INFLUENCE OF APPLICATIONS AND USAGE OF TECHNOLOGY ON STUDENT ENGAGEMENT IN THE CLASSROOM
A QUALITATIVE STUDY

by

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Abstract

This qualitative phenomenological study focuses on the influence of technology applications and usage on student engagement in the classroom setting for high school (9th-12th grade) students and their teachers at a high school in New Mexico. The literature reviewed includes findings that technology applications and usage influence student engagement. However, there were gaps in literature in sharing teacher's lived experience. The theory guiding this study is Bandura's social cognitive theory. A qualitative phenomenological framework was followed to collect data from ten 9th through 12th-grade teachers. Individual interviews, focus groups, and non-participant observations were used as data collection approaches to address the central research question, how does technology applications and usage influence student engagement in the classroom? Data were analyzed through thematic analysis, constant comparisons, and observational field notes. The study's findings resulted in five major themes, which are reviewed along with implications and future study recommendations.

Keywords: technology, engagement, influence, applications, usage

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Dedication

I dedicate this dissertation to my daughter, Merissa, and my son, Ben, who are my motivation and drive in every aspect of my life.

Acknowledgments

I would like to acknowledge my committee chair Janet Deck, Ed.D. and my committee member/methodologist Dr. Susan Stanley. Additionally, I would like to acknowledge the ten teacher participants who volunteered to participate in my study.

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List of Abbreviations

Information and Communication Technology (ICT)

Learning Management Systems (LMS)

Levels of Technological Engagement (LTE)

Social Cognitive Theory (SCT)

Social Determination Theory (SDT)

Technology Enhanced Learning (TEL)

CHAPTER ONE: INTRODUCTION

Overview

Technology is an essential component in the global world and the education world. The impact of technology on students and the classroom environment have become more apparent in recent years, especially as educators have continued educating students through a global pandemic. In many instances, education has become dependent on technology. Teachers implement strategies to utilize technology's benefits while lessening the adverse effects, including decreased student engagement leading to student motivation and achievement issues. The benefits of technology in the classroom are known, technology applications and usage, such as access to learning applications, learning platforms, and the infinite amount of information accessible with technology (Seemiller & Stover, 2017).

When students have access to technology applications and usage, including learning management systems, such as Google Classroom or Canvas, student engagement increases. Google Classroom is a collaborative technology that is linked to engagement that can also lead to disengagement when used with non-teacher-created materials (Bond, 2020). The benefits of technology applications and usage are documented in the research of Bond; however, gaps in the research exist. Gaps are seen in the student and teacher experience of applications and technology usage. Despite the gaps and mixed findings based on contextual factors, using technology to promote student engagement is still recommended (Schindler et al., 2017). Conducting a qualitative phenomenological study will help to understand how educational technology, such as Canvas and Google Classroom, influence student engagement. More specifically, this study will focus on how technology applications and usage influence students' engagement in 9th through 12th-grade classrooms. Chapter one covers the background, historical

context, social context, and theoretical context of the influence of technology on student engagement in the classroom. The remainder of the chapter will discuss the problem statement, purpose statement, study significance, central research question, sub-questions, and definitions pertaining to the study will be shared.

Background

Historically, educators have seen technology's evolution and growth in the classroom. Selwyn (2020) posited that using technology in education is a good thing through educational opportunities for students. As such, technology is prevalent in people's everyday lives and has created a role in education to help increase student learning (Boonmoh et al., 2021). Technology's historical background leads to the social aspects of technology usage in the classroom setting through collaboration and social platforms that students utilize. Many technological advances in education include social features that add to the social context of the topic of technology in the classroom, social features found in learning management systems, and teaching practices that require collaboration among users. Google Classroom is a learning management system that is utilized, where students can work on the same document or meet in virtual meeting rooms to collaborate, adding to the social feature of the system. Student engagement and technology are apparent in social cognitive theory, as technology can influence student engagement (Schunk & DiBenedetto, 2020).

Tyler was one of the early philosophers whose work in the 1930s focused on student engagement (Groccia, 2018). His work led researchers such as Astin (1999), Fredricks, Blumenfield, Paris (2004), and Kahu (2013) to illustrate the importance of student engagement as part of educators' best practices. In recent years, student engagement has been studied. Researchers have revealed that student engagement is crucial for optimal and deep-level learning

(Cents-Boonstra et al., 2020). The importance of student engagement in learning is essential. Educators need the tools to establish and maintain student engagement in the classroom.

There are many varied definitions of student engagement. For the purpose of this study, *student engagement* is defined as the time and effort students devote to activities that are empirically linked to desired outcomes (Groccia, 2018). When technology integration occurs in the classroom environment, the influence is apparent for teachers.

Historical Context

The historical context of technology is important to note. Students are graduating high school while being globally connected through social and virtual environments (Pittman et al., 2020). Educators are teaching digital natives in a digital world in continual transition. Technology, as a conceptualization, is consistently evolving at a fast pace. Technology applications and usage are advancing and ever-changing. The evolution of change is grounded in the individuals that utilize technology. As advancements take place, applications have changed the daily lives of technology users (Schindler et al., 2017). Before the existence of technology, scientists anticipated the development of a worldwide network of information in the 1900s (Andrews, 2019). The early anticipation led to the development of the internet in 1969; then, email was made available in 1971 (Swatman, 2015). In the 1990s, dial-up phone lines connected individuals to the world wide web, allowing more widespread internet access (*An Internet History Timeline: From the 1960s to Now*, 2016). Throughout the 1990s, the creation of many technical applications, for example, Amazon, online dating, eBay, Microsoft windows, Hotmail, Netflix, AOL, Yahoo, Google, and online music access (*World Wide Web Timeline*, 2020), developed. In the 2000s, technology access continued to grow, with 55 million and growing internet users. The growth of technology brought the quick accent of social media into the digital

world. Technology advances are easily accessible, making technology easily accessible in the classroom.

The need for technology has increased as technology's evolution has occurred. The digital revolution affects the daily lives of individuals (Schindler et al., 2017). People continuously seek effortless, effective, and efficient ways to accomplish daily tasks, meet deadlines, and reach their goals in the digital revolution. Technology constantly connects day-to-day life (Seemiller & Stover, 2017). Worldwide, a need has been created that requires technology to evolve constantly. Individuals need technology to interact in their daily life, for example, to connect with others in the workplace or personal life. Many workplaces are fully technology-based, with technology usage necessary to apply for job openings. As technology has become a daily necessity to function in the digital world, a need for the evolution to meet the demands of daily living tasks of communication and business relations is created.

Educators are no different in the evolution of technology. Educators have seen advances due to technology in the curriculum as an instructional delivery system, a means of adding instructions, and a tool to enhance the entire learning process (Raja & Nagasubramani, 2018). Technological advances have opened numerous opportunities for teachers and students within the last 10 years. The opportunity to utilize technological advances, such as 3D printing, augmented reality, virtual reality, cloud computing, hologram technology, biometrics, smartphones, multi-touch LCD screens, internet of things, artificial intelligence, big data, and QR code technology allows teachers to enhance the teaching and learning process, which leads to the creation of the interest of learners (Halili, 2019).

Educators are teaching in the digital era, and technology's role is vital in creating and exchanging knowledge and information. In the digital era, technology plays an essential role in

creating and exchanging knowledge and information in the field of education. Technology in educational settings may increase teacher knowledge and support students' learning. Students have a need and a want for technology in their education. Seemiller and Stover's (2017) research have shown the many benefits of using technology in the classroom, such as access to learning applications and platforms and the infinite amount of information accessible. Digital learning allows students to interact in human-to-human mediums and human-to-human interactions, creating a varied level of engagement (Florenthal, 2018). The list of benefits includes the transformational power of technology utilization. The transformational power can help affirm and advance relationships among teachers and students, reinvent approaches to learning and collaboration, decrease equity and accessibility gaps, and adapt learning experiences to meet the needs of all learners (*Office of Educational Technology, 2017*).

The need for technology grew as the world faced the global COVID-19 pandemic. Education was only able to continue with the use of technology. School campuses across the country and the world were closed to prevent the spread of the virus. While school campuses were closed, education was not closed. Educators had to adapt to teaching their students while being in a different location than their students. Technology applications and usage became educators' tools to continue educating their students. Virtual classrooms were set up using technology applications, such as Canvas, Google Classroom, Zoom, and Microsoft Teams, allowing teachers to stay connected to their students and their educational progress while keeping everyone distanced from one another and safe from contracting the virus. Technology will continue to evolve, and the need for research based on its influence on student engagement is imperative (Zhao et al., 2022).

Student engagement dates to the work of Tyler in the 1930s. Tyler's work presented the positive effects of time on task, leading to the seven principles of good teaching practices (Groccia, 2018). The seven principles, student-teacher contact, cooperation among students, active learning-where engagement fits in, prompt feedback, time on task, communicating high expectations, and respect for diverse ways of learning, are integral to instructional design (Fiock, 2020). Since Tyler's early work in the 1930s, student engagement has become essential to best teaching practices. Student engagement is critical when designing instructional material. Student engagement is a classroom component that can be implemented and measured. The engagement of students is a multifaceted, complex phenomenon critical to supporting student development and learning (Nkomo et al., 2021). In many states, student engagement is part of the formal and informal observation processes of evaluating teachers, elaborating on its importance.

Social Context

Social engagement plays a role in students' learning processes (Nkomo et al., 2021). As learning is a social process, technology also has a social context. Students in classrooms are digital natives both in and out of the classroom. Technology is easily accessible for most of today's 21st-century students. Teachers face the competition of the technology distractions that influence students during and after school hours. Technology usage in the classroom environment influences the educator's experience, impacting student engagement and thus impacting their learning (Carstens et al., 2021). All stakeholders are affected by the technology that impacts the classroom environment: the students, staff, parents and guardians, and the extended community. Students and staff would be affected by a study that identifies the influence of technology on student engagement and identifies strategies to lessen said influences that negatively influence overall student achievement.

Christians are living through the fourth industrial revolution (Oliver, 2020). Technology is a component of the revolution. The social impacts of technology come from social media platforms that have skewed people's social and moral norms, students and youth included. Social media, such as Facebook, Instagram, Snapchat, TikTok, and Twitter, are part of the everyday life of people of all ages (Alshare et al., 2019). Alshare et al. concluded that social media websites (e.g., Facebook, Twitter, YouTube, and WhatsApp) have a statistically significant impact on the development of the moral and social aspects of students. Social media is a part of many people's daily lives. People have become addicted to scrolling and refreshing for new content, checking likes and comments, and updating their lives on social media, causing them to be influenced by other people's negative and positive posts (Vinesh, 2019). Educators encourage technology usage in the classroom while limiting or lessening the distractions caused by the social influencers experienced with technology. The Bible says, "Train a child in the way he should go. And when he is old, he shall not depart from it" (NIV, 2017, Proverbs. 22:6). Identifying how technology influences student engagement and strategies that teachers can utilize to lessen the impacts is essential.

Theoretical Context

The study focuses on technology's influence on student engagement in the classroom. The researcher identified strategies teachers can utilize to lessen the influence of technology integration on student engagement. Many researchers, practitioners, and policymakers have increased attention on student engagement, conceptualization, and measurement tools in the past decade (Bond et al., 2020). Bandura's (1986) social cognitive theory (SCT) addresses these concerns and consists of three core concepts: observation, mental state impacts learning, and learning does not always lead to behavior changes. According to Bandura's theory, the variables

of learning, attention, retention, reproduction, and motivation impact learning. The variables influence motivation closely in a learning environment. SCT posits that motivation has two variables: expectancy and reinforcement value. Bandura shared that behavioral variables influence motivation through the choice of activities, effort, persistence, achievement, and environmental regulations. The theory reveals that influences in the environment impact motivation in learning.

Different types of motivation as a source of energy activate students to be engaged in activities (Chiu, 2021). The SCT supports the research that technology can be a social concept. Technologies changing the environment have meant that SCT helps understand human behavior, thus connecting technology to social concepts (Ratten & Ratten, 2007). Technology acts as an influencer. The constant evolution and growth in technology are on track to continue, thus identifying strategies to lessen the impacts is vital. Today's educators face keeping students engaged with environmental influences acting as distractions. The study adds to current research bodies regarding student engagement, as the study is phenomenology-based, focusing on the teacher's experiences.

Problem Statement

The problem is that the applications and usage of technology in the classroom environment adversely influence student engagement, directly influencing both educators and students. Technological benefits are apparent in current research. For example, Raja and Nagasubramani's (2018) research concluded that the positive impacts of technology applications and usage are not limited to include enhanced teaching and learning, globalization, or no geographical limitations. Student engagement is an essential learning indicator of the quality of education with active learning (Lee et al., 2019). Past researchers have identified various

strategies to support engagement better. However, a limited understanding of how technologies engage students and enhance learning outcomes are known (Nkomo et al., 2021). Furthering qualitative research focused on the teacher experiences of educational technology's application and usage influence on engagement is meaningful to education. To make the research more meaningful, this study focuses on teachers' feedback and their perspective on their experiences in virtual or in-person learning environments to identify the influence that utilizing technology has on student learning and overall academic achievement.

Although the Bible does not speak of technology negatively or positively, research in educational technology is crucial to Christians. Sire et al. (2020) discussed moral and social norms shifts. Technology intensifies these shifts through easy access. As Christians, we now face the challenge of contextualizing information in this disruptive era (Oliver, 2020). The line between the digital and physical worlds is becoming increasingly invisible.

Purpose Statement

This qualitative phenomenological study's focus is the influence that technology applications and usage have on student engagement in the classroom setting for high school (9th-12th grade) students and their teachers at a high school in the state of New Mexico. For the purpose of the study, *student engagement* is defined as the time and effort students devote to activities that are empirically linked to desired outcomes (Groccia, 2018).

Significance of the Study

A triad of sources shapes technology, the primary being the motivation behind technology, the influence of technological history, and society's choices (Euchner, 2021). Technology's growth and evolution have considerably impacted society throughout history. Technology is vital in structuring individuals, groups, organizations, and industries (Van Den

Oord & Van Witteloostuijn, 2018). Technological advances are constantly developing and transitioning. Before the pandemic, technologies' importance was growing. Then, technology became necessary for organizational operations and social communications among people. As the world heals from the pandemic and transitions to a new standard, technology will still be a significant component in educational settings, adding to its significance.

People use technology to complete daily living and educational tasks. With the growth of technology, educators need to continue to grow students' 21st-century skills while harnessing the resources that come with technology. Classroom teaching has changed from stand-alone lectures to teachers acting as facilitators. The roles have changed; students are responsible for teaching and learning by actively participating in learning activities, while the teacher is no longer lecturing but facilitating. Students play the role of facilitator during teaching and learning sessions in the classroom by actively participating in each learning activity, while the teacher acts as a facilitator (Masek, A. 2019). Teachers are no longer standing in front of a podium in the classroom, lecturing students, hoping students will retain the information they are transmitting. Educators have taken on the role of facilitator of learning. Facilitating student learning has opened the traditional classroom to include personalized learning, project-based learning, flipped classrooms, personal response systems, and problem-based learning. Technology applications and usage are crucial components of these types of learning. The need for technology is established, although the importance of negative influences that come with technology utilization is important to note. This study focuses on what influences technology has on student engagement.

Additionally, the researcher identified strategies teachers can utilize to lessen the negative influences. In their article, Georgiou and Kyza (2018) illustrated how empirical research in

technology-rich educational environments and students' increased learning is often contradictory. Creating a phenomenological-based study focusing on the experiences of high school (9th-12th grade) teachers increased the literature base**.**

Research Questions

While acknowledging past research on the influences on student engagement and the growth of technology applications and usage in education, the central need to investigate teacher and student experiences exists. The following central research and two sub-questions guided the phenomenological study to identify the influence technology applications and usage have on student engagement in the classroom while identifying strategies to lessen the negative influences.

Central Research Question

How does technology applications and usage influence student engagement in the classroom?

Sub-Question One

What are the experiences of high school teachers (9th- 12th grade) utilizing technology in the classroom?

Sub-Question Two

What strategies can educators implement to lessen the negative influences of technology on student engagement?

Definitions

1. *Academic distraction*– Academic distraction is distraction occurring in an educational setting caused by digital devices, such as laptops, tablets, and smartphones (Chen et al., 2020).

2. *Active learning*- Active learning is learning that is completed with the expectation of using the material (Mintzes & Walter, 2020).
3. *Educational technology* – Educational technology pertains to the application of mechanical and material tools (especially, computers and computer programs) to problems in education (Lakhana, 2014).
4. *Engagement*- Student engagement is defined as the time and effort students devote to activities that are empirically linked to desired outcomes of college and what institutions do to induce students to participate in these activities (Groccia, 2018).
5. *Passive learning*- Passive learning is when learners are not visibly doing anything, other than watching, listening, or reading (Magana et al., 2018).

Summary

Technology use in education has grown, especially with the onset of the global COVID-19 pandemic; therefore, the need for technology in education is exponential. Educators have the task of integrating technology applications in their classrooms with unexpected, fast growth while not having the applications become a distraction and negatively influence student engagement. The research is adequate on engagement in the social cognitive theory of learning. The study's focus is to address the problem that technology applications and usage in the classroom may influence student engagement, which, posthaste, affects student learning and achievement. A qualitative phenomenological study was conducted to understand the influence that technology applications and usage has on the engagement of high school (9th-12th grade) students and their teachers. A phenomenological framework will lead to answering the established central and sub-questions. Strategies to minimize the negative influences on student engagement will be explored by exploring the influences of technology.

