THE IMPROVEMENT OF EDUCATIONAL TECHNOLOGY INTEGRATION AT A LOW SOCIOECONOMIC URBAN HIGH SCHOOL

by

Josiah John Phillips

Liberty University

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

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ABSTRACT

The purpose of this applied study was to solve the problem of ineffective educational technology integration for a low socio-economic urban high school in Kansas City, Missouri, and to design an educational technology integration improvement plan to address the problem. A multimethod design was used for this study. The data collection methods consisted of interviews with the district and school administrators, a focus group with certified teachers within the school, and a quantitative survey of the high school’s certified teachers. Further, the research resulted in the creation of a comprehensive educational technology integration improvement plan to successfully improve the adoption and effective integration of educational technology by the school’s teachers and administrators.

Keywords: educational technology, digital divide, socio-economic status, technology integration.
Dedication

It is with an extraordinary sense of love and partnership that I dedicate this work to my
wife, Amanda. Without your guidance, patience, understanding, and intellect, I would never have
begun or completed this journey. Thank you for always being my partner, best friend,
proofreader, and sounding board. I love you more every day. 143.
Acknowledgments

I thank the Lord for placing me on this journey. Without God, I would not have this calling to work in education and to make this world a better place for those who need the most help.

To my boys, Blake, Isaiah, Arden, Riley, and Parker, thank you for allowing me to take the time to do this work. This journey has taken many hours from our family time, and I could not have completed this without your understanding, encouragement, and support.
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List of Abbreviations

Attitude Toward Using (ATU)
Behavioral Intention to Use (BIU)
Kindergarten through 12th grades (K-12)
National Defense Education Act (NDEA)
Perceived Usefulness (PU)
Perceived Ease of Use (PEU)
Science, Technology, Engineering, and Math (STEM)
Socio-economic Status (SES)
Technology Acceptance Model (TAM)
Theory of Planned Behavior (TPB)
Theory of Reasonable Action (TRA)
CHAPTER ONE: INTRODUCTION

Overview

The purpose of this applied study was to solve the problem of ineffective educational technology integration for a low socio-economic urban high school in Kansas City, Missouri, and to design an educational technology integration improvement plan to address the problem. This chapter served as the foundation for this multimethod applied research study on the problem of inadequate educational technology integration at a low-socioeconomic status (low-SES) urban high school in Kansas City, Missouri. For this study, the pseudonym Liberty High School was used when referring to the school. Additionally, the participants in this study were provided with pseudonyms using the social security administration database of the 100 most popular baby names for 2020. Chapter One provides details regarding the historical, social, and theoretical contexts surrounding the background of this study. The problem statement, purpose statement, and significance of this study are then explained. Finally, the central research question and three sub-questions are introduced.

Background

The exponential rise in information technologies has provided opportunities for the advancement of educationally-based technologies, which can assist in producing achievement-related outcomes (Dolan, 2016; Makki et al., 2018; Murry et al., 2018). As such, for the past several years, there has been an increased focus among educational leaders on bringing educational technology resources into K-12 classrooms. This increase in focus has been coupled with hopes that the simple placement of these continually evolving technologies into classrooms would lead to better educational outcomes for students (Dolan, 2016; Kelly, 2015; Masullo, 2017). However, as Vongkulluksn et al. (2018) explained, the simple placement of technology
resources into K-12 classrooms has not shown a significant increase in educational gains for students. In fact, without a shift in the beliefs, perspectives, and practices of classroom teachers, they will not be able to answer the call to integrate technology into their classrooms successfully (Havard et al., 2018; Murry et al., 2018; Vongkulluksn et al., 2018). Further, those attempting to implement effective educational technology integration are faced with numerous challenges, which are commonly categorized as first- and second-order barriers (Kelly, 2015; Salleh, 2016).

First-order barriers include ineffective leadership, ineffective planning, poor teacher educational technology professional development, limited access to technology (hardware and software), inadequate technology support, a school cultural environment which lacks a unified vision for classroom technology integration, user demographics, and lack of appropriate funding (Cheng, 2019; Joo et al., 2018; Vongkulluksn et al., 2018). Additionally, second-order barriers are intrinsic to teachers. These barriers include the knowledge and skill of how to use classroom technologies effectively, their beliefs surrounding the value which technology has on learning, and the perceived difficulty of incorporating technology into their classrooms (Kelly, 2015; Salleh, 2016; Vongkulluksn et al., 2018). This applied study sought to understand which of these first- and second-order barriers were prevalent in the prevention of the effective integration of educational technology at Liberty High School.

The purpose of this applied research study was to solve the problem of ineffective integration of educational technology at a low-SES urban high school in Kansas City, Missouri, and to design an educational technology integration plan to address the problem. Further, because this study focused on a high school within a low-SES urban district, it was essential to highlight the additional challenges which low-SES schools face. That is, in addition to the first- and second-order barriers which their high-SES counterparts also face, low-SES schools must
face a digital divide consisting of inequalities such as lack of access, motivation, skills, and use (Hohlfeld et al., 2017; Makki et al., 2018). Since these students in a low-SES status face additional challenges, this research needed to be conducted to try and solve the problem of ineffective integration of educational technology within the context of these additional low-SES challenges, including the digital divide.

There are three levels of the digital divide mentioned above. The first level includes school infrastructure, including hardware, software, internet access, and technology support. The second level includes how the technology is used differently by teachers and students from different SES levels (Hohlfeld et al., 2017; Makki et al., 2018). For example, Hohlfeld et al. (2017) found that there was a significant difference between high- and low-SES schools relating to technology, professional development, communication, and integration ability. That is, high-SES schools placed much more importance and higher levels of support on them than their low-SES counterparts (Hohlfeld et al., 2017). The third level is individual student empowerment, which is when students select and use classroom technologies as seamlessly as selecting and using pencil and paper (Hohlfeld et al., 2017). All three of these levels seem to impact each other in either a positive or negative manner, depending on whether they are serving as bridges or barriers toward effective educational technology integration.

Because these first- and second-order barriers and additional challenges hamper many low-SES schools, they are limited to using classroom technology for drill and practice while high-SES schools use technology for higher-order thinking skills, including using graphs and spreadsheets to perform an analysis (Hohlfeld et al., 2017, Makki et al., 2018). However, understanding the symptoms and causes of this digital divide has assisted in the creation of an
educational technology integration plan which has the potential to successfully reverse it and lead to a higher educational potential for Liberty High School students.

**Historical**

Attempts by U.S. educators to integrate educational technologies have been around since the first educational technology revolution during the 1920s (Cuban, 1986, 1993; Delgado et al., 2015). These included technologies such as film, radios, and teaching machines (Hof, 2018; Leo Doyle, 2004; Sanders & George, 2017). The next educational technology revolution began in the 1950s and included the passing of the National Defense Education Act of 1958 (NDEA), putting a focus on science, technology, engineering, and math (Hof, 2018; Reeves & Oh, 2017; Sanders & George, 2017). This brought a reintroduction of film, radio, and teaching machines into many classrooms nationwide (Hof, 2018; Reeves & Oh, 2017; Sanders & George, 2017). Television was also introduced into the classroom during this time, along with other new auto-instructional media in hopes of accelerating the rate of learning for students (Hof, 2018; Reeves & Oh, 2017; Sanders & George, 2017).

The third revolution sprang up in the 1980s and 1990s, with another influx of technologies emerging into the workplace, market, home, and U.S. schools (Delgado et al., 2015; Hof, 2018; Spector, 2015). These technologies included microprocessors, the personal computer, data processing, and software programs (Hof, 2018; Solomon, 2015). Along with those attempts to integrate these technologies into classrooms came the problem of ineffective educational technology integration, and so began a cycle of promising and falling short (Delgado et al., 2015). Since then, the United States has continued to face issues with effective educational technology integration (Cho & Littenberg-Tobias, 2016; Makki et al., 2018; Masullo, 2017). The problem is exacerbated in low-SES districts and schools that do not have the funding or expertise
needed to overcome their unique barriers (Cohron, 2015; Eisenman, 2018; Makki et al., 2018). This again shows how low-SES schools are facing an uphill battle of digital equity with their high-SES counterparts.

**Social**

The social construct of generational family poverty and adversity has been shown to degrade mental and physical health, increase developmental delays in children, and decrease levels of educational and skill attainment (Najman et al., 2018; Silva-Laya et al., 2019). Not surprisingly, even though they can attend school, some economically disadvantaged people who live in urban areas are not able to fulfill their right to education (Bower & Rossi, 2018; Silva-Laya et al., 2019). Instead, their educational achievement is deficient, and their educational trajectory is stifled (Bower & Rossi, 2018; Silva-Laya et al., 2019).

It is these low-SES urban students who generally realize the lowest achievements, and this leads to a significant impact on their overall socio-economic potential (Silva-Laya et al., 2019; Taubenbock et al., 2018). In fact, between 35 percent and 40 percent of these students will continue to experience poverty throughout early and middle adulthood (Lesner, 2018). Worse yet, it is these low-SES urban children who attend schools that do not have the resources and structure needed to teach them how to overcome their opportunity gaps and climb out of poverty (Barbarin & Aikens, 2015; Beckett & Wrigley, 2014).

Technology use in K-12 urban classrooms is declining in many districts across the United States (Cohron, 2015; Murry et al., 2018; Young et al., 2017). According to the literature, this decline may indicate that the challenges of effectively integrating educational technology into urban schools have not been overcome but have instead become more substantial (Cohron, 2015; Murry et al., 2018; Young et al., 2017). In fact, Makki et al. (2018) found that 56 percent of
teachers view a lack of digital resources as a barrier to their students’ learning. This issue has widened the digital divide and significantly impacted the ability of urban students to compete in an increasingly digital economy (Cohron, 2015; Murry et al., 2018; Taubenbock et al., 2018). In other words, the digital divide is widened for low-SES students living in these urban areas, and these students are simply left behind as compared to urban and suburban students from wealthier socio-economic backgrounds (Eisenman, 2018; Makki et al., 2018; Murry et al., 2018).

**Theoretical Contexts**

The theoretical framework for this applied research study was the technology acceptance model (TAM) created by Fred Davis (Davis, 1989; Davis & Venkatesh, 1996; Lala, 2014). Derived from Fishbein and Ajzen’s (1975) theory of reasonable action (TRA) and Ajzen’s (1985) theory of planned behavior (TPB), the TAM is an information systems theory and a dominant model used in the investigation of factors which impact users’ acceptance or rejection of technology (Davis, 1989; Davis & Venkatesh, 1996; Marangunic & Granic, 2015). It is based upon a causal relationship of the belief, attitude, intention, and behavior of the subjects, and centers on the perceived ease of use as well as the perceived usefulness (Davis, 1989; Davis & Venkatesh, 1996; Marangunic & Granic, 2015). Further, because Liberty High School is a low-SES school in the urban core of a large metropolitan city, the TAM was essential to understanding the context surrounding the barriers faced by these educators. That is, these educators face a higher number of barriers, as well as more challenging obstacles than those faced by their higher-SES and suburban counterparts (Mossberger et al., 2006; Simmons & Martin, 2016). By understanding the implementation barriers faced by these teachers, it may be possible to create a project which can assist in overcoming them and improve the effectiveness
of the educational technology integration for this school (Heath, 2017; Simmons & Martin, 2016).

**Problem Statement**

Liberty High School in Kansas City, Missouri, has a problem with ineffective educational technology integration. Ample evidence exists to support that effective integration of educational technology has a multitude of benefits for teachers and students (Kelly, 2015; Makki et al., 2018; Masullo, 2017). However, the teachers and administrators at Liberty High School are not adequately integrating educational technology into their classrooms. While they are attempting to use the technologies in their classrooms, the simple placement and use of educational technologies are not enough to create significant increases in educational gains for students (Vongkulluksn et al., 2018). This problem has negatively impacted the students at Liberty High School by preventing the teachers and administrators from adequately closing the digital divide and achievement gaps experienced by their students (Hew & Tan, 2016; Hohlfeld et al., 2017; Makki et al., 2018). A possible cause of this problem is an inability to overcome the barriers which are preventing teachers and administrators from effectively integrating educational technology in their classrooms (Capraro et al., 2016; Salleh, 2016; Vongkulluksn et al., 2018). According to the literature, these causes may include a lack of educational technology professional development, lack of access to software and hardware, poor technology resources, and the absence of a unified vision for classroom technology integration (Kelly, 2015; Salleh, 2016; Vongkulluksn et al., 2018).

There are numerous studies on the need for effective educational technology integration for K-12 schools, especially in low-SES schools (Hew & Tan, 2016; Hohlfeld et al., 2017; Nelson et al., 2019). However, Liberty High School still struggles with the effective integration
of educational technology. Perhaps a study that investigates the causes and remediations to inadequate educational technology integration by a multimethod design could remedy the situation.

**Purpose Statement**

The purpose of this applied study was to solve the problem of inadequate educational technology integration for Liberty High School in Kansas City, Missouri, and to design an educational technology integration improvement plan to address the problem. A multimethod design was used, which means the design consisted of both qualitative and quantitative means of collecting data. The first data collection method was structured interviews with school and district administrators. The second data collection method was a focus group with Liberty High School teachers. The third data collection method was a close-ended internet survey with Liberty High School teachers using a single static web page via the website Survey Monkey. The first two methods were qualitative measures; the third method was a quantitative measure.

**Significance of the Study**

This study was designed to improve the educational technology integration at Liberty High School and could lead to significant educational gains for its students and the other students of the district (Salleh, 2016; Joo et al., 2018; Vongkulluksn et al., 2018). As a low-SES high school, most students that Liberty High School serves are highly disadvantaged (Cohron, 2015; Eisenman, 2018; Makki et al., 2018). For example, 100% of their students are eligible for free meals, and the current graduation rate is 61% (2018). Further, one in five students does not speak English as their primary language, and the school placed in the bottom 50% of all Missouri schools on the Measure of Academic Progress (MAP) test in 2017 (2018). Moreover, these students face a digital divide consisting of inequalities such as lack of access,
motivation, skills, and use (Hew & Tan, 2016; Hohlfeld et al., 2017; Masullo, 2017).

However, the outcome of this study, along with the educational technology integration improvement plan, seeks to transform how technology is integrated at Liberty High school and work to address these issues that are created and exacerbated by the widening digital divide. Instead of using educational technology for simple drill and practice as most low-SES schools do, the teachers and administrators at Liberty High School could begin using educational technology for higher-order thinking skills and to perform high-level analysis (Hew & Tan, 2016; Hohlfeld et al., 2017; Masullo, 2017). Additionally, the outcome of this study could also assist in increasing parent involvement and engagement for Liberty High School students in the educational process (Bond, 2019). This increased parental involvement and engagement coupled with effective educational technology integration has the potential to positively impact the generational family poverty and adversity that Liberty High School students face (Najman et al., 2018; Silva-Laya et al., 2019). Moreover, the outcome of this study may assist in the ability of Liberty High School and district students to overcome the numerous obstacles they face and fulfill their right to an education (Bower & Rossi, 2018; Silva-Laya et al., 2019).

**Research Questions**

**Central Research Question**

How can educational technology integration be improved at Liberty High School in Kansas City, Missouri?

**Sub-Question 1**

How would administrators in an interview solve the problem of inadequate educational technology integration at Liberty High School?

**Sub-Question 2**
How would educators in a focus group solve the problem of inadequate educational technology integration at Liberty High School?

**Sub-Question 3**

How would quantitative survey data solve the problem of inadequate educational technology integration at Liberty High School?

**Definitions**

1. *Digital divide* – Digital divide dynamic form of social inequality consisting of differences in access to technology, the accumulation of technology skills, and the ability to use various forms of computing devices (Hohlfeld et al., 2017).


3. *Effective Educational Technology Integration* - Creating sound instruction by combining pedagogical knowledge, content knowledge, and technology knowledge (Nelson et al., 2019).

**Summary**

This applied study examined the problem of inadequate educational technology integration for Liberty High School in Kansas City, Missouri. A multimethod design was used, which means it consisted of both qualitative and quantitative data collection and analysis approaches. The study was framed by the technology acceptance model (Davis, 1989; Davis & Venkatesh, 1996; Lala, 2014) and consisted of structured interviews with school and district administrators, a focus group with Liberty High School teachers, and a close-ended internet survey with Liberty High School teachers using a single static web page via the website Survey...
Monkey. The outcome of this study could lead to a significant improvement in the effectiveness of the educational technology integration for Liberty High School (Capraro et al., 2016; Delgado et al., 2015; Joo et al., 2018).
CHAPTER TWO: LITERATURE REVIEW

Overview

The purpose of this applied study was to solve the problem of ineffective educational technology integration for a low socio-economic urban high school in Kansas City, Missouri, and to design an educational technology integration improvement plan to address the problem. Ample evidence exists to support that effective integration of educational technology has a multitude of benefits for teachers and students (Kelly, 2015; Makki et al., 2018; Masullo, 2017). However, the teachers and administrators at Liberty High School are not effectively integrating educational technology into their classrooms. While they are attempting to use the technologies in their classrooms, the simple placement and use of educational technologies are not enough to create significant increases in educational gains for students (Vongkulluksn et al., 2018). The problem of ineffective educational technology integration at Liberty High School was studied using a multimethod applied approach.

While there is ample literature on the issues of ineffective educational technology integration, integration barriers for low-SES schools, and integration barriers for urban schools, there is very little existing literature that combined the three of these issues into a comprehensive understanding of this complex problem. This chapter provides a review of the technology acceptance model (TAM), which was derived from the theory of reasonable action (TRA) and the theory of planned behavior (TPB) and was used as the theoretical framework for this study (Davis et al., 1989). The review of the existing literature discusses each of these three issues. This review of the literature also discusses the constructs of the TAM, including external variables, perceived usefulness, perceived ease of use, attitude toward using, and behavioral intention to use. This study also examined how these constructs impact ineffective educational
technology integration, integration barriers for low-SES schools, and integration barriers for urban schools. Previous studies are reviewed and presented, including the use of the TAM for pre-service and in-service teachers. Further, this study explored the history and benefits of educational technology integration as well as the needed improvement of educational technology integration. Additionally, first- and second-order barriers, additional barriers, and factors that can be barriers or bridges are explored and reviewed.

**Theoretical Framework**

The theoretical framework for this applied research study was the TAM created by Fred Davis (Davis, 1989; Davis & Venkatesh, 1996; Lala, 2014). Derived from Fishbein and Ajzen’s (1975) theory of reasonable action and Ajzen’s (1985, 1991) theory of planned behavior, the TAM is a dominant model used in the investigation of factors that impact users’ acceptance or rejection of technology. The TAM is based on a causal relationship of the belief, attitude, intention, and behavior of the subjects, and centers on the perceived ease of use as well as the perceived usefulness (Davis, 1989; Davis & Venkatesh, 1996; Lala, 2014; Marangunic & Granic, 2015).

Numerous studies have been conducted using the TAM as a framework to understand and improve the user’s perception of technology (Joo et al., 2018; Marangunic & Granic, 2015). There have also been many studies that have focused on educators in a one-to-one computing environment, and several common barriers to implementation have been discovered (Heath, 2017; Simmons & Martin, 2016). Further, the TAM has been empirically validated by numerous previous studies that have shown it to be a suitable model for explaining users’ intention to use technology (Cheng, 2019; Marangunic & Granic, 2015; Teo 2010).
**Theory of Reasonable Action (TRA)**

The TRA is one of the foundational theories, which Davis (1989) used to build the TAM. The TRA, developed by Fishbein and Ajzen (1975), predicts that attitudes and subjective norms create behavioral intent. This theory further postulates that people have voluntary control of their behaviors and can decide how and if they behave in specific ways (Akinde, 2016; Vallerand et al., 1992). However, the idea that people have total voluntary control of their behaviors was later realized to be inaccurate, and the idea of perceived behavioral control emerged as well as the TPB (Akinde, 2016; Vallerand et al., 1992).

**Theory of Planned Behavior (TPB)**

The other theory that serves as a framework for the TAM is the TPB. The TPB is guided by behavioral beliefs, normative beliefs, and control beliefs. Behavioral beliefs create a favorable or unfavorable attitude toward a behavior (Ajzen, 1985, 1991; Akinde, 2016). Normative beliefs create perceived social pressure or subjective norms (Ajzen, 1985, 1991; Akinde, 2016). Control beliefs create perceived behavioral control, the perceived ease or difficulty of performing the behavior (Ajzen, 1985, 1991; Akinde, 2016).

**Technology Acceptance Model (TAM)**

Davis (1989) developed the TAM to model user acceptance or rejection of technology. When developing the TAM, Davis considered the actual use of technology to be a behavior. Therefore, he believed that the TRA and TPB would be suitable to predict and explain the resultant behavior (Davis, 1989; Davis & Venkatesh, 1996; Lala, 2014; Marangunić & Granič, 2015). However, Davis made two changes to TRA and TPB when he created the TAM. Initially, he only considered the attitude of the person and not the subjective norm when predicting an actual attitude. He also initially only identified perceived usefulness and perceived ease of use as
the beliefs that impacted attitude toward using technology (Davis, 1989; Davis & Venkatesh, 1996; Lala, 2014; Marangunić & Granić, 2015). However, he later updated and extended his model several times to incorporate other factors. Those updates and extensions led to evolutions of the model, including TAM2 and TAM3 (Marangunić & Granić, 2015; Venkatesh & Bala, 2008). However, TAM2 and TAM3 have proven to have lower empirical validity, and some research has shown that the removal of attitudes as a construct in TAM3 decreases the ability to explain user intentions (Cheng, 2019). Therefore, this study utilized the original TAM as the theoretical framework.

As shown in Figure 1, the TAM is a system of constructs in which actual system use (ASU) for users is based on their attitudes toward using (ATU) and the behavioral intention to use (BIU). As shown, both attitudes toward using and behavioral intention to use are dependent upon perceived usefulness (PU) and perceived ease of use (PEU). Also, perceived ease of use has an impact on perceived usefulness. Further, external variables can impact both the perceived ease of use and perceived usefulness (Davis et al., 1989; Joo et al., 2018; Venkatesh & Bala, 2008).

**Figure 1**

*Technology Acceptance Model*

As shown in Figure 1, the TAM framework allowed for the inclusion of external variables that influence perceived usefulness and perceived ease of use as well as the other TAM constructs of attitude toward using and behavioral intention to use (Cheng, 2019; Davis et al., 1989; Venkatesh & Bala, 2008). These external variables can significantly impact perceived usefulness and perceived ease of use in either a positive or negative manner (Joo et al., 2018; Porter & Donthu, 2006). Therefore, for this study, external variables that negatively impact perceived usefulness and perceived ease of use were referred to as barriers.

