach?
4. Do you teach in a one-to-one environment?

#### Teacher Interview Questions:

1. Please, tell me about your technology environment.
2. What are your feelings when you are seated in professional development for technology integration?
  - a. What do you feel when it is over?
3. Did your beliefs about technology integration change following participation in professional development for technology integration?
  - a. If so, describe how they changed?
4. How do you think the professional development impacted your skill level for integrating technology in the classroom?
5. How do you think the professional development for technology integration impacted your self-confidence to integrate technology in the classroom?
6. Describe the changes in your classroom instruction after participating in the professional development program?
7. What are the barriers that exist that can prevent you from integrating technology in the classroom?
  - a. After hearing your thinking about barriers, what would be your top three?
8. What are some of the complexities that come with effectively integrating technology?
  - a. How have those influenced the integration of technology in your classroom?
9. Is there anything else you would like to add about technology integration in the classroom?

## APPENDIX B

### Request for Recommendation and Assistance

Spring 2020

Principal Name

Participant School

Dear Principal,

I am completing the doctoral program in Educational Leadership at Southwest Baptist University in Bolivar, Missouri. I am writing to request your help with my basic qualitative study. The study will incorporate semi-structured group interviews of five teachers. Completing the interview should take 45-60 minutes. The focus of my dissertation is on teacher perceptions of technology integration after participating in professional development. Results will be used to provide schools planning to implement technology with teacher perceptions of how to have a successful one-to-one technology implementation. The results should help to support teachers through the technology integration initiatives.

As the building administrator, please coordinate the teacher group to be interviewed, as well as the location and time of the interview. The teacher interview is confidential, and will take approximately 45-60 minutes to complete. The teacher interview contains nine questions and four demographic questions. The participation of teachers is voluntary and they may withdraw at any time. This research study survey has been approved by the Southwest Baptist University Research Review Board.

Thank you, in advance, for your help in this study. Please feel free to contact me if you have further questions. I will be happy to provide you with the results of the basic qualitative study in an executive summary form if requested.

Thank you for your consideration,  
Josh Groves, (417) 838-0563, [jgroves@spsmail.org](mailto:jgroves@spsmail.org)  
Educational Doctorate Student, Southwest Baptist University

This project has been reviewed by the Southwest Baptist University Research Review Board for research and research-related activities including human subjects (417) 326-1659.

## APPENDIX C

### Teacher Recruitment Letter

To whom it may concern:

I am a doctoral student at Southwest Baptist University in Bolivar, Missouri. As a final part of the doctoral program, I am completing my doctoral dissertation on teacher perceptions of technology integration after participating in professional development. I am writing to ask if you would be willing to participate in a semi-structured group interview.

I am interviewing teachers in small groups in Southwest Missouri who teach in a one-to-one environment. Completing the interview should take between 45-60 minutes, and I would really appreciate your input.

This research study has been reviewed by the Southwest Baptist University Research Review Board. Results will be used to provide schools planning to implement technology with teacher perceptions of how best to have a successful one-to-one technology implementation. The teacher interview is confidential. Your participation is voluntary, and you may withdraw at any time.

To agree to participate, please reply to your building administrator who will be coordinating the interview group, location, and time. I would like to thank you in advance for your participation, and let you know that it is much appreciated!

Thank you for your consideration,

Josh Groves, (417) 838-0563, [jgroves@spsmail.org](mailto:jgroves@spsmail.org)  
Educational Doctorate Student, Southwest Baptist University

This project has been reviewed by the Southwest Baptist University Research Review Board for research and research-related activities including human subjects (417) 326-1659.