The study is significant to Christians and Christian educators. As time passes, a shift in moral and social thinking has occurred, mainly revolving around technology and social media platforms. As the study progressed, the focus on the word of God was crucial. Romans 12:2 (NIV, 2017) says, “Do not be conformed to this world, but be transformed by the renewal of your mind, that by testing you may discern what is the will of God is, what is good and acceptable and perfect.”

CHAPTER TWO: LITERATURE REVIEW

Overview

Chapter two reviews relevant academic peer-reviewed journal articles from various databases, such as ERIC, Jerry Falwell Library, Google Scholar, ProQuest, and JSTOR. Utilization of synthesis and systematic process applying keywords and phrases, such as social cognitive theory, COVID-19, educational technology, learning management systems, Google Classroom, Canvas, Blackboard, student engagement in the classroom, technological engagement, social media, and academic distractions in the classroom. In addition to peer-reviewed journal articles, online sources and published reports were consulted. First, chapter two presents the theoretical framework of the study of Social Cognitive Theory (SCT). A review of related literature is complete on the key topics relating to the study and gaps in the literature as it relates to the teacher experience of technology applications and usage in the classroom environment. The literature reviewed in this chapter examines the influences of technology applications and usage on student engagement in the classroom as it relates to SCT, COVID-19, educational technology, learning management systems, Google Classroom, Canvas, Blackboard, student engagement in the classroom, technological engagement, social media, and academic distractions in a classroom setting. The purpose of this literature review is to recognize current research and studies that relate to educational technology applications and usage in the classroom environment and its influence on student engagement.

Theoretical Framework

Social Cognitive Theory

In education, theories are used to understand learning and how it occurs with students. *Educational theories* are the principles on which the practice of an activity is based

(Akpan & Kennedy, 2020). Four leading theories provide the framework in educational research. Humanistic theories, behaviorist theories, cognitivist theories, and constructivist theories make up the four leading theories. Albert Bandura's (1978) SCT is one of the main cognitivist theories. The following section will detail Albert Bandura's SCT of learning, the theoretical framework for this study.

Albert Bandura was a Canadian-born American psychologist known as the father of cognitive theory (Lindzey & Runyan, 2007). The social cognitive theory was developed in 1977. In psychology and applications in education and healthcare, the social cognitive theory is the most studied theory (Beauchamp et al., 2019). The theory has been accepted as a learning theory and accepted in educational research. The original theory, Bandura's social learning theory, was later changed to SCT and contributed to students and teachers within the education field (Barkha et al., 2016).

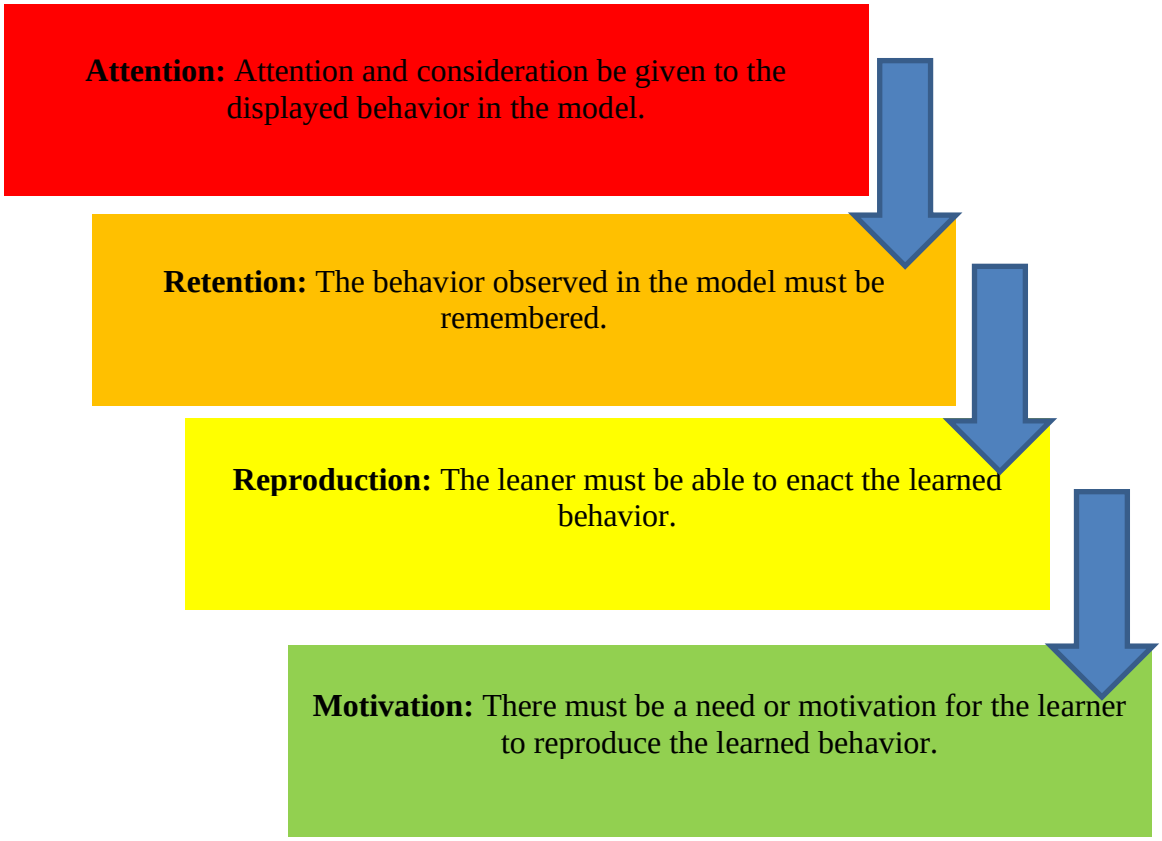
Albert Bandura's SCT connects behaviorist and cognitive learning theory (Ilmiani, et al., 2021). Bandura objected to his theory being associated with behaviorism, as he believed behavior was learned as a cognitive process (Lindzey & Runyan, 2007). SCT is based on an interactional view between individuals and their environment (Eun, 2018). Learning occurs through interactions with individuals in a social context (Bandura). In a classroom environment, the social interactions are teacher-to-student, as well as student-to-student.

SCT is comprised of the principle that people learn from one another (Bandura, 1986). The theory uses a framework to explain human behavior that leads to building knowledge. Learning takes place based on observation, imitation, and modeling, leading to behavior change. Behaviorist theories posit that learning occurs after a permanent behavior change occurs; Bandura's SCT theory argues that learning may or may not result in a behavior change. SCT

explains that learning occurs through observational learning and a modeling process (Figure 1) (Akpan & Kennedy, 2020).

Figure 1

Observational Learning and Modeling Process

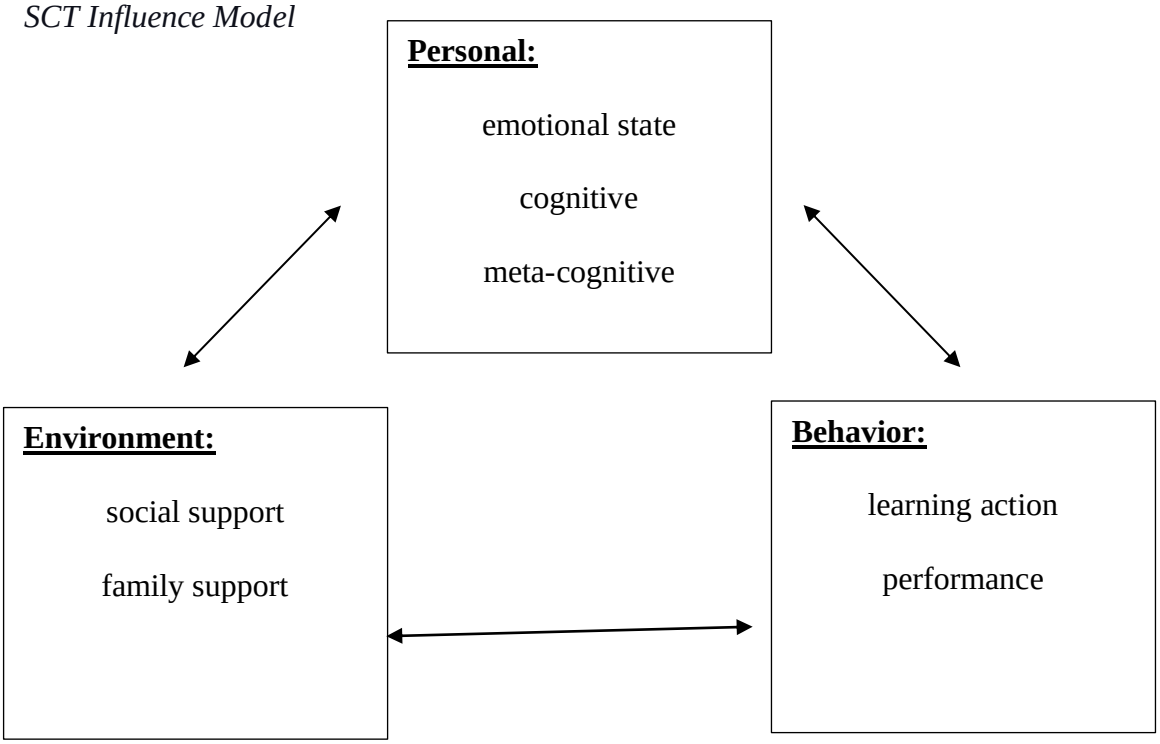


Bandura (1986) developed the observational learning and model process framework as the base of SCT, while the theory also has developed assumptions within the internal structure. The internal structure is comprised of behavioral, environmental, and personal variables (Figure 2) (Schunk, 2019). The causation is a functional dependence between the environment, person, and behavior (Stajkovic & Sergent, 2019). The three variables relate, are inseparable, and influence each other consistently. Within each influence, the situation describes the mental or cognitive and illustrates the physical or social environment that impacts a learner's actions and

behavior. SCT's standpoint on the social environment is vital in learning; the influence of the social environment leads to motivation that leads to learning.

Figure 2

SCT Influence Model



Environmental influences can be social or physical in nature (Bandura, 1986). Social and environmental influences can be family, friends, peers, teachers, or other individuals the learner is in contact with during their life (Blazevic, 2016). The room itself, the room's climate, the room's lighting, the location of the room, and the availability of items in the room all make up the physical environment of influences (Bandura).

Self-efficacy is a focus that SCT is built on to describe the framework. In Bandura's theory, self-efficacy is a personal variable defined as "an individual's belief in his or her own ability to organize and implement action to produce the desired achievements and results"

(Bandura, 2001, p. 3). Bandura (1986) believed that an individual's thoughts, beliefs, and feelings all influence and impact one's behavior.

A relationship between self-efficacy and student satisfaction exists where a strong sense of efficacy increases human well-being and influences the amount of experienced stress and anxiety as they engage in an activity and when a student engages in a course (Doménech-Betoret et al., 2017). Self-efficacy has different effects on cognitive processes, such as being purposive and regulating valued goals (Bandura & Watts, 1996). Bandura (1986) posited that the stronger sense of efficacy, the more challenges people will commit to and believe they can overcome. When an individual has a low sense of self-efficacy, negative thoughts will increase, and a task's challenge is threatened (Yusuf, 2011).

SCT views motivation as having two variables, expectancy, which is one's belief that reinforcement occurs after a behavior, and reinforcement value, how much an individual desires an outcome relative to a potential outcome (Bandura, 1986). Behavioral variables influence motivation through the choice of activities, effort, persistence, and achievement, as well as environmental regulations (Schunk & DiBenedetto, 2020). Several influences in the environment affect motivation in learning. These influences can be student expectations, self-reflection, or reward systems. Personal variables include one's emotions, reasoning, and faith. The influences all impact student motivation. Vicarious learning occurs when the learner performs a task that was part of the early social-cognitive theory. This type of learning depends on the learner having enough motivation to watch or experience the task being performed; another example of how motivation is associated with social cognitive learning is engagement and learner behaviors—self-evaluations, goals, and social comparison act as motivating factors in the theory.

As with any theory, SCT has limitations. Several limitations need to be taken into consideration when studying the theory. *The Social Cognitive Theory* (2019) includes limitations of SCT, which are the assumption that changes in the environment lead to changes, the theory is loosely organized, biological, and hormonal predispositions are ignored, and the theory can be broad reaching in nature. At times, SCT is viewed as learning is a passive process (Akpan & Kennedy, 2020). Asakura et al. (2020) posited that reproduction does not always occur from modeling and demonstrated behavior different from the modeled behavior may occur. When researching theoretical frameworks, it is essential to keep such limitations in mind.

Related Literature

COVID-19

Technology and online learning usage have expanded internationally in recent years (Quesada-Pallares et al., 2019) in education, as well as in other industries and individuals' personal lives. However, in 2020, the COVID-19 pandemic almost brought the world to an unprecedented stop (Aristovnik et al., 2020). The Covid pandemic began with an outbreak of a deadly virus in Wuhan, Hubei, China, in late December 2019 (Wu, et al., 2020). The virus spread quickly; by January 2021, 93 million and rising rapidly cases of COVID-19 had been confirmed, with more than two million deaths associated with the virus (Klingelhöfer et al., 2021). As of September 11th, 2022, there have been 613,697,577 coronavirus cases and 6,516,287 deaths worldwide. The coronavirus disease was significant in all industry fields, especially education (Pratama et al., 2021).

As the world faced the global COVID-19 pandemic in 2020, education became dependent on technology due to closed school campuses. Staff and student absenteeism, prevention of disease transmission, and limiting the risk to the vulnerable population led to

worldwide forced school closures (Li et al., 2022). All levels of educational campuses were faced with closures, some by local and state orders. In March 2020, all 50 states in the United States closed kindergarten through twelfth-grade schools and childcare centers, with nearly all colleges and universities closing as well (Donohue & Miller, 2020). The closures were unprecedented, impacting 21 million children in childcare, 57 million students in kindergarten through twelfth grade, and 20 million college and university students (Donohue & Miller). As students and teachers alike were banned from campuses, the impact on the educational process and progress was detrimental. Hammerstein et al. (2021) shared that there is clear evidence for a negative effect of COVID-19-related school closure on student achievement. The research reviewed shows that the COVID-19 pandemic had negative impacts on the educational process, as well as other effects, such as income and life expectancy as long-term consequences (Donohue & Miller). Research by Li et al. showed that school plays a vital role in the societal function of children's overall well-being. Most of the current research mainly points to school closure with remote and virtual learning only taking place having negative impacts on student learning and achievement (Spitzer & Musslick, 2021). However, researchers have demonstrated positive effects.

Hebebci et al.'s (2020) research revealed that teachers viewed distance education positively as distance learning is planned and programmed to allow for the assurance of equal learning opportunities. Spitzer and Musslick's (2021) research shared that the positive impacts of online learning were observed, specifically relating to consistency and less distraction. Positive and negative outcomes are influenced by varying factors, such as technology equity issues because of social income disadvantages that created a gap between students. In Engzell et al.'s

(2021) research, parents' education level also impacted students' distance learning success and achievement.

Physical resources are a necessity for students to access and engage in online learning; students need hardware, software, and internet accessibility (Tate & Warschauer, 2022). A digital divide occurs when students do not have these necessities. As COVID-19 quickly became an educational issue in the last two and half years, and technology is closely tied to it, the literature on its impacts must be reviewed, as the study focuses on the influence of technology applications and usage on student engagement.

Education at all levels has grown and experienced a change in the last 50 years, and COVID-19 has been the most significant challenge that national education systems have faced (Daniel, 2020). Educational technology applications and usage is the answer to the challenge education has faced in the last two years. The increased utilization of technology in education systems to address the challenges that COVID-19 has caused forced educators to examine strategies to deal with the impact of increased teaching applications and usage.

Educational Technology

The word *technology* is a keyword in the world today, even though it is greatly confused (Agar, 2019). Agar posited the confusion comes from the origin of the word where the understanding of the word causes conflicting meanings. Since the beginning of human's existence on earth, technological devices have been rife (Alhumaid, 2019). The confusion can be from a number of sources. In Paleolithic times, technology was a tool and what the base of the current understanding should be. Technology is a tool, however in previous times and even in some instances in current times, the tool is thought of as a physical tool, such as a hammer or a shovel. Technology is a broad concept that address a specific usage of a tool for a craft and how

the tool impacts the environment in which it is used (Okafor, 2022). For the intent of the study, technology should be viewed as a digital tool to utilize as a resource.

Combining the word *educational* to *technology* adds to the confusion. On the Tech Edvocate website (Lynch, 2022), *educational technology* is defined as "the utilization of apps and tech devices for the purpose of teaching and learning." Applications can be learning platforms, such as Canvas, Blackboard Learn, Google Classroom, EdApp, Udemy School, WizIQ, Skillshare, or Coursera. Desktops, laptops, tablets, interactive display boards, keyboards, mice, and smart phones are all types of hardware that are categorized as tech devices. Essentially, all electronic devices and technology-based software that is used in a classroom to teach and learn belongs in the educational technology category. Many curricula textbook companies have ample digital resources that are used for teaching and learning, some only offering digital resources.