Many studies have been conducted regarding the discovery of these barriers and what can be done to overcome them to impact perceived usefulness and perceived ease of use (Aldunate & Nussbaum, 2013; Joo et al., 2018; Marangunic & Granic, 2015). The ability to use the TAM to discover the barriers to perceived usefulness and perceived ease of use and develop a plan of interventions to overcome them and positively impact actual system use is why the TAM was chosen as the theoretical framework for this study.

**Technology Acceptance Model Constructs**

As previously mentioned, the TAM consists of several constructs, and those constructs include external variables, perceived usefulness, perceived ease of use, attitude toward using, and behavioral intention to use. The interworkings of these constructs are what lead to successful or unsuccessful actual system use (Joo et al., 2018; Marangunic & Granic, 2015). By understanding each of these constructs, how the TAM can be influenced, and how the TAM influences other
constructs, a plan consisting of appropriate interventions could be created with the intention of positively impacting actual system use (Davis et al., 1989; Parkman et al., 2018).

**Perceived Usefulness**

Perceived usefulness is the level of belief that a user has for a specific technology to increase performance (Al-Emran et al., 2018; Cheng, 2019; Davis, 1989). Perceived usefulness directly impacts a user’s attitude toward using technology, and numerous studies have shown that it is the most significant factor in predicting and explaining a user’s adoption or rejection of technology (Davis, 1989; Davis et al., 1989; Joo et al., 2018; Porter & Donthu, 2006). In fact, Davis (1989) found that “no amount of ease of use can compensate for a system that does not perform a useful function” (p. 333). For teachers, perceived usefulness means that they can see the value of integrating educational technology into their classrooms (Akinde, 2016). If they do not feel that they can recognize or achieve the value of the specific educational technology, then they will not use it as a part of their curriculum (Akinde, 2016; Delgado et al., 2015).

**Perceived Ease of Use**

Perceived ease of use is the degree to which a user finds a system to be free of effort (Al-Emran et al., 2018; Cheng, 2019; Davis, 1989). Several studies have shown that perceived ease of use impacts both perceived usefulness and attitude toward using (Aldunate & Nussbaum, 2013; Davis, 1989; Davis et al., 1989; Marangunic & Granic, 2015; Porter & Donthu, 2006). As discussed in this chapter, external variables, such as teacher self-efficacy and technology anxiety, play a substantial role in the perceived ease of use for educational technology (Cheng, 2019; Davis, 1989; Joo et al., 2018). Several studies have been conducted that highlight the impact of teacher self-efficacy and anxiety on perceived ease of use, and teachers’ perceived ease of use has a significant impact on their perceived usefulness and their intention to use technology.
(Cheng, 2019; Davis, 1989; Joo et al., 2018). In fact, Parkman et al. (2018) found that the link between self-efficacy and behavioral intention to use technology is so strong that they recommended it be its individual construct alongside perceived usefulness and perceived ease of use. However, it is essential to note that, while Cheng (2019) also found that self-efficacy has a significant impact on perceived ease of use, after controlling for perceived ease of use and perceived usefulness, he was unable to find a strong correlation between self-efficacy and attitude toward using technology.

**Attitude Toward Using**

Attitude toward using technology describes a user’s level of desire to use a specific technology (Cheng, 2019; Davis, 1989; Joo et al., 2018). If a user perceives that a particular form of technology is easy to use and useful, they were more likely to have a positive attitude toward the technology and were more likely to use it (Cheng, 2019; Davis, 1989; Joo et al., 2018). The user’s attitude toward using technology is influenced by perceived ease of use and perceived usefulness, with perceived ease of use, also having a direct influence on perceived usefulness (Marangunić & Granić, 2015).

**Behavioral Intention to Use**

Behavioral intention to use technology describes the degree to which a user would be likely to use a specific technology in the future (Davis, 1989; Joo et al., 2018). Behavioral intention to use is based on the combination of perceived usefulness and perceived ease of use, resulting in the attitude toward using. Thus, when perceived usefulness and perceived ease of use are positive, it is more likely that the user will develop a positive attitude toward using and have a behavioral intention to use a specific technology (Cheng, 2019; Davis, 1989; Joo et al., 2018).
**External Variables**

Several studies have been conducted using a variety of external variables to ascertain the influence of those variables on both perceived usefulness and perceived ease of use, which in turn influences attitude toward using and the behavioral intention to use (Abdullah et al., 2016; Joo et al., 2018). The most commonly studied external variables useful to this study include user experience, subjective norms, user enjoyment, technology anxiety, and user self-efficacy (Abdullah et al., 2016). Further, many studies also included perceived educational technology implementation barriers as external variables in the TAM. Those studies included the additional variables of leadership, planning, professional development, access to technology, technology support, organizational culture, user demographics, and funding (Akinde, 2016; Cheng, 2019; Davis et al., 1989).

**Previous Studies**

As early as 1985, studies were being conducted on computer-based education in K-12 schools (Kulik et al., 1985). While the number of computers in schools began to increase drastically, the use and adoption of those computers were inconsistent (Davis, 1989; Kulik et al., 1985; Schrum, 1999). For example, in their study on computer-based education in elementary schools, Kulik et al. (1985) found that there were significant discrepancies in how school computers were being utilized. They found that four categories of use had emerged, and they described those categories as drill and practice, tutorial mode, dialogue mode, and computer-managed instruction (Kulik et al., 1985). However, since the TAM had not yet been created by Davis (1989), Kulik et al. were unable to use it as a theoretical framework for their study. Even so, they still found that user attitude toward using computers was a significant construct in successful educational technology integration (Kulik et al., 1985).
Since the creation of the TAM, numerous studies have been conducted using the model to understand and predict the adoption and use of technologies. However, most of these studies focused on understanding user adoption of technology in various organizations. In fact, the use of the TAM for research focused on teacher adoption and integration of educational technology, has been limited and primarily focused on pre-service teachers and mobile technologies. Even so, research with the use of the TAM as a theoretical framework for technology adoption has been exhaustive (Joo et al., 2018; Porter & Donthu, 2006; Simmons & Martin, 2016).

Additionally, the current literature shows that the TAM is a well-constructed and empirically tested model that is based on two empirically tested theories, the Theory of Planned Behavior and the Theory of Reasonable Action (Akinde, 2016; Cheng, 2019; Marangunic & Granic, 2015).

**The TAM and Pre-Service Teachers**

As previously mentioned, few previous studies have focused on pre-service teachers’ intentions to use technology. The previous studies include Teo’s (2010) study on the intention to use technology among pre-service teachers, Joo et al.’s (2018) study on the factors influencing pre-service teachers’ intention to use technology, Parkman et al.’s (2018) study on pre-service teachers’ acceptance of technology-rich learning environments and Wong et al.’s (2012) study on the influence of gender and computer teaching efficacy on computer acceptance among Malaysian student teachers. While these studies focus on preservice teachers, the information gleaned from them has been consistent with the TAM, and these studies could be replicated with in-service teachers (Joo et al., 2018; Parkman et al., 2018; Teo, 2010; Wong et al., 2012).
The TAM and In-Service Teachers

A handful of studies were conducted to examine the TAM in the context of in-service teachers. These studies include Zhonggen and Xiaozhi’s (2019) study of the TAM for mobile learning technology, Al-Emran et al.’s (2018) study on the TAM in a mobile learning context, and Huntington and Worrell’s (2013) study of information communication technologies in the classroom. The results of each of these studies indicated that the TAM is a useful model in the study of educational technology adoption for in-service teachers (Al-Emran et al., 2018; Huntington & Worrell, 2013; Zhonggen & Xiaozhi; 2019).

How the TAM Relates to This Study

The TAM has been widely used to study the acceptance of technology in organizations as well as the acceptance of technology by students and teachers at various educational levels (Akinde, 2016; Lee et al., 2011; Marangunić & Granić, 2015). Also, the purpose of this applied research study was to solve the problem of ineffective educational technology integration for Liberty High School in Kansas City, Missouri, and to design an educational technology integration improvement plan to address the problem of ineffective integration of technology. Because the TAM focuses on understanding and improving the adoption of technology by users, it directly related to this study and served as a suitable theoretical framework. That is, the framework allowed for the study of external variables, perceived usefulness, perceived ease of use, and attitudes toward using educational technology that teachers had at Liberty High School (Cheng, 2019; Joo et al., 2018; Parkman et al., 2018).

The constructs of the TAM further assisted in helping to frame the first- and second-order barriers which Liberty High School teachers face when attempting to adopt and integrate educational technology (Delgado et al., 2015). By framing the barriers within the framework of
the TAM, it was possible to understand how each of the barriers impacts the user’s behavioral intention to use educational technology. It also makes it possible to develop a plan that should be able to impact each of these barriers and turn them into bridges for effective educational technology integration. Also, it is possible that this study could allow other researchers to expand the TAM for their studies and further the literature in this area.

**Related Literature**

The ever-changing landscape of educational technology is creating and sustaining a digital divide between high- and low-SES students in U.S. schools. Throughout the 21st century, the model of education has seen an abundance of reform. The banking model of education, a model in which the teacher owns the information and deposits it into the minds of their students, has been replaced with a model where information is at the students’ fingertips and the role of the teacher is to facilitate the students’ discovery and application of that knowledge (Akinde, 2016; Blau et al., 2016; Chang, 2016). The current focus is on ensuring students develop the critical thinking, creativity, and research skills needed to operate successfully in the 21st century, also known as 21st-century skills (Akinde, 2016; Blau et al., 2016). To do this, educators must adopt and effectively integrate educational technologies into their classrooms; however, many educators continue to face problems when attempting to do so (Blau et al., 2016; Chang, 2016; Makki et al., 2018). These problems are especially prevalent for educators in low-SES districts, where teachers and administrators face additional challenges (Hew & Tan, 2016; Hohlfeld et al., 2017; Nelson et al., 2019).

**History of Educational Technology Integration**

Educators have been using educational technologies such as film, radios, and teaching machines since electricity became increasingly available in the 1920s (Hof, 2018; Leo Doyle,
2004; Sanders & George, 2017). While the Great Depression caused school budgets to be cut and curtailed the purchase of these technology solutions for many schools and districts, the U.S. military began to use many of these technologies during World War II (Hof, 2018; Jolly, 2009; Spector, 2015). Then, in 1957, the Soviet Union’s launch of Sputnik led to the United States, creating the National Defense Education Act of 1958 (NDEA). The NDEA intended to counteract what seemed to be a far superior Soviet education system, which focused on intently on creating a pipeline of young Science, Technology, Engineering, and Mathematics (STEM) workers. To accomplish the new plan delineated in the NDEA, it stressed a revision in primary, secondary, and post-secondary curriculums nationwide. These new curriculums would have a heavy focus on STEM subjects, and many classroom technologies were touted as a means to achieve the United State’s goal of keeping up with and surpassing the Soviet Union (Hof, 2018; Jolly, 2009; Spector, 2015). To bring this plan to fruition, the United States government invested over one billion dollars of federal funds into loans, scholarships, fellowships, and classroom resources. The United States then invested an additional one billion dollars to the states for their individual STEM initiatives (Harris & Miller, 2005; Jolly, 2009; Spector, 2015).

**Educational Technology Integration in the 1950s and 1960s**

The significant investments made by the United States government under the NDEA in the 1950s and 1960s led to film, radio, and teaching machines being reintroduced into many classrooms nationwide (Hof, 2018; Reeves & Oh, 2017; Sanders & George, 2017). Television was also introduced into the classroom during this time, along with other new auto-instructional media in hopes of accelerating the rate of learning for students. In fact, it became the machine’s role to transfer knowledge to the students, and the teacher’s role changed to that of a facilitator (Hof, 2018; Reeves & Oh, 2017; Sanders & George, 2017).
This revolution came at a steep price, with the U.S. government spending more than two billion dollars on educational technology and other STEM initiatives (Harris & Miller, 2005; Hof, 2018; Jolly, 2009). Further, under the NDEA, the focus of technology solutions grew from STEM subjects to other areas, including language arts, social studies, administration, and management (Harris & Miller, 2005; Hof, 2018; Spector, 2015). This overhaul of curricular priorities and influx of capital had the potential to create a significant impact on the U.S. educational system.

However, during the 1950s and 1960s, the promise of educational technology’s potential to accomplish vast and sweeping educational improvements fell short of being realized due to poor integration and poor implementation (Delgado et al., 2015; Reeves & Oh, 2017; Sanders & George, 2017). By the 1970s, numerous studies were indicating that the cycle of promises of new technologies were falling short, and then a rebirth of more new promises and new technology innovations occurred (Reeves & Oh, 2017; Romiszowski & Rushby, 2015). The concept was so prevalent in the literature that it was coined the “Phoenix Phenomenon” (Romiszowski & Rushby, 2015). This shift from optimism to the skepticism surrounding educational technology integration coincided with a drop of political interest and support for educational technology throughout the 1970s (Harris & Miller, 2005; Hof, 2018). However, even though this technology-based educational reform failed to produce the benefits expected, the shift in the political interest and support would not last. After the effects of stagnation and skepticism surrounding educational technologies wore off, along with waning political support, educational technologies would again be touted as the answer to systemic educational issues (Hof, 2018; Sanders & George, 2017; Spector, 2015).
The Education Technology Revolution of the 1980s and 1990s

Even with a large amount of preexisting skepticism and a significant drop in political interest and support throughout the 1970s, in the 1980s and 1990s, another influx of technologies emerging into the workplace, market, and home led to a new revolution of educational technologies into U.S. schools (Delgado et al., 2015). This time the new boom was closely tied to the development of the microprocessors, the personal computer, data processing, and software programs (Hof, 2018; Solomon, 2015). This new revolution began, like those before it, with promises of preparing children for the new workplace and the new economy, again shifting teaching to a self-directed facilitated model, and making teaching and learning faster and more productive (Cuban 1993, Delgado et al., 2015; Sanders & George, 2017).

As a result of these promises, the 1980s saw the renewal of schools beginning to consistently purchase new computers and computer software for classroom applications (Hof, 2018; Sanders & George, 2017; Spector, 2015). Games and other software provided teachers with new ways to teach social studies, spelling, vocabulary, typing, geography, science, mathematics, and much more (Cuban, 2001; Leonard, 2003; Solomon, 2015). Further, computers and software quickly evolved from classroom learning applications to non-classroom applications, including digital grade books, digital college admission test preparation, desktop publishing software, digital spreadsheets, and other business applications (Makki et al., 2018; Masullo, 2017).

However, as early as the mid-1980s, studies were again being conducted, and doubt was being created regarding the effectiveness of educational technology integration into classrooms. In one such study, Cuban (1986) found that there was a pattern of policymakers boasting extravagant claims about educational technology devices bringing significant positive change to
the classroom, only to be followed by studies which showed limited classroom use, and there
was a systematic tendency of administrators and others in authority to blame teachers for
shortcomings. Additionally, in their meta-analysis of 32 comparative studies, Kulik et al. (1985)
found that while educational technologies did increase test scores, there was a lack of evidence
related to broader educational outcomes, including attitudes toward school, attitudes toward
computers, instructional efficiency, or the development of higher-order skills.

Even with these skepticisms and integration issues, in the 1980s and 1990s, U.S. schools
continued to invest billions of dollars on classroom computer hardware and software for their
teachers and students (Makki et al., 2018; Masullo, 2017). In fact, from 1981 to 1998, the
number of schools with classroom computers rose from 18% to 98%, and the ratio of students to
computers during that same time frame changed from 125:1 to 18:1 (Cuban, 2001). Further, by
the late 1990s, new technologies were being invented monthly, and educators found themselves
struggling to keep pace with technology and the changes required (Makki et al., 2018; Masullo,
2017). The changes in technology created during the 1980s and 1990s not only impacted the
educational environment but impacted society as a whole. Technology became embedded into
the fabric of U.S. culture, and globalization led to new competition for companies and countries,
resulting in a need for employees with new 21st-century skill sets (Makki et al., 2018; Masullo,
2017). Therefore, even with seemingly poor implementation in the majority of cases, the amount
of educational technology in the classroom did not dwindle in the 1980s and 1990s (Delgado et
al., 2015; Romiszowski & Rushby, 2015).

Educational Technology Integration from the Early 2000s to the Present

Literature indicates that beginning in the late 1990s, educators began pushing for a 1:1
ratio of devices to students (Delgado et al., 2015; Romiszowski & Rushby, 2015). However,
some literature also shows that educators have continually missed the mark in terms of effectively integrating technology into their districts and classrooms (Hew & Tan, 2016; Union et al., 2015). This lack of effective educational technology integration is primarily due to the increase of classroom technology, again creating a new, unfulfilled need for the role of the teacher to shift to that of instructional method specialists and technology integrationists, and for the machine to again take the role as the transferrer of information and knowledge (Hew & Tan, 2016; Masullo, 2017). Similar to educational technology revolutions of the past, teachers are now expected to not only know the subject matter, but they must also be able to seek solutions through critical thinking and challenge their students by having them use problem-solving approaches (Hew & Tan, 2016; Masullo, 2017; Romiszowski & Rushby, 2015).

While there has been a desire to make this shift to the role of the teacher in many districts and schools throughout the country, teachers continue to face challenges when attempting to integrate educational technology into their classrooms. Extant literature shows that teachers continue to face these same challenges because, despite their desire to cause a shift to the teacher’s role, few districts and schools have spent the necessary time, effort, or money to actually do so and successfully integrate educational technology into the classroom (Cho & Littenberg-Tobias, 2016; Makki et al., 2018; Masullo, 2017). This premise is especially true for low-SES urban districts and schools where there are additional issues of digital inequality, including a significant digital divide which are preventing these students from experiencing the benefits of effective educational technology integration (Cohron, 2015; Eisenman, 2018; Makki et al., 2018).
**Benefits of Effective Educational Technology Integration**

Many researchers have investigated the benefits of educational technology in the classroom (Blau et al., 2016; Chang, 2016; Lee et al., 2017). While some studies have mixed or no results, others show that when it is properly integrated, educational technology does have numerous benefits. These benefits include increased student achievement, increased motivation for learning, improvement of student engagement, and an increase in the ability for teachers to transform their teaching methods (Blau et al., 2016; Hershkovitz & Karni, 2018; Hull & Duch, 2019).

**Increasing Student Achievement**

Literature shows that many teachers and school leaders desire their educational technology programs to result in better student achievement (Blau et al., 2016; Harper & Milman, 2016; Harris et al., 2016). While there has long been a debate surrounding the ability of educational technology to have a positive impact on student achievement, empirical research has repeatedly shown that educational technology does have a significant positive impact on student achievement (Harper & Milman, 2016; Harris et al., 2016). Further, not only is there a favorable impact of educational technology integration on student achievement, but this impact has been demonstrated across numerous subjects and multiple grade levels (Delgado et al., 2015; Harper & Milman, 2016; Harris et al., 2016).

**Motivation for Learning**

Numerous studies have shown that motivation for learning is critical for deep and effective learning (Hashmi et al., 2018; Lawlor et al., 2016). However, it is also shown in the literature that intrinsic motivation for students decreases from pre-school through secondary school, and this creates a significant challenge for effective learning (Lawlor et al., 2016; Pitzer
& Skinner, 2017). Further, there is ample evidence that student autonomy, the orientation of learning goals, the relationship between students, level of collaborative working, and the student-teacher relationship are all critical variables in student motivation for learning (Hashmi et al., 2018; Pitzer & Skinner, 2017; Stevens et al., 2018). Additionally, because of the ability proper educational technology integration has on these variables, many believed that placing educational technologies into the classroom would have a significant impact on student motivation for learning by ensuring the creation, support, and development of ideas and knowledge (Ibanez et al., 2020; Lawlor et al., 2016; Stevens et al., 2018). While several studies do show that this is accurate, it is essential to point out that ineffective educational technology integration can have the opposite effect on student motivation (Hashmi et al., 2018; Lawlor et al., 2016).

Effectively integrated educational technology can lead to a sense of liberation in learning, increased enjoyment in learning, increase curiosity, and increased intrinsic motivation for learning (Hashmi et al., 2018; Ibanez et al., 2020; Lawlor et al., 2016). In fact, by tapping into students’ inherent relationship with technology, teachers have the ability to improve students’ motivation and instruction as well as encourage them. This improvement includes thinking creatively through analysis, reflecting on and generating ideas, implementing ideas, building things, and experimenting (Hashmi et al., 2018; Lawlor et al., 2016). Further, once educational technology is used effectively to increase student motivation, the level of student engagement can also increase (Groccia, 2018; Hashmi et al., 2018; Lawlor et al., 2016).

**Improved Student Engagement**

Research shows that student engagement is the best predictor of learning and personal development (Groccia, 2018; Henrie et al., 2015). Further, student engagement is a shared
responsibility involving virtually all members of the academic community: teachers, administrators, staff, and other students (Buskist & Groccia, 2018). However, the relationship between school staff and their students is deteriorating. Teachers and administrators at thousands of schools around the country are attempting to change this relationship, but they have been focusing on treating the symptoms instead of the overall cause (Dupere et al., 2015, 2018; Washor, 2018). This focus of teachers and administrators on symptoms instead of the overall cause is especially prevalent for people at schools in lower-income urban districts because these students are impacted more by complex factors such as needing to work, being homeless, getting married, starting a family, or joining the military (Dupere et al., 2015, 2018; Washor, 2018). These issues are further exacerbated in low-SES schools because the shortage of mental health staff, funding, and professional development for teachers leave teachers and other staff members ill-prepared for the social, emotional, behavioral, and developmental needs of their students (Dupere et al., 2015, 2018; McDermott et al., 2019; Washor, 2018). When all these factors combine with a long process of disengagement from school, the situation often culminates in students dropping out (Dupere et al., 2015, 2018; McDermott et al., 2019).

Even with all the challenges faced by low-SES students, teachers, schools, and districts, the literature shows that all students, including low-SES students, gain more from their educational experiences when they invest more time and energy in educationally purposeful tasks; this includes studying, interacting with their peers and teachers about substantive matters, as well as applying what they are learning to concrete situations and tasks. Additionally, what students do in the learning process impacts outcomes more than who they are, their socio-economic status, or where they go to school. As a matter of fact, the most effective schools are
those where teachers and other staff members are able to channel students’ attention and energies toward activities that engage them at high levels (Groccia, 2018; Mason et al., 2017).

**Challenges for Increasing Student Engagement in Low-SES Educational Settings.** By properly integrating educational technology into the classroom, teachers can engage their students at much higher and deeper levels. This higher and deeper level of student engagement has been demonstrated by success among students in high-SES schools where they are increasingly turning to the use of educational technology to close achievement gaps, differentiate learning, and introduce facilitated learning models (Groccia, 2018; Mason et al., 2017). However, the story is different at low-SES schools where more than 85% of teachers report using educational technology for computer-based drill and practice as their primary utilization of technology in the classroom (Lawless, 2016).