In educational technology, educators are educating in a digital world in a state of continual transition. Technology has evolved at a fast pace. As a concept, it is evolving and ever-changing. The evolution is grounded in the individuals that utilize technology. The internet was developed in 1969 (Andrews, 2019); then email was made available in 1971 (Swatman, 2015). In the early 2000s, social media made a quick ascent into the digital world. Currently, technology advances are available at our fingertips, making technology easily accessible in the classroom setting.

In the education realm, the terms *educational technology* and *technology enhanced learning* (TEL) are related. Educational technology has been discussed as digital technology used to facilitate learning (Scully et al., 2021). Moreover, in education the term *technology enhanced learning* is used in learning design with the understating that TEL is any technology

that enhances learning and teaching (Mangaroska & Giannakos, 2019). The two terms are often supplemented for one another.

The need for technology to be created through the evolution has occurred. The digital revolution affected the daily lives of many individuals (Schindler et al., 2017). People continuously seek more effortless, more effective, and efficient ways to accomplish daily tasks, meet deadlines, and reach their goals in the digital revolution. A constant connection to electronics and individuals is apparent in people's day-to-day life (Seemiller & Stover, 2017). Educators are not different in the evolution of technology. Many benefits exist to using technology in the classroom, such as access to learning applications and platforms, in addition to the infinite amount of information accessible on the internet.

In the world of education, the need for technology is the reasoning behind the evolution. Educators always have a need to improve their best classroom practices to optimize student learning and student achievement. The technology incorporated into teaching is standard practice and is no longer a unique opportunity (Eiland & Todd, 2019). Educators need to implement best practices that are easy and efficient. Educational technology is one area that impacts best practices in the classroom and teaching.

Technological advances in education have enabled educators to plan and teach efficiently while being more effective. Educational technology has given teachers the ability to access resources and create content. Teachers no longer find themselves needing to use lengthy, heavy, pricey textbooks because they can utilize digital resources. Digital resources have created time savers for teachers and for students' access to resources. Many educational institutes need to disseminate information to a large number of students at a time, and technology is an integral part of disseminating this information (Barchilon Ben-Av & Ben-Av, 2016).

Educational technology has impacted the educational environment and student achievement through enhancement and influences engagement. Four categories in educational technology have been identified: inquiry, communication, construction, and expression (Varier et al., 2017). Resources, such as learning apps, learning platforms, and an unmeasurable amount of information, are at educators' and students' fingertips. Blikstad-Balas and Davies (2017) shared research that teachers have identified significant benefits in their workload, as well as financial benefits from technology utilization in the classroom. Digital learning allows students to interact with human-to-human mediums and human-to-human interactions (Florenthal, 2018). Technology in education has grown exponentially in recent years. With the widespread closures at the peak of the global COVID-19 pandemic (Tupper & Colijn, 2021), the assumption can be made that technology in education will only continue to grow.

Online learning was developed in the last decade. Parents and students have had the option of online learning at all levels of education, from primary to higher education, including graduate-level education. Technology was created as a resource to engage students; however, in the era of COVID-19, it became a universal necessity (Nkomo et al., 2021). A tripartite model was used to review student engagement with digital technologies. An analysis focused on student engagement and LMS, social media, and lecture capture concluded a lack of shared understanding of student engagement, especially with digital technologies. At the peak of the global COVID-19 pandemic, school campuses were closed worldwide, the technology quickly became the only means to educate students, and technology will continue to evolve and grow. Teachers must also grow and evolve. With the evolution in education, educators must address the influences of technology on their classrooms. While nearly 100% of classrooms today utilize

technology, many educators have not focused on how technology applications and usage influence students' engagement.

Learning Management Systems

As technology has progressed and grown in the educational field, educators have access to numerous resources in their teaching toolbox. Technology growth leads education into the 21st century as part of the teaching and learning process that has dramatically changed from paper-based products to digital products (Pujasari & Ruslan, 2021). Learning Management Systems (LMS) are a significant resource of a digital product that has helped educators teach remotely more effectively and efficiently with digital tools. LMS is defined as Learning: the core delivery of an education or training program; Management: the stem of a learning program that manages all aspects for the user; and System: the e-platform used to deliver the programs **(**15 Best Learning Management Systems, *2022*). A more straightforward explanation of LMS is a web-based software application with functions that, through content creation and storage, sees student participation and assesses student performance (Wicaksono et al., 2021). Learning platforms encompass many kindergarten through twelfth-grade systems to facilitate students' learning **(***Trust Radius***,** 2022). Several learning platforms are available as technology applications. The more popular traditional learning platforms utilized in classrooms are Google Classroom, Canvas, and Blackboard (Perry, 2022). The efficacy of platforms needs to be clarified, partly due to ever-evolving technology (Heggart & Yoo, 2018). Confusion about social media online learning and the use of technology occurs among educators.

Reviewing the top learning platforms is beneficial when researching technology applications and usage in the classroom. In education, massive growth in the utilization of learning platforms occurred during COVID-19 school campus closures; however, the usage is

still high in many public schools, as school campuses have re-opened to in-person learning. After reviewing current and past research on LMS platforms such as, Google Classroom, Canvas, and Blackboard, one can conclude that they are all similar in the features offered, and the preference for one above another LMS is a personal preference to the person's perception of ease of use and usefulness. Researchers concluded that the overall success of any LMS is dependent on the successful implementation of the LMS (Tseng, 2020). Kaushik and Agrawal's (2021) study identified what factors enable or inhibit students from utilizing LMS. Student views of utilizing LMS in their learning are important when reviewing LMS. Their survey highlighted students' positive attitudes toward e-learning (Kaishik & Agrawal). The positive outcomes of utilizing LMS have led educators to continue utilizing the resource despite the necessity seen during school campus closures.

Zoom

Zoom is a web-based collaborative video conferencing tool (Serhan, 2020). The application gives educators many of the same capabilities as on-campus classrooms. The tool gives users the capability to meet virtually and conduct online meetings and lectures, as well as webinars. Collaborative group work is achieved using breakout rooms. Features, such as polling, thumbs up, and thumbs down, add to student engagement. Zoom offers free and paid options, which makes it an excellent option for public school educators. Zoom is compatible with the LMS Google Classroom, Canvas, and Blackboard, as well as other LMS. The literature review will review Google Classroom, Canvas, and Blackboard and how Zoom is utilized with the LMS. Google Classroom was chosen to review, as it is a free LMS that is widely used in public schools. Canvas and Blackboard were chosen, as they are part of the top 17 LMS internationally and widely used in public schools (*Trust Radius***,** 2022).

Google Classroom

Google Classroom is a learning management system (LMS) that is a part of the Google Suite with productivity applications available (Ketut-Sudarsana et al., 2019). The application was developed and launched in 2014 as a free platform in Google Apps (Moonma, 2021). Currently, Google Classroom is reported to have 40 million users **(***How Google Conquered the Classroom: The Googlificaiton of Schools Worldwide,* 2022**).** Utilizing the full Google Classroom suite allows teachers to access to virtual meetings, create and grade assignments, present videos and other media, collaboration of documents, and communication with students and parents, all of which are essential in any classroom but especially important with online learning. Google Classroom is a top choice for elementary and secondary classroom teachers, as the application is an extension of brick-and-mortar classrooms and is easy to use (Ketut-Sudarsana et al). The familiarity with Google products has increased the appeal of using Google Classroom. Google's G Suite is now at six million paying customers (Novet, 2020). Google Classroom can be utilized for classes that are fully remote with its features, and it can also be used in a traditional classroom setting to allow for collaboration and technology integration.

As a paperless application, users can save time, manage classes, and assign tasks, all in a paperless systematic manner (Hulse, 2019).

The Technology Acceptance Model (TAM) has been used since the 1980s to study the acceptance of technology adoption. Perceived usefulness and ease of use predict information technologies acceptance is proposed by TAM (Davis, 1989). Perceived usefulness is apparent when people believe that using a particular technology will improve their actions (Venkatesh & Davis, 2000). Moonma's (2021) qualitative research used TAM to study the perceived usefulness

of Google Classroom. The study's data analysis concluded that the overall Google Classroom was simple to use, accessible, effective, and students strongly desired to use the application.

Khapre et al. (2021) conducted an educational interventional study to assess the effectiveness of integrated flipped classroom and reciprocal teaching using Google Classroom as an LMS and to access leaner's satisfaction. Teachers in the study utilized Google Classroom with Google Docs, Drive, and Gmail. The study included 17 student participants that completed pre- and post-tests to assess knowledge and skills. The Wilcoxon signed-rank test was used to analyze pre-and post-test data. Additionally, participants completed a questionnaire at the end of the module. The study came to two conclusions based on the research focus. The first was that integrating a flipped classroom with Google Classroom, including reciprocal teaching led to an increase in the knowledge and skill of the students. Secondly, learner satisfaction was high due to the approach and the flexible environment that Google Classroom allows.

Canvas

Canvas is an LMS and a tool for digital teaching and learning. Two graduate students developed the concept of Canvas, which was then launched in 2011 and was introduced globally three years later (*Our Story: About*, 2022). Since 2014, Canvas has grown to 6 million concurrent users. Paynter and Barnes (2019) explained that Canvas uses collaborative prototyping for crowdsourcing suggested updates, changes, and features within the LMS. The Canvas platform allows educators convenient access to assignments, discussions, video and other media, messaging capabilities, and peer review (Pujasari & Ruslan, 2021). Canvas allows access through multiple applications, such as Windows, IOS, and Android. The ease of accessibility of Canvas allows educators to utilize it for instruction in a remote environment, as well as in a traditional classroom setting. As many schools across the nation have returned to full in-person

instruction on school campuses, educators are utilizing the LMS for their daily instruction (Singh et al., 2021).

Mukhtar et al. (2020) conducted a qualitative case study in the spring of 2020, exploring teacher and student perceptions regarding the limitations and recommendations of the LMS, Canvas. The case study concluded that the number of positive features outweighed any negative features. Simple registration, clear working sections, straightforward design, video capabilities, audio capabilities, text capabilities, access to assessments, and student-centered added to the list of positive features making Canvas a top choice of preference for students and teachers alike as a full-time, as well as alternative method of instruction. The research was positive. The case study sampled 12 faculty members and 12 students through four focus group interviews. The data from the focus groups were transcribed verbatim and then analyzed for themes. However, Paynter and Barnes (2021) study concluded with mixed reviews considering the perceptions of faculty, students, and LMS administrators regarding the ease of use or preferences for Canvas. Their literature review included the perceptions of faculty, students, and administrators who have utilized Canvas as an LMS in their learning, teaching, and supervising.

Blackboard is a LMS similar to both Google Classroom and Canvas in features and functions. The original application was launched in 1997, holding the largest market share among LMS and rising as a top LMS in 2015 ahead of Canvas (Paynter & Barnes, 2021); however, in 2020, Canvas surpassed Blackboard. In 2021, Blackboard, as a company, combined with Anthology to create Campus Management, Campus Labs, and iModules (Hill, 2021). Blackboard reports having 100 million international users (Blackboard Inc., 2018). In the Blackboard application, students can participate in classroom tasks and interactions from desktop computers, laptops, or portable devices, such as cell phones or tablets (Khalaf et al., 2022). The

creation of courses, incorporating multimedia educational resources, task completion, assessments, and communication are features offered within the application to keep students connected to a familiar brick-and-mortar school environment.

Almelhi (2021) researched the attitudes and perceptions of faculty and students of e-learning. The researcher utilized a quantitative study, where 47 instructors and 103 students completed surveys based on e-learning effectiveness and attitudes. Survey data were analyzed using SPSS. The study generally uncovered positive outcomes, with participants believing that Blackboard was efficient in teacher-student communication, comprehension facilitation, and boosting engagement. Student participants' attitudes were positive regarding the convenience of use, platform availability, system quality, and quality of e-learning.

Additionally, Tseng (2020) researched the functionality of Blackboard, as well as how students perceived the application. The collected data from 358 students through a community of inquiry survey and a benefits survey, were analyzed using Pearson r correlations. The study revealed a correlation between students and educators with an ease of use and opportunity to collaborate.

Student Engagement in the Classroom

In the twenty-first century, education and technology influences every aspect of human life, transforming the process of teaching and learning (Zhang et al., 2022). Technology has the potential to transform education and make it a more personalized experience (Fonseca et al., 2020). The transformation of education based on technology has influence on all features of learning and teaching, including student engagement. Technologies rise has presented educators with the opportunity to use innovative technology applications to engage students (Bouilheres et al., 2020). Reliance on technology affects students' competencies in core subjects (Alhumaid, K.,

2019). Engagement-related terminologies, such as student engagement, school engagement, academic engagement, and task engagement are reflected in the literature on student engagement (Li et al., 2022).

Student engagement is an essential concept in teaching that leads to student academic growth and higher academic success. Students, educators, institutions, and education partners all benefit from student engagement (Baszuk & Heath, 2020). Teaching kindergarten through 12th grade students requires a wide array of knowledge. Student engagement is one of the many vital concept's teachers must know in the teaching and learning process. The topic of student engagement is significant in education (Green, 2018). As an important topic in education, student engagement is a trend in academic research (Alrashidi, et al., 2016). Theorist's research, such as Astin (1984), Berger and Milem, and Chickering and Gamson (1987), brought significant attention to student engagement since the early 1990s after Astin's work in the 1980s (Astin, 1984, 1999: Berger & Milem, 1999).

Engagement in learning is an essential part of teaching (Abla & Fraumeni, 2019). Contemporary educational research demonstrates that student engagement and disengagement impact the learning outcomes of students (Perez-Salas et al., 2021). Researchers have shown that school engagement is a significant predictor of student achievement and overall success (Steenberghs et al., 2021). High engagement in student learning tasks leads to a more positive learning experience and the overall school experience for students. Educators have many resources available to increase student engagement. Technology is one resource. Teachers are educating in the technological era, so naturally, technology is an easily accessible resource. Student engagement is strongly tied to technology in the classroom as it relates to instructional delivery, as well as task process (Martin & Bolliger, 2018).

The term *engagement* emphasizes students' various patterns in motivation, cognition, and behavior (Alrashidi et al., 2016). Multiple definitions exist for student engagement (Table 1). One such definition is the quality of student involvement with classroom activities that include interactions with teachers and peers (Perez-Salas et al., 2021). Ali and Hassan (2018) prefaced student engagement as student participation, academic participation, student involvement, academic involvement, or involvement in school assignments or tasks. Maricutoiu and Sulea (2019) shared Schaufeli's definition of student engagement as a positive, fulfilling, and work-related state of mind that is characterized by vigor, dedication, and absorption. Despite the definition, student engagement is characterized by the qualities of student-focused, participation/involvement, and interactions. Along with the qualities listed, engagement is also not merely physical, there are emotional, and cognitive connection (Hewson, 2018).

Table 1

Empirical Based Definitions of Engagement (Alrashidi et al., 2016)

Term	Source	Definition
Engagement	Audas & Willms (2001)	The participation of students in the activities held at the school
	Hu & Kuh (2002)	The level of participation of students in academic and non-academic activities and students' appreciation of schooling goals.
	Skinner et al. (2009)	The quality of effort shown by students in educational activities contributes to expected outcomes.
	Suh & Suh (2006)	The quality of contact or participation of students with the efforts shown in the school which covers social relationships, activities, goals' value, and the environment.
	Furlong et al. (2003)	Denotes relationship, participation, attachment and integration within the environment or task.

Engagement's prominence is exhibited to improve disaffection, curb student boredom, enhance motivation, increase overall student achievement, and understand students' development (Alrashidi et al., 2016). When students are not engaged, dissociation occurs, as they act without feeling engaged. As students become dissociated, teachers see a rise in classroom management and behavior issues. Teachers with high levels of student engagement in the classroom have less disruption to instruction and learning. Educators are challenged with maintaining student engagement and even more so when technology is involved, which leads to poor academic performance and overall achievement (Wang et al., 2022).

Student engagement is tied to a more robust overall school climate, leading to overall academic achievement (Martin & Bolliger, 2018). Increased academic achievement is produced when students participate in engaging classroom activities that increase their attention and focus. A study was conducted of 155 students who completed a 38-item survey on learner-to-learner, learner-to-instructor (most beneficial), and leaner-to-content engagement strategies. Topic and analytical coding were utilized to code, detect, create categories, and to develop common themes. Students who are part of an engaging classroom increase individual engagement and expand students critical thinking capacity while encouraging relevant learning. Four types of learner engagement have been recognized: procedural, conceptual, consequential, and critical (Sinha et al., 2015).

Several factors influence student engagement in the classroom. For example, factors can be personal learner characteristics, the teacher, the teaching methodology, other students, and the classroom setting (Amerstorfor & Freiin von Munster-Kistner, 2021). Learner characteristics can be the type of learner the student is, such as visual, auditory, or kinesthetic. The rapport and relationship the teacher has with their students are influential. Because all learners are different

and respond differently to a teacher's methodology, the methodology can significantly influence the student's engagement. Technology applications have a place in teaching methodologies, as technology can be used throughout the learning process and instructional delivery. Bandura (1986) showed the vitality of social importance in learning, thus, proving that other students in a classroom can influence student engagement. In most schools, teachers do not have a choice in where their classroom is or the make-up of the room, causing it to be a factor of influence beyond a teacher's control.