**Challenges for Increasing Student Engagement of Minority Students.** In low-SES schools where students who are of minority ethnic backgrounds are in the majority, the teachers reported that they had not participated in professional development regarding technology use within the previous five years (Lawless, 2016). The students at those schools also had less access to computers at home, so it took them more time to adapt to new technologies (Lawless, 2016). Therefore, teachers in low-SES high minority schools were left on their own to tackle the complexities of properly implementing educational technologies into their classrooms with the students who are least able to adapt to them. This complex situation creates an environment in which low-SES students and their teachers are entirely postured for failure. It takes high student engagement and teachers becoming engaged with their students to foster the best results among students and help them embrace educational technologies. Low-SES students need an environment in which they can trust in their teachers and believe that they can achieve, and they
must be able to demonstrate this ability to others. If students cannot demonstrate this, they will find ways to avoid adverse situations because of a fear of failure. For example, they may cheat, underachieve, set goals that are too lofty, and even quit school (Schunk, 2016). However, it is difficult for teachers to create such a favorable environment when they do not have the technology self-efficacy, support, and professional development needed to do so (Ramey, 2016).

**Transforming Teaching Methods**

As previously stated, there is a significant shift in the issues and challenges that teachers of low-SES students face, as well as the tools these teachers and students have available to them. In fact, during the past decade, emotional intelligence has come to be considered one of the main components of leadership effectiveness in many different contexts, including the educational ones, especially that of classroom management (Sterian & Mocanu, 2015; Valente et al., 2019).

The current educational system was created to meet the standards of the Industrial Revolution during which the educational focus was on “acquiring the knowledge, on learning it by heart and merely reproducing it, on the respect for authority, on the skills to follow exactly some instructions, in a word on a mechanistic view of the world” (Mocanu & Sterian, 2013, p. 119). However, the past few years have garnered in a new series of changes in the educational environment worldwide. These changes, combined with the expansion of globalization, have led to a new educational paradigm in which technologies and the way people communicate are undergoing an evolution (Sterian & Mocanu; Valente et al., 2019).

The world is changing, and the traditional methods of teaching and learning can no longer keep pace with the rate of change. Therefore, to help foster the educational process for 21st-century students, the role of the teacher must fundamentally change from that of being a master of content to being a master of teaching students how to use content that is readily
available (Lawless, 2016). Further, 21st-century teaching and learning go beyond educational technology integration and STEM content; it is also about fostering new ways of thinking and promoting perspectives that support success with rapidly changing and expanding technologies (Ramey, 2016). Furthermore, the role of the 21st-century teacher is more focused on preparing students for adult life, careers, and college readiness. This preparation of students includes social-emotional aspects, proper use of social media, and how to use technology to integrate and incorporate learning. To fully prepare students, 21st-century teaching and learning requires educators to create environments and provide educational opportunities and experiences that encourage exploration and inquiry and nurture creativity and curiosity. Successfully integrating educational technologies into this new teaching and learning model not only contributes to deeper levels of engagement, but it also assists with enhancing problem-solving, critical thinking, collaboration, authentic learning, and cross-disciplinary teaching (Ramey, 2016).

**Challenges with Transforming Teaching Methods.** While there has been some progress toward attaining this new method of teaching in high-SES educational environments, low-SES educational systems still have significant challenges (Pick et al., 2015). Not only do the standards and purposes of education need to change in these districts, but these districts also need new curriculum frameworks, instructional methods, and assessment strategies (Carmel & Badash, 2018). This shift is very difficult for educators in low-SES districts to accomplish. For example, many students require differentiation of instruction and the ability to learn at their own pace. Savvy teachers who can multitask and create varied learning experiences for their students are needed. However, low-SES districts have a difficult time attracting and retaining teachers who are able to do this. As previously discussed, this work is more complicated and more demanding in low-SES districts than in high-SES districts, and it is common for the best teachers
to be drawn to these higher-SES districts (Delgado et al., 2015). Therefore, even though the literature indicates that 21st-century skills are vital to solving economic, civic, and global challenges and to engaging effectively in those spheres, it is very challenging to accomplish developing those skills in students in lower-income urban districts where those students are beginning their educational journey on the disadvantaged side of the digital divide (Delgado et al., 2015). If these challenges cannot be overcome in these schools and districts, teachers will continue to teach these students with outdated practices while their cohorts in neighboring districts are learning via 21st-century methods (Delgado et al., 2015). These neighboring districts will continue to graduate students who are able to compete for 21st-century jobs, while those struggling will continue to produce students who are unable to compete (Delgado et al., 2015).

**A Holistic and Comprehensive Approach is Needed.** The literature indicates that a holistic and comprehensive approach should be taken to address the educational technology integration and transformational teaching challenges faced by students in low-SES districts. This approach should include proper planning, professional development for teachers, proper funding, and an organizational culture where the positive effects can be increased (Davies, 2017; Henderson-Rosser & Sauers, 2017; Kim et al., 2019). With the proper approach, it is possible to overcome the common barriers so staff at low-SES districts can effectively integrate educational technology (Harris et al. 2016; Hershkovitz & Karni, 2018).

**Needed Improvement of Educational Technology Integration for Low-SES Students**

While research shows that there are numerous benefits to effective educational technology integration, the literature also shows ample room for improvement of ineffective educational technology integration (Harper & Milman, 2016; Hershkovitz & Karni, 2018; Puckett, 2014). For example, Havard et al. (2018) found that when educational technology is
effectively integrated into the math classroom, it has a positive impact on student learning. Conversely, they also found that when educational technology is integrated ineffectively, it can have a negative impact on student learning in these same classes (Havard et al., 2018).

Likewise, Delgado et al. (2015) found that the purchase and placement of educational technology resources in classrooms drastically increased, such that 97% of K-12 teachers now have one or more computers in their classrooms and the ratio of student-to-computers increasing from 11:1 to 1.7:1. However, they also found that only 40% of students use computers “often,” and only 29% use them “sometimes” (Delgado et al., 2015). These statistics indicate that, although educational technologies are being purchased, a comprehensive approach to educational technology integration is not occurring. Therefore, although the technology is in place, the value that technology could be bringing to the classroom is not being realized (Davies, 2017; Havard et al., 2018; Hershkovitz & Karni, 2018;)

**Improvement in Educational Technology Leadership**

The transition from ineffective to effective educational technology integration does not happen overnight or without ample leadership to model how it is to be done; it requires effective leadership, which can be a rare find in schools. As Masullo (2017) found, “many times, the people given the title of an administrator of the district or school are not prepared or qualified to be leaders in technology” (p. 58). This leaves districts and schools without the vision and direction needed to properly integrate educational technology into their classrooms (Masullo, 2017). Further, schools are left without the ability to individualize the learning of their teachers about how to integrate educational technology effectively, and many are not capable of providing feedback to teachers or increase their confidence in these efforts (Aljuzayri et al., 2017; Masullo, 2017).
To address this inability to individualize the learning of their teachers and conquer the challenge of effectively integrating educational technology into their classrooms, school leaders need to provide training and support, and then they need to monitor and evaluate the integration of educational technology by each of their teachers. When this does not occur properly, teachers are left on their own to figure out how to do this, if it is even possible, or worth the effort. To assist with this, school leaders can leverage the informal leaders within their organizations. These informal leaders are those who are not in an official leadership position but have the knowledge, skills, and abilities to influence the attitudes, behaviors, and skills of others in the school (Aljuzayri et al., 2017; Masullo, 2017).

**Impact on Low-SES Students**

The digital divide exacerbates the conditions of ineffective educational technology integration. While high-SES students are experiencing effective integration at much higher rates, low-SES students are being provided with technology tools but are not being taught how to use them (Cohron, 2015; Hohlfeld et al., 2017). The literature highlights that education and income are among the leading factors driving the overall digital divide in the United States (Cohron, 2015; Murry et al., 2018; Pick et al., 2015). Without disruption to the current trends, low-SES students will continue to fall further behind their counterparts from high-SES backgrounds in deep system use (Cohron, 2015; Eisenman, 2018; Pick et al., 2015). That is, low-SES students may now have access to technology, but their skills and abilities to use the technology will fall further and further behind those students at the top of the socio-economic scale (Eisenman, 2018; Pick et al., 2015; Vigor et al., 2014).

In an attempt to address this growing divide, the Federal Communications Commission (FCC) created the E-rate program under the Universal Service Administration Company (USAC)
and allocates up to $2.25 billion each year to assist public schools and libraries in obtaining services such as internet access, videoconferencing, phone service, and needed infrastructure, such as networking equipment (Cohron, 2015; Vigor et al., 2014). However, while this does assist those in low-SES school districts in providing a robust infrastructure for their students, it does not significantly impact how classroom technology is used by their students or improve how they use, adapt, and transfer technology skills (Cohron, 2015; Vigor et al., 2014). To do this will require an understanding of the barriers and bridges impacting effective educational technology integration and then working to build the ability for students and teachers to use, adapt, and transfer their technology skills (Cohron, 2015; Vigor et al., 2014; Wamuyu, 2017).

First- and Second-Order Barriers

To effectively integrate educational technology into classrooms requires a change in many aspects of teachers’ routines, including their personal beliefs about the educational process, classroom management skills, organizational practices, pedagogical knowledge, and classroom culture (Makki et al., 2018; Wang, 2017). While these changes are essential, teachers and administrators face barriers that prevent them from enacting these changes needed to integrate educational technology effectively. Ertmer (1999) is among many researchers who divided these barriers as first- and second-order.

First-Order Barriers

First-order barriers include poor technology integration, ineffective planning, a lack of appropriate funding, ineffective leadership, a school cultural environment which lacks a unified vision for classroom technology integration, poor teacher educational technology professional development, limited access to technology (hardware and software), teacher preexisting technology experience, and inadequate technology support (Akinde, 2016; Cheng, 2019;
Coleman et al., 2016). These barriers are extrinsic to the end-user and are able to be modified the individuals in charge of the district or school (Akinde, 2016; Cheng, 2019; Coleman et al., 2016). Likewise, understanding which of these barriers are negatively impacting educational technology integration and then improving upon them can create an environment which is more conducive to the effective integration of educational technology (Akinde, 2016; Cheng, 2019; Coleman et al., 2016).

**Poor Technology Integration.** Poor technology integration happens when there is not a clear vision of how technology should be used in a school or district. Without a clear vision, technology is selected and placed into classrooms, which does not align with the needs of the teachers or students (Tondeur et al., 2016). Although the importance of integrating technology into the classroom is well known, many schools and districts continue to use poor integration techniques when attempting to do so effectively (Salleh, 2016; Vongkulkuksn et al., 2018). This inadequate approach leaves teachers only being able to have their students learn technology and learn from technology rather than using technology as a learning partner. Therefore, these teachers are not using technology as a cognitive tool to facilitate authentic student learning and are instead still using it mostly for low-level drill-and-practice and other replacement functions. Additionally, with poor integration, the frequency in which teachers use technology is diminished, with only a third of teachers requiring their students to use computers more than a few times per week (Salleh, 2016; Vongkulkuksn et al., 2018).

**Ineffective Planning.** Proper and effective planning is critical to the successful implementation and integration of educational technology (Capraro et al., 2016; Hew & Tan, 2016; Nelson et al., 2019). Literature shows that effective planning requires more than just the logistical elements of getting educational technology into the hands of all users; it must
incorporate the professional and educational development for all students, teachers, and staff (Capraro et al., 2016). However, many districts do not take the time to perform the level of planning needed to ensure that proper integration can occur (Hew & Tan, 2016; Nelson et al., 2019). For planning to be effective, it must incorporate the logistical elements necessary to provide access to technology, new pedagogical beliefs and strategies, pre-integration professional development, ongoing professional development, communication planning, digital citizenship training for students, teachers, and staff (Capraro et al., 2016; Hew & Tan, 2016; Nelson et al., 2019). However, many districts face challenges with getting all of the planning elements completed and implemented correctly, and this leads to ineffective planning and deteriorates educational technology integration into their classrooms (Cho, 2017; Coleman et al., 2016; Hew & Tan, 2016).

**Lack of Appropriate Funding.** Literature shows that appropriate funding is a significant factor and a critical component of proper educational technology integration. Without appropriate funding, the ability to provide appropriate access to quality teacher educational technology professional development, adequate access to technology (hardware and software), and adequate technology support are severely negatively impacted (Joo et al., 2018; Vongkulluksn et al., 2018). However, even though appropriate funding is one of the most critical aspects of successful educational technology integration, many districts struggle to come up with and distribute the appropriate level of funding needed. Further, many districts focus funding on the purchase of technology while not adequately funding adequate teacher educational technology, professional development, and technology support. Without funding all the factors needed to for successful implementation, merely purchasing and deploying technologies into the classroom can actually lead to more harm than good as the technology becomes used for low-
level learning instead of profound enriched learning experiences (Joo et al., 2018; Makki et al., 2018).

**Ineffective Leadership.** Literature shows that adequate policies, procedures, and ongoing support are all essential to the integration of educational technology (Makki et al., 2018; Preston et al., 2015; Wang, 2017). However, the literature indicates that many researchers have found current policies, procedures, and ongoing support to be lacking in many of the schools which are attempting to integrate educational technology. For example, Wang (2017) found that, without supportive policies that assist in balancing teachers’ workloads, it is unlikely that teachers would be willing to add to their already busy and hectic workloads. Many teachers simply do not have the time or energy to add something more to their schedules and other obligations (Preston et al., 2015; Wang, 2017). Further, many administrators do not provide the support needed for their teachers to experiment with their curricula and lessons to make them more exciting and engaging with technology even though doing so has been shown to increase student engagement and increase standardized test scores (Ertmer & Ottenbreit-Leftwich, 2013). Without this type of support from their leaders, teachers feel stifled and are likely to fall back to their low-level use of educational technology in their classrooms (Ertmer & Ottenbreit-Leftwich, 2013; Preston et al., 2015).

**Poor School Culture.** The effective integration of educational technology is complex and relies heavily on the cultural, social, and organizational contexts in which teachers live and work. However, a majority of U.S. schools have still not embraced the concept of effective teaching that is centered on students learning with technology as a cognitive tool. This lack of buy-in leaves many teachers who do not understand how to or have the ability to integrate educational technologies as a student-centered authentic instruction (Gürfidan & Koç, 2016;
Simmons & Martin, 2016; Sun & Gao, 2019). Therefore, the teachers who are willing to integrate educational technologies into their classrooms are a small part of their school’s counterculture (Gürfidan & Koç, 2016; Sun & Gao, 2019).

Without the central culture of the organization shifting to encompass the needed values, norms, beliefs, and perceptions, the effective integration of educational technology would have been hampered. The literature shows that this culture should include the belief that educational technology must be used for dynamic learning and that this learning should be interesting for students (Gürfidan & Koç, 2016; Kelly, 2015; Sun & Gao, 2019). Further, the culture should “promote openness, colleagueship, professionalism, trust, loyalty, commitment, pride, continuous and collaborative learning, and academic excellence and cooperation, which are all required for developing a positive work environment” (Gürfidan & Koç, 2016, p. 104).

**Inferior Educational Technology Professional Development for Teachers.** When working to integrate educational technologies into classrooms effectively, simply pumping and dumping technologies is not effective. When pumping and dumping of technologies happen, it creates frustrated teachers who are unlikely to utilize the technology (Coleman et al., 2016; Lee et al., 2017; Makki et al., 2018). Instead, teachers need to be trained in how these technologies function as well as be trained in how to use these technologies effectively as part of their curriculum (Coleman et al., 2016; Lee et al., 2017; Makki et al., 2018).

However, in many schools, strategic and systematic efforts have not been developed to provide this training to teachers. Instead, the focus is placed on providing technologies, and teachers are left on their own to figure out how to use them best. This process leads many teachers to either reduce their use of these technologies or not use them at all (Joo et al., 2018; Lee et al., 2017). Furthermore, while educational technology professional development has been
shown to assist in overcoming first-order barriers, this has only been shown to work in cases which professional development activities connect with teachers’ teaching practices (Coleman et al., 2016; Lee et al., 2017; Makki et al., 2018). Additionally, Coleman et al. (2016) found that successful teacher professional development includes models that allow teachers to learn the way that they are expected to teach their students. However, many schools and districts have not been able to accomplish this and still provide inadequate professional development, which does not center on administrative uses, research, and communication (Coleman et al., 2016; Joo et al., 2018; Lee et al., 2017).

**Limited Access to Technology.** While we are now several years into the 21st century, only 39% of public schools have the capability to provide their entire school with access to highspeed Wi-Fi (Makki et al., 2018). Further, numerous students still attend school without access to the internet and or access to a one-to-one device ratio (Makki et al., 2018; Wang, 2017). This lack of access mostly impacts low-SES districts with minority students. In fact, Makki et al. (2018) found that 56% of teachers at low-SES schools believe that a lack of access to effective digital resources impedes their ability to teach their students. Additionally, only 12.9% of teachers in Makki et al.’s (2018) study “agreed or strongly agreed that in-class computer access was sufficient” (p. 94).

In addition to needing adequate access to technology while at school, students need access to these technologies and high-speed internet access at home in order to maximize the possible educational gains (Hull & Dutch, 2019; Wang, 2017). The literature shows several studies which have found that students not having the digital devices or highspeed internet available for them to do their assignments at home is a significant impediment to teachers who are trying to integrate educational technology into their classrooms effectively. This digital
access impediment is especially important and challenging for districts and schools that have low-SES students. In this case, many of their students will not already have access to adequate devices or high-speed internet at home (Hull & Dutch, 2019; Selwyn et al., 2017; Wang, 2017).

**Teacher Preexisting Technology Experience.** Over the past several decades, educational technologies have made their way from the science and math classrooms to the general classroom. In many U.S. schools, these educational technologies have permeated nearly every facet of the teaching and learning environment. However, while new technologies are continually being introduced into U.S. classrooms, the ability for teachers to effectively integrate these technologies has created mixed results (Sanders & George, 2017). That is, while there is more technology available, the availability is not equal across all schools, and many teachers do not have prior experience with technology (Grigoryan & Babayan, 2015; Helding, 2011; Wang et al. 2014). In fact, literature shows that modern U.S. students come into the classroom with more general technology experience than their teachers.

Today’s students are digital natives who were born into a world of technology and have grown up alongside it. However, many teachers are digital immigrants who grew up without abundant access to technology. As a result, teachers have had to migrate over to using it in their personal and professional lives (Grigoryan & Babayan, 2015; Kurniawati et al., 2018; Wang et al., 2014). Wang et al. (2014) stated that this assumption presumes digital immigrant teachers are less technology savvy than the digital native teachers and students, resulting in a disconnect between students’ technology experiences inside and outside of the formal school setting.

Digital immigrants are defined as those born before 1980. The first generation of digital natives are those born from 1980 to 1990; the second generation of digital natives are those born between 1990 and 2000; and the third generation of digital natives is the current generation of
teenagers who were born around the year 2000 (Grigoryan & Babayan, 2015; Howlett & Waemusa, 2018, Kurniawati et al., 2018; Wang et al., 2014). While the teachers who have entered the field in the past 15 years are more likely to be the first and second generation of digital natives, teachers born before 1980 are most likely digital immigrants (Howlett & Waemusa, 2018; Jarrahi & Eshraghi, 2019). This disparity between digital immigrant teachers and digital native students creates an educational environment in which students have inverse technology experience relationships with many of their teachers (Grigoryan & Babayan, 2015; Howlett & Waemusa, 2018; Kurniawati et al., 2018).

When teachers are digital immigrants, their students are likely to rely heavily on the internet to search for information to support learning, but their internet activities are likely to be restricted due to the classroom time, lack of sufficient technology resources, or teachers’ lack of technology integration plans. Further, students of teachers who are digital immigrants are less likely to recognize the benefits that educational technologies could have in the classroom, and their educational technology use is mostly limited to using word processing tools for writing, conducting research activities via the internet, sending emails, preparing and giving presentations, performing drill and practice activities, and using spreadsheets to manage data (Grigoryan & Babayan, 2015; Howlett & Waemusa, 2018; Kurniawati et al., 2018).

There is a significant negative impact on student learning when teachers are digital immigrants. That is, instead of using the full power of educational technology to enable deep learning, teachers who are digital immigrants merely replace their traditional classroom modalities and practices with their digital counterparts; doing this limits the impact that classroom technology can have as these teachers are not leveraging educational technologies to integrate new and improved teaching and learning methods such as differentiated learning, deep
learning, project-based learning, or facilitated learning (Grigoryan & Babayan, 2015; Kurniawati et al., 2018; Wang et al., 2014).

**Inadequate Technology Support.** When integrating educational technology, teachers need to know that they will be supported when technical issues arise. Technological devices break, and when they do, teachers can be left in a significant bind and without the ability to use educational technology in their lesson at that time. Teachers need to be able to know the technology will work and know those who are responsible for keeping it working (Akinde, 2016; Coleman et al., 2016; Makki et al., 2018). When this does not occur, it can harm teachers’ self-efficacy, perception, and beliefs surrounding the use of educational technologies in their classrooms.

**Second-Order Barriers**

Second-order barriers are intrinsic to teachers. These barriers include teachers’ knowledge and skill of how to effectively use classroom technologies, their beliefs surrounding the value which technology has on learning, and the perceived difficulty of incorporating technology into their classrooms (Kelly, 2015; Salleh, 2016; Vongkulluksn et al., 2018). Further, many teachers do not integrate educational technology into their classrooms due to an actual or perceived low level of skills, a high level of negative attitudes toward computing in the classroom, and high levels of anxiety about using computers with and teaching computing to their students (Coleman et al., 2016). Ertmer (1999) found that these negative beliefs, coupled with high levels of educational technology anxiety and other beliefs surrounding the role of technology in the teaching process, further prevented teachers from using authentic and student-centered practices in their teaching.

Unfortunately, these second-order barriers are preventing many U.S. students from
obtaining the skills needed to thrive in the 21st century (Coleman, 2016). Further, Ertmer et al. (2012) found that these student-centered beliefs could overcome numerous substantial first-order barriers that teachers commonly encounter when integrating educational technology into their classrooms. Ertmer and Ottenbreit-Leftwich (2013) believed this suggested that, while first-order barriers are essential factors in the integration of educational technology, the best approach is to address second-order barriers first.

**First- and Second-Order Barriers and the TAM**

While Ertmer’s (1999, 2005) first- and second-order barriers provide actual limitations to successful educational technology integration, by aligning them to the TAM, it can be seen that they also negatively impact the perceived usefulness, perceived ease of use, and teachers’ attitudes toward using technology (Akinde, 2016; Cho & Littenberg-Tobias, 2016; Higgins & BuShell, 2018). As shown in Figure 2, for the purpose of this study, the first- and second-order barriers (Ertmer, 1999) have replaced the external variables in the TAM (Davis, 1989) and impact perceived usefulness and perceived ease of use.