Student engagement has multiple dimensions that consist of more than just involvement or participation (Delfino, 2019). Fredricks et al., (2004) identified three dimensions of student engagement following the work of Bloom (1966). All the dimensions must be taken into consideration when reviewing student engagement. Behavioral engagement refers to students' compliance with behavioral norms, as described by Mercer (2019). Attendance and involvement are behavioral norms that, if absent, cause negative and disruptive issues (Mercer). Emotionally engaged students demonstrate responses as interest and enjoyment and can also demonstrate a sense of belonging for the student (Soffer & Cohen, 2019). The third dimension is cognitive engagement when students invest in their learning and go above and beyond expectations (Raes et al., 2020). While the dimensions are not dependent on one another, they are interconnected.

Student engagement is influenced by Bandura's (1986) theory. SCT shows that the environment influences an individual's behavior (Sökmen, 2019). Interactions within the environment, teacher-to-student, student-to-teacher, and student-to-student, influence each student's self-efficacy and task engagement (Bandura). The interaction within the learning environment leads to either an increase or a decrease in student engagement. In addition to the

influence of the environment, personal factors also influence student behavior, leading to engagement. Self-efficacy leads influence on a student's engagement.

Utilizing technology in the classroom falls into all four types of engagement, dependent on educational technology. When teachers use learning platforms and learning apps, they apply procedural engagement based on mere use and conceptual engagement (Griffith et al., 2019), e.g., Blackboard, Canvas, Class Dojo, Google Classroom, or Seesaw. Consequential engagement occurs when educational technology, such as digital resources, are utilized in teaching. Critical engagement occurs when questioning is employed through technological means, for instance, with SMILE, Stanford Mobile Inquiry-based Learning Environment (*Office of Educational Technology, 2017*). Technology falls in a situational focus related to the specific engagement of students within a particular lesson (Cents-Boonstra et al., 2020). The excellent access to and demand for technology has created opportunities and challenges for many industries, including education (Schindler et al., 2017). Teachers are tasked with creating, increasing, and maintaining learners' engagement throughout their lessons, whether in an in-person environment or a virtual learning environment.

Technology-enhanced classrooms have gained popularity; however, the understanding of how to promote student engagement in a technology-rich environment is still evolving (Wang et al., 2022). Several studies have been conducted studying student engagement in the classroom, as well as student engagement in relation to technology implementation to aide in the evolution of student engagement with technology. Wang’s et al. qualitative research focused on student and teacher beliefs on the relationship between classroom process quality and student engagement. The findings of the study revealed that teacher beliefs were not related to the use of technology, although they believed that other factors had an influence on the classroom process

quality. On the other hand, students believed that the connectedness and use of technology positively influenced student engagement. Additionally, the results revealed that the teacher's education level correlated to student engagement. A review of significant studies has shown the relationship between student engagement and technology, along with the need for further research on the influence technology applications and usage have on student engagement.

Technological Engagement

Technology applications and usage enhance learning engagement, thus creating importance in reviewing how learner engagement and technological engagement affect student learning (Chen et al., 2019). Digital technology utilization to deliver content, connect learners, and enable anytime, anywhere learning has risen while keeping students engaged has become a challenge (Greener, 2022). The challenge of engaging students is an ongoing concern among teachers regardless of technology utilization (Attard & Holmes, 2020).

According to Chen et al. (2019), high Level of Technological Engagement (LTE) occurs when a student is unable to complete an assignment of task without the use of a technological applications or a device, such as an electronic device or a learning management system. When a teacher utilizes a smart board or electronic devices, such as a laptop or tablet to deliver instruction the LTE is at a low level. Finally, traditional instruction refers to learning that takes place without any enhancement from technology and is less than low level. Various researchers have conducted research related to technological engagement. The positive and negative effects of utilizing technology to increase and maintain student engagement have been examined. Chen’s study focused on the varying levels of technological engagement. The quantitative study participants, 168 students, completed a scientific concept test and a scientific argumentation skills test which were analyzed through a t-test, moreover, ANCOVA, and with the Johnson-

Neyman method. The findings showed that technology-supported learning significantly improves students' scientific knowledge and argumentation skills. Additionally, the study showed that higher LTEs lead to increased results. The study's empirical findings claimed that higher LTEs have a more positive impact on a student's learning. The study agreed with Greener's (2022) concern that, when learning technology is used properly, student's disengagement is decreased.

Additional research from Calvo-Porral and Pesqueira-Sanchez (2022) focused on whether engagement with technology drives the use of technology and whether the use of technology creates engagement with technology. The researchers collected data from 715 individuals, which, in turn, went through a comprehensive analysis and comparison of three competing structural models on technology behavior. The conclusion of the empirical study concluded that technology engagement and technology usage could be considered a consequence of motivational variables, instead of being an antecedent of the other. Secondly, the study revealed that users need to be engaged with technology to use it and, conversely, need to use technology to be engaged with it.

Social Media

Social media applications are used for a number of purposes, such as, messaging, sharing, chatting, studying, booking of services, and advertising (Gulzar et al., 2021). Over the years, social media has advanced, evolved, and gradually metamorphosed from a social application to a commercial, educational, and social entity (Hosen et al., 2021). Social media has found a place with positive and negative influences in the classroom.

Social media platforms have been in existence since the late 1990s, with social media being coined in 1997; however, Usenet was created in 1979, as a precursor to social media as it posted articles and news events (Duong, 2020). Social media has grown immensely since that

time. In 2022, social media platforms number in the high teens (*Global Social Media Statistics*, 2022). Social media platforms are internet-based applications that allow users to exchange and share content with followers or a public audience (Van Den Beemt et al., 2019). Social media is used to explain interaction among individuals or groups through platforms (Akram & Kumar, 2017). Images, text, and location content are all shared via social media. Users can share, like, or comment on content (Toivonen et al., 2019). Profiles can be set as private or public.

Social media is much like technology; it is ever-changing, especially among teenagers (Vogels et al., 2022). Many social media platforms exist, such as Snapchat, Instagram, YouTube, WhatsApp, TikTok, Twitter, and Facebook. The top four social media platforms utilized by teens are YouTube, Instagram, Snapchat, and Facebook. Social media has profoundly impacted the modern world and, more so, the youth of the world (Allcott et al., 2020). The phrase *double-edged sword* has been used to describe social media (Keles et al., 2019). Social media impacts are both negative and positive. On the positive side, students can become more socially capable, communicate with others they may not usually, share information, be entertained, and create web content (Akram & Kumar, 2017). Social media has allowed classrooms to become social through collaboration on projects with peers that are local and abroad. Looking at social media's negative impacts, researchers show a link between social media and depression, anxiety, and distress (Orben, 2020). Ansari and Khan (2020) studied the application and usefulness of social media in the classroom. Data were collected from 360 students completing offline and online surveys, and the data were analyzed through SPSS, AMOS, and confirmatory factor analysis. The study concluded that there was a significant positive association of collaborative learning and knowledge sharing. Ten percent of a rise in student engagement was found through the research. The research ignored any impacts that addiction to social media may have in the classroom when

utilizing social media. Reviewing current research on social media usage in the classroom, the conclusion can be made that social media has both negative and positive impacts on student engagement and overall learning.

Gleason and Von Gillern (2018) looked at social media usage in formal and informal secondary learning spaces and how it develops digital citizenship. Digital citizenship includes a span of theoretical conceptions that includes the norms of responsible technology use, the capacity to participate in society online, networking, and a change in social, political, cultural, and economic structures. The article suggested that social media enabled digital citizenship through digital media applications and software both offline and online.

Academic Distraction in the Classroom

Academic distraction has become a significant concern for educators in the learning environment, which continues to evolve (Dontre, 2020). Academic distractions are a struggle for individuals that vary to different degrees. They can come in numerous forms, both internal and external. Internal distractions are distractions that occur internally, from one thinking about what they need to do, remembering or thinking about memories. Phone calls, text messages, emails, messaging apps, social media, and streaming apps are examples of external technology distractions (Schmidt, 2020). Other examples of external distractions that one may experience are daily life noises or other people in the environment. Distractions occur in numerous environments; the classroom environment is no different. External and internal distractions occur in a brick-and-mortar or virtual classroom environment. Teachers are not in control of internal distractions that students may experience, other than teaching them self-help skills (Dontre). As technology has grown in unmeasurable significance in the classroom or learning setting, the most

significant challenge educators face is controlling and limiting the distractions caused by technology.

Student learning and achievement are impacted by distracted learning. Schmidt (2020) showed that distracted learning has detrimental effects on student learning. Educational and entertainment technology have increasingly become a struggle in classrooms creating digital distractions. The term *digital distraction* has been coined by researchers as a technology-enabled user behavior that has harmful consequences (Chen et al., 2020). In essence, digital distractions are created through multitasking behaviors. May and Elder (2018) suggested that learning is impaired from using a learner's limited information processing channels. Schmidt shared that evidence from numerous studies by Fernandes and Mosocovitch (2020); Foerde, Knowlton, and Poldrack (2006); Glass and Kang (2019); Jamet et al. (2020); May and Elder (2018); Neiterman and Zaza (2019); Paul (2013); Rosen, Carrier, and Cheever (2013); Sana, Weston, and Cepeda (2013), collectively found that negative outcomes occur as a result of student's disengagement and off-task behavior. When teachers allow their students to utilize technology in the classroom, they observe an increase in multitasking behaviors, and the teacher is tasked with limiting the negative outcomes (Chen, et al).

Teachers are also tasked with how instructional variables impact learning in the classroom. Instructional variables can positively or negatively impact a student's motivation that is focused on teachers, feedback, materials, and equipment (Steinmayr, et al., 2019). Feedback improves engagement, although it depends on the teacher's wording (Toma, 2020). Student learning is impacted by the materials and equipment that are accessible to students. Social and environmental resources make up the contextual variables, including location, time of day, distractions, temperature, and ongoing events. Contextual variables are usually out of the

learner's control and directly impact their motivation. Many factors contribute to the results in motivation and general education; none are as important as the teacher. Technology in the educational environment is one of the biggest changes in education that has occurred in the past decade (Collins & Halverson, 2018). Technology benefits continue to grow, as 21st-century learning evolves, and even more so, technology has become a necessity throughout the global COVID-19 pandemic (Tupper & Colijn, 2021). Educators are tasked with the responsibility of limiting digital distractions. Thomas et al. (2013) showed that teachers support using cell phones in the classroom for academic purposes, with benefits identified as student engagement and motivation; however, lack of access and class disruptions were found as being non-beneficial.

Regardless of the benefits, educators must understand the factors affecting digital distractions. Gender, peer behavior, instructional methods, and restrictions are all factors that affect digital distractions (Kay et al., 2017). The type of digital distraction that occurs is affected by gender. Kay et al. postulated that if many students are not using their technology for non-academic learning, peers are hesitant to follow usage. The occurrence heavily influences the classroom management and teacher expectations, and the last two factors impact student learning. The expectations that a teacher gives for technology utilization impacts whether the technology becomes a distractor. If the teacher places restrictions on using technology in the classroom, the impact of both on-task and distracting behaviors is limited. Strong policies, sharing the rationale behind the policies, making learning engaging, and informing students of digital distractions are all simple, practical ways for educators to curb digital distractors in the classroom (Seemiller & Stover, 2017).

Kearney and Maakrun (2020) posited that media and technology had become ubiquitous elements that offer benefits to student engagement. The researchers conducted a case study to

determine the level of engagement based on students recording the digital distractions they encountered throughout a lesson. The case study determined that the link between digital technologies and learning may not only not exist but can also be found to have a negative correlation due to students' multitasking and superficial engagement. Additionally, the researchers found that even when media and technology are boosting student engagement, it may be a different kind of engagement that promotes learning. The issue of how engagement is defined was also raised in the study. Superficial engagement is viewed as passive engagement. Passive engagement is when a student passively attends to a task assigned by a teacher; for example, a student listening to a teacher's instruction, online reading group discussion, or reading another peer's work (Amerstorfer & Freiin von Munster-Kistner, 2021). Furthermore, active student engagement is the magnitude to which students are actively participating in a learning activity or task (Ahshan, 2021). Amerstorfor & Freiin von Munster-Kistner, defined active engagement as when a student actively attends to a task assigned by a teacher. Active engagement examples are writing a document, searching relevant instructional materials, online discussion participation, or interacting with the teacher or other peers about the assigned task.

Summary

The current research and studies demonstrate that learning is closely related to student engagement. Researchers, such as Halverson and Graham (2019), posited that learning engagement directly correlates with critical educational outcomes: academic achievement, persistence, satisfaction, and a sense of community. Teachers are educating students in a technology-rich environment that shapes their learning and access to information with the challenge of creating a bridge between the student's learning and the resources (Lubniewski & Kiraly, 2020). As technology enhancements have impacted education, the conclusion can be

made that technology applications and usage in the classroom environment will continue to be present and grow as technology continues to evolve and grow.

While ample research exists on student engagement and its importance in learning, there are research gaps based on how technology explicitly influences student engagement in a classroom environment (Bond et al., 2020). A gap is seen at the high school level, creating a need for further research. High schoolers are in a critical time of their life as they transition into college and careers; disengaged students are more likely to drop out of school before graduating and are less likely to enroll in postsecondary educational opportunities (Perry, 2022). Qualitative research can further focus on the teacher experiences of technology applications and usage influence on student engagement in the high school classroom. The increased attention on student engagement with technology usage is a central aspect of education, leading to the need for research on the experiences of the teacher (Bond et al). Specifically, teachers' information and feedback focused on their experiences in virtual environments and in-person learning environments to identify the influence that utilizing technology has on their academic achievement. Collecting data and analyzing the teacher experience will increase the digital literacy of students and teachers alike, which has been identified as a need in many pre-service teacher programs (Falloon, 2020).

CHAPTER THREE: METHODS

Overview

The purpose of this study was to investigate how technology applications and usage influence student engagement in the classroom setting, specifically in the 9th-12th grade setting. The problem has become more apparent in the recent education world, where educators taught through a global pandemic. In many instances, education has become dependent on technology. Teachers are faced with implementing strategies to lessen the influence technology applications and usage has on student engagement. The benefits of technology in the classroom are well-established. Many benefits to using technology in the classroom have been identified, such as access to learning applications and platforms, in addition to the infinite amount of information accessible to its users (Seemiller & Stover, 2017).

Educational researchers have identified the importance of engagement in the classroom and learning (Bond et al., 2020). Engaged students perform academically, put forth effort, persist, self-regulate, challenge, and generally enjoy challenges and learning (Heilporn et al., 2021). Engagement in learning is the relationship that is present in the classroom among teachers and students. Student engagement is tied to a more robust overall school climate, leading to overall student academic achievement (Martin & Bolliger, 2018).

While the benefits of technology have been established, gaps in research still exist. The research gaps are created by the lack of teacher perspectives and experiences in studies. Schindler et al. (2017) recommends using technology to promote student engagement despite the gaps and mixed findings, such as limited studies that show technology positively influencing student engagement through the teacher experience. Conducting this qualitative case study

promotes understanding of how technology, such as Canvas, and Google Classroom, influence student engagement.

The qualitative phenomenological study focuses on the influence that technology applications and usage have on student engagement in the classroom setting for high school (9th-12th grade) students and their teachers at a high school in the state of New Mexico. The problem is that the applications and usage of technology in the classroom environment adversely influence student engagement, directly influencing both educators and students (Xie & Liu, 2022). Technological benefits are apparent in the current research. Past researchers have identified various strategies to better support engagement, although a limited understanding of how technologies engage students and enhance learning outcomes is available (Nkomo et al., 2021). Qualitative research can be furthered to focus on the teacher and the student experiences of educational technology's influence on engagement. Specifically, teacher and student feedback focused on their experiences in virtual environments or in-person learning environments to identify the influence that utilizing technology has on their academic achievement. The teachers' perspectives are shared through this dissertation; recognizing current research and studies is the first step to answering the central research question and sub-questions.

Research in educational technology is essential to Christians. Technology is not explicitly mentioned in the Bible. However, authors, such as Sire and Hoover (2020) have brought to light the shift within our society's social and moral norms that technology has exaggerated. Graphic material is more easily accessible, creating exaggeration and norms. Oliver (2020) has named this current shifting era *the disruptive era*. In *the disruptive era,* where the world is becoming troubled and moving away from God, Christians must be present in the Word of God and be

present in the old Word of God. Christians and educators are tasked with utilizing technology and keeping it from changing the morals and norms of students.

Research Design

This qualitative study on the phenomena of technology's influence on student engagement addresses the problem and purpose statement. The research followed a qualitative framework by illuminating the experience and interpretation of events (Aspers & Corte, 2019). A qualitative method gives a valuable picture and description of how students are influenced in the classroom setting. The research approach for this study is phenomenology. Phenomenology was followed, as the study is describing the experiences of educators (Neubauer et al., 2019). Understanding the educator experience when utilizing technology in the classroom provides answers to the research questions. The research design was based on transcendental phenomenology outlined by Husserl (Eddles-Hirsch, 2015). The transcendental process allows the researcher to reveal the underlying structures of technology applications and usage influences on student engagement. Through the transcendental reduction process, a deeper delve is possible to uncover underlying structures, thus, allowing a better and more comprehensive understanding of the experiences of teachers.