**Figure 2**

*Technology Acceptance Model with First- and Second-Order Variables*
The first-order barriers of poor technology integration, ineffective planning, a lack of appropriate funding, ineffective leadership, a school cultural environment that lacks a unified vision for classroom technology integration, poor teacher educational technology professional development, limited access to technology (hardware and software), teacher preexisting technology experience, and inadequate technology support impact both perceived usefulness and perceived ease of use (Akinde, 2016; Cheng, 2019; Joo et al., 2018). The second-order barrier of self-efficacy can be aligned with the perceived ease of use. Also, the beliefs surrounding the value that technology has on learning can be aligned with perceived usefulness, and the perceived difficulty of incorporating technology into their classrooms can be aligned with perceived ease of use (Akinde, 2016; Cheng, 2019; Joo et al., 2018).

**Factors Can be Barriers or Bridges**

Research shows that the factors that serve as first- and second-order barriers can also serve as enablers for effective educational technology integration. That is, when these factors of leadership, planning, teacher educational technology professional development, access to technology (hardware and software), technology support, a school cultural environment with a unified vision for classroom technology integration, user demographics, and funding are working well, they can serve as bridges to effective integration (Ertmer, 1999; Simmons & Martin, 2016).

In fact, many studies that suggest improvements to educational technology integration, propose goals, objectives, and actions which focus on switching these factors from negative to positive or from barriers to bridges (Akinde, 2016; Kim et al., 2019; Marangunić & Granić, 2015). One of the most common factors mentioned among the literature is teacher educational technology professional development (Doron & Spektor-Levy, 2019; Hull & Duch, 2019; Simmon & Martin, 2016). For example, Joo et al. (2018) found that teachers Technology
Pedagogy and Content Knowledge (TPACK) had a direct impact on their self-efficacy, perceived ease of use, and perceived usefulness. That is, if TPACK was low, teachers were not likely to adopt educational technologies in their classrooms. However, if TPACK was high, they were likely to adopt technologies (Joo et al., 2018). Joo et al. (2018) recommended that to increase the teachers’ TPACK, professional development should focus on the development of what Blau et al. (2016) referred to as digital wisdom.

The ideas mentioned above indicate that a study that focuses on identifying which of these factors are negative and positive at Liberty High School is essential and creating a plan to improve the negative factors should result in an improvement to the educational technology integration at the school. For example, Blau et al.’s (2016) conducted a qualitative study of seventh-grade students and their teachers. They found that a professional development process that helped teachers develop “digital wisdom” and shift their roles from a “sage on the stage” to a “guide on the side” enabled them to shift from lecturing to monitoring, have better classroom management and facilitation, and have higher levels of technical knowledge (Blau et al., 2016).

**Summary**

The literature highlighted the notion that ineffective educational technology integration is a significant burden that several K-12 districts and schools are currently facing (Davies, 2017; Puckett, 2014; Schrum, 1999). Further, as an urban school with a high percentage of students from low SES backgrounds, Liberty High School is faced with the common first- and second-order barriers to effective educational technology integration as well as additional barriers faced explicitly by urban schools with many students from low SES households, including digital inequality and a significant digital divide (Cohron, 2015; Eisenman, 2018; Makki et al., 2018).

This chapter provided a review of the TAM as the theoretical framework used for this
study. Further, a review of the existing literature discussed the history of educational technology integration, the benefits of effective educational technology integration, the needed improvement of educational technology integration, first- and second-order barriers, additional barriers for low-SES urban school districts and schools, and the premise that factors can be barriers or bridges.

It is not known which of the factors of leadership, planning, teacher educational technology professional development, access to technology (hardware and software), technology support, a school cultural environment with a unified vision for classroom technology integration, user demographics, and funding are working as barriers and which are working as bridges. However, the utilization of the TAM as the theoretical framework for this multimethod applied research study can assist with discovering which first- and second-order barriers are preventing the educators at Liberty High School from effectively integrating their educational technology. Additionally, this study could assist in designing an educational technology integration improvement plan to address the problem.
CHAPTER THREE: METHODS

Overview

Liberty High School in Kansas City, Missouri, has a problem with ineffective educational technology integration. Ample evidence exists to support that effective integration of educational technology has a multitude of benefits for teachers and students (Kelly, 2015; Makki et al., 2018; Masullo, 2017). However, the teachers and administrators at Liberty High School were not adequately integrating educational technology into their classrooms. While they were attempting to use the technologies in their classrooms, the simple placement and use of educational technologies were not enough to create significant increases in educational gains for students (Vongkulluksn et al., 2018).

The purpose of this research was to determine the current barriers preventing the effective integration of educational technology at a low-SES urban high school in Kansas City, Missouri. For the past several years, educational leaders have placed an increased focus on bringing technology resources into the K-12 classroom with the hopes that this new focus would lead to better educational outcomes for students. However, the simple placement of technology resources into K-12 classrooms has not shown a significant increase in educational gains for students. In fact, without a shift in the perspectives and practices of teachers, they were not able to answer the call to integrate educational technology into their classrooms successfully.

Also, the research sought to create a plan to successfully overcome these barriers and positively impact the adoption and effective integration of educational technology by the school’s teachers and administrators. This chapter begins with a description of the design used to collect and analyze data. Next, the research questions are stated, and the setting of the study is described. Then, an explanation of the researcher’s role in the study is provided, which includes
the researcher’s motivation for conducting this study, the researcher’s relationship with
participants, the researcher’s biases and assumptions, the research design, and implications
related to data collection and analysis. Further, the procedures and data analysis of this study are
identified. The data collection includes interviews with school and district administrators, a focus
group with five Liberty High School teachers, and a quantitative survey. Finally, the contents of
the chapter are summarized.

**Design**

The design for this applied study centered on a multimethod design which incorporated
both qualitative and quantitative methods. The design consisted of the qualitative methods of
face-to-face interviews with the district level leaders and Liberty High School administrators and
a focus group with five Liberty High School teachers. The quantitative method included a
quantitative survey of the high school’s teachers.

Applied research is distinguished from basic research in that it is used in an attempt to
use knowledge to solve real-world problems as opposed to seeking out new knowledge for the
sake of discovering new knowledge (Bickman & Rog, 2009). Additionally, applied research has
a significantly different contextual approach in which the researcher studies phenomenon in real-
world settings rather than in closed environments. Finally, the methods used in applied research
vary from those in basic research, and the focus of applied research is on external validity
(Bentley et al., 2015; Bickman & Rog, 2009; Shalfawi, 2016).

The applied research multimethod design was the best fit for this study for several
reasons. First, the purpose of this study was to use the knowledge gleaned from the data
collection and analysis to produce a plan that may improve the current state of educational
technology integration for this high school. Also, this study required that a multimethod
approach consisting of both quantitative and qualitative methods was used to strengthen conclusions and create a full picture of the phenomenon (Schoonenboom & Johnson, 2017; Turner, et al., 2017). That is, by using the TAM as the theoretical framework for the qualitative interviews and focus group as well as the quantitative survey, it was possible to develop a more robust understanding of the barriers preventing effective educational technology integration at Liberty High School (Schoonenboom & Johnson, 2017; Turner, et al., 2017).

**Research Questions**

**Central Research Question**

How can educational technology integration be improved at Liberty High School in Kansas City, Missouri?

**Sub-Question 1**

How would administrators in an interview solve the problem of inadequate educational technology integration at Liberty High School?

**Sub-Question 2**

How would educators in a focus group solve the problem of inadequate educational technology integration at Liberty High School?

**Sub-Question 3**

How would quantitative survey data solve the problem of inadequate educational technology integration at Liberty High School?

**Setting**

The setting for this study was Liberty High School, a low-socioeconomic high school in the urban core of Kansas City, Missouri. Liberty High School was established in the early twentieth century and was closed in the late twentieth century. It was then reopened as an
elementary school and finally again became a high school in the early 2000s (kcpublicschools.org, 2019). At the time of this study, Liberty High School was one of the largest high schools in Kansas City, Missouri, and was one of the most diverse high schools in Missouri (niche.com, 2018).

**History of the Site**

Liberty High School has struggled to integrate educational technology resources successfully. The district launched a one-to-one initiative in the 2014-2015 school year, providing each student in grades K-12 with a laptop. As part of the initiative, high school students were required to take their laptops home each night and bring them back to school the next day. However, training was not provided to teachers or administrators. Also, the district did not put a digital citizenship program into place or invest in an inventory system. Therefore, the students were not educated on what their responsibilities were for taking care of the technology.

As a result of the lack of accountability and tracking, the district has spent an average of $250,000 per year on lost and stolen laptops and an average of $500,000 per year on repairing damaged laptops. In addition to the fiscal impact, the chaos produced by the inefficient and ineffective integration has prevented teachers from using laptops in their lessons because many of their students are not bringing their laptops to class. As previously mentioned, the purchasing and placement of educational technology into classrooms must be coupled with a comprehensive integration approach, and this had not happened at Liberty High School (Delgado et al., 2015).

Further, while other schools in the district were facing similar issues, Liberty High School was the school impacted the most by these challenges. For example, Liberty High School had 270 missing devices at the end of the 2018-2019 school year, which equates to 25% of its students not returning their devices to the school. This number was almost twice as large as the
other district high schools. Worse, this number was compounded by the 250 laptops that were purchased to replace lost and stolen laptops during the 2018-2019 school year for Liberty High School. In total, this equates to 520 lost or stolen laptops, which was 47% of the total laptops needed for the school. Further, this evidence demonstrated a low level of perceived usefulness and perceived ease of use among students, teachers, and administrators, was negatively impacting their attitude toward using and behavioral intention to use and created a culture of low actual use at Liberty High School (Abdullah et al., 2016; Joo et al., 2018).

The Rationale for Site Selection

Liberty High School was an ideal site for this study due to the challenges faced by students and staff, as well as the administration’s desire to overcome these challenges and become an educational technology-focused school. The principal of the school strongly desired to create an educational technology transformation in his classrooms. Therefore, it was believed that this school would be open to the study and that the results of the study would be implemented.

Participants

The participants in this study included four male administrators, and one female administrator that participated in the district and school administrator interviews. Additionally, one male teacher and four female teachers participated in the teacher focus group. Because all 68 teachers at the school were selected to participate in the quantitative survey, random sampling was not conducted for this portion of the study; instead, a census survey was conducted. Also, because a subset of the school’s administrators was selected for in-person interviews, a purposeful nonprobability sampling was conducted to deliberately select these individuals (Bickman & Rog, 2009; Onwuegbuzie & Collins, 2017; Palinkas et al., 2015). Similar to the
school administrators, the district administrators were deliberately selected to be interviewed for this study. It was believed that the specific roles these district administrators held provided them with unique perspectives that are vital to the research. These participants included the district’s Director of Instructional Technology, Assistant Superintendent of School Leadership, Principal of Liberty High School, and two Assistant Principals of Liberty High School.

According to Niche (2018), at the time of this study the school had approximately 1100 students in grades 9-12. One hundred percent of the students were eligible for free lunch, only 46% of the students were proficient in reading, and only 47% of the students were proficient in math. Demographic data included: 42.6% of the students were Hispanic, 38.6% were African American, 9.5% of the students were Asian, and 8.6% were Caucasian. Additionally, 47% were female, and 53% were male. The school had a 17:1 teacher-student ratio, with 29.4% of the teachers in their first or second year (Niche, 2018).

**The Researcher’s Role**

In June 2018, I was hired as Director of Technology for this school district. In this position, I was to be a change agent and improve the state of their educational technology. That is, the core purpose of my position was to ensure the successful integration of educational technology throughout the district. This included providing the resources and support needed to assist in preparing our students for the 21st century. As such, I had a vested interest in assisting Liberty High School to improve its implementation of educational technology. Further, conducting this study was a crucial component in assessing the challenges and barriers impacting the successful integration of educational technology and creating a plan to improve the state of educational technology integration. Further, once this research was finalized and the plan was
successfully implemented at Liberty High School, the plan could be used for the other schools within the district.

**Relationship with Participants**

At the time of this study, I was a district-level administrator. In that position, the principal and other administrators of Liberty High School reported to my peers. Importantly, I did not have any direct oversight or supervision of any of the participants in this study. I conducted the study and used the findings of the study to create a Technology Improvement Plan (TIP) for Liberty High School. I then intended to work with the school’s administrators and teachers to implement the TIP. Upon successful implementation of the TIP, I intended to use the plan with other schools in the district.

**Bias and Assumptions**

As the Director of Technology for the district in the study, I did have a vested interest in improving the state of educational technology integration in the district. This vested interest provided me with a particular bias in the form of believing that there was an issue and that real-world solutions needed to be found that could be implemented to produce measurable results (Bickman & Rog, 2009). It was important to note that I was a student in this district from Kindergarten through seventh grade. However, I did not attend the school that I selected for this research study.

**Research Design and Implications on Data Collection and Analysis**

My role as the researcher in this study fell within the scope of this research design. I did have access to the participants and the data needed for qualitative analysis. Also, I created and distributed the survey, conducted the focus group, and conducted all the in-person interviews. I did my best not to let personal biases influence the interviews or focus and relied on statistical
analysis for the results of the survey (Bickman & Rog, 2009). I limited my personal bias by
doing my best to adhere to the prewritten questions, not asking leading questions, and allowing
the participants to clarify their thoughts (Bickman & Rog, 2009). Further, allowing interview
participants to read, correct, and approve the final transcript of their interviews assisted in
minimizing my personal bias by ensuring that their words had been appropriately captured
(Bickman & Rog, 2009).

**Procedures**

This study consisted of three data collection methods: school and district administrator
interviews, a focus group of Liberty High School teachers, and a quantitative survey. Further,
permission from the IRB was obtained (see Appendix A). Written permission to conduct the
study was obtained from the Superintendent of the district (see Appendix B). The Superintendent
was responsible for approving all research conducted within the district. Also, permission was
obtained from the principal of Liberty High School (see Appendix C).

**Data Collection and Analysis**

Three data collection methods were used for this applied dissertation. The first method
was qualitative; it was in the form of face-to-face interviews via Microsoft Teams with the
administrators at the school and in the school district. The second method consisted of a
qualitative focus group that was made up of Liberty High School teachers. The third method was
a quantitative survey.

**School and District Administrator Interviews**

The first sub-question for this study explored how administrators in an interview would
solve the problem of inadequate educational technology integration at Liberty High School in
Kansas City, Missouri. A total of five interviews were conducted. These interviews were
conducted with Liberty High School administrators, including the principal and two vice principals. Additionally, interviews were conducted with district administrators to include the Director of Instructional Technology and Assistant Superintendent of School Leadership. All school and district administrators signed the consent form for participants (see Appendix E).

Interviews were conducted in an office type setting to encourage minimal distractions, and all interviews were audio- and video-recorded and transcribed. All interviews were semi-structured and used open-ended questions. All questions were prepared in advance, and the same questions were asked to all of the school and district administrators (Bickman & Rog, 2009; Sorsa et al., 2015). Administrators chosen to participate in interviews received invitations via email. The invitations included the interview protocol, the purpose of the study, information on how long the data will be kept, as well as my status as a doctoral candidate.

**Interview Questions**

The interview questions for school and building administrators utilized the TAM as the theoretical framework and focused on teacher self-efficacy, technology anxiety, technology support, perceived ease of use, perceived usefulness, attitude toward using, and behavioral intention to use. After participants consented to participate in the study, the following 17 questions were utilized in the interviews:

1. Please tell me about your educational background and if you received training in educational technology integration?

   This question was aimed to determine the administrator’s educational level and if their educational process contained the attainment of knowledge around educational technology. By asking this question, the researcher was able to glean the administrator’s educational technology preparation in their personal, formal educational setting. Formal preparation in educational
programs has been shown to be a significant indicator of educational technology integration success (Barbarin & Aikens, 2015).

2. Please tell me about your professional background and your previous experiences with educational technology integration?

The purpose of this question was to determine to what extent the administrator had professional experience with educational technology integration. A leader’s previous experience with educational technology integration is a significant indicator in future successful integrations (Grigoryan & Babayan, 2015; Helding, 2011; Wang et al., 2014).

3. What does educational technology mean to you?

The purpose of this question was to ascertain the beliefs that the administrator held about the meaning of educational technology. An administrator’s beliefs around the meaning of educational technology can have a significant impact on the extent that educational technology is integrated into the classroom (Hohlfeld et al., 2017, Makki et al., 2018).

4. Please describe your view of the importance of educational technology integration to the success of the students at Liberty High School.

The purpose of this question was to discover the beliefs that the administrator had surrounding the value of educational technology for student success. Administrators understanding the perceived usefulness that educational technology brings to students is critical in the successful integration and implementation of educational technology (Akinde, 2016; Delgado et al., 2015).

5. Please describe your personal level of comfort with educational technology.
The purpose of this question was to determine the administrator’s level of anxiety with educational technology. Anxiety has a direct impact on perceived ease of use, perceived usefulness, and the intention to use technology (Cheng, 2019; Davis, 1989; Joo et al., 2018).

6. How important do you believe that it is to use educational technology in Liberty High School classrooms?

The purpose of this question was to determine the administrator’s individual perceived usefulness of educational technology in the classroom. Perceived usefulness has a direct and significant impact on the level of effective educational technology integration in the classroom (Cheng, 2019; Davis et al., 1989; Joo et al., 2018; Venkatesh & Bala, 2008).

7. What has your experience been with technology support for Liberty High School?

The purpose of this question was to determine the value and current satisfaction that the administrator had with the technology support that they had been provided. Technology support has a direct impact on technology self-efficacy and technology anxiety and can impact how comfortable the administrator is with attempting to implement educational technologies into the classroom (Akinde, 2016; Cheng, 2019; Davis et al., 1989).

8. Please describe how successful you feel the current level of educational technology integration is at Liberty High School.

The purpose of this question was to determine if the administrator felt that the current level of educational technology integration was satisfactory or if they felt it needed to be improved. An administrators' beliefs about the current state of educational technology integration can have a direct correlation with the amount of effort they will put into improving it (Akinde, 2016; Cheng, 2019; Joo et al., 2018).
9. Please describe the level of confidence you believe that Liberty High School teachers have in their skills and ability to integrate educational technology into their classrooms.

The purpose of this question was to uncover how the administrator felt about Liberty High School teachers’ self-efficacy and anxiety. Understanding the level of self-efficacy and anxiety is critical for administrators to accurately understand the amount of focus needed on professional development in this area (Cheng, 2019; Davis et al., 1989; Joo et al., 2018; Vongkulluksn et al., 2018).

10. Do you feel that technology anxiety has an impact on Liberty High School teachers’ ability to integrate educational technology into their classrooms? If so, how strong do you believe that impact is?

The purpose of this question is to determine if the administrator believes in the negative impact of technology anxiety and if they believed that these negative impacts had effected Liberty High School teachers (Cheng, 2019; Davis et al., 1989; Joo et al., 2018; Vongkulluksn et al., 2018).

11. What do you believe the quality of technology support experiences for Liberty High School teachers has been?

The purpose of this question was to determine the value and current satisfaction that the administrator believed that the Liberty High School teachers had with the technology support that they were being provided. Technology support has a direct impact on technology self-efficacy and technology anxiety and can impact how comfortable the teachers are with attempting to implement educational technologies into their classrooms (Akinde, 2016; Cheng, 2019; Davis et al., 1989).
12. How easy is it for Liberty High School teachers to use their educational technology in their classrooms?

This question focused on the perceived ease of use for the teachers of Liberty High School and was used to determine the administrator’s belief surrounding their teachers’ beliefs. Administrators having an accurate view of their teachers’ perceived ease of use has a significant impact on their willingness to place focus and resources on overcoming the issues of ineffective educational technology integration (Delgado et al., 2015).

13. What can you tell me about the educational technology professional development that Liberty High School teachers have received?

The purpose of this question was to determine the extent that the administrator tracked and understood the importance of educational technology professional development. This professional development is significant in decreasing teacher technology anxiety and increasing their technology self-efficacy (Cheng, 2019; Davis, 1989; Joo et al., 2018).

14. How effective do you believe this professional development has been?

The purpose of this question was to determine how the administrator felt about the success of previous professional development for teachers, and if this aligned with how the teachers felt. Professional development is significant in overcoming the first-order barriers of educational technology integration (Cheng, 2019; Davis et al., 1989; Joo et al., 2018; Vongkulluksn et al., 2018).

15. What barriers do you believe are preventing the teachers at Liberty High School from successfully integrating educational technology into their classrooms?

The purpose of this question was to determine what first- and second-order barriers were in existence and actively preventing the successful integration of educational technology.
Understanding which of these barriers were currently in place aided in the determination of the bridges which could be used to overcome those barriers (Kelly, 2015; Salleh, 2016).

16. What do you believe could be done to improve the current state of educational technology integration at Liberty High School?

The purpose of this question was to determine what the administrator believed could be done to improve the situation. As a leader, the administrator’s beliefs and intentions regarding the improvement of the educational technology integration were significant in the creation of a successful improvement plan (Aljuzayri et al., 2017; Masullo, 2017).

17. Is there anything you would like to add that has not been covered?

**Focus Group**

The second sub-question for this study explored how educators in a focus group would solve the problem of inadequate technology integration at Liberty High School in Kansas City, Missouri. Conducting a focus group with five Liberty High School teachers assisted in discovering the deeper reasons behind why educational technology was not being integrated, how it could have been better integrated, and what type of integrations would have been most effective. Additionally, conducting a focus group with Liberty High School teachers also helped to better explain the quantitative survey data and the data collected from the qualitative interviews (Bickman & Rog, 2009; Kite & Phongsaven, 2017; Rothwell et al., 2016; Traynor, 2015). The focus group was conducted via Microsoft Teams. The five teachers were selected from all teachers at the school, and an attempt was made to have teachers participate in the focus group who represented several different core and elective subject areas, as well as a range of years of teaching experience. A list of focus prompts was used to keep the discussion focused on the topics while allowing the participants to take ownership of the conversation (Bickman &
Rog, 2009; Traynor, 2015). All selected teachers signed the consent form for participants (see Appendix E).

**Focus Group Questions**

The video- and audio-recorded focus group centered around the topic of first- and second-order barriers, which the teachers believed were preventing effective educational technology integration at Liberty High School. To accomplish this, the focus group focused on three topics (Jung & Ro, 2019; Rothwell et al., 2016; Traynor, 2015). These topics included the deeper reasons behind why educational technology is not being integrated, how it could be better integrated, and what type of integrations would be most effective. Additionally, probing questions were asked when it was determined that the group is not going deep enough or was not discovering important information on the topics (Bickman & Rog, 2009; Jung & Ro, 2019; Trayor, 2015). These probing questions focused on perceived usefulness and perceived ease of use and include:

1. Why do you think educational technology is not effectively integrated into Liberty High School classrooms?

   The purpose of this question was to ascertain the teachers’ viewpoint surrounding which first- and second-order barriers were impacting the successful integration of educational technology. The teachers’ perspective in this area was crucial for understanding their perceived ease of use, perceived usefulness, attitude toward using, and their behavioral intention to use (Salleh, 2016; Vongkulluksn et al., 2018).

2. What things can be done to better improve the integration of educational technology at Liberty High School?
The purpose of this question was to determine what the teachers at Liberty High School believed regarding how to improve the ineffective educational technology integration at their school. The feedback from the teachers was a significant factor in understanding the scope of the current problem. This information was also important in the creation of a successful improvement plan (Havard et al., 2018; Murry et al., 2018; Vongkulluksn et al., 2018).

3. Is educational technology useful to teachers at Liberty High School?

The purpose of this question was to determine the perceived usefulness of educational technology for the teachers at Liberty High School. If the teachers did not believe that educational technology is or could be useful in the fulfillment of their jobs, then buy-in for an improvement plan would have been very low (Kelly, 2015; Salleh, 2016; Vongkulluksn et al., 2018).

4. What type of educational technology would be most useful?

The purpose of this question was to determine which educational technologies the teachers already have an established perceived usefulness belief for. This information assisted in understanding the types of technologies they already found useful as well as understanding what level of educational technology integration would be accepted by them. Perceived usefulness directly impacts a user’s attitude toward using technology, and numerous studies have shown that it is the most significant factor in predicting and explaining a user’s adoption or rejection of technology (Davis, 1989; Davis et al., 1989; Joo et al., 2018; Porter & Donthu, 2006).

5. What type of training or professional development would be most useful?

The purpose of this question was to determine an acceptable starting point for professional development for Liberty High School teachers. By discovering and focusing on their perceived
usefulness of specific training, it would be possible to develop professional development, which could be more readily accepted by the teachers (Lawless, 2016).

6. How does technology support play a role in educational technology integration?

The purpose of this question was to determine how the teachers felt about the level of the technology support they were receiving. Technology support is a significant indicator of whether educational technology becomes used for low-level learning instead of profound enriched learning experiences (Joo et al., 2018; Makki et al., 2018).

7. How does technology anxiety impact educational technology integration?

The purpose of this question was to determine how the teachers felt about their current level of technology anxiety. Technology anxiety is an indicator of how successful professional development and technology support are at preparing and support the teachers’ use of educational technology (Joo et al., 2018; Makkie et al., 2018).

Quantitative Survey

The third sub-question for this study explored how quantitative survey data would solve the problem of inadequate educational technology integration at Liberty High School in Kansas City, Missouri. The delivery of this survey was via a single static web page that will allowed the respondents to view all the questions on one page without having to view additional pages. Further, the web survey tool, Survey Monkey, was utilized to administer the survey. The link to the survey was emailed to the participants with verbiage, which stated the purpose of the survey, that the survey was voluntary, and that they could opt-out by not clicking the link (Bickman & Rog, 2009). Once the participants clicked on the link, they were taken directly to the survey. The first page of the survey was the consent form for participants (see Appendix E). All participants signed the consent form in order to move to the survey questions. Participants were again able to
opt-out of the survey by closing the survey and not proceeding any further. To allow for quantitative analysis of the data, the survey response style included close-ended questions. The respondents were able to use sliders on a Likert-type slider scale to roughly gauge how they felt their answer best fit their intended response (Bickman & Rog, 2009; Magro et al., 2015; McPeake et al., 2014).

Once participants chose to opt-in, they were moved to the second page of the survey, which included instructions listed on the top of the page. These instructions informed each respondent to read each question and then to move the slider to the number that corresponded to the answers that they agreed with the most. To submit the surveys, respondents clicked the “submit” button at the bottom of the survey. Once the respondent clicked this button, they were taken to a screen that informed them they had completed the survey. Because participants could do all of this inside the Survey Monkey website link and not have to email their survey to the researcher, the respondents were able to experience a higher level of anonymity (Bickman & Rog, 2009; Magro et al., 2015; McPeake et al., 2014). Also, their responses were saved in Survey Monkey and added to the aggregated quantitative data in Survey Monkey.

Survey Questions

The survey questions utilized the TAM as the theoretical framework and focused on educator beliefs (self-efficacy and technology anxiety), technology support, perceived ease of use, perceived usefulness, attitude toward using, and behavioral intention to use. After participants consented to participate in the study, the following 24 questions were utilized for the survey:

1. How confident do you feel in your ability to integrate educational technology into your classroom?
The purpose of this question was to gauge the participant's self-efficacy for integrating technology. A teacher’s self-efficacy for integrating technology has a direct impact on their perceived ease of use and perceived usefulness (Abdullah et al., 2016; Cheng, 2019; Parkman et al., 2018).

2. How confident do you feel using educational technology which you have never used before?

This question was designed to gauge the participant's level of self-efficacy and technology anxiety. Both teacher technology self-efficacy and technology anxiety have a direct impact on perceived ease of use and perceived usefulness (Abdullah et al., 2016; Cheng, 2019; Parkman et al., 2018)

3. How confident do you feel that your professional development experiences have prepared you to integrate educational technology into your classroom?

The purpose of this question was to gauge how prepared the participant believes they had become based on their professional development for educational technology integration. Professional development focused on educational technology integration has been shown to increase teachers’ self-efficacy and lower technology anxiety (Abdullah et al., 2016; Cheng, 2019; Parkman et al., 2018)

4. How well do you feel you were prepared by your teaching certification program to incorporate educational technology into your teaching?

This question was designed to gauge the level of preparation that the participant believed they received as part of their certification program. This type of preparation has been shown to impact teacher self-efficacy (Abdullah et al., 2016; Cheng, 2019; Parkman et al., 2018).

5. How confident do you feel that you can ask for help in integrating educational technology into your classroom?
The purpose of this question was to gauge the level of access to educational technology integration support that the participant believed they had. This perceived level of support has been shown to directly impact the successful integration of classroom technology by impacting teacher self-efficacy, technology anxiety, and perceived ease of use (Hohlfeld et al., 2017; Makki et al., 2018).

6. How confident do you feel that the technology support offered in your school can assist you in integrating educational technology into your classroom?

The purpose of this question was to determine the extent of the value which the participant placed upon technology support in assisting them with educational technology integration. The value that teachers place on technology support has been shown to directly impact their perceived ease of use and perceived usefulness (Hohlfeld et al., 2017; Joo et al., 2018).

7. How strongly do you feel that the current level of technology support impacts your ability to integrate educational technology into your classroom?

This question was designed to gauge the participant’s belief surrounding the quality of technology support they were receiving. By measuring the level of support that Liberty High School teachers felt they had, it was possible to see if their perceived usefulness and perceived ease of use had been negatively or positively impacted (Akinde, 2016; Cheng, 2019; Simmons & Martin, 2016).

8. How strongly do you feel that your school administration supports your efforts to integrate educational technology into your classroom?

This question was intended to determine the level of support the participant believes that they had from their school leaders. Support from school leadership has been shown to be a significant
factor in a teacher’s self-efficacy, perceived ease of use, and perceived usefulness (Joo et al., 2018).

9. How strongly do you feel that your district administration supports your efforts to integrate educational technology into your classroom?

   This question was intended to determine the level of support the participant believed that they had from their district leaders. Support from district leadership is a significant factor in a teacher’s self-efficacy, perceived ease of use, and perceived usefulness (Joo et al., 2018).

10. How well are you communicated with by your school leadership about the expectations of integrating educational technology into your classroom?

   The purpose of this question was to ascertain if the participant believed they had clear expectations from their school leadership for integrating educational technology into their classroom. The level of clearly communicated expectations for educational technology integration has been shown to impact perceived usefulness directly, attitude toward using, and behavior intention to use technology in classrooms (Akinde, 2016; Simmons & Martin, 2016).

11. How well are you communicated with by your district leadership about the expectations of integrating educational technology into your classroom?

   The purpose of this question was to ascertain if the participant believed they had clear expectations from their district leadership for integrating educational technology into their classroom. The level of clearly communicated expectations for educational technology integration has been shown to impact perceived usefulness directly, attitude toward using, and behavior intention to use technology in classrooms (Akinde, 2016; Simmons & Martin, 2016).

12. How scared are you of educational technology?
This question was intended to determine the level of technology anxiety and technology self-efficacy the participant had. Technology anxiety and technology self-efficacy have been shown to have a direct impact on perceived ease of use and perceived usefulness (Abdullah et al., 2016; Cheng, 2019; Parkman et al., 2018).

13. How nervous does working with educational technology make you?

This question was intended to determine the level of technology anxiety and technology self-efficacy the participant had. Technology anxiety and technology self-efficacy have been shown to have a direct impact on perceived ease of use and perceived usefulness (Abdullah et al., 2016; Cheng, 2019; Parkman et al., 2018).

14. How comfortable are you when working with educational technology?

This question was intended to determine the level of technology anxiety and technology self-efficacy the participant had. Technology anxiety and technology self-efficacy have been shown to have a direct impact on perceived ease of use and perceived usefulness (Abdullah et al., 2016; Cheng, 2019; Parkman et al., 2018).

15. How easy is it for you to use the educational technology that is currently in your classroom?

The purpose of this question was to determine the perceived ease of use for the participants current classroom technologies. Because perceived ease of use impacts both perceived usefulness and attitude toward using, it was essential to determine the current perceived ease of use that Liberty High School teachers have (Marangunic & Granic, 2015).

16. How easy would it be for you to learn how to use the educational technology that is currently in your classroom?

The purpose of this question was to determine the self-efficacy and perceived ease of use that the participant had for their current classroom technologies. Because perceived ease of use
impacts both perceived usefulness and attitude toward using, it was essential to determine the current perceived ease of use that Liberty High School teachers have (Cheng, 2019; Joo et al., 2018).

17. How easy would it be for you to learn to effectively integrate the educational technology that is currently in your classroom?

The purpose of this question is to determine the self-efficacy and perceived ease of use that the participant had for learning how to integrate the current classroom technologies they have access to. Because perceived ease of use impacts both perceived usefulness and attitude toward using, it was essential to determine the current perceived ease of use that Liberty High School teachers have (Cheng, 2019; Joo et al., 2018).

18. How easy would it be for you to learn to integrate new educational technology into your classroom?

The purpose of this question is to determine the perceived ease of use that the participant had for learning how to integrate new technologies. Because perceived ease of use impacts both perceived usefulness and attitude toward using, it was important to determine the current perceived ease of use that Liberty High School teachers have (Cheng, 2019; Joo et al., 2018).

19. How easy would it be for you to integrate new educational technology into your classroom?

The purpose of this question is to determine the perceived ease of use that the participant had for the actually integrating new technologies into their classroom. Because perceived ease of use impacts both perceived usefulness and attitude toward using, it was important to determine the current perceived ease of use that Liberty High School teachers have (Cheng, 2019; Joo et al., 2018).

20. How easy is it for your students to use educational technology in your classroom?
This question was intended to determine the participant’s perceived ease of use for their students to use educational technologies in their classroom. Teacher’s beliefs about their students’ perceived ease of use can have a direct impact on the level to which they integration educational technologies into their classroom (Hohlfeld et al., 2017; Makki et al., 2018).

21. How useful is educational technology in helping you educate your students?

The purpose of this question was to determine the perceived usefulness that the participant had for educational technology to help them educate students. Perceived usefulness has a direct impact on a user’s attitude toward using technology. Further, numerous studies have shown that perceived usefulness is the most significant factor in predicting and explaining a user’s adoption or rejection of technology (Davis et al., 1989; Joo et al., 2018).

22. How much is your current educational technology helping you improve your effectiveness as a teacher?

The purpose of this question was to determine the participant’s attitude toward using the current educational technology they had access to in helping them educate students. If a participant perceived that their current educational technology was easy to use and useful, they would be more likely to have a positive attitude toward the technology and would be more likely to use it (Cheng, 2019; Joo et al., 2018).

23. How strong is your intention to use your current educational technology in your classroom?

The purpose of this question was to determine the participant’s behavioral intention to use their current educational technologies. Behavioral intention to use technology describes the degree to which a user would be likely to use a specific technology (Joo et al., 2018). Therefore, the participant’s current behavioral intention to use their classroom technologies indicated their
current level of perceived usefulness and perceived ease of use for their current technologies. (Cheng, 2019; Joo et al., 2018).

24. How strongly do you believe that you would use new educational technology in your classroom?

The purpose of this question was to determine the participant’s behavioral intention to use future educational technologies. Behavioral intention to use technology describes the degree to which a user would be likely to use a specific technology (Joo et al., 2018). Therefore, the participant’s behavioral intention to use future classroom technologies indicated their current level of perceived usefulness and perceived ease of use for their current technologies. (Cheng, 2019; Joo et al., 2018).

**Data Analysis**

This applied research study used a multimethod design that consisted of both qualitative and quantitative means of collecting data. The first data collection method was qualitative structured interviews with school and district administrators. The second data collection method was a qualitative focus group with Liberty High School teachers. The third data collection method was a quantitative close-ended internet survey with Liberty High School teachers using a single static web page via the website Survey Monkey. The data collected from the school and district administrator interviews, teacher focus group results, and teacher survey results were analyzed using the following methods.

**School and District Administrator Interviews**

All interviews were video- and audio-recorded using the Microsoft Teams application. These recordings were transcribed using the Microsoft Teams application. Microsoft Teams was selected as the recording and transcription software application because it was accessible to all
potential participants, and due to the COVID-19 response including the closure of all district schools, all potential participants had become familiar with the daily use of this application. Once the data was transcribed, the software programs Microsoft Word, Microsoft Excel, and Quirkos were utilized to assist in the coding or fracturing and rearranging of the transcribed data into categories and to qualitatively analyze the data for key themes using the Rapid and Rigorous Qualitative Data Analysis (RADaR) technique (Watkins, 2017). Quirkos was chosen as the software to assist in this process because it supports qualitative and mixed methods research as opposed to similar products, which are primarily focused on qualitative data analysis (Houghton et al., 2017). The codes were then organized into broader themes to discover which external variables were acting as barriers and which were acting as bridges for the effective educational technology integration for Liberty High School (Bickman & Rog, 2009; Elliott, 2018; St. Pierre & Jackson, 2014).

**Focus Group**

Similar to the qualitative interviews, the focus group conversation was video- and audio-recorded using the Microsoft Teams application. These recordings were also transcribed using the Microsoft Teams application. Microsoft Teams was selected as the recording and transcription software application because it is accessible to all potential participants, and due to the COVID-19 response, including the closure of all district buildings, all potential participants had become familiar with the daily use of this application. Once the data was transcribed, the software programs Microsoft Word, Microsoft Excel, and Quirkos were utilized to assist in the coding or fracturing and rearranging of the transcribed data into categories and to qualitatively analyze the data for key themes using the Rapid and Rigorous Qualitative Data Analysis (RADaR) technique (Watkins, 2017). Quirkos was chosen as the software to assist in this process
because it supports qualitative and mixed methods research as opposed to similar products, which are primarily focused on qualitative data analysis (Houghton et al., 2017). The codes were then organized into broader themes to discover which external variables were acting as barriers and which were acting as bridges for the effective educational technology integration for Liberty High School (Bickman & Rog, 2009; Elliott, 2018; St. Pierre & Jackson, 2014).

Survey Analysis

Survey data was analyzed using Microsoft Excel to create frequency count tables as well as pie charts. The data analyzed from the survey was used to create a more in-depth picture of the barriers preventing teachers from integrating technology into their classrooms and allowed the author to gauge the overall level of discomfort, anxiety, and support that the teachers felt that they had.

Ethical Considerations

All digital data collected during this research was filed and maintained in password-protected accounts that are accessible only by the researcher. The survey data was kept in the Survey Monkey website account that was created specifically for this study. The researcher is the only person with access to this account information. Further, all notes were taken in a password-protected Microsoft OneNote notebook. The researcher is the only person with access to this account and the information. Additional paper notes or documents are being kept in a locked filing cabinet in the researcher’s office for three years and then will be destroyed.

Further, pseudonyms for all participants were selected from the social security administration’s list of the 100 most popular baby names for 2020. The list of participants and their pseudonyms was kept in the password-protected Microsoft OneNote notebook. Additionally, the pseudonym Liberty High School was used in place of the high school’s actual
name. Participation in this study was entirely optional for all participants, and the researcher ensured that they were not the direct supervisor and did not possess any undue influence over any of the participants in this study.

Summary

The design for this applied study centered on a multimethod design which incorporated both qualitative and quantitative methods. The design consisted of the qualitative methods of face-to-face interviews with the district level leaders and Liberty High School administrators and a focus group with five Liberty High School teachers. The quantitative method included a quantitative survey of the high school’s teachers. The applied research multimethod was chosen to strengthen conclusions and to create a full picture of the phenomenon and develop a more robust understanding of the barriers preventing effective educational technology integration at Liberty High School.
CHAPTER FOUR: FINDINGS

Overview

The purpose of this applied study was to solve the problem of ineffective educational technology integration for a low socio-economic urban high school in Kansas City, Missouri, and to design an educational technology integration improvement plan to address the problem. This chapter begins with the results of the data collected by the researcher through district and school administrator interviews, a focus group with five Liberty High School teachers, and an anonymous quantitative teacher survey. Additionally, a summary of the participants is provided as well as an evaluation of the data regarding the central and sub-questions.

Microsoft Word, Microsoft Excel, and Quirkos were utilized to code the transcribed data into categories and to qualitatively analyze the data for key themes using the Rapid and Rigorous Qualitative Data Analysis (RADaR) technique. This process’s findings are shown in the following tables and discussed throughout the remainder of this chapter. The overall themes which emerged from this process were technology support, staff experiences, student technical skills, and educator beliefs. The chapter concludes with a discussion of the findings, as well as a summary of the contents of the chapter.

Participants

The participants in this study included one male teacher, four female teachers for the teacher focus group, four male administrators, and one female administrator from participated in the district and school administrator interviews. Because all 68 teachers at the school were selected to participate in the quantitative survey, random sampling was not conducted for this portion of the study. Also, because a subset of the school’s administrators was selected for in-person interviews, purposeful nonprobability sampling was conducted to deliberately select
these individuals (Bickman & Rog, 2009; Onwuegbuzie & Collins, 2017; Palinkas et al., 2015). Similar to the school administrators, the district administrators were deliberately selected to be interviewed for this study. It is believed that the specific roles these district administrators hold provided them with unique perspectives that are vital to the research. These participants included the district's Director of Instructional Technology, Assistant Superintendent of School Leadership, Principal of Liberty High School, and two Assistant Principals of Liberty High School.

The researcher used purposeful sampling for qualitative methods and convenience sampling for the quantitative method. All participants were required to be employees of the district. For the administrator interviews, participants had to be either a school administrator for Liberty High School or a district administrator. For the focus group, all participants had to be a certified teacher at Liberty High School. For the quantitative survey, all participants had to be a certified teacher at Liberty High School.

In total, the study included 43 participants, all of whom met the criteria for at least one part of the study. Participants in the administrator interviews and focus group were assigned a pseudonym selected from the Social Security Administration's list of the 100 most popular 2020 baby names. Limited demographic data was collected for each administrator interview and focus group participant, which was then utilized in the data analysis process.

**Interview Participants**

Five administrators participated in the face-to-face interviews. The interviews were conducted, recorded, and transcribed via Microsoft Teams. All data from the interviews, including the recording and transcription, were password-protected on the researcher's computer and in the researcher's password-protected Microsoft Office account. Further, the
researcher conducted the interviews from a private and secure location. Each participant was either in their private office or at their home for the duration of their interview. The average years of total experience between the five administrators were 19. Further, the average years of experience with the district were 9. Finally, the average number of years in their current position were four. The demographics of each administrator interview participant are shown in Table 1.

**Table 1**

*Demographics of Administrator Interview Participants*

<table>
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<tr>
<th>Participant</th>
<th>Gender</th>
<th>Total Years of Experience</th>
<th>Years with the District</th>
<th>Years in Current Position</th>
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<td>4</td>
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<td>F</td>
<td>29</td>
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<td>5</td>
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<td>Oliver</td>
<td>M</td>
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<td>5</td>
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<td>Liam</td>
<td>M</td>
<td>9</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Elijah</td>
<td>M</td>
<td>16</td>
<td>2</td>
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</tbody>
</table>

**Lucas.** The first interview participant was Lucas, who was a school administrator at Liberty High School. Lucas had worked for the district for eight years and had been in his current position at Liberty High School for four years. Prior to that, Lucas was a school administrator for another school within the district. Lucas described his comfort level with technology as "an 8 out of 10" and his formal education and professional development in educational technology integration as "almost non-existent." Lucas explained that he "did not take any tech classes" and that he "I just learned from the technology in classrooms that we were given." However, Lucas believes that educational technology is vital to his students'
education. He stated, "given the fact that our students are going to be graduating high school into a different era as when I graduated their background knowledge of technological skills has to be greater than it was for me."

**Emma.** The second interview participant was Emma, who was also a school administrator for Liberty High School. Emma had 29 years of teaching experience to include teaching at both the post-secondary and secondary levels. She had been with the district for 19 years, including five years as a school administrator for Liberty High School. Prior to that, she spent five years as a building administrator for another district high school. Emma stated that she was not very comfortable integrating educational technology and did not feel she had the requisite skill set to do so effectively. Further, when describing her formal education and professional development in educational technology integration, Emma stated, "There was no training, on anything any computer at all." Additionally, while Emma does believe that educational technology integration can be significant, she also believes that "teachers really need to be strategic and have a balance between what your role is as the instructor and what the technology role is in bridging and filling those gaps."

**Oliver.** The third interview participant was Oliver, a district administrator. Oliver had been an educator for 17 years. Seven of those years had been with the district, and five of those had been in his current position. Oliver stated he was very comfortable with effectively integrating educational technology. Further, when discussing his formal education and professional development in educational technology integration, Oliver stated, "the Community College I went to had required an EdTech class that was very basic, and you know obviously it was early 2000, so it didn't really talk so much about integration, but just about tools that you could use as a teacher, and then my Masters had nothing with EdTech,
even though it was literacy and definitely nothing EdTech related as part of the eds for school leadership." Oliver was also a strong proponent of effective educational technology integration and stated, "I don't think that's an option to not include tech these days. I mean, it's all around us; whether we want to admit it or not, our students are immersed in it. What we have to do is show our students how to leverage that the power of technology for learning."