Research Questions

While acknowledging past research on the influences on student engagement and the growth of technology applications and usage in education, the central need to investigate teacher experiences exists. The following central research question and two sub-questions guided the phenomenological study in identifying the influence technology applications and usage have on student engagement in the classroom while identifying strategies to lessen the negative influences.

Central Research Question

How does technology applications and usage influence student engagement in the classroom?

Sub-Question One

What are the experiences of high school teachers (9^{th}- 12^{th} grade) utilizing technology in the classroom?

Sub-Question Two

What strategies can educators implement to lessen the negative influences of technology on student engagement?

Setting and Participants

To answer the central research question and two sub-questions, a qualitative phenomenological study was conducted. The study focused on how technology applications and usage influences student engagement in high school classrooms. The data collected was based on the teacher's experiences. Qualitative research is conducted in a natural setting based on work by researchers, LeCompte and Schensul (1999), Hatch (2010), Marshal and Rossman, (2014), and Ravitch and Carl (2016). The study focused on the influence of technology applications and usage on student engagement in a classroom setting; therefore, the setting is based in a high school classroom, indicating the natural setting. Throughout the qualitative research, participants' perspectives and meanings are the focus of the data collection (Creswell & Poth, 2018). In their book, Creswell and Poth includes Polkinghorne's (1989) recommendation that interviews in phenomenological research should be conducted with 5 to 25 participants. The study focused on the perspectives of 10 adult teacher participants.

Site (or Setting)

The research setting was a 9th-12th grade high school in New Mexico, part of the New Mexico Public Education Department. The high school is made up of four administrators, four counselors, 62 teachers, 23 educational assistants, along with multiple classified staff members. The student-to-teacher ratio is at 26:1. Currently, the student population is 1,513. Most of the student population is Hispanic, with 28% categorized as American Indian/Alaska Native, Asian, Black, White, and two or more races.

The high school was chosen out of convenience, as the researcher is employed at the school as a Learning Innovation Coach. Additionally, the students at the high school have experienced technology applications and usage in the classroom in different settings. During the 2019-2020 school year, the students experienced in-person learning and then finished the school year with remote only learning due to the COVID-19 pandemic mandated school campus closures. In the 2020-2021and 2021-2022 school year, the students attended school in a mix of settings, including remote, asynchronous, and/or in person. In the current school year 2022-2023, the students at the school are all in-person only; however, the amount of instructing and learning that takes place with technology applications and usage is high. Collecting data from teachers who have had varied experiences with technology in the classroom painted a better picture of how technology applications and usage influence student engagement.

Participants

The participants in the data collection process were 10 teachers that teach career and technical education, English, math, or science courses to 9^{th}-12^{th} grade students. The teachers participated on a voluntary basis. The variedness of teacher participants within the data collection allows for a suitable saturation level. Saunders et al. (2017) suggested that saturation is

reached with collecting data until more data becomes counter-productive and does not add anything to the overall study.

Researcher Positionality

The researcher's motivation for conducting the study was that as an educator for 16 years, she has seen the evolution of technology in education and experienced the necessity of technology throughout the COVID-19 pandemic. While experiencing the evolution of technology, the researcher has also witnessed how student engagement in the classroom has changed in the last 10 years.

Interpretive Framework

As a researcher who has been an educator for 16 years in primary and secondary school settings, the researcher's identified interpretative framework is social constructivism. Social constructivism is explained by Creswell and Poth (2018) as an individual that seeks an understanding of the world in which they live and work. As the researcher has experienced the field of education from various lenses, such as, student, teacher, administrator, and learning innovation coach who supports teachers' instruction and innovation practices in the classroom, the researcher followed the social constructivism framework throughout the dissertation research. The goal of the research was similar to the goal of research in social constructivism, relying on the participants' view of the situation. Social constructivism allows for one's experiences to form subjective meanings. Through qualitative research, participants were utilized to illustrate their subjective meanings formed by their experiences.

Philosophical Assumptions

Philosophical assumptions are key components used in qualitative research that build interpretive frameworks. Four philosophical assumptions, ontology, epistemology, axiology, and

methodology have been identified that have implications for qualitative research. Each assumption can work in favor of a researcher negatively or positively. These assumptions are important to research as they give a researcher direction in their goals and outcomes (Creswell & Poth, 2018). Researchers use assumptions to direct who, what, where, when of the information they seek for their research.

Ontological Assumption

Ontological assumption relates to the nature of reality and its characteristics (Creswell & Poth, 2018). The assumption gives life and reality to the data through themes. Data and results can be viewed differently among different people. The researcher's Christian faith leads her to believe that only one reality exists, the reality of God, which is the positionality on ontology. While multiple realities may exist, the Word of God warns against other realities. Corinthians 2:14 (NIV, 2017), "The person without the Spirit does not accept the things that come from the Spirit of God but considers them foolishness and cannot understand them because they are discerned only through the Spirit." As a researcher, I acknowledge that individuals in the study may have multiple realities.

Epistemological Assumption

Epistemological assumptions in qualitative research mean that the researcher attempts to get as close as possible to the participants (Creswell & Poth, 2018). Establishing a closeness between the participants and the researcher allows the researcher to build a subjective view of the participant's experiences, thus, building knowledge on the topic. As a researcher, epistemology brings one close to their subjects. Much like James 4:8 (NIV, 2017) says, "Come near to God and he will come near to you. Wash your hands, you sinners, and purify your hearts you double-minded." In faith, as in research, the closer one is to the participant, the more

accurate, detailed knowledge base will be attained. The researcher is a peer in a colleague position among the participants and has no leadership authority over the teacher participants.

Axiological Assumption

Axiological assumptions focus on the researcher's value to the study (Creswell & Poth, 2018). The researcher's experiences and background created positive influences on the study itself. In research, the researcher brings a set of values, intuitions, and biases that take part in interpreting and explaining the data. Christian researchers bring their values and biases with them from a Christian perspective. Timothy 3:16-17 (NIV, 2017) reminds that we should follow God's Word in all we do. "All Scripture is God-breathed and is useful for teaching, rebuking, correcting and training in righteousness, so that the servant of God may be thoroughly equipped for every good work" (Timothy 3:16-17).

Researcher's Role

Qualitative research focuses on the researcher as a proponent of the research itself. A qualitative researcher can take on various roles throughout the process of a study. The researcher acknowledges the relationship and the essentiality to the study. Qualitative inquiry is dependent on the idea that research is co-constructed by the researcher, a participant (Roger et al., 2018). Furthermore, the relationship requires the researcher to be aware of herself through reflective pieces. Another noteworthy point is that the researcher is considered as the primary instrument in qualitative studies.

The researcher for the study has a bachelor's degree in elementary education and a master's degree in educational leadership and policy studies. She has worked in education for 16 years. Currently, as a Learning Innovation Coach, the researcher supports teachers in their instructional and innovating practices, where the study participants are teaching staff.

As the relationship between the researcher and participants was already established, the researcher's bias has been revealed and acknowledged. The researcher focused on maintaining all aspects of trustworthiness by monitoring and reducing biases, using correct procedures and protocols for collecting and analyzing data, and presenting the study's findings which led to the study's credibility, dependability, confirmability, and transferability.

Procedures

Institutional Review Board (IRB) approval for the study was secured from Liberty University. Site participation was solicited from the school district and approval received (Appendix B). The site was secured, participants were identified and agreed to participate. All approval documentation is in the appendices. Face-to-face interviews took place in a quiet area that participants were familiar with on the school campus. The researcher facilitated the completion of the interviews by the teacher participants. The focus group took place through the Zoom virtual platform. Observations took place during a 50-minute class period in the classes of teachers who completed a face-to-face interview and participated in the focus group. Data from each data collection source was analyzed. The data analysis conclusions were composed to create a narrative of the results explaining the essence of the experience studied while answering the research questions.

Permissions

The Institutional Review Board (IRB) approval through Liberty University was secured, and the approval letter is included in Appendix A. Proposed site permission was sought from the principal of the site school and site permission secured, consent for participation was secured from the teacher participants. A copy of all permission documents is included in the appendix.

Recruitment Plan

Teachers were recruited from the career and technical education, math, English, and science, and social studies teaching staff at the high school. The teachers were recruited with the use of a recruitment letter (Appendix C), which described all requirements. From that number, criterion sampling was used to identify the participants. The criterion was participants must be a teacher that is currently teaching a 9th through 12th grade class in English, math, science, social studies, or career technical education course at a high school in New Mexico. Phenomenological studies require the participants to have lived the experience being studied, and criterion sampling works well when the individuals studied have experienced the phenomenon (Creswell & Poth, 2018). Teacher participants signed consent forms prior to any data collection (Appendix D).

Data Collection Plan

The study was qualitative phenomenological research. Qualitative research offers multiple data sources or data collection methods. A phenomenological study answered the central research question: How does technology applications and usage influence student engagement in the classroom? Additionally, the study addressed two sub-questions: What are the experiences of high school teachers (9th-12th grade) utilizing technology in the classroom? What strategies can educators implement to lessen the negative influences of technology on student engagement? Three data source collection approaches were utilized for the study, including individual interviews, a focus group, and non-participant observations, allowing for data triangulation, validity, and reliability.

Individual Interviews Data Collection Approach

Interviews are one of the most frequently used data collection sources in qualitative phenomenological research (Moser & Korstjens, 2017). Individual interviews occur with conversations between the researcher and the participant. Semi-structured guidelines allow the

researcher to include probes and prompts (DeJonckheere & Vaughn, 2019). The questions encourage participants to share their lived experiences.

The first data collection source of the study was individual interviews. A group of 10 high school teachers completed the interview. Interviews were conducted on a face-to-face, one-on-one basis. The interview guide included 11 open-ended questions (Appendix E). Utilizing open-ended questions focused on understanding the central phenomenon in the study (Creswell & Poth, 2018). The researcher conducted the interviews, lasting approximately 30 minutes based on the interview guide, allowing for flexibility and semi-structure. The researcher began the interviews with an ice breaker to establish a level of comfort. Interviews took place in the teacher's classroom to add to comfort and familiarity. An audio recording device was used to record the interview. Participants were familiar with cameras in the classroom settings, creating a level of comfort with a recording device. The researcher recorded interview data digitally on an interview form.

Individual Interview Questions

1. Please describe your educational background and career through your current position.
2. Describe the technology applications and usage in your classroom? SQ1
3. Please discuss your experiences using technology remotely. SQ1
4. How was your student's engagement throughout your lesson structure during remote instruction? CRQ SQ1 SQ2
5. How would you compare your teaching with remote instruction to face-to-face classroom instruction with applications and usage of technology? SQ1
6. What are the differences in student engagement when you are actively using technology in your classroom to times when you are not? SQ2

7. In your experience, what are the pros and cons in utilizing technology in your teaching practice? CRQ SQ1
8. Technology applications and usage is expected in the current classroom environment. If you had a choice, would you utilize technology in your classroom? How? SQ1
9. How does technology add to your student's engagement? SQ2
10. How does technology distract from student engagement? SQ2
11. What else would you like to add to our discussion of your experiences with technology applications and usage in the classroom?

Individual Interview Data Analysis Plan

Thematic analysis is a critical component when analyzing individual data in qualitative research. Identifying themes allows the research to address the challenge of analyzing through the open-ended lens instead of the numbers-only approach (Castleberry & Nolen, 2018). Moustakas' (1994) version of phenomenological analysis will be followed. Personal experiences were collected through the individual interviews to detail the participants' experience concerning the technology distractions in the classroom setting. A list of significant statements was created from analyzing and reading through the interviews. These statements were then grouped into broader units of information. Initial coding of intermediate codes of the interview results occurred, followed by grouped intermediate codes, then resulting themes were identified. The resulting themes were utilized to compose a narrative description of participants' personal experiences with technology applications and usage in the classroom. The result of this analysis process is the narrative description illustrating the essence of the phenomenon.

Focus Group Data Collection Approach

Focus groups are one of the top utilized data collection tools used in qualitative research (Thelwall & Nevill, 2021). Focus groups are a way of data collection from a small group during an informal discussion that have a specific focus (Lauri, 2019). The data from the focus group discussion was collected to describe the experience of teachers. As a triangulation of data, the focus group provided meanings and conceptualizations from participants (Xerri, 2018).

The focus group consisted of 10 teacher participants. O. Nyumba et al. (2018) shared that generally six to eight participants are sufficient. Staying with the 10 participants is consistent with the number of participants for the other two data collection approaches. The group met virtually through a Zoom link. The participants all had access to the platform and have extensive experience utilizing Zoom. Ten open-ended questions guided the focus group (Appendix F).

Focus Group Questions

1. How many years have you been in education?
2. How important is technology in your daily teaching practices?
    - very important
    - important
    - not important at all
3. How has your teaching changed with the use of technology?
4. Is teaching easier or harder with the technology applications and usage?
5. What is your level of confidence in using technology in your teaching practices?
    - not confident
    - somewhat confident
    - confident
    - completely confident

6. What stage would you say you are in with technology applications and usage in your classroom?
    - Entry stage: the system is slow to change.
    - Adaptation Stage: technology becomes thoroughly integrated into teaching.
    - Transformation Stage: technology is seamlessly integrated into teaching.
7. What is the technology usage policy/expectation for your classroom?
    - If you do have a policy, how well does it work?
    - Do students follow it?
8. How would you describe the student engagement in your classroom?
    - high
    - medium
    - low
9. What influence does technology have on your student's engagement?
10. What else would you like to contribute to this study on student engagement in classrooms with technology usage?

Focus Group Data Analysis Plan

A constant comparison analysis was utilized to analyze data collected from the focus group. The three stages of constant comparison were followed: data chunked into small units, a code attached to each, and one or more themes were developed from the groups (Onwuegbuzie et al., 2009). The revealed themes were compared with the themes discovered in the individual interviews and non-participant observations.

Non-Participant Observations Data Collection Approach

Observations are a data collection source that is applicable in qualitative research. Non-participant observations reveal research biases that may be apparent in other methods (Eldh et al., 2020). The observer as a non-participant allows for authentic interactions. In the non-participant observations, there is a potential for the observation to impact the actions of the participants. The observer visited the classrooms before the observation on multiple occasions, to lessen the impact of being a visitor to the classroom. Multiple visits to the observation setting with an initially limited objective will be part of the role of the researcher (Creswell & Poth, 2018).

In multi-content classrooms, the observations occurred in English, math, science, and career technical education classes. Observations occurred for one, 55-minute class period in each identified ninth through twelve grade classrooms. Student and teacher actions, student-to-student interactions, and teacher-to-student interactions were recorded in observational notes by the researcher. A pre-developed form allowed for descriptive and reflective notes. The researcher used a pre-developed form for documentation (Appendix G). During the observation, the researcher looked for engagement and distractions seen in the student's behavior based on technology used during the time of observation. Instances of engagement were recorded in ten-minute intervals during the observation. An audio recorder was in the room. Teachers and students are familiar with cameras in the classroom settings, an audio recorder will allow for the same level of comfort with the device recording. Following the observation notes, a narrative description was composed.

Non-Participant Observations Data Analysis Plan

Non-participant observations reveal research biases that may be apparent in other methods (Eldh et al., 2020). Observational field notes were analyzed to establish a chronology of

information (Creswell & Poth, 2018). Engagement percentages in the classroom were identified from the field notes. From the engagement data, descriptive and reflective notes were grouped into themes of observations. These themes were triangulated with the individual interview data and the focus group data to aid in creating the description of the phenomenon through the identified themes.

Data Synthesis

Triangulation of data is a standard of rigor in data analysis (Johnson et al., 2020). Triangulation occurred as the researcher drew from multiple data sources from different time periods (interviews, focus group, and observations), locations (interviews and observations), and perspectives (Natow, 2019). Data from each of the three data collection sources, individual interviews, focus group, and non-participant observations, were triangulated to analyze collected data and arrive at a conclusion. The data were collected; then, research questions were reviewed as an initial step in the analysis plan. Findings from each data collection source were reviewed while identifying themes, patterns, or commonalities among the data. The findings of the review were composed. A final narrative description of the essence of the phenomenon was crafted while answering the established research questions.

Trustworthiness

Positivists often question the trustworthiness of qualitative research (Shenton, 2004). Four criteria have been identified by Lincoln and Guba (1985) to address trustworthiness in a qualitative research study: credibility, dependability, transferability, and confirmability (Stahl & King, 2020). Each piece of data collected in the study is articulated because the data is or is not credible data. In any trustworthy study, the collected data must be valid, dependable, and

accurate. The researcher is responsible for designing a research plan that meets the four following criteria for trustworthiness.

Credibility

According to Haven and Van Grootel (2019), who follow Eisner's interpretation of credibility, credibility is the meeting of evidence that allows confidence to grow reading the observations, interpretations, and conclusions. The study must have honest and truthful participants in the sharing of their lived experiences. The researcher has built relationships with the teacher participants in the interviews, focus group, and observations as a colleague and source of support. The existing relationship additionally lending to the persistent observation of the study participants. The three data collection sources and subsequent analysis allowed for data triangulation, increasing creditability (Nassaji, 2020). Research on past studies and literature were reviewed for case analysis. Data from past studies is shared that contradict reviewed research (Aspers & Corte, 2019).

Transferability

Daniel (2019) poised that transferability in qualitative research suggests that findings in a study can be applied to other settings or people while being congruent to the concept of reliability without advocating generalizability. Reliability refers to the replicability of the processes and the results (Leung, 2015). Research that follows specific, valid, and ethical procedures increase transferability. The study included specific procedures for data collection: individual interviews, focus group, non-participant observations, and analysis of data making transferability possible. The findings have the potential to transfer to other settings that are comparable to the settings of the study.

Dependability

Dependability is the extent that the research in a study is replicable in a similar setting (Stenfors et al., 2020). The dissertation committee and the Qualitative Research Director examined the processes of data collection and analysis and the findings of the study. It was found that the research is solid, and the participation is reliable while applying to the study through themes and member checks.

Confirmability

Confirmability is the extent in which another can confirm the researcher's interpretations and conclusions (Nassaji, 2020). A confirmability audit will be completed following Lincoln and Guba (1985) with the six groups of records of the audit-raw data, data reduction and analysis, data reconstruction and synthesis, process notes, materials associated with intentions and dispositions, and instrument development information (Nowell et al., 2017). Data triangulation will also build confirmability with the three outlined data sources: individual interviews, focus group, and non-participant observations.

Ethical Considerations

Data collection occurred with morals and ethics as a priority. The data collection took place at a public high school where the researcher obtained site permission to collect data. Participants in the interviews and the focus group were the teacher participants in the study. The non-participant observations were in classrooms of said teacher participants, observing 9^{th}-12^{th} grade classrooms. Teacher participants signed an informed consent form for the interviews, focus group, and non-participant observations data collection sources, following federal guidelines, such as withdrawing from the study. The consent form is included in appendix D. Minimal risks are related to the study. Names of all participants are never be shared in any manner. Per Liberty University's IRB, all data will be permanently destroyed after three years as no further study is

planned. All interview forms and notes, focus group notes, and observation notes will be stored in a locked file cabinet in a locked office that only the researcher can access. Digital notes and audio recordings of interviews, focus group, and non-participant observations will be password protected within the researcher's digital data on a password protected computer.

Summary

The qualitative research study based on phenomenology was conducted to answer the central research questions and two sub-questions. The researcher's assumptions and biases were minimized by using trustworthy and dependable data source collection techniques and data analysis. Individual interviews were conducted with reliable participants and procedures to explain the participants' lived experiences. A focus group added to the data triangulation of the participant's experiences with how technology influences student engagement in a classroom setting. Non-participant observations add another component to the triangulation of data. Each data source was analyzed, eliminating bias from the researcher. The essence of the phenomenon is illustrated and presented in the study's conclusion.

CHAPTER FOUR: FINDINGS

Overview

The following chapter describes the purpose statement, central research question, two sub-questions, the results of the three data collection approaches, and the findings of this qualitative phenomenology study. The accepted themes of applications and usage distractions, positive teacher experiences, negative teacher experiences, balance, and strong policies and procedures are aligned to answer the central research question, how does technology applications and usage influence student engagement in the classroom? Including the two sub-questions, what are the experiences of high school teachers (9th- 12th grade) utilizing technology in the classroom, and what strategies can educators implement to lessen the negative influences of technology on student engagement? The accepted themes with the research questions offer the broad lived experience of teachers utilizing technology in their teaching practice.

This qualitative study focuses on the influence that technology applications and usage have on student engagement in the classroom, specifically in secondary 9th-12th grade classrooms at a high school in New Mexico. For this study, student engagement is defined as the time and effort students devote to activities that are empirically linked to desired outcomes (Groccia, 2018). The participants in the study are currently employed as a teacher who teach English, math, science, or CTE courses, to 9th-12th grade students at a public education department school in the state of New Mexico. The study addressed one central research question and two sub-questions through individual interviews with 10 teacher participants, a focus group of 10 individuals, and non-participant observations of 10 teacher participants. All data collection was completed with the same 10 teacher participants.

Participants

The qualitative research study followed the setting and participants' guidelines in Chapter Three: Research Methods. All 10 teacher participants were labeled with the pseudonym Teacher 1, Teacher 2, and so on for all data collection records. The researcher sent an email to all teachers at the high school where data were collected and asked for volunteer participants. The plan was to secure 10 to 12 teachers who taught career and technical education, English, math, social studies, or science courses to 9th-12th grade students. Initially, before any consent forms were signed, 11 teachers volunteered. However, one decided they did not have the time to commit to being a participant before a consent form or any data were collected. The plan was to have at least one teacher from each content offered at the setting high school. Data were collected from 2 math, 2 special education, 3 English, 2 career and technical education, and 1 chemistry (science) teacher. The researcher was unable to secure a social studies teacher for data collection. The participant's level of education, content, and years of experience created diversity, aiding the saturation level of the study. The average age of the teachers was 46. The average years of experience among the teachers were 14 years. The diversity of the teacher participants within these numbers gave the study an appropriate saturation level. The data gathered was saturated based on similar responses that aligned to themes from participants in the individual interviews, focus group, and non-participant observations.

Table 2

Teacher Participants

Teacher Participant	Years Taught	Highest Degree Earned	Content Area	Grade Level
Teacher 1	17	Masters	Math	10th-11th
Teacher 2	4	Bachelors	Special Education-English	9th
Teacher 3	14	Masters	English	10th-11th
Teacher 4	8	Bachelors	CTE	9th-12th
Teacher 5	14	Masters	English/Technology	9th-12th
Teacher 6	15	Masters	English	10th
Teacher 7	2	Masters	CTE	9th-12th
Teacher 8	25	Masters	Math	11th-12th
Teacher 9	22	Masters	Special Education-All Subjects	9th-12th
Teacher 10	20	Masters	Chemistry	10th

Results

Data collection for the research study resulted in five major themes outlined in Table 3. Following Husserl's (Eddles-Hirsch, 2015) outline for transcendental phenomenology, collected data were analyzed through the coding process; five significant themes were identified, which are outlined in Table 3, and allow for answering the central research question, along with the two sub-questions. The themes were developed by coding the transcripts for each data collection approach. From the individual interview, focus group, and non-participant observation transcripts, initial coding was completed expressing 201 initial codes with overlapping codes attached to 601 snippets or quotes. The initial codes were labeled as descriptive, in-vivo, and process, then collated with snippets. Codes were then grouped into themes and revised to create the five accepted themes. After the analysis process, applications and usage distractions, positive teacher experiences, negative teacher experiences, balance, and strong policies and procedures were the resulting themes. By revising the process and theme categorizing, the subthemes of technology applications and usage influence student engagement positively, technology applications and usage influences student engagement negatively, and teacher's confidence level in utilizing technology emerged.

The following table, Table 3 shows the identified themes along with the frequency of each, the descriptor, and the research question that is addressed.

Table 3

Major Themes in Relation to Research Questions

Major Theme (Frequency)	Descriptors	Research Question
application and usage distractions (255)	engagement applications distractions	CRQ
positive teacher experiences utilizing technology (64)	positive experiences	SQ1
negative teacher experiences utilizing technology (126)	negative experiences	SQ1
balance (16)	strategies balance	SQ2
policies and procedures (25)	policy procedures strategies	SQ2

Technology Applications and Usage Distractions

Teacher participants shared that technology applications and usage distractions significantly influenced student engagement in the classroom. The theme emerged throughout teacher participant individual interviews, the focus group, and during non-participant

observations, speaking to applications such as Canvas, Google Workspace, Safari, Chrome, Microsoft Suite, Apple Applications, and Zoom. The term *usage* pertains to students' utilization of technology through technological devices, software, or applications. In the current education world, technology applications and usage are expected of teachers. Technology applications and usage are expectations as teachers educate students to prepare students for their life beyond secondary education.

Addressing the distractions caused to student engagement is essential for educators. Teacher 3 accepted that technology applications and usage can be a distraction, "Even though I sing the praises of technology, it has limitations and can potentially pull students away, especially if it is personal technology. Teaching students the difference between school technology and personal technology is important. Personal technology can distract them if they are doing an assignment where they must be on their MacBook." Teacher 6 shared the same thought on technology as a distraction, "Technology is a blessing and a curse. Technology allows our students and us many opportunities but is also a distraction. The MacBooks give students access to unlimited ways and things to learn while also opening them up to the negative things and distracting their learning." In her individual interview, Teacher 5 spoke about applications that influenced student engagement, "It is all about time and place, what is the actual purpose behind the technology, like, EdPuzzle, has great engagement." Although the teacher participants agreed that technology applications influenced student engagement, the subtheme supported technology applications that could positively and negatively influence student engagement. between school technology and personal technology is important.

Reviewing the individual interviews and focus group data, technology applications and usage distract students in the classroom. Throughout the non-participant observations,

technology applications and usage appear as a distraction to students, as well. The researcher collected field notes regarding student phone usage during the observation class period. While collecting notes in classroom observations, it was observed that out of the 10 teacher participant observations, there was not one observation period where a student's cell phone was not out, and a teacher did not have to address it in some manner. The researcher's notes included observations such as, "Student playing on the phone. Teacher 1 said, "Playing a game on your phone is unacceptable, put it away."

Additionally, a student in the classroom commented to another, "Put your phone away, that is not acceptable." On Teacher 10's observation notes, it was noted, "Female on the phone. The teacher called her name and motioned her to pay attention to the front. The student turned and rolled her eyes, eventually putting the phone down." While observing in Teacher 8's math classroom, students did not pay attention to the teacher lecturing and were not using their MacBooks to take notes on the lecture. The observation notes read, "Female student on MacBook visibly working on an assignment that looks like an English discussion board." Moreover, personal devices, school-issued devices, and applications create distractions in the classroom.

Positive Teacher Experience Utilizing Technology

Teacher experiences utilizing technology come from positive and negative perspectives. All 10 teacher participants shared positive experiences with technology. The experiences shared were related to teacher participants' use of technology and those of their students.

Throughout the focus group, teacher participants shared their experiences with technology, even dating back to early technology usage when projectors and punch card computers were the technology that educators utilized in their instruction. Teacher 10 added to the focus group,

"Punch cards were how you stored your data on a computer." As a self-explained non-tech savvy person, teacher 4 discussed his change and positive experience utilizing technology, "I am somewhat confident. I was used to hammer and chisel. I begin teaching without technology. Then I had to use all the new technology. At first, I was really stressed, but then I started getting organized. I realize the pluses and the pros of all the technology we use." Teacher 5 elaborated on her positive experiences with technology, "I have utilized Canvas as a foundational practice. Lately, I have been doing more with creativity and creating things. So, implementing things like Spiro Bolt or Lego Education. The kids need to look at the bigger idea, taking it down into small pieces, then creating something is really valuable." Positive experiences utilizing technology were evident in non-participant observations. While in Teacher 3's classroom, the researcher described the activities in the classroom, “Teacher reviewing agenda on Smartboard. Agenda made with Canva, Jigsaw assignment, 17 students completing work in collaborative groups on MacBooks.” Similar positive interactions with technology were noted in Teacher 1's classroom. The lesson was structured on the I Do, We Do, You Do model. In the We Do portion of the lesson, it was recorded, "Students are passing around iPad, completing sections of triangles and choosing the next person to pass the iPad to." Students high level of engagement during the iPad activity was noted.

Negative Teacher Experience Utilizing Technology

The teacher participants spoke about the negative and positive experiences of utilizing technology through the three data collection approaches. Negative teacher experience utilizing technology developed as a theme through the three data collection methods. Teacher 9 expressed her negative experience utilizing technology in her individual interview, "I, honestly and truly, feel these kids are on technology 24/7. They lack paper and pencil writing. They need paper and

pencil skills. They are missing those tools." Multiple teacher participants spoke about encountering negatives while utilizing technology. Teacher 10 suggested a negative experience with technology utilization, "Students have the ability when they are on laptops to navigate down the rabbit hole. The kids are getting good at cheating with technology." Teacher 5 elaborated on the negatives, "Students are always behind a square. The learning can stop there, losing the human connection, critical thinking skills of communication and body language." Negative experiences were noticed during non-participant observations. In Teacher 6's classroom, the teacher participant asked students to log in to a specific website to complete an assignment on a fallen officer. The non-participant observation form included, "Teacher had access on Smartboard to the website; however, students could not log in and research their assigned officer." It is important to note that despite the negative experience's teachers have dealt with utilizing technology, the teacher participants in the study all agreed that the positive experiences surpassed the negative experiences.

Teachers Confidence Level

The teacher's confidence level subtheme presented itself as teacher participants discussed their positive and negative experiences with utilizing technology. In individual interviews and the focus group teacher participants discussed their confidence level in utilizing technology in their classrooms. The confidence level of the participants ranged from somewhat confident to completely confident. Teacher 9 shared her confidence level and introduction of technology in her teaching practices, "I know with me, the internet started when I started going to college. If I had known more back then, it would have been easier to complete my undergraduate and graduate degrees. I am not as confident as I should be, but I know that I can learn the new technology coming out, it just takes me time." Teacher 8 commented that he was completely

confident, “I would definitely say I am completely confident. I use it completely, and I also teach the kids to use the technology.” Teacher participants who gauged their confidence level lower also reported a more negative experience utilizing technology. On the other hand, teachers who felt they had a higher level of confidence shared a more positive experience utilizing technology.

Balance

When discussing technology's negative and positive influences on student engagement, balance was a theme that developed in the individual interviews, focus group, and observed in practice during the non-participant observations. Balance in the sense of the amount of time technology is being utilized in the classroom and the type of technology used. Speaking to balance, teacher participants referenced the amount of time teachers utilize technology during instructional time or the amount students are required to utilize technology for educational purposes. Balance was part of Teacher 1's interview, "I think there must be a balance in general." Teacher 5 agreed with the importance of having balance regarding technology in the classroom, "What are the different tools that are built into the different pieces that we have at our disposal to really increase a lot of engagement." In the focus group teacher participants mentioned that the balance depends on the students you teach. Teacher 10, "The argument is, are you really going to get more engagement with technology or are those kids just going to engage in other ways." The balance of utilizing technology in the classroom was apparent in non-participant observations. While observing in Teacher 10's classroom, the balance was notable as the teacher participant utilized the Smartboard for direct instruction while simultaneously using the dry-erase board next to the Smartboard. The balance was also viewed in the students completing work. Students were working with pencils and paper or their MacBooks. Teacher 8 also exhibited a balance of technology usage in his classroom. The researcher noted on the observation notes, "Teacher

using Smartboard to review and explain computation. Three female students took notes in notebooks, and the remainder of the class took notes on their MacBooks in word.

Strong Policies and Procedures

Strong policies and procedures concerning strategies to lessen technology's negative influence on student engagement in the classroom emerged during the individual interviews, focus group, and non-participant observations. All teacher participants concurred that strategies must be implemented to lessen the negative influences, strong policies concerning expectations and consequences when students misuse technology in the classroom. Procedures are essential in the classroom environment and for all conditions in the room. Teacher 1 discussed her policy with the focus group, "I have calculator pockets to collect cell phones during instructional time." Teacher 6 shared his cell phone policy in his classroom, "I have lights in my classroom, the red light, green light, and yellow light. When red lights are on, phones need to be away." Expectations in the classroom were discussed by teacher 4, "If that behavior is excepted, then that is what can be done." While teachers spoke of the policies and procedures they have in their classroom in the individual interviews and focus group, the non-participant observations did not show evidence of said policies and procedures. Teacher 6 spoke of the light system he has in his class for cell phones. However, he did not reference it or employ the lights during the non-participant observation in his classroom.

Additionally, during Teacher 1's observation, the calculator pocket chart was hanging up in the classroom. However, when she addressed a student who had his phone out during instructional time, she did not utilize the chart nor remind the student of the consequence of it. Therefore, the teachers agreed on a strategy to lessen the influence; however, it was not observed in practice.

Outlier Data and Findings

Two significant outliers were revealed during the individual interviews, focus group, and non-participant observation data collection and analysis. The first outlier related to special education students based on comments made by two special education teachers. The experience of special education teachers with applications and usage of technology was not expected to be different from regular education content teachers' experiences prior to data collection. All 10 teacher participants agreed upon the second outlier, which surprised the researcher. The second outlier was that teachers find teaching easier by utilizing technology regardless of its influence on student engagement.

Outlier Finding #1

Two special education teachers participated in the study. The two teachers taught English as their main content. Both teachers raised concerns about utilizing technology for special education students. Special education students have established disability determinations and Individual Education Plans (IEPs). The other eight teacher participants did not mention special education students in their individual interviews, focus group, or non-participant observations, despite each teacher having special education students with IEPs on their class load. The experiences of the special education teachers utilizing technology in their classrooms were vastly different from the regular education teacher's experiences.

Teacher 9 included in the focus group, in response to the importance of technology, "For me, it is not that important because my kids learn better with hands-on approaches due to their cognitive disabilities." The same teacher noted, "Many kids do paper and pencil because of their cognitive disability; using Canvas and other technology is hard. The required uploading, downloading, copying, and pasting is difficult for my students. It is sometimes just easier to give

them paper and pencil. Moreover, it is simple if we do anything on the computer." Teacher 9 also included the following statement in the individual interview, "One of the things with special education is it does not meet their needs; it meets the needs of one student. Everyone believes technology is good because it is geared toward one student. However, you have other students whose needs are not met. Everybody is on a different level.