**Liam.** The fourth interview participant was Liam, a school administrator for Liberty High School. Liam had nine years of experience as an educator. All nine years had been with the district and the last four years were as a school administrator for Liberty High School. Prior to that, he had been a Social Studies teacher and department head. Liam stated that he was very comfortable integrating educational technology but expressed that his comfort was based upon things he had learned on his own instead of through his formal education or professional development. When discussing his formal education and professional development in educational technology integration, Liam stated that he did not have any substantive education or training in the area as part of his bachelors or master's degree, nor had he been offered any quality professional development since starting his employment with the district or Liberty High School. Liam further explained that teachers were left to fend for themselves with a lack of formal professional development from the district or school level. For example, Liam stated, "one teacher would find something and be like, hey, this is cool, you should try this too, and that I think was how my technology integration was happening." Further, when describing the importance of effective educational technology integration, Liam expressed, "Well. We talk a lot now about like 21st-century skills. In preparing students for. Ah, for a career and college and more than ever, those jobs are
incorporating technology on a level that has never been used before."

**Elijah.** The fifth interview participant was Elijah, a district administrator for the district. Elijah had over 20 years of experience as an educator but had only been with the district for two years. Before that, he was a district administrator for another public school district. Elijah stated that he was very comfortable with integrating educational technology. In fact, when asked, Elijah stated, "Yeah, I am probably too comfortable with that." Further, when discussing his formal education and professional development in educational technology integration, Elijah explained that he did have some formal education in the area as part of his bachelor's degree. He further stated that in his previous district, the professional development he received around effective educational technology integration was very effective. Further, when discussing the importance of educational technology integration, Elijah stated, "It really expands what a teacher can do, and it's an extension of learning opportunities for students when teachers really are comfortable with it."

**Focus Group Participants**

The focus group consisted of five teachers from Liberty High School. The group consisted of five participants including four female teachers and one male teacher. All participants knew each other and indicated that they had worked together for at least two years. The group had an average of 10 years of teaching experience and an average of four years working at Liberty High School. Additionally, the group taught a range of subjects, including math, English, JROTC, music, band, and foreign languages. The focus group was conducted, recorded, and transcribed via Microsoft Teams. All data from the focus group, including the recording and transcription, were password-protected on the researcher's computer and in the researcher's password-protected Microsoft Office account.
Further, the researcher conducted the focus group from a private and secure location. Each participant was either in their private office or at their home for the duration of their focus group.

**Survey Participants**

The quantitative survey invitation was sent via email to all certified teachers at Liberty High School. All 68 teachers were invited to participate if they were actively teaching at Liberty High School during the 2020-2021 school year. An initial email containing the link to the survey was sent, as well as two follow-up emails. Out of 68 possible participants, 23 certified teachers participated in the survey, resulting in a 34 percent response rate. Demographic data was not collected for the survey participants as it was not necessary for the purpose of this research.

**Results**

The purpose of this applied research study was to solve the problem of ineffective integration of educational technology at a low-SES urban high school in Kansas City, Missouri, and to design an educational technology integration plan to address the problem. The results from this study have been categorized according to the central research question and three sub-questions presented in Chapter One. This applied study's design centered on a multimethod design that incorporated both qualitative and quantitative research methods. The qualitative methods for this study included face-to-face interviews with the five district and school administrators and a focus group with five Liberty High School teachers. The quantitative method included a quantitative survey of the high school's teachers.
Central Research Question

The central research question for this study was “How can educational technology integration be improved at Liberty High School in Kansas City, Missouri?” To determine the answer to this question, building and administrator interviews were conducted with five participants, a focus group was conducted with five certified Liberty High School teachers, and a quantitative survey was conducted with 23 certified Liberty High School teachers. The central research questions was divided into three sub-questions. The data analysis and themes are presented below.

Sub-Question 1

Sub-question one for this study was: "How would administrators in an interview solve the problem of inadequate educational technology integration at Liberty High School?" Interviews were conducted, recorded with five district and school administrators via Microsoft Teams. The research utilized open-ended questions, and the recordings were transcribed via Microsoft Teams. The researcher then uploaded the transcriptions into Quirkos to perform coding and determine which themes would emerge. Quirkos allowed for the researcher to perform open-coding and the RaDaR technique across multiple transcriptions. The codes and frequency of codes are illustrated in Table 2.

Table 2

<table>
<thead>
<tr>
<th>Codes</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>Professional Development</td>
<td>47</td>
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<tr>
<td>Technology Support</td>
<td>24</td>
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<tr>
<td>Educator Beliefs</td>
<td>24</td>
</tr>
<tr>
<td>Educator Anxiety</td>
<td>22</td>
</tr>
<tr>
<td>Technology Self-Efficacy</td>
<td>16</td>
</tr>
<tr>
<td>Importance</td>
<td>16</td>
</tr>
<tr>
<td>Staff Experiences</td>
<td>12</td>
</tr>
<tr>
<td>EdTech Experience</td>
<td>12</td>
</tr>
</tbody>
</table>
The researcher used the codes illustrated in Table 2 to determine themes from the qualitative interviews. To do so, the researcher grouped the codes according to their similarities.

The themes and their corresponding codes are outlined in Table 3.

**Table 3**

*Interview Codes Grouped into Themes*

<table>
<thead>
<tr>
<th>Technology Support</th>
<th>Staff Experiences</th>
<th>Educator Beliefs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology Support</td>
<td>Professional Development</td>
<td>Educator Beliefs</td>
</tr>
<tr>
<td>EdTech Knowledge</td>
<td>Ease of Use</td>
<td>Educator Anxiety</td>
</tr>
<tr>
<td>Current EdTech Integration</td>
<td>Usefulness</td>
<td>Technology Self- Efficacy</td>
</tr>
<tr>
<td>Barriers</td>
<td>Staff Experiences</td>
<td>Importance</td>
</tr>
<tr>
<td>Improvements</td>
<td>EdTech Experience</td>
<td>Attitude Toward Using</td>
</tr>
<tr>
<td></td>
<td>Barriers</td>
<td>Behavior Intention to Use</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leadership</td>
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<tr>
<td></td>
<td></td>
<td>Unified Vision</td>
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<tr>
<td></td>
<td></td>
<td>Culture</td>
</tr>
</tbody>
</table>

As shown in Table 2, technology support, staff experiences, and educator beliefs emerged as the dominant themes from the school and district administrator qualitative interviews. During the interview process, it became increasingly clear that these themes encompass the overall general view that the school and district administrators have toward the effective integration of educational technology at Liberty High School. During the course of these interviews, the researcher found that the areas of needed improvement seemed to be commonly known by all the school and district administrators in the study. Additionally, all interview participants seemed
optimistic about the ability to improve in these areas successfully. The following themes are presented in no particular order.

**Theme #1: Improving Technology Support**

The first theme of improving technology support emerged across all interviews. Each participant stated that technology support had improved over the past two years, but they believed there was an ample need for further improvement. As shown in the following statements, the participants highlighted the correlation between effective and trustworthy technology support and teachers' willingness to integrate educational technology into their classrooms.

**Lucas:** "You know, if we can adjust the level of tech support that we have in our building, I think that would take that now. It is a lot of stress on our teachers' minds because we have 1200 high school kids, and they are going to be needing a lot more assistance, you know, and that has a big role in our teachers being willing to use the tech."

**Emma:** "I think that the intent of technology support has been good. I think the desire has been good. Um, I think that, unfortunately, the labor workforce has not been, and I'm not talking about their knowledge; I'm just talking about the number of techs you know that exist that are able to meet Liberty's needs. So we, you know, we really need full-time people all day, every day. And, you know we didn't have that, and that makes teachers hesitant to use technology in their teaching."

**Oliver:** "Two years ago, there was no consistency in the support, and as far as the district level with the integration, I mean. It was nil to none, but as of recent, I feel from the Technology Department I feel like we've gotten a lot more consistent with our support to buildings, so I feel that's gotten better. I still think that's an area that's lacking because there is very little to no
expertise at the secondary level, with how to integrate technology from the team that supports that."

**Liam:** "We still need to improve tech support in areas like ensuring every student has a working device every day, and of course, some of that's outside of our control. But you know, things like the Wi-Fi connection being effective. In the building, kids having hotspots that work, you know. For example, right now, we have some teachers in the building who are using Chromebooks because their teacher laptops were, you know, were on hold getting to them, so that's preventing them from really having a full array of technology use available to them. And that's impacting teaching and learning."

**Elijah:** "Technology support has a huge impact on the comfort level of that teacher and their ease of use with their technology. And so how do we create that great setup where the teacher is comfortable, and they see the technology is useful for learning and teaching?"

The interview participants made it clear that technology support is a significant factor in Liberty High School teachers' willingness and ability to integrate technology into their classrooms effectively. The selected quotes demonstrate the need for improved technology support for Liberty High School. They further indicate that improved technology support could positively impact the use of technology in Liberty High School classrooms. Of note is that all three school administrators indicated the need for a full-time technology support person at Liberty High School in their interviews. Further, all three school administrators indicated that the level of technology support needs to include training and coaching and not just break/fix technology support.

*Theme #2: Staff Experiences*
The second theme that emerged from the school and district administrator interviews was staff experiences. The experiences include professional development, the ease of use of technologies, the usefulness of technologies, previous EdTech experiences, and previously experienced barriers to successful educational technology integration. The participants shared the following statements regarding their perception of Liberty High School staffs' previous experiences.

**Lucas:** "When I first started at the district, I remember going through training, and no one taught me how to use our student information system. They gave me the username and password and said, here you go. And I remember the first day I sat in my office, and I'm like, what do I do?"

**Emma:** "Historically, the district has rolled things out too fast. That's what the problem is, and that's why it has not been effective because what you're doing hasn't been working. But I think that has a lot to do with the high turnover rate of Superintendents. You know, they only have two or three years to get this gain, to get this bump right. So they bring in their own stuff. And so we do this every two, three years. And so, uh, that's what is crash course philosophy of professional development has kind of crept in."

**Oliver:** "I think historical experience with the district in the technology we've provided is a barrier. The scars run so deep from that initial rollout of technology that I think that's one of the barriers that we still face. Plus, in the past, we tended to roll out new technologies and not really think through all the training and all the implications that it might have for teachers and students."

**Liam:** "I will just say the way that we integrated one-to-one a few years ago I thought was not good. We just threw computers at kids, and that was not a recipe for success because it
ended up being used in that substitution category. We went from writing on paper to just writing on a laptop, and the difference was the kids didn't know how to type, and so we just slowed down our learning. We didn't enhance the learning. We were slowing down the learning."

**Elijah:** "I think sometimes we undervalue the low-level technology. Not everything has to be all these bells and whistles, but how are you utilizing even your PowerPoint presentations? How are you utilizing your student response? You know Google when I look at it, think about Google Classroom, how are we utilizing that to really leverage learning for kids?"

All the interview participants highlighted negative staff experiences revolving around the professional development, the ease of use of technologies, the usefulness of technologies, previous EdTech experiences, and previously experienced barriers to successful educational technology integration at Liberty High School. Throughout the interview process, it became evident that there is a history of purchasing new technologies and then mandating the use of them without adequate training. This process seems to have decreased the ease of use and usefulness of these technologies. Further, all participants indicated that this has significantly improved in the past two years but that there is still a need for improvement in the area of staff experiences. They expressed that this is especially significant in the area of professional development.

**Theme #3: Educator Beliefs**

The third theme to emerge from the interviews was educator beliefs surrounding the effective integration of educational technology. These beliefs include anxiety, teacher self-efficacy, the importance of educational technology, the teachers' attitude toward using educational technology, the teachers' intention to use educational technology, leadership, a unified vision, and what the culture of educational technology integration is at Liberty High
School. The following comments highlight the perceived educator beliefs of Liberty High School teachers.

**Lucas:** "So I believe that there's a lot of fear, but I believe the way that we've interacted with our staff that we've encouraged them to try, we've encouraged them to fail, and then to try again."

**Emma:** "You know it's just their own personal thoughts of the world changing into this digital age. And just kind of feeling left behind in a sense. So it's so much insecurity, if you will, because you know that other people's, especially the Millennials' knowledge base, is certainly much higher than yours. Things they do that is second nature to them on the computer is not second nature to you, and you don't know how to do that. I think that's just an internal barrier that a lot of people, probably my age and older, have."

**Oliver:** "Because the tech rollout hasn't really been consistent and clear in the past, I think there is a lot of tech anxiety, and we had a tendency in the past in our district to just switch things on folks and not really give teachers time to get comfortable or provided very clear training. Yeah, I think it's high, and I think it impacts greatly their abilities to use technology in their classrooms."

**Liam:** "There was a part of the staff who just were kind of like, this is not how I teach. I believe that I don't need these things to be effective, and so I'm going to really minimally use this stuff like I'm only going to use this when it's absolutely necessary. I'm not going to look for the newest ways of using EdTech. That's not really my priority in my classroom. I'm going to keep to what I know and what I've been trained on because I'm good at that."
**Elijah:** "It really depends on the comfort level of that teacher and their ease of use with their technology. So I often wonder how do we create that great setup where the teacher is comfortable, and they see the technology is useful for learning and teaching?"

As shown throughout the comments above, Liberty High School's educator beliefs have been formed through a history of negative educational technology experiences. Some have completely been turned off to the idea of using educational technology in their classrooms as they believe that technology does not add value to their teaching. Further, it became evident throughout the interview process that the participants believed that the teachers at Liberty High School had a high level of technology anxiety and a low level of technology self-efficacy. Further, while the Liberty High School administrators had a robust unified vision and intention to use technology in the educational process, there had not yet been a culture developed around educational technology's importance.

**Sub-Question 2**

Sub-question two for this study was: "How would educators in a focus group solve the problem of inadequate educational technology integration at Liberty High School?" A focus group was conducted and recorded with five Liberty High School teachers via Microsoft Teams. The researcher utilized open-ended questions, and the recordings were transcribed via Microsoft Teams. The researcher then uploaded the transcriptions into Quirkos to perform coding and determine which themes would emerge. Quirkos allowed for the researcher to perform open-coding and the RaDaR technique across multiple transcriptions. The codes and frequency of codes are illustrated in Table 4.
Table 4

*Frequency of Codes for Focus Group*

<table>
<thead>
<tr>
<th>Codes</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Development</td>
<td>20</td>
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<tr>
<td>Ease of Use</td>
<td>10</td>
</tr>
<tr>
<td>Student Tech Skills</td>
<td>10</td>
</tr>
<tr>
<td>Barriers</td>
<td>6</td>
</tr>
<tr>
<td>Usefulness</td>
<td>6</td>
</tr>
<tr>
<td>Tech Support</td>
<td>5</td>
</tr>
<tr>
<td>Technology Anxiety</td>
<td>3</td>
</tr>
<tr>
<td>Ways to Improve</td>
<td>1</td>
</tr>
</tbody>
</table>

While analyzing the data, it became apparent that the codes and themes for the teacher focus group were very similar to those of the school and district administrator interviews. The similarity in the codes provided further evidence that supported the data gathered through the administrator interviews. The researcher used the codes illustrated in Table 4 to determine themes from the teacher focus group. To do so, the researcher grouped the codes according to their similarities. The themes and their corresponding codes are outlined in Table 5.

Table 5

*Focus Group Codes Grouped into Themes*

<table>
<thead>
<tr>
<th>Technology Support</th>
<th>Staff Experiences</th>
<th>Educator Beliefs</th>
<th>Student Technology Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tech Support</td>
<td>Professional Development</td>
<td>Technology Anxiety</td>
<td>Student Tech Skills</td>
</tr>
<tr>
<td></td>
<td>Ease of Use</td>
<td>Ways to Improve</td>
<td></td>
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<tr>
<td></td>
<td>Barriers</td>
<td></td>
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<td></td>
<td>Usefulness</td>
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</table>

**Theme #1: Technology Support**

Every participant of the focus group indicated that technology support for teachers and students needed significant improvement. Specifically noted was the need for a full-time technology support specialist for Liberty High School. Several participants stressed that the
current model of a part-time technology support specialist who is also shared with other schools is not working effectively and has served as a catalyst for higher technology anxiety for teachers and staff. Participants shared the following statements when asked how technology support plays a role in educational technology integration at Liberty High School.

**Isabella:** "I would never make something that couldn't have been done without technology because I just could not be sure that everyone's technology will be working or that it would be able to be working that day."

**Mia:** "The support we have right now doesn't work for me because I have a laptop that needs to be fixed, and I'm like, how do I, you know, get myself to trust that I can be back up and running between the within the working period if I have an issue."

**Harper:** "Getting technology support is like a hunt. We send our students to the tech office, and who knows when or if they'll be back, and it's not necessarily that they've skipped class. Sometimes it's truly just there was a line. There were people there was a longer fix. So we don't know where our students are, and we don't know if anyone from I.T. is even there to help them."

**Mason:** "I think we look at technology support is kind of the baseline, we want support with software, but I think it's more of a hardware issue. Do they have Internet? Do they have a laptop? Can we even move forward? Cause we're willing to work in our classes to explain, we've all sat down said how to send an email; you put the outlook.live.com in the chatbox, or I go there. But without knowing that we have the technology support, we aren't willing to try as many things."

**Ava:** "If we had good I.T. support, yes, 'cause then you could like trust that. OK, this online activity will work, and everybody will be able to do it. OK."
These quotes further highlight the importance of reliable technology support in the educational technology integration process. As these teachers pointed out, they are reluctant to experiment and integrate technologies into their lessons. They are not confident that they will be able to complete the lesson with the current level of support that they receive. This hesitancy among teachers seems to serve as a significant barrier that would need to be overcome to accomplish effective educational technology integration at Liberty High School.

**Theme #2: Staff Experiences**

The second theme to emerge from the focus group was staff experiences. When discussing the historical experiences surrounding educational technology integration at Liberty High School, each participant shared that they had received mostly or wholly negative experiences since beginning to teach at Liberty High School. These experiences included technology being "forced" upon them by the district without a coherent implementation plan. Further, the participants stressed that they had received little to no training on new technologies or professional development to integrate educational technology into the teaching effectively. They also stated that they have had to use several technologies that were challenging to use or offered little additional value to their teaching. The following statements highlight these experiences.

**Mia:** "They keep giving us all these technologies, we have all these technologies that we never asked for, but no one has shown us how to use them or told us why we have them. Sometimes we get some very quick training, but no one is showing us how to teach with these things."

**Harper:** "I think it's very much an echo chamber if we don't have someone double checking with us and explaining why we have to use some of this technology; I think that's
what's escaping, as Mia said. Just you get this echo chamber of well, I'm doing this and no one's
telling me otherwise, and no one is really penalizing me now that we need to do that, but just no
ones saying that this shouldn't be done."

**Mason:** "So we don't do a very good job of training people to use things. We just give it
to them and say, you know, make it work. Many of these things we don't know how to use, or we
don't think it will do us any good in our classrooms."

**Ava:** "I think you need to make sure that when people are brought into the district, they
have Tyler student information system training 'cause this is my second year with the district,
and last year I was never trained on Tyler. It was like I showed up to a Tyler PD, and they didn't
have our login information, so we weren't able to go in, and then the Internet went out, so they
just sent us home and said that someone at our school would teach us. So, I have had many
experiences like that, but that was my training on Tyler."

**Isabella:** I can speak as someone who's been in the district for five years. Just be my fifth
year now. That's pretty much how the Tyler training goes. A lot of them will say, well, you don't
need to know that until later, or you don't need to know that right now. It'll come up later.
Someone will teach you, and that someone often ends up being your coworker who is equally as
lost as you are. Thankfully, we have a team at Liberty of teachers who are really trying hard to
learn Tyler and get good at it. But you are very reliant; the entire district is very reliant on other
teachers figuring it out along the way."

These comments illustrated that the Liberty High School staff seem to have endured a
significant amount of negative experiences surrounding the selection, implementation, and
training of educational technology. The researcher found that these experiences seemed to have
impacted the educator's beliefs, abilities, and willingness to integrate educational technology into
their classrooms. Specifically of note, the participants viewed as the complete failure of the district to train educators on the basic systems that teachers need to use daily such as the Tyler student information system. This lack of adequate training could partially explain how the third theme of educator beliefs emerged from the focus group.

**Theme #3: Educator Beliefs**

The third theme to emerge from the focus group was educator beliefs. Primarily, technology anxiety and technology self-efficacy. The focus group participants shared that some teachers at Liberty High School are very comfortable integrating educational technology into their classrooms. However, they also stated that several others have very high anxiety and very low self-efficacy when trying to do so. The participants also indicated that this divide seems to be at least somewhat based on age. The researcher believed that this aligns with the digital immigrant and digital native phenomenon outlined in chapter two. The participant comments below illustrate the participants' views surrounding Liberty High School educator's beliefs.

**Isabella:** "I'd like to incorporate technology more, but some of these things, I have not been shown how to use, and I think that synergy level of it hasn't taken what we're doing and gone beyond. It's just done the same thing we're doing and doing it in a digital space. I haven't necessarily seen any of the technology we've been provided, and encouraged to use, that have allowed us to do more than what we've been able to do without technology."

**Mia:** "There are people that I know that can easily have a panic attack. I know it did worry them at the beginning of the school year. I know I had to talk to a lot of, you know, more than a few teachers that got in touch with me like, hey, how are you? How are you handling all this technology stuff?"
Harper: "We have people who can't post a document with the assignment for kids to just click on an open to do it. They say they are scared to try, and they're like, I don't know what to do. Then kids don't know how to answer questions. Or like I've seen some people trying to type in math problems and solve math algebra equation in a Google Doc. They don't know what they are doing, and they don't know how to find out."

Mason: "So just like with the student side, there's a teacher curve and generally the older teachers, but I've worked with some teachers, where I've been like, hey, that's the camera there, like they didn't understand that what they thought was a light was a camera lens. So you know the teachers have just as much as struggle."

Ava: "We had a lot of nervous people trying to use Teams, since we had no training on it. I know a group of our friends here, had a meeting and decided to try out Teams, and that was our training. Yes, it was very informal. Then I think we had a happy hour where we were on Teams instead of Zoom. That was like our training on it, and it made a lot of us more comfortable using it."

As shown in the comments above, each participant was acutely aware of the high anxiety and low technology self-efficacy that several of their peers experience. Some of the participants even mentioned experiencing a high level of technology anxiety and low technology self-efficacy themselves and how it prevented them from integrating educational technology into their classrooms. The researcher also found that each participant linked a high-level of anxiety to inadequate training and professional development. This anxiety was significantly caused by the technologies that they were being mandated to utilize in their instruction. As highlighted in chapter two, technology training and professional development have been shown in the literature to decrease technology anxiety and increase technology self-efficacy.
Theme #4: Student Technology Skills

The fourth theme to emerge from the focus group was student technology skills. Several participants indicated that they had spent a significant amount of time teaching their students basic technology skills. They also indicated that they believe that students should have obtained these skills before entering high school. They further expressed that the lack of student technology skills serves as a barrier to effectively integrating educational technology into their classrooms. The comments below express their viewpoints.

Isabella: "Yeah, I've definitely been helping kids. I'm available if you want help with whatever. Now I swear I've seen a lot of kids sharing their work with me, and it's not always uniform. It's missing a bunch of the basic stuff that just makes it that one extra hurdle. It is frustrating."