The second special education teacher, Teacher 2, noted the difference in how technology distracts special education students and influences their engagement. In her interview, she said, "For almost all learners, it is a distraction. Even more so for the special education kids because they struggle with learning as it is, and it is easier for them to disengage."

Outlier Finding #2

All 10 teacher participants in the study agreed that teaching is easier with technology, notwithstanding any influences it has on student engagement. They credited more straightforward teaching to technology applications such as Google Workspace, learning management systems, Canvas, accessibility to information, and overall storage capabilities. Teacher 3 illustrated, “It helps with organization, but I think even for myself, I can look back and reflect on more tech-based teaching.” Teacher 6 agreed, “I agree because it makes things easier. Like you are saying, when I finish my lessons, I can go back, reflect, make changes, and have things ready for the next time or the next class.

Research Question Responses

The three data collection approaches of the research aimed to answer one central research question and two sub-questions. The following sections answer each question and provide teacher participant quotes to adduce alignment with the accepted themes to contribute a comprehensive picture of the teacher experience.

Central Research Question

How does technology applications and usage influence student engagement in the classroom?

Applications used in instructional design positively influence student engagement applications utilized in the classroom, such as apps that gamify instruction and learning, like Kahoots and Blookit. Students using apps such as Keynote, Podcasts, and Edpuzzle add to student engagement in academic content subjects. Teacher 6 shared how different apps and tools engaged his students, “I wanted to create more engagement, so I started using different apps and different tools to engage kids.” Teacher 5 added to the theme that technology applications and usage influence student engagement in the classroom. She commented, “In Canvas…they can interact with their learning 24/7 if needed. I build direct instruction.” Teacher 8 elaborated on the positive influence on student engagement in the classroom, with students receiving immediate feedback through applications. “Canvas which connects to MyLab, for math, grades student work, and then the student gets immediate feedback.”

Technology usage in the classroom positively influences student engagement through tools that allow collaboration and sharing of knowledge, learning, and experiences. Teacher 5's comment reinforces the theme that technology usage is positively influences engagement through the usage of technological collaboration tools, "When I think about technology as a variety of tools, I think, like, this is leaning into some of the ISTE standards, right? We can be global communicators within technology. Technology is a tool that can extend our classroom beyond just the four walls. We can now collaborate and communicate with people who are no longer inside of our school building.”

While the data showed that applications and usage of technology had a positive influence on student engagement, it also showed that it could have a negative influence. The negative influence led to lower levels of student engagement in the learning or task at hand. Teacher 10 elucidated the development of this theme, "With technology on their tabletop, their ability truly, to run down the rabbit hole, you know, where they can find entertainment. We have given them a whole entertainment center right in front of them, and their engagement in the activity is lost." Teacher 7's comment, "I think that would be one thing, but since it has so many things to offer, it is a distraction," strengthens the theme that technology applications and usage negatively influence student engagement by becoming a distraction.

Sub-Question One

What are the experiences of high school teachers (9^{th}- 12^{th} grade) utilizing technology in the classroom?

Much like how technology applications and usage negatively and positively influence student engagement, the experiences of high school teachers are similar. They are similar in the sense that there is a negative and a positive side to the teacher's lived experiences utilizing technology in their classrooms.

The negative side of a teacher's lived experiences is detailed by Teacher 7,

I have given up movies or video clips; they get right on their phones. I have had a couple of conversations with teachers about what technology they use for engagement. Videos and clips way back when were exciting. Now students are inundated by the infinite number of things they have access to on their phones, and they do not care about videos or clips to add engagement to a lesson in class.

Another experience with the utilization of technology that is on the negative side was discussed by Teacher 10, “I hear an awful lot of people say we are going through an evolutionary process, especially with technology. Obviously, we do not know what is next in the country, the state, or the school district. We have started several things and platforms, and we do it for six months, then it changes. The change is a big frustration for many.”

While the data collected showed the negative experiences teachers have experienced, some teachers have had positive experiences with the utilization of technology. Teacher 3 explicated the positive technology experience that she experienced, "It allows students to grow critically, become more structured, and streamlined." Teacher 7 shared his positive experiences using technology, "We use MacBooks, Canvas, and I use my Smartboard constantly. I can airplay body camera videos, news clips, a lot of stuff like that helps in the criminal justice classes because we can show real-world stuff." Likewise, Teacher 8 added his positive experience with using technology in his classroom by commenting, "On the whiteboard app, I share screen and do examples for students during lectures. I can also use Desmos, which is an online calculator that is honestly easier and more powerful than the TI-89 calculators."

Sub-Question Two

What strategies can educators implement to lessen the negative influences of technology on student engagement?

Teacher participants described strategies to lessen the negative influences of technology on student engagement during individual interviews and the focus group. Two teacher participants' descriptions included strategies categorized within the domain of accessibility for technology usage by students. For example, Teacher 3 said, "I will say one of the things that I have worked more on in the past couple years is accessibility tools, and how those can

seamlessly be integrated to increase and not take away from engagement. Just today, students, we are going to be writing things, but I have some students that cannot type in a quick way. I think, I have a tool for to help them like Google Slides or Docs and they are using just speech to text or turning on those adaptations." Teacher 2 added to the accessibility strategies, "With Canvas, we use text to speech. A lot of the support things that are on the MacBook support accessibility and help student engagement."

Additionally, it was identified that consistency in the change of state and change in the type of technology being utilized in direct instruction is a strategy to lessen the negative influence of technology applications and usage on student engagement. Teacher 1 noted, "It becomes a drag if I use video notes for two weeks in a row. If I give them hands-on worksheets for two weeks in a row, it will be a drag. So, there must be a balance of back and forth. You would need to incorporate multiple pieces of technology, so the engagement does not drop off. When it becomes monotonous, it is the same thing every day. If I use technology in different ways, there is more engagement."

Teacher 5 elaborated on the importance of intentionally and purposeful utilizing technology to influence engagement positively to lessen the negative influence on student engagement. She said, "If you are not intentional, and it is just a device somebody carries around with it, then that is the value students will hold. Thinking about design, to make sure that it is engaging and interactive is important to lessen any negative influences technology has on engagement."

The following table, Table 4, shows the level of engagement in range percentages of each teacher participant during non-participant observations. The ranges noted on the observational field notes displayed engagement ranges from medium to high. During the collection period,

some level of technology was being utilized in the classroom. The utilization of technology ranged from the teachers using the Smartboard for direct instruction with applications to students utilizing MacBooks with applications such as Canvas or search engines. The engagement data showed that students were medium to highly engaged during instruction when technology was utilized, highlighting that technology applications and usage positively influenced student engagement in the classroom.

Table 4

Engagement Levels from Non- Participant Observations

Teacher	Range of Engagement in Percentages	Level of Engagement
1	67%-80%	medium to high
2	60%-93%	medium to high
3	79%-93%	high
4	83%-94%	high
5	86%-100%	high
6	75%-100%	high
7	89%-96%	high
8	47%-100%	low to high
9	86%-93%	high
10	32%-58%	medium

Summary

Chapter four detailed the data collection results of individual interviews, a focus group, and non-participant observations with 10 high school teacher participants. Identifying technology

applications and usage influence on student engagement in the classroom was the purpose of the study. The findings communicated the themes, application and usage distractions, positive teacher experiences, negative teacher experiences, balance, and strong policies and procedures through thematic and constant comparison analysis. The themes were then used to compose the participants' lived experiences. The accepted themes led to answering the central research question, how does technology applications and usage influence student engagement in the classroom? As well as the sub-question, what are the experiences of high school teachers (9th-12th grade) utilizing technology in the classroom? Moreover, what strategies can educators implement to lessen the negative influences of technology on student engagement? All 10 teacher participants agreed that technology applications influence student engagement.

CHAPTER FIVE: CONCLUSION

Overview

This phenomenology's purpose was to determine the influence that technology applications and usage have on student engagement in the high school (9th – 12th) grade setting. Chapter five is the synthesis of the study, including a discussion and interpretations of the results based on the five accepted themes, applications and usage distractions, positive teacher experiences, negative teacher experiences, balance, and strong policies and procedures. The chapter also includes implications for policy and practice, theoretical and empirical implications detailed with the limitations and delimitations of the study. The chapter concludes with the researcher's recommendations for future research.

Discussion

The study’s findings were discussed in chapter four. The five developed themes from the data analysis are synthesized into a comprehensive narrative to define the essence of technology applications and usage experiences of the teacher participants. Moustakas (1994) suggested through Husserl's phenomenological outline a composite structural description and a synthesis of textual and structural meanings to result in the essence of the phenomenology. The study's phenomenon was the lived experiences of teacher's experiences utilizing technology while answering the research questions. Bandura's (1986) SCT impacts technologies influence on student engagement through his theory that includes the variables of learning, attention, retention, reproduction, and motivation impact learning. His theory details the variables that influence motivation in the learning environment, and technology applications and usage play a role in the learning environment.

The preceding discussion extends the empirical and theoretical literature discussed in Chapter Two, connecting to the overall result of the data collection and analysis with the intent to validate and potentially vary from previous bodies of work. The following section includes the five themes detailed with the researcher's interpretation of findings.

Interpretation of Findings

This section begins with a brief Summary of Thematic Findings, as discussed in Chapter Four, followed by a series of interpretations deemed significant by the researcher. Data collection and analysis from the 10 teacher participants expressed the lived experience of each teacher along with the succeeding five themes, applications and usage distractions, positive teacher experiences, negative teacher experiences, balance, and strong policies and procedures. Applications and usage distractions were revealed as the most significant influence on student engagement in the classroom. While applications and usage of technology were found to be distracting in the classroom, categorizing the distractions as a negative influence on student engagement, teacher participants also detailed how technology positively influences student engagement. Aligned with the positive and negative influences, the researcher found that teacher participants had positive and negative experiences utilizing technology in the classroom, leading to the subtheme of teacher confidence levels. Addressing the second sub-question, the themes of balance and strong policies and procedures were revealed. In line with Bandura's (1986) SCT that acknowledges that there are outside factors or variables that influence student learning the underlying idea that technology applications and usage influence student engagement is supported.

The findings of this study supplied specific implications for all stakeholders in the educational community together with instructional foundations including recommendations for

further research opportunities. Bouilheres' et al. (2020) research suggested that technologies' rise has given educators the tools to use innovative applications to engage students which reinforces the study's result that technology influences student engagement in the classroom. The reviewed literature by Carstens et al., 2021, Blikstad-Balas and Davies, 2017, Florethal, 2018, Zhang et al., 2022, and Bouiheres et al. in the literature review details that technology in education influences all features of learning and teaching, including student engagement.

Summary of Thematic Findings

Data collection and data analysis ensued five significant themes. The themes emerged through the teacher participants' perspectives of their own lived experiences with the utilization of technology and its influence on student engagement. The utilization of technology is focused on technology applications and usage. Student engagement has multiple definitions and meanings to educators. Research has been conducted to investigate the structure and meaning of student engagement, resulting in literature that reflects the substantial difference in the definition of the term (Alrashidi et al., 2016). For the study's intent, the researcher has accepted the definition of *student engagement* as the time and effort students devote to activities that are empirically linked to desired outcomes (Groccia, 2018). Prior literature has confirmed that engagement is essential in teaching (Abla & Fraumeni, 2019). Perez-Salas's et al. (2021) research furthered the body of literature, illustrating that student engagement and disengagement influence student learning.

The influence that technology applications and usage have on student engagement in the classroom falls into either a negative or positive category based on the teacher participant discussions. Past research and literature agree that technology acts as an influencer in the classroom. Amerstorfor and Freiin von Munster-Kistner (2021) research acknowledged that

several factors influence student engagement, such as personal learner characteristics, the teacher, the teaching methodology, other students, and the classroom setting. Technology applications and usage is represented in all four of the mentioned factors.

Consistent with the negative and positive influence of technology applications and usage, the research revealed that the teacher participants had negative and positive experiences utilizing technology in their classrooms. Through the developed theme came the sub-theme of teacher confidence, which played a role in the teacher's positive or negative experience. Discussing the positive and negative experiences with the teacher participants generated the themes that to lessen the negative influences, teachers must have a balance of technology in their classroom and strong policies and procedures regarding technology use.

Technology's Applications and Usage Positive vs Negative Influences

Educators and the academic environment have been at the forefront of the evolution and growth of technology. In recent years with the COVID pandemic, technology has only increased, and the trajectory will continue to grow. Teacher participants established an agreement to Tupper and Colijn's (2021) thought that technologies benefits continue to grow as 21st century learning evolves.

Teacher participants confirmed Carstens et al. (2021) statement that technology usage in the classroom environment influences the educator's experience, influencing student engagement and thus impacting their learning. Teacher participants agreed that technology applications and usage influence student engagement in the classroom. Their thought that technology applications and usage influence student engagement was supported throughout the data collection analysis.

Schindler et al. (2017) acknowledged that despite gaps and mixed findings, using technology to promote student engagement is still recommended as a best teaching practice.

When asked if they would use technology in their teaching practice if it were not required or expected, all 10 teacher participants adamantly said yes without hesitation. Other researchers, such as Selwyn (2020), supported using technology in the classroom, notwithstanding its negative influence on student engagement. Selwyn asserted that technology is universal in everyday life and thus has developed a role in educating our youth. Conversely, Boonmoh et al. (2021) posited that technology helps increase a student's motivation to learn, which lends itself to Bandura's (1986) SCT that connects student motivation to student engagement.

The negative and positive influences were apparent throughout data collection analysis. Teacher 3 captured the positive influence of student engagement in her comment, “I use technology for interactive activities, such as graphic organizer, or I have students complete corrective sentences on the Smartboard.” Teacher 8 shared his lived experience of technology applications and usage in an individual interview,

> Kids focus has changed for the future with technology. I feel that if they are proficient with a computer and with technology that is where they are going to go as a career path. Technology is needed to build, and problem solve in many of today’s careers. So, I think we really need to focus on technology and not let them get sidetracked and disengaged.

Teacher 7 commented, "Kids seem much more engaged when using technology, even their phones. I will let them use their phones to do things, or whenever students create podcasts or videos, they engage with the technology a lot more." Teacher 1 strengthened the confirmation, "They are more engaged when we are using technology. Because when we use technology, they must look at their MacBooks." While observing in a non-participant observation, the researcher recorded an interaction of negative influence on student engagement, "Teacher: Student's Name, why are you on your phone? Student: I am watching TikTok's and snapping people. Student puts

the phone away." This observation is a direct example of how technology applications and usage, in this instance, social media, influence student engagement in the classroom.

Positive vs Negative Teacher Experiences

Through reviewing the experiences, the teacher participants' experiences were comparable with the influence of technology on applications and usage; teacher participants communicated having negative and positive experiences. As teacher participants shared their lived experience of utilizing technology in their classrooms, it became clear that the students in the classroom, the type of technology, and the teacher's confidence level in utilizing technology were all factors in their positive or negative experiences.

Teacher participants spoke about their positive experiences utilizing technology in their teaching practice throughout the three data collection approaches. When asked if technology adds to student engagement, Teacher 10 replied, "My presentations (PowerPoint), the videos they all add to the G wiz you have to have to have the engagement of kids." Teacher 4 described how technology applications influence student engagement in his classroom, "We are using technology because we are putting up a website called Animated Knots. They are watching it and trying to do the knots independently." Teacher 3 captured the positive influence of student engagement in her comment, "I would say one is getting students ready for the outside world. I always tell my students that the vast majority of jobs they may have do not exist yet because technology is ever-changing." Kay et al. (2017) article validated the teacher's experience as they posited gender and instructional methods factored into distractions in the classroom. Teacher participants shared those distractions in the classroom lead to a negative experience with utilizing technology applications and usage. The negative experiences also correlated with the

teacher participants who had lower confidence levels in self-reflection of confidence in utilizing technology.

Strategies to Lessen Negative Influences

All the teacher participants agreed that technology applications and usage positively and negatively influence student engagement. Even with the negative influences, the teacher participants concurred that the positives offset the negatives. Data from the study corroborated with Kay et al. (2017), agreeing that gender, peer behavior, instructional methods, and restrictions affect digital distractions.

Additionally, teacher participants spoke about utilizing strategies to lessen the negative influences of digital distractions. As teacher participants shared their experiences utilizing technology applications and usage that influences student engagement, all 10 participants shared a need to have strategies to minimize the negative influences while maximizing the positive ones. Establishing and reinforcing strong policies is a strategy that was mentioned multiple times throughout the individual interviews and focus group. Seemiller and Stover's (2017) research showed that strong policies, the rationale of policies, engaging students in learning, and sharing with students the research behind digital distractions were a strategy to lessen the negative influence of technology applications and usage in the classroom. Teacher participants spoke of strong policies; however, many of the non-participant observations showed a lack of strong policies.

In addition to strong policies, teacher participants discussed balancing technology applications and usage as a strategy to lessen the negative influences, balance in the amount of time and the type of technology applications being utilized. Balancing the type of technology applications ranges from utilizing games or having students work in collaborative groups.

Duncan (2020) posited that all games have some engagement element, as participants must physically interact to be successful. Moreover, Youngren's (2021) data showed that students working in collaborative groups had higher levels of engagement than when students were working independently. The balance can be viewed as a bridge between the student's learning and the resources (Lubniewski & Kiraly, 2020); the resources include technology applications and usage.