Harper: "Some of the students who are coming to us have had zero prior experience with computers, and one of the things that has caught my attention more than anything else is that we do not offer a class that supports students who've never used a computer before in their lives."

Mia: "For many of my students, it is so difficult for them to find information that they have stored electronically. It will take forever, and we also take a lot of instructional time."

Mason: "It is incredible what it took to get my students to figure out how to manipulate a PDF file and then attach it to their classwork and turn it in. It was a long, arduous process over and over and over again, and it's, like a basic function that we expect them to do in an office setting or something like that."

Ava: "I know I had a student at A's in every subject except for one, and it's because that teacher wasn't accepting work in the same way that everyone else was. It wasn't standardized,
and they weren't using Google Classroom, and this student couldn't figure out how to submit their work and that student suffered."

As these comments from the participants have shown, many students at Liberty High School have not developed basic technology skills. It may seem that these students should be digital natives. However, the researcher believes the participants' comments lend credence to the literature in showing that many Liberty High School students' low-socioeconomic status has prevented them from having access to the same technologies that their higher socio-economic peers have grown up with. This lack of access also referred to as the digital divide, seems to be a significant barrier in the teaching and learning process. Even when teachers are willing and able to use technology in their classrooms, their students may not be able to perform well.

**Sub-Question 3**

Sub-question for this study was: "How would quantitative survey data solve the problem of inadequate educational technology integration at Liberty High School?" A link to the quantitative study was emailed to all certified teachers at Liberty High School to glean an overall view of the state of educational technology integration and possible themes from the areas which teachers rated as higher and lower. Out of the 68 teachers invited to participate, 23 responded, which equated to a 34% response rate for the survey. The researcher utilized the survey questions found in Appendix H of this document. The survey included 24 overall questions, which were based on the TAM as the theoretical framework. The survey questions focused on teacher self-efficacy, technology anxiety, technology support, perceived ease of use, perceived usefulness, attitude toward using, and behavioral intention to use. The survey questions were also formatted with both positive and negative implications. Table 6 displays each survey questions as well as
the frequency and average of responses. The questions and responses are organized by seven areas of focus.

Table 6

Frequency and Average of Survey Results Listed by Focus Area

<table>
<thead>
<tr>
<th>Question</th>
<th>Not At All</th>
<th>A Little</th>
<th>Neutral</th>
<th>Somewhat</th>
<th>Very</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-1.9</td>
<td>2.0-3.9</td>
<td>4.0-5.9</td>
<td>6.0-7.9</td>
<td>8.0-10</td>
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<tr>
<td><strong>Self-Efficacy</strong></td>
<td></td>
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</tr>
<tr>
<td>How confident do you feel in your ability to integrate educational technology into your classroom?</td>
<td>2</td>
<td>7</td>
<td>1</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>8.70%</td>
<td>30.43%</td>
<td>4.35%</td>
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<td>26.09%</td>
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<tr>
<td>How confident do you feel using educational technology which you have never used before?</td>
<td>9</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>4</td>
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<tr>
<td></td>
<td>39.13%</td>
<td>4.35%</td>
<td>13.04%</td>
<td>26.09%</td>
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</tr>
<tr>
<td>How confident do you feel that your professional development experiences have prepared you to integrate educational technology into your classroom?</td>
<td>4</td>
<td>5</td>
<td>3</td>
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<td>6</td>
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<tr>
<td></td>
<td>17.39%</td>
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<td>13.04%</td>
<td>21.74%</td>
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<tr>
<td>How well do you feel you were prepared by your teaching certification program to incorporate educational technology into your teaching?</td>
<td>8</td>
<td>5</td>
<td>3</td>
<td>4</td>
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<td></td>
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<tr>
<td><strong>Technology Anxiety</strong></td>
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<td></td>
</tr>
<tr>
<td>How scared are you of educational technology?</td>
<td>11</td>
<td>1</td>
<td>1</td>
<td>9</td>
<td>1</td>
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<tr>
<td></td>
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<td>4.35%</td>
<td>39.13%</td>
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<tr>
<td>How nervous does working with educational technology make you?</td>
<td>9</td>
<td>5</td>
<td>2</td>
<td>6</td>
<td>1</td>
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<tr>
<td></td>
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<td>21.74%</td>
<td>8.70%</td>
<td>26.09%</td>
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<tr>
<td>How comfortable are you when working with educational technology?</td>
<td>0</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>11</td>
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<td>30.43%</td>
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<td>47.83%</td>
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<tr>
<td><strong>Technology Support</strong></td>
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<tr>
<td>How confident do you feel that you can ask for help in integrating educational technology into your classroom?</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>9</td>
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<tr>
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<td>13.04%</td>
<td>8.70%</td>
<td>39.13%</td>
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<tr>
<td>How confident do you feel that the technology support offered in your school can assist you in</td>
<td>5</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>9</td>
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<td></td>
<td>21.74%</td>
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integrating educational technology into your classroom?

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<th>7</th>
<th>8</th>
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<tbody>
<tr>
<td>How strongly do you feel that the current level of technology support impacts your ability to integrate educational technology into your classroom?</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>9</td>
<td>8</td>
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<tr>
<td>How strongly do you feel that your school administration supports your efforts to integrate educational technology into your classroom?</td>
<td>1</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td>10</td>
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<td>4.35%</td>
<td>43.48%</td>
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<tr>
<td>How strongly do you feel that your district administration supports your efforts to integrate educational technology into your classroom?</td>
<td>3</td>
<td>8</td>
<td>1</td>
<td>2</td>
<td>9</td>
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<td>8.70%</td>
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<tr>
<td>How well are you communicated with by your school leadership about the expectations of integrating educational technology into your classroom?</td>
<td>4</td>
<td>8</td>
<td>0</td>
<td>4</td>
<td>7</td>
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<tr>
<td>How well are you communicated with by your district leadership about the expectations of integrating educational technology into your classroom?</td>
<td>3</td>
<td>10</td>
<td>1</td>
<td>4</td>
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Perceived Ease of Use

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<tr>
<th>Question</th>
<th>1</th>
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<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>How easy is it for you to use the educational technology that is currently in your classroom?</td>
<td>1</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>8</td>
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<td>8.70%</td>
<td>34.78%</td>
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</tr>
<tr>
<td>How easy would it be for you to learn how to use the educational technology that is currently in your classroom?</td>
<td>0</td>
<td>8</td>
<td>1</td>
<td>6</td>
<td>8</td>
<td></td>
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<tr>
<td>How easy would it be for you to learn to effectively integrate the educational technology that is currently in your classroom?</td>
<td>0</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>10</td>
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<tr>
<td>How easy would it be for you to learn to integrate new educational technology into your classroom?</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>5</td>
<td>9</td>
<td></td>
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</tr>
<tr>
<td>How easy would it be for you to integrate new educational technology into your classroom?</td>
<td>1</td>
<td>8</td>
<td>2</td>
<td>4</td>
<td>8</td>
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<td>8</td>
<td>5</td>
<td>1</td>
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</tbody>
</table>
Examining the data within each focus area made it possible to ascertain potential reasons why there is ineffective educational technology integration at Liberty High School. Further, the themes which emerged from the teacher survey seemed to be consistent with those which emerged from the administrator interviews and the teacher focus group. These themes included educator beliefs, technology support, and staff experiences. Each of these themes is described below.

**Theme #1. Educator Beliefs**

The data was analyzed by area of focus, and the researcher found that the data indicates a strong dichotomy in educator beliefs at Liberty High School. This dichotomy is especially highlighted in the areas of self-efficacy and technology anxiety. As shown in Figures 3 and 4, Liberty High School educator beliefs in the areas of self-efficacy, technology anxiety, and perceived usefulness seem to be split almost down the middle. This dichotomy among Liberty High School teachers further supports the data collected during the administrator interviews.
and teacher focus group. The data may further indicate that there is a tangible divide between digital immigrants and digital natives.

**Figure 3**

*Combined Teacher Self-Efficacy Responses*

![Combined Teacher Self-Efficacy Responses](image)

**Figure 4**

*Combined Teacher Technology Anxiety Responses*

![Combined Teacher Technology Anxiety Responses](image)

Alternatively, in the areas of attitude toward using and behavioral intention to use, the
teachers' responses, shown in Figures 5 and 6, seem to indicate a less negative educator belief in teachers' attitude toward using as well as a stronger intention to use technology in their classrooms. Of note is the large percentage of neutral teacher responses in the area of attitude toward using. This large number of neutral responses may indicate that there is still a significant amount of work to do in order to shift a significant amount of Liberty High School teachers' attitude toward using technology from neutral to positive. Conversely, the number of neutral teacher responses for teacher behavioral intention to use is minimal. These responses may indicate that a large number of Liberty High School teachers already believe that they intend to use technology in their classrooms but are perhaps facing barriers when attempting to effectively integrate educational technology.

**Figure 5**

*Teacher Attitude Toward Using Responses*
**Theme #2. Staff Experiences**

Liberty High School teachers' perceived ease of use, perceived usefulness, and professional development experiences showed a significant divide between positive and negative responses and significant neutral responses. As shown in Figure 7, more teachers had more high perceived ease of use responses than low perceived ease of use responses. However, the number of teachers with low perceived ease of use responses was still a significant amount as 35% of respondents indicated that they have low perceived ease of use. These responses may have indicated that several Liberty High School teachers struggled to use the educational technology they had been provided.
As shown in Figure 8, the divide between low and high perceived usefulness responses was also dichotomous while there was also a small percentage of neutral responses. These staff experience responses aligned with responses received regarding the theme of educator beliefs. Additionally, it aligned with the information received during the administrator reviews and focus group. Specifically, teacher perceived usefulness aligns with the concept that emerged from both qualitative methods. There are several teachers at Liberty High School who were comfortable with educational technology and several who are uncomfortable with educational technology and who also do not find it very useful in their teaching. Therefore, it seemed as though an effort to increase teacher perceived usefulness would be supported by the data.
Figure 8

Teacher Perceived Usefulness Responses

![Teacher Perceived Usefulness Responses](image)

**Theme #3. Technology Support**

Like the themes that emerged from the administrator interviews and teacher focus group, the theme of technology support emerged in the teacher survey with the same type of divided experiences. As shown in Figure 9, 50% of the Liberty High School teachers shared positive responses, seven percent of the responses were neutral, and 43% of the responses were negative. These responses demonstrated the potential need for more effective technology support from technology support specialists and showed the need for more effective technology support from Liberty High School administrators. Based on this data, the researcher believed that the improvement of technology support could have been a significant factor in improving educational technology integration at Liberty High School.
Ample evidence exists to support that effective integration of educational technology has a multitude of benefits for teachers and students (Kelly, 2015; Makki et al., 2018; Masullo, 2017). However, the data indicates that the teachers and administrators at Liberty High School are not effectively integrating educational technology into their classrooms. Chapter Two reviewed and examined the literature regarding effective educational technology integration within the theoretical framework of the TAM. The review included external variables, perceived usefulness, perceived ease of use, attitude toward using, and behavioral intention to use. The review and examination of the literature were vital to the study of improvement of educational technology integration at Liberty High School. Through administrator interviews, a teacher focus group, and a teacher survey, the factors serving as barriers and bridges to effective educational technology integration at Liberty High School were identified and analyzed. The results of which are supported by current research.
Theoretical Literature

The theoretical literature for this study focused on the Technology Acceptance Model (TAM) created by Fred Davis (Davis, 1989; Davis & Venkatesh, 1996; Lala, 2014). The TAM is a dominant model used in the investigation of factors that impact users' acceptance or rejection of technology. The data analyzed in this chapter has confirmed the TAM and supports the constructs of perceived usefulness, perceived ease of use, attitude toward using, and behavioral intention to use. Further, the data analysis supports the construct of external variables to define the barriers and bridges impacting the effective integration of educational technology at Liberty High School.

These barriers and bridges were identified during the coding process and combined into the emergent themes of student technology skills, educator beliefs, staff experiences, and technology support. During the teacher focus group, the participants shared several of their concerns regarding a lack of technology skills among their high school students. Teachers shared that they have often had to pause instruction to assist students with properly using their technology. These experiences caused several teachers to become hesitant in integrating educational technology into their classrooms. This admitted hesitancy indicates that although the technology is in place, the value that technology could be bringing to the classroom is not being realized (Davies, 2017; Havard et al., 2018; Hershkovitz & Karni, 2018;).

Further, participants in the administrator interviews, teacher focus group, and teacher survey shared evidence that Liberty High School educators are working to integrate educational technologies into their classrooms effectively but that they continue to face problems when attempting to do so. If these challenges cannot be overcome at Liberty High School, the teachers will continue to teach the students with outdated practices while their
cohorts in neighboring districts are learning via 21st-century methods (Delgado et al., 2015). The students in neighboring districts will continue to graduate ready and able to compete for 21st-century jobs. In contrast, Liberty High School students will continue to be unable to compete upon their graduation (Delgado et al., 2015).

**Empirical Literature**

The empirical literature showed that integrating educational technology into classrooms effectively required a change in many aspects of teachers' routines, including their personal beliefs about the educational process, classroom management skills, organizational practices, pedagogical knowledge, and classroom culture (Makki et al., 2018; Wang, 2017). The literature also revealed that to accomplish these changes, the effective integration of educational technology at Liberty High School should focus on the process of discovering barriers and turning them into bridges (Davis, 1989; Ertmer, 1999). In alignment with the TAM, several first- and second-order barriers were identified and coded. The coded first- and second-order barriers found during the data collection and analysis process supported the first- and second-order barriers identified in the literature. The identified barriers also confirmed that it is very challenging to develop 21st-century skills in students in lower-income urban districts where students begin their educational journey on the disadvantaged side of the digital divide (Delgado et al., 2015).

Further, in this research study, the emergent themes of student technology skills, educator beliefs, staff experiences, and technology support confirmed that a holistic and comprehensive approach should be taken to address the educational technology integration and transformational teaching challenges faced by Liberty High School teachers (Davies, 2017; Henderson-Rosser & Sauers, 2017; Kim et al., 2019). The teacher survey data indicated
that there existed a divide among Liberty High School educator beliefs. While some teachers are very comfortable integrating educational technology into their classrooms, others have significantly high levels of anxiety and a lack of self-efficacy required to do so. Previous research highlighted the impact of teacher self-efficacy and anxiety on perceived ease of use. Teachers' perceived ease of use has a significant impact on their perceived usefulness and intention to use technology (Cheng, 2019; Davis, 1989; Joo et al., 2018).

Additionally, the information obtained through the teacher focus group and administrator interviews demonstrated that previous staff experiences are a significant hindrance to the current successful integration of educational technology at Liberty High Schools. Teachers and administrators shared that the district had a history of purchasing technologies and dumping them onto the school and teachers to figure out how to integrate with a lack of educator feedback, professional development, or instructional support. The literature shows that the successful integration at Liberty High School would require that the standards and purposes of education change. New curriculum frameworks, instructional methods, and assessment strategies should also be incorporated alongside new technologies (Carmel & Badash, 2018). Further, the literature showed that although the importance of integrating technology into the classroom is well known, many schools and districts continued to use poor integration techniques when attempting to do so effectively (Salleh, 2016; Vongkulluksn et al., 2018).

Additionally, the theme of technology support emerged as an important theme throughout the teacher focus group, administrator interviews, and teacher survey. The teacher survey showed a divide in teacher technology support experiences. Further, the administrator interviews and teacher focus group each revealed that the technology support at Liberty High
School was a current barrier. The participants shared that this is primarily due to a lack of technology mentoring and Liberty High School not having a full-time technology support specialist assigned. Liberty High School aligns with many other schools and districts which focus their funding on the purchase of technology while not adequately funding technology professional development and technology support. Without funding all the factors needed for successful implementation, merely purchasing and deploying technologies into the classroom can lead to more harm than good as the technology becomes used for low-level learning instead of profound enriched learning experiences (Joo et al., 2018; Makki et al., 2018).

This study extended prior research in that it demonstrated the need and challenges with successfully integrating educational technology into the classrooms of a low-socioeconomic urban high school. Through the analyzed data, it was evident there are two camps of teachers at Liberty High School. One camp seemed very confident in the use of educational technology, while the other camp was very hesitant in the use of educational technology. Further, this study supported the TAM's use in discovering the barriers that needed to be overcome at Liberty High School to improve the integration of educational technology. The barriers seemingly impacted the digital immigrants more than the digital natives. Further, the process of understanding the barriers and bridges impacting effective educational technology integration and then working to build the ability for students and teachers to use, adapt, and transfer their technology skills would serve to improve the state of educational technology integration for all Liberty High School teachers (Cohron, 2015; Vigor et al., 2014; Wamuyu, 2017).

**Summary**

This chapter described the data collected and analyzed to understand how to improve
the educational technology integration for Liberty High School. The data was collected and analyzed by the researcher through five district and school administrator interviews, a focus group with five Liberty High School teachers, and an anonymous quantitative teacher survey with 23 certified teacher participants. The themes which emerged from the administrator interviews, teacher focus group, and teacher survey were technology support, staff experiences, student technical skills, and educator beliefs. The data showed that these themes served as the barriers which must be turned into bridges in order to improve educational technology integration at Liberty High School. Chapter Five will present a proposed improvement plan which addresses each of these identified barriers and the steps needed to improve them.
CHAPTER FIVE: CONCLUSION

Overview

This applied research study sought to inform the problem of ineffective educational technology integration at Liberty High School. Previous research had demonstrated the importance of effective educational technology integration. However, further research was needed which focused on the additional challenges that low-socioeconomic urban schools faced when attempting to integrate educational technology. Therefore, this research study utilized qualitative and quantitative methods to study the barriers to effective educational technology integration at a low-SES urban high school and determine how to turn them into the bridges needed to successfully and effectively integrate educational technology into its classrooms. The collected data was analyzed, and similar themes emerged from the participants. This chapter restates the problem and proposes a solution to the researcher's central questions. The rest of the chapter outlines the resources needed, funds needed, roles and responsibilities, timeline, solution implications, and evaluation plan. Finally, a summary of the chapter is provided.

Restatement of the Problem

While they were attempting to use the technologies in their classrooms, the simple placement and use of educational technologies were not enough to create significant educational gains for Liberty High School students (Vongkulluksn et al., 2018). This problem negatively impacted the students of Liberty High School by preventing the teachers and administrators from adequately closing the digital divide and achievement gaps experienced by their students (Hew & Tan, 2016; Hohlfeld et al., 2017; Makki et al., 2018). This research study utilized a comprehensive multimethod approach to gather and analyze data from the
teacher perspective and the school and district administrator perspective. This approach consisted of qualitative interviews with school and district administrators, a focus group with Liberty High School certified teachers, and a survey of Liberty High School certified teachers. Together these approaches informed the problem of ineffective educational technology integration at Liberty High School.

**Proposed Solution to the Central Question**

The central question for this applied research study was "How can educational technology integration be improved at Liberty High School in Kansas City, Missouri?" After analyzing the data presented in Chapter Four, it is evident that there is substantial room for the improvement of educational technology integration at Liberty High School. The data analysis also showed that the improvements would need to occur at the district as well as the school level. Therefore, the following improvement plan focused on technology support, staff experiences, student technical skills, and educator beliefs has been proposed to assist with the effective integration of educational technology at Liberty High School.

**Goal #1: Full-time Technology Support**

The data from the administrator interviews, teacher focus groups, and teacher surveys illustrated that the technology support currently being provided at Liberty High School is not adequate to assist with the effective integration of educational technology. Technology support directly impacts technology self-efficacy and technology anxiety and can impact how comfortable the teachers are with attempting to implement educational technologies into their classrooms (Akinde, 2016; Cheng, 2019; Davis et al., 1989). Currently, there is not a full-time technology support specialist assigned to Liberty High School, and the data shows this is causing a significant negative impact. Teachers and administrators shared their experiences of students
being sent to the Liberty High School technology office and not receiving assistance due to inadequate staffing. They further shared that this led to an increase of anxiety and decreased self-efficacy when attempting to utilize educational technology during instruction.

To improve this inadequate level of support, the Director of Technology should consider assigning a full-time technology support specialist, as well as a contract technology support specialist, to Liberty High School. The need for two persons is based upon the premise that one technology support specialist would need to ensure that the Liberty High School technology office stayed open for students, while the other technology support specialist would be able to move about the building to provide technology support. Further, the technology support provided should go deeper than solving technical issues and include providing basic technology integration support as well. Although the importance of integrating technology into the classroom is well known, many Liberty High School teachers are using poor integration techniques when attempting to do so effectively (Salleh, 2016; Vongkulluksn et al., 2018). Having the technology support specialists assist with this could improve staff experiences and educator beliefs (Akinde, 2016; Cheng, 2019; Davis et al., 1989).

**Goal #2: Creation of Technology Mentors**

Another goal that the district and school administrators should be to work together to create a technology mentor position for Liberty High School. Data from the administrator interviews and teacher focus group illustrated the potential value of receiving technology integration assistance from a technology mentor. In addition to the technology support specialists' low-level technology integration support, the technology mentor could provide higher-level integration support. The technology mentor could also help improve staff experiences and educator beliefs by providing additional technology training and professional
development in a more individualized way (Akinde, 2016; Cheng, 2019). Further, this mentor
could be a certified Liberty High School teacher who is paid an additional stipend to provide
support to their peers. The mentor could also obtain specialized training and professional
development in order to facilitate this extra duty.

Goal #3: Differentiate Technology Professional Development

Another goal that could be implemented for Liberty High School is the differentiation of
technology professional development. The data from the administrator interviews, teacher focus
group, and teacher survey indicated that while most Liberty High School students are digital
natives, Liberty High School teachers are split between the digital native and digital immigrant
groups. Therefore, a one-size-fits-all approach to educational technology integration professional
development is unlikely to be successful. The data indicates that if the professional development
is geared toward digital natives, the digital immigrants are likely to become lost and give up.
However, if the training is geared toward digital immigrants, the digital natives will likely
become bored and tune out. A more effective way to provide this professional development
could be to create differentiated training cohorts (Aljuzayri et al., 2017; Masullo, 2017). The
cohorts could be self-identified where the teachers choose if they would like to participate in the
beginner, intermediate, or advanced cohort. If this differentiation were to prove effective, it
could increase teacher self-efficacy and decrease teacher anxiety (Cheng, 2019; Davis et al.,
1989; Joo et al., 2018; Vongkulluksn et al., 2018).

Goal #4: Formation of a Technology Committee

The fourth goal to improve the educational technology integration at Liberty High School
would be the formation of a technology committee. The data from the administrator interviews
and teacher focus group showed a need to bring teachers to the table when making technology
decisions for Liberty High School. The administrators and teachers both shared that this piece was vital, yet missing, in the current educational technology selection and implementation process. The technology committee should consist of Liberty High School teachers with a wide range of subjects and technology skills. Further, the selected committee members should be informal leaders within Liberty High School. These informal leaders are not in an official leadership position but have the knowledge, skills, and abilities to influence others' attitudes, behaviors, and skills (Aljuzayri et al., 2017; Masullo, 2017). The successful implementation of this committee would assist in identifying and improving poor staff experiences as well as improve the educator beliefs at Liberty High School.

**Goal #5: Implement a 21st-Century Skills Curriculum**

The data from the administrator interviews and teacher focus group demonstrated the need for Liberty High School students to obtain relevant technology skills prior to ninth grade. To assist with this challenge, the district should implement a 21st-century skills curriculum. The focus of this curriculum should be on ensuring students develop the critical thinking, creativity, research, and technology skills needed to operate successfully in the 21st century (Akinde, 2016; Blau et al., 2016). Implementing a 21st-century skills curriculum would also help prepare Liberty High School students to be competitive in the globalized workforce (Makki et al., 2018; Masullo, 2017).

**Resources Needed**

The resources needed for the successful realization of these listed goals consist of two technology support specialists, a district-wide 21st-century skills curriculum, effective training materials, teacher volunteers, and time. The two technology support specialists can be reassigned from other support locations throughout the district through a restructure of the
department of technology's support team. While this may cause a strain on other areas of support, closely monitoring these areas for any lapses in support can ensure the hiring of additional personnel if needed. Further, by evaluating the benefits of additional technology support for Liberty High School, the model could serve as a proof of concept for a technology support structure change at other locations throughout the district.

The district curriculum, instruction, and professional development division and is currently working on the development of a 21\textsuperscript{st}-century skills curriculum, which is slated for implementation for the 2021-2022 school year. The pivot of the district's educational processes in response to COVID-19 illustrated the district-wide need for students to develop these critical skills. Further, in response to COVID-19, the district became a full 1-to-1 district in grades PreK-12. This added increased focus to ensuring that all district students are developing the required technology skills to function in the district's new environment. This shift will likely benefit the integration of educational technology at Liberty High School, as students will begin entering ninth grade with a new baseline of technology skills.

The creation of effective training materials will be instrumental in the fulfillment of these goals. These materials will be beneficial for the differentiation of technology professional development. The materials will need to be differentiated between beginner, intermediate, and advanced to allow for effective implementation of the differentiated professional development. It could also be beneficial to create an adult learning platform where the training materials could be organized and stored. This platform would allow Liberty High School teachers to return to these materials for refresher training as needed.

Teacher volunteers will be critical for the successful implementation of these goals. The technology mentor and technology committee members will need to be volunteers. While the
intent is to pay them a stipend, the time and dedication needed from these Liberty High School teachers will be significant. Selecting volunteers who are willing to participate in these endeavors will need to include a careful process. The process will need to ensure that individuals are volunteering for the right reasons and have the capability to fulfill the obligations for which they are volunteering.

Finally, time will be an invaluable resource in the successful implementation of these goals. Teachers and administrators are very busy, and adding more work to their hectic schedules could be very taxing. Efforts should be made to ensure that minimum time is utilized to achieve maximum results. For example, technology committee meetings should have agendas to keep the meetings on track. Further, the technology mentor should track the amount of time spent assisting fellow teachers in determining if additional technology mentors are needed at Liberty High School.

**Funds Needed**

The funds needed for the plan will include twelve thousand dollars for stipends. This amount includes a two thousand dollars per year stipend for the Liberty High School technology mentor and one thousand dollars each for the ten technology committee members. The two technology support specialists for Liberty High School will be paid for out of current funds. The district-wide 21st-century skills curriculum implementation will also be paid for out of current funds. The cost for effective training materials will be covered within the department of technology's annual training budget. There may be additional costs as the Liberty High School technology committee determines the need for additional materials or technologies.
Roles and Responsibilities

To improve the integration of educational technology at Liberty High School, the district’s Director of Technology and Liberty High School principal should work together to create and select the technology committee members. The technology committee should meet monthly during the school year and be responsible for suggesting additional needed training, tools, support to improve the integration of educational technologies into Liberty High School classrooms. Further, the district’s Director of Technology will be responsible for reassigning the needed technology support specialists to Liberty High School. The district’s Director of Technology will also work with the Liberty High School administrative team and technology committee to create effective technology training materials that will be used in the differentiated technology professional development. Additionally, the assistant superintendent of curriculum, instruction, and professional development will be responsible for implementing the district's 21st-century skills curriculum.

Timeline

The creation of the Liberty High School technology committee should begin in May 2021. This suspense date will allow the committee to meet at least twice throughout the summer months and prepare for the upcoming school year. The reassignment of the technology support specialists to Liberty High School should occur no later than May 2021. This suspense date will allow them to become familiar with the school and the staff before the summer break. The 21st-century curriculum should be implemented during the 2021-2022 school year, and adjustments should be made as needed in each subsequent school year. Additionally, the effective training materials should be developed throughout the rest of the 2020-2021 school year and reviewed during the summer of 2021. This timeline will allow the
materials to be ready for the district’s back to school teacher institute in August 2021.

**Solutions Implications**

When it is effectively integrated into the classroom, educational technology has numerous benefits. These benefits are especially powerful for students in a low-socioeconomic urban high school where students are traditionally unable to compete with their high-socioeconomic suburban contemporaries effectively. If proven effective, this solution could include increased student achievement, increased motivation for learning, improvement of student engagement, and an increase in teachers' ability to transform their teaching methods. Most importantly, it could improve the futures of Liberty High School students. However, there are also some negative implications of this solution. Although minor, these negative implications include additional work time for some Liberty High School teachers and administrators, a potential strain on the technology support at other district schools, and additional time for Liberty High School teachers to attend technology professional development. Further, there is a potential risk that this solution's elements could be poorly implemented, which would cause the benefits of the solution to be diminished.

**Evaluation Plan**

The benefits of effectively integrating educational technology into the classroom include increased student achievement, increased motivation for learning, improvement of student engagement, and an increase in the ability for teachers to transform their teaching methods (Blau et al., 2016; Hershkovitz & Karni, 2018; Hull & Duch, 2019). These benefits are significant and needed for the students at Liberty High School. To evaluate this plan's effectiveness, the Director of Technology should conduct the teacher survey twice per year, once in the fall semester and again in the spring semester. These surveys would allow for the Director of Technology to see
any growth or changes in the data. Specifically, the technology director should monitor the data in the dichotomous areas of focus within the themes of educator beliefs, staff experiences, and technology support and compare it to the data obtained throughout this study.

Additionally, the Director of Technology and Liberty High School principal should meet with the teacher technology committee at least twice per year to go over recommendations and lessons learned from the committee's perspective. These meetings could serve as a focus group of sorts and ensure that the committee's data is trending in a positive direction. If not, the Director of Technology and Liberty High School principal should work together to determine and implement the needed adjustments. Finally, the Director of Technology should interview the Liberty High School administrators at least once per year to determine if they see improvement in the overall integration of educational technology.

Limitations of this study include the small sample size of the administrator interview, teacher focus group, and teacher survey participants. Further, the focus of this study was limited to one high school. This narrow focus was intentional due to the nature of an applied research study. However, it does limit the scope in which the research results can be applied. A further limitation is that no demographic information was collected from the survey participants. While this was intentional due to the nature of the survey instrument, the lack of demographic information made it impossible to determine if the responses correlated to the participants' age. Finally, an important limitation of this study is that the world was responding to the COVID-19 pandemic during this study. It is not possible to determine the impact of the COVID-19 pandemic on the collected and analyzed data.

Future research should focus on the ineffective integration of educational technology at a low-socioeconomic urban high school and the challenges this produces for administrators,
teachers, and students. Low-income schools in urban areas are presented with unique challenges that may require district and school staff to approach them from varying perspectives. Future researchers should look back at studies like this one in which the barriers to effective educational technology were identified and reevaluate to see if these barriers have been successfully turned into bridges.

Summary

Schools all over the world have seen the exponential rise of educational technologies over the past several decades. This multimethod applied research study analyzed the central question of how to improve the educational technology integration at Liberty High School, a low-SES high school in Kansas City, Missouri. This study utilized both qualitative and quantitative research methods to inform the problem and understand the themes related to the current ineffective educational technology integration at Liberty High School. District and school administrator interviews as well as a teacher focus group revealed the common themes of educator beliefs, staff experiences, technology support, and student technology skills. A teacher survey further informed the problem. A solution was proposed to improve educational technology integration. This solution provided for teacher input and collaboration between school and district administrators. Through this research study and proposed solution, Liberty High School has the opportunity and ability to help improve the integration of educational technology in its classrooms.

The purpose of this applied study was to solve the problem of ineffective educational technology integration for a low socio-economic urban high school in Kansas City, Missouri, and to design an educational technology integration improvement plan to address the problem. This chapter served as the foundation for this multimethod applied research study on the
problem of inadequate educational technology integration at a low-socioeconomic status (low-SES) urban high school in Kansas City, Missouri.
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https://doi.org/10.14742/ajet.796


https://doi.org/10.1002/cae.22111
APPENDIX A: IRB APPROVAL LETTER

September 1, 2020

Josiah Phillips
Russell Claxton

Re: IRB Exemption - IRB-FY19-20-461 The Improvement of Educational Technology Integration at a Low Socioeconomic High School

Dear Josiah Phillips, Russell Claxton:

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

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

Category 2(iii). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by §46.111(a)(7).

Your stamped consent form can be found under the Attachments tab within the Submission Details section of your study on Cayuse IRB. This form should be copied and used to gain the consent of your research participants. If you plan to provide your consent information electronically, the contents of the attached consent document should be made available without alteration.

Please note that this exemption only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued exemption status. You may report these changes by completing a modification submission through your Cayuse IRB account.

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

Sincerely,

G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
Research Ethics Office
APPENDIX B: DISTRICT APPROVAL LETTER

Superintendent of Schools

June 9, 2020

Dear Mr. Phillips,

I understand that, in your capacity as a doctoral student at Liberty University, you would like to complete a study on the improvement of Educational Technology Integration at a Low Socioeconomic Urban High School. I have reviewed your request and it is approved.

Further, you have permission to contact staff and educators within [redacted] to invite them to participate in your study.

Yours in education,

[Redacted]

Superintendent
Office of the Principal  
High School  
Kansas City, MO  

Date: June 19, 2020  

Dear Mr. Phillips:  

After careful consideration of your study proposal regarding The Improvement of Educational Technology Integration at a Low Socioeconomic Urban High School, I have decided to approve your study and grant you permission to conduct your interviews, focus group, and survey at [Redacted] High School.  

Sincerely,  

[Redacted]  
Principal, [Redacted] High School
APPENDIX D: INTERVIEW CONSENT FORM

CONSENT FORM FOR PARTICIPANTS

Consent

**Title of the Project:** The Improvement of Educational Technology Integration at a Low Socioeconomic Urban High School

**Principal Investigator:** Josiah J. Phillips, Liberty University School of Education

---

**Invitation to be Part of a Research Study**

You are invited to participate in a research study. In order to participate, you must be 18 years of age, and you must be a district administrator for the school district of the low socio-economic urban high school in this study. Taking part in this research project is voluntary.

Please take the time to read this entire form and ask questions before deciding whether to take part in this research project.

---

**What is the study about and why is it being done?**

The purpose of the study is to solve the problem of ineffective educational technology integration for a low socio-economic urban high school in Kansas City, Missouri and to design an educational technology integration improvement plan to address the problem.

---

**What will happen if you take part in this study?**

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

1. Participate in a recorded interview session consisting of 17 questions centering on your educational technology experiences. The anticipated time needed for this interview will be 45-60 minutes.
   a. Once interviews have been completed, they will be transcribed.
   b. The transcription of the interview will be provided back to participate so they may review it for accuracy.
   c. Participants will have an opportunity to make any corrections needed and approve the final transcript before it is used in the data analysis.

---

**How could you or others benefit from this study?**

Participants should not expect to receive a direct benefit from taking part in this study.

Benefits to society include the results of this study and the corresponding action plan being shared, providing the leaders of schools and districts with a more in-depth understanding of the problem of ineffective educational technology integration for low socioeconomic urban high schools.
What risks might you experience from being in this study?
The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

How will personal information be protected?
The records of this study will be kept private. Research records will be stored securely, and only the researcher will have access to the records. Data collected from you may be shared for use in future research studies or with other researchers. If data collected from you is shared, any information that could identify you, if applicable, will be removed before the data is shared.

- I will file and maintain all digital data I collect during this research in password-protected accounts that are accessible only by me. I will be the only person with access to this account information. Further, all notes I take will be taken in a password-protected Microsoft OneNote notebook. I will be the only person with access to this account and the information. I will keep any additional paper notes or documents in a locked filing cabinet in my office. Further, pseudonyms for all participants will be selected from the Social Security Administration’s list of the 100 most popular baby names.
- The list of participants and their pseudonyms will be kept in the password-protected Microsoft OneNote notebook. Additionally, the pseudonym Liberty High School will be used in place of the high school’s actual name.
- All video- and audio-recordings will be kept in a password-protected file on a password-protected computer. All video- and audio-recordings will be erased after three years.
- Confidentiality cannot be guaranteed in focus group settings. While discouraged, it is possible that other members of the focus group may share what was discussed with persons outside of the group.

Is study participation voluntary?
Participation in this study is voluntary. Your decision on whether to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free not to answer any question or withdraw at any time without affecting those relationships.

What should you do if you decide to withdraw from the study?
If you are chosen to participate in an interview session or the focus group and later choose to withdraw from the study, please contact the researcher at the email address/phone number included in the next paragraph. Should you choose to withdraw, data collected from you, apart from focus group data, will be destroyed immediately and will not be included in this study. Focus group data will not be destroyed, but your contributions to the focus group will not be included in the study if you choose to withdraw.

Whom do you contact if you have questions or concerns about the study?
The researcher conducting this study is Josiah Phillips. You may ask any questions you have now. If you have questions later, you are encouraged to contact him at 816-777-7416 or jphillips67@liberty.edu. You may also contact the researcher’s faculty sponsor, Russ Claxton, by email at rlclaxton@liberty.edu.
If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at irb@liberty.edu

By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. You will be given a copy of this document for your records. The researcher will keep a copy with the study records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

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

Printed Subject Name ______________________________ Signature & Date ______________________________
APPENDIX E: FOCUS GROUP CONSENT FORM

CONSENT FORM FOR PARTICIPANTS

Consent

**Title of the Project:** The Improvement of Educational Technology Integration at a Low Socioeconomic Urban High School

**Principal Investigator:** Josiah J. Phillips, Liberty University School of Education

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<tbody>
<tr>
<td>You are invited to participate in a research study. In order to participate, you must be 18 years of age, and you must be a teacher or staff member of the low socioeconomic urban high school in this study. Taking part in this research project is voluntary.</td>
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Please take the time to read this entire form and ask questions before deciding whether to take part in this research project.

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<th>What will happen if you take part in this study?</th>
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<tr>
<td>If you agree to be in this study, I would ask you to participate in a video- and audio-recorded 45-60 minute focus group of teachers and staff members.</td>
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<td>Participants should not expect to receive a direct benefit from taking part in this study.</td>
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Benefits to society include the results of this study and the corresponding action plan being shared, providing the leaders of schools and districts with a more in-depth understanding of the problem of ineffective educational technology integration for low socioeconomic urban high schools.

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<td>The records of this study will be kept private. Research records will be stored securely, and only the researcher will have access to the records. Data collected from you may be shared for use in future research studies or with other researchers. If data collected from you is shared, any information that could identify you, if applicable, will be removed before the data is shared.</td>
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</table>
I will file and maintain all digital data I collect during this research in password-protected accounts that are accessible only by me. I will be the only person with access to this account information. Further, all notes I take will be taken in a password-protected Microsoft OneNote notebook. I will be the only person with access to this account and the information. I will keep any additional paper notes or documents in a locked filing cabinet in my office. Further, pseudonyms for all participants will be selected from the Social Security Administration’s list of the 100 most popular baby names.

The list of participants and their pseudonyms will be kept in the password-protected Microsoft OneNote notebook. Additionally, the pseudonym Liberty High School will be used in place of the high school’s actual name.

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Confidentiality cannot be guaranteed in focus group settings. While discouraged, it is possible that other members of the focus group may share what was discussed with persons outside of the group.

### Is study participation voluntary?

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

### What should you do if you decide to withdraw from the study?

If you are chosen to participate in an interview session or the focus group and later choose to withdraw from the study, please contact the researcher at the email address/phone number included in the next paragraph. Should you choose to withdraw, data collected from you, apart from focus group data, will be destroyed immediately and will not be included in this study. Focus group data will not be destroyed, but your contributions to the focus group will not be included in the study if you choose to withdraw.

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The researcher conducting this study is Josiah Phillips. You may ask any questions you have now. If you have questions later, you are encouraged to contact him at 816-777-7416 or jphillips67@liberty.edu. You may also contact the researcher’s faculty sponsor, Russ Claxton, by email at rlclaxton@liberty.edu.

### Whom do you contact if you have questions about your rights as a research participant?

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at irb@liberty.edu

### Your Consent
By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. You will be given a copy of this document for your records. The researcher will keep a copy with the study records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

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

______________________________  __________________________
Printed Subject Name                      Signature & Date
APPENDIX F: TEACHER SURVEY CONSENT FORM

CONSENT FORM FOR PARTICIPANTS

Consent

Title of the Project: The Improvement of Educational Technology Integration at a Low Socioeconomic Urban High School

Principal Investigator: Josiah J. Phillips, Liberty University School of Education

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Please take the time to read this entire form and ask questions before deciding whether to take part in this research project.

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future research studies or with other researchers. If data collected from you is shared, any information that could identify you, if applicable, will be removed before the data is shared.

- I will file and maintain all digital data I collect during this research in password-protected accounts that are accessible only by me. The survey data will be kept in the Survey Monkey website account that I will create specifically for this study. I will be the only person with access to this account information. Further, all notes I take will be taken in a password-protected Microsoft OneNote notebook. I will be the only person with access to this account and the information. I will keep any additional paper notes or documents in a locked filing cabinet in my office. Further, pseudonyms for all participants will be selected from the Social Security Administration’s list of the 100 most popular baby names.
- The list of participants and their pseudonyms will be kept in the password-protected Microsoft OneNote notebook. Additionally, the pseudonym Liberty High School will be used in place of the high school’s actual name.

**Is study participation voluntary?**
Participation in this study is voluntary. Your decision on whether to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free not to answer any question or withdraw at any time without affecting those relationships.

**What should you do if you decide to withdraw from the study?**
Anonymous Survey Research: If you are chosen to participate in the anonymous survey and later choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

**Whom do you contact if you have questions or concerns about the study?**
The researcher conducting this study is Josiah Phillips. You may ask any questions you have now. If you have questions later, you are encouraged to contact him at 816-777-7416 or jphillips67@liberty.edu. You may also contact the researcher’s faculty sponsor, Russ Claxton, by email at rlclaxton@liberty.edu.

**Whom do you contact if you have questions about your rights as a research participant?**
If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at irb@liberty.edu.

**Your Consent**
By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. You will be given a copy of this document for your records. The researcher will keep a copy with the study records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.
I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

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

_________________________ ________________________
Printed Subject Name Signature & Date
APPENDIX G: ADMINISTRATOR INTERVIEW QUESTIONS

1. Please tell me about your educational background and if you received training in educational technology integration?

2. Please tell me about your professional background and your previous experiences with educational technology integration?

3. What does educational technology mean to you?

4. Please describe your view of the importance of educational technology integration to the success of the students at Liberty High School.

5. Please describe your personal level of comfort with educational technology.

6. How important do you believe that it is to use educational technology in Liberty High School classrooms?

7. What has your experience been with technology support for Liberty High School?

8. Please describe how successful you feel the current level of educational technology integration is at Liberty High School.

9. Please describe the level of confidence you believe that Liberty High School teachers have in their skills and ability to integrate educational technology into their classrooms.

10. Do you feel that technology anxiety has an impact on Liberty High School teachers’ ability to integrate educational technology into their classrooms? If so, how strong do you believe that impact is?

11. What do you believe the quality of technology support experiences for Liberty High School teachers has been?
12. How easy is it for Liberty High School teachers to use their educational technology in their classrooms?

13. What can you tell me about the educational technology professional development that Liberty High School teachers have received?

14. How effective do you believe this professional development has been?

15. What barriers do you believe are preventing the teachers at Liberty High School from successfully integrating educational technology into their classrooms?

16. What do you believe could be done to improve the current state of educational technology integration at Liberty High School?

17. Is there anything you would like to add that has not been covered?
APPENDIX H: FOCUS GROUP QUESTIONS

1. Why do you think educational technology is not effectively integrated into Liberty High School classrooms?

2. What things can be done to better improve the integration of educational technology at Liberty High School?

3. Is educational technology useful to teachers at Liberty High School?

4. What type of educational technology would be most useful?

5. What type of training or professional development would be most useful?

6. How does technology support play a role in educational technology integration?

7. How does technology anxiety impact educational technology integration?
APPENDIX I: EDUCATIONAL TECHNOLOGY INTEGRATION SURVEY

QUESTIONS

1. How confident do you feel in your ability to integrate educational technology into your classroom?

2. How confident do you feel using educational technology which you have never used before?

3. How confident do you feel that your professional development experiences have prepared you to integrate educational technology into your classroom?

4. How well do you feel you were prepared by your teaching certification program to incorporate educational technology into your teaching?

5. How confident do you feel that you can ask for help in integrating educational technology into your classroom?

6. How confident do you feel that the technology support offered in your school can assist you in integrating educational technology into your classroom?

7. How strongly do you feel that the current level of technology support impacts your ability to integrate educational technology into your classroom?

8. How strongly do you feel that your school administration supports your efforts to integrate educational technology into your classroom?

9. How strongly do you feel that your district administration supports your efforts to integrate educational technology into your classroom?

10. How well are you communicated with by your school leadership about the expectations of integrating educational technology into your classroom?
11. How well are you communicated with by your district leadership about the expectations of integrating educational technology into your classroom?

12. How scared are you of educational technology?

13. How nervous does working with educational technology make you?

14. How comfortable are you when working with educational technology?

15. How easy is it for you to use the educational technology that is currently in your classroom?

16. How easy would it be for you to learn how to use the educational technology that is currently in your classroom?

17. How easy would it be for you to learn to effectively integrate the educational technology that is currently in your classroom?

18. How easy would it be for you to learn to integrate new educational technology into your classroom?

19. How easy would it be for you to integrate new educational technology into your classroom?

20. How easy is it for your students to use educational technology in your classroom?

21. How useful is educational technology in helping you educate your students?

22. How much is your current educational technology helping you improve your effectiveness as a teacher?

23. How strong is your intention to use your current educational technology in your classroom?

24. How strongly do you believe that you would use new educational technology in your classroom?