Implications for Policy or Practice

An implication for policy was discovered in the research that influence public high schools and potentially all public schools within the United States Department of Education system. The data collected included one 9th-12th grade high school; all public schools have similar systems and structures. Therefore, policy implications are transferable to other high schools and potentially elementary schools with the same structure as the study's data collection site.

Technology applications and usage potentially negative influences on student engagement were considered in the study. Teacher participants agree that technology applications and usage have the potential to negatively influence student engagement while discussing how to lessen the influence in their classrooms. When asked about the technology policies in their classrooms, only three of the 10 teacher participants admitted to having a policy that is currently in place and is effective. The school site for data collection does not have a school or district-wide policy for technology applications and usage in the classroom. The district does have an acceptable use policy; however, it does not integrate any policy on students using applications or personal devices in the classroom. Teacher participants all agreed that a strong technology usage policy needs to be in place to lessen the negative influence on student

engagement. Olofsson et al.'s (2020) research acknowledged that technology has the potential to reform and transform teaching; however, it does not correlate at the policy level.

Implications for Policy and Practice

Practical implications for high school teachers and administrators were exposed in the study. All 10 teacher participants believed that while technology applications and usage can influence student engagement negatively, the positives outweigh the negatives in its utilization. Sharing of experiences with the teacher participants also uncovered that teachers' negative or positive experience correlates with the teacher's confidence level of technology utilization. The practical implications are focused on training and professional development.

The first practical implication is ensuring that teachers receive training and ongoing professional development on technology applications and how to utilize applications to lessen the negative influence on student engagement. The need for training and professional development to be ongoing is based on the accelerated pace that educational technology is developing (Valtonen et al., 2022). Technology's landscape is only going to continue to grow and evolve. Educators, essential school, and school district administrators must recognize the need for continuous training and professional development to keep teachers prepared.

The second practical implication aligns with the training and professional development in consideration of the teacher's level of confidence in their technology utilization. Hartman et al. (2019) posited that to meet the needs of current students, educators must be able to be comfortable and adapt quickly to the technology-rich teaching and learning environment found in schools today. Training and professional development must constantly be available to obtain and maintain teachers with high levels of technology confidence.

Theoretical and Empirical Implications

Specific implications were revealed from the data analysis of this phenomenological study. The study's theoretical and empirical implications are presented in this section. The following section presents the implications that affect stakeholders in the educational community, including parents, students, teachers, administrators, researchers, and community benefactors. Further recommendations relevant to the stakeholders are included in the study's results and identified implications.

Theoretical Implications

The study's results extend Bandura's (1986) learning theory SCT. SCT's foundation is an interaction view among learners and the environment (Eun, 2018). Bandura's observational learning and model process provided a framework for the theory of developing internal structure assumptions. Schunk (2019) shared Bandura's internal structure of behavioral, environmental, and personal variables. The behavior, environment, and person impact one another and are inseparable (Stajkovic & Sergent, 2019). The teacher participants' responses and subsequent emerging themes from the data collection extend into SCT. Data analysis unveiled that technology applications and usage influence student engagement positively and negatively. Technology applications and usage connect with the variables as both play a part in students' behavior, impact the environment, and add to the personal aspect of the theory. In each influence, the mental and cognitive situation illustrated the physical or social environment that impacts the learner. Technology applications and usage in the classroom is behavioral through the student's behavior of using the technology. The teacher also plays into the behavior of technology that influences students’ learning. Technologies present in the classroom influence the environment and thus, influence the student’s engagement and learning based on SCT.

Personal variables relate to technology in the classroom through personal characteristics or knowledge that vary from learner to learner.

Empirical Implications

The study resulted in empirical significance as it adds to previous literature wherein researchers agree that technology applications and usage influence student engagement, additionally strategies to help lessen the negative influence. Previous research was confirmed, including the theoretical SCT framework. In the individual interviews, teacher participants gave a first-hand look into teachers' experiences utilizing technology. The focus group reinforced the teacher participant's experiences. The non-participant observations created a real-life visual picture of technology utilization that teacher participants shared in the individual interviews and focus group. Ratten and Ratten's (2007) research revealed that technology changes the environment, thus influencing student engagement, to which teacher participants agreed. Understanding how technologies engage students and learning outcomes is limited (Nkomo et al., 2021). The current teacher experiences that were revealed add to the body of knowledge on student engagement.

The study confirmed prior research that technology influenced student engagement. Georgiou and Kyza (2018) revealed that earlier empirical research is often contradictory. However, there is a limited understanding of how technologies engage students and enhance learning outcomes (Nkomo et al., 2021). The study's findings concurred with this statement as it was found that technology applications and usage influence student engagement positively and negatively.

Limitations and Delimitations

he teacher participants in the study met the setting and participant guidelines outlined in Chapter Three. All 10 teacher participants were currently teaching math, English, science, or a CTE course at a high school in New Mexico. Two teachers had bachelor's degrees, while the remaining eight held master's degrees. The teacher participants had an average of 14 years of teaching experience. To effectively answer the central and sub research questions, decisions of the study were made before conducting data collection. The study acknowledged limitations and delimitations as outlined in the preceding section.

Limitations

The research revealed two potential weaknesses, sample size and site inclusion. One such limitation that weakened the study is the sample. While the research participants met the study participant requirements of teaching English, math, science, and CTE courses to 9th through 12th-grade students, the teacher's experience level and comfort level of utilizing technology in the classroom varied. Experience and comfort level influence the teacher's overall perspective on technology applications and usage in the classroom. Additionally, site inclusion limited the study. Data were collected from high school teacher participants at one high school. The conclusion might have been narrower if the research had included high school teachers from other area high schools with similar demographics and similar technology access. Moreover, the researcher is employed at the school site of data collection and has spent time in the teacher participant's classrooms on multiple occasions. Being a staff member on the same campus has created a working relationship between the researcher and the teacher participants, which may have influenced the interpretations of the data.

Delimitations

The researcher revealed two potential weaknesses, sample size and site inclusion. One such limitation that weakened the study is the sample. While the research participants met the study participant requirements of teaching English, math, science, and CTE courses to 9th through 12th-grade students, the teacher's experience level and comfort level of delimitations were decided upon and set prior to the study to limit boundaries. One beneficial delimitation of the study was limiting the participants to teachers who currently teach a subject offered at the data collection school site. Before choosing the site, the researcher knew that the school site was a one-to-one device campus, and that technology utilization is expected of the teachers from the site administration and the district. Participants were required to currently teach a high school course, allowing for current data to be collected and analyzed to illustrate the present-day lived experience of teachers utilizing technology while limiting a wide experience. Following the phenomenological approach, this qualitative study was decided upon to allow for the true lived experience of teachers to be presented. Also, the approach followed Husserl's (1970) framework giving the outline to compose a rich narrative of the essence of the teacher experience. The study following the transcendental approach allowed the experience to be fresh (Moustakas, 1994).

Recommendations for Future Research

Recognizing that the study confirmed earlier findings that technology influenced student engagement and considering the study's findings, limitations, and delimitations, two recommendations were identified. Furthering research would add to the conversation and increase strategies to lessen the negative influences that technology applications and usage has on student engagement.

The first recommendation for future research focuses on the sample of the study. The research sample size and participant guidelines were met. Data saturation was reached based on

the responses of the teacher participants. The creditability, dependability, and transferability of the study were valid. However, the study sample included teacher participants from one high school and was limited to math, English, science, and CTE content which led to limited sample size and site inclusion. Conducting a study with a bigger sample size would create a more comprehensive picture of the influence. Comparison can be made on several aspects of the study. Comparisons can occur based on the influence in different content areas, the size of classrooms, and reviewing how the policies and procedures of one teacher or school drive the influence positively or negatively.

Secondly, the study conducted was qualitative; therefore, only qualitative data were collected and analyzed. Conducting a study looking at the quantitative data on student engagement when utilizing technology in the classroom would strengthen qualitative data on the influence of technology engagement. Solé-Beteta et al. (2022) have proposed a methodology and a model to measure student engagement with a software prototype. The methodology and model can provide transferability and additional research studies to add to the current literature and body of knowledge.

Conclusion

The problem investigated in the study was that the application and usage of technology in the classroom influenced student engagement in the classroom. The purpose of the study was to describe the lived experience of high school teacher's experiences utilizing technology while answering the central research question regarding the influence of technology applications and usage on student engagement. The literature review established the base of research acknowledging the benefits of technology in the classroom, such as technology learning applications and platforms (Seemiller & Stover, 2017). Bandura's (1986) learning theory, SCT,

was utilized as a framework to generate the central research and sub-questions. Through data collection and analysis, five major themes amid the teacher participant descriptions of experience, application and usage distractions, positive teacher experiences, negative teacher experiences, balance, and strong policies and procedures align with the central research question, how does technology applications and usage influence student engagement in the classroom? And the two sub-questions, what are the experiences of high school teachers (9th- 12th grade) utilizing technology in the classroom? And what strategies can educators implement to lessen the negative influences of technology on student engagement?

The teacher participants met the study's requirements of currently teaching 9th-12th grade math, English, science, or career and technical education at a public high school in the state of New Mexico. Each teacher participant participated in the three data collection methods outlined in the study's design, individual interviews, focus group, and non-participant observations. Chapter five is comprised of the findings, implications for policy and practice, theoretical and empirical implications, concluding with limitations and delimitations of the study, and finally ending with recommendations for future research.

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Appendix A

IRB Approval Letter

Nimrah Marquez
Janet Deck

Re: IRB Exemption - IRB-FY22-23-546 INFLUENCE OF APPLICATIONS AND USAGE OF TECHNOLOGY ON STUDENT ENGAGEMENT IN THE CLASSROOM A QUALITATIVE STUDY

Dear Nimrah Marquez, Janet Deck,

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 46:104(d):

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(s) and final versions of your study documents can be found under the Attachments tab within the Submission Details section of your study on Cayuse IRB. Your stamped consent form(s) 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(s) 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

Site Approval Letter

LOS LUNAS HIGH SCHOOL
PO DRAWER 1300 LOS LUNAS, NM 87031
PHONE 505-865-4646 FAX 505-565-2847

DR. ARSENIO ROMERO, SUPERINTENDENT
PAUL CARDER, PRINCIPAL
ROBERT SIMS, JR., ASSISTANT PRINCIPAL
JENNIFER GAERLAN, ASSISTANT PRINCIPAL
REGINA LUCERO, ASSISTANT PRINCIPAL

November 22nd, 2022

Nimrah Marquez
Doctoral Candidate
Education, Liberty University

Dear Ms. Marquez:

After careful review of your research proposal entitled Influence of Applications and Usage of Technology on Student Engagement in the High School Classroom: A Qualitative Study, I have decided to grant you permission to conduct your study at Los Lunas High School.

Sincerely,

[redacted]

Paul Carder
Principal
Los Lunas High School

Appendix C

Participant Recruitment Letter

[Recipient]
[Title]
Los Lunas High School
1776 Emilio Lopez Rd
Los Lunas, NM 87031

Dear [Recipient]:

As a Doctoral Student in the School of Education at Liberty University, I am conducting research as part of the requirements for a Ph.D. in Education with a concentration in Organizational Leadership. The purpose of my research is to determine the influence technology applications and usage have on student engagement in the high school (9^{th}-12^{th} grade) classroom. My research will attempt to answer the central research question, "How does technology applications and usage influence student engagement in the classroom? Additionally, two sub questions will also be asked, "What are the experiences of high school teachers (9^{th}-12^{th} grade) utilizing technology in the classroom?" and "What strategies can educators implement to lessen the negative influence of technology on student engagement?", and I am writing to invite eligible participants to join my study.

Participants must be a 9^{th} through 12^{th} grade teacher. Participants, if willing, will be asked to participate in an individual interview with 11 guiding questions that will take no longer than 30 minutes, one 30-minute focus group conversation and 1 period long non-participant observation. All three will be audio recorded. Participation will be completely anonymous, and no personal, identifying information will be collected.

To participate, please contact be by email or phone.

Sincerely,

Nimrah Marquez
Leaning Innovation Coach
Doctoral Candidate

Appendix D

Consent for Study Participation

Title of the Project: Influence of Applications and Usage of Technology on Student Engagement in the High School Classroom: A Qualitative Study
Principal Investigator: Nimrah Marquez, Doctoral Candidate, Education, Liberty University

Invitation to be Part of a Research Study

You are invited to participate in a research study. To participate, you must be a 9th-12th grade content classroom teacher. Taking part in this research project is voluntary.

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

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

The purpose of the study is to determine the influence that technology applications and usage have on student engagement in the classroom setting, while also identifying strategies that can lessen the negative influence.

What will happen if you take part in this study?

If you agree to be in this study, I will ask you to do the following:

1. Face-to-Face Interview: Participant meets with researcher for approximately 30 minutes on a one-on-one basis covering 11 questions following an interview guide. This interview will be audio recorded.
2. Focus Group: Participant will participate in a 30-minute focus group with other study participants which will be guided by 10 open-ended questions in a Zoom session that will be recorded.
3. Non-Participation Observation: Researcher will observe one class period, 50 minutes, to collect data on student engagement. This observation will be audio-recorded.

How could you or others benefit from this study?

The direct benefits participants should expect to receive from taking part in this study include learning how technology applications and usage influence student engagement, as well as strategies that can be implemented in the classroom to lessen the influence.

Benefits to society include increased knowledge base of how technology applications and usage influence student engagement, as well as identifying strategies teachers can implement to lessen the influence.

What risks might you experience from being in this study?

The expected risks from participating in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

I am a mandatory reporter. During this study, if I receive information about child abuse, child neglect, elder abuse, or intent to harm self or others, I will be required to report it to the appropriate authorities.

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.

- Participant responses from the individual interviews will be anonymous and be kept confidential.
- Interviews will be conducted in a location where others will not easily overhear the conversation.
- Data will be stored on a password-locked computer/in a locked file drawer. After three years, all electronic records will be deleted, and all hardcopy records will be shredded.
- Audio recordings will be stored on a password locked computer for three years. The researcher/the researcher and members of her doctoral committee will have access to these recordings.

How will you be compensated for being part of the study?

Participants will not be compensated for participating in this study.

Is the researcher in a position of authority over participants, or does the researcher have a financial conflict of interest?

The researcher serves as an innovation learning coach at the participant school. The position is not supervisory or evaluative in any manner.

Is study participation voluntary?

Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with Liberty University or Los Lunas High School or Los Lunas Public Schools.
If you decide to participate, you are free to not 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 choose to withdraw from the study, your responses will not be recorded or included in the study.

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

Whom do you contact if you have questions or concerns about the study?

The researcher conducting this study is Nimrah Marquez. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her.
Contact information:

You may also contact the researcher's faculty sponsor, Dr. Janet Deck
Contact information:

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 IRB. Our physical address is Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA, 24515; our phone number is 434-592-5530, and our email address is irb@liberty.edu.

Disclaimer: The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.

Your Consent

Before agreeing to be part of the research, please be sure that you understand what the study is about. You will be given a copy of this document for your records/you can print a copy of the document for your records. If you have any questions about the study later, you can contact the researcher using the information provided above.

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 audio-record me as part of my participation in this study.

_____
Printed Subject Name

_____
Signature & Date

Appendix E

Individual Interview Questions

1. Please describe your educational background and career through your current position.
2. Describe the technology applications and usage in your classroom? SQ1
3. Please discuss your experiences using technology remotely. SQ1
4. How was your student's engagement throughout your lesson structure during remote instruction? CRQ SQ1 SQ2
5. How would you compare your teaching with remote instruction to face-to-face classroom instruction with the application and usage of technology? SQ1
6. What are the differences in student engagement when you are actively using technology in your classroom to times when you are not? SQ2
7. In your experience, what are the pros and cons been in utilizing technology in your teaching practice? CRQ SQ1
8. Technology applications and usage is expected in the current classroom environment. If you had a choice, would you utilize technology in your classroom? How? SQ1
9. How does technology add to your student's engagement? SQ2
10. How does technology distract from student engagement? SQ2
11. What else would you like to add to our discussion of your experiences with technology applications and usage in the classroom?

Appendix F

Focus Group Questions

1. How many years have you been in education?
2. How important is technology in your daily teaching practices?
    - very important
    - important
    - not important at all
3. How has your teaching changed with the use of technology?
4. Is teaching easier or harder with the technology applications and usage?
5. What is your level of confidence in using technology in your teaching practices?
    - not confident
    - somewhat confident
    - confident
    - completely confident
6. What stage would you say you are in with technology applications and usage in your classroom?
    - Entry stage: the system is slow to change.
    - Adaptation Stage: technology becomes thoroughly integrated into teaching.
    - Transformation Stage: technology is seamlessly integrated into teaching.
7. What is the technology usage policy/expectation for your classroom?
    - If you do have a policy, how well does it work?
    - Do students follow it?
8. How would you describe the student engagement in your classroom?

- high
- medium
- low

9. What influence does technology have on your student's engagement?

10. What else would you like to contribute to this study on student engagement in classrooms with technology usage?

Appendix G

Non-Participant Observation Form

Class:

Lesson:

Number of Students:

Male Students:

Female Students:

Visible technology in the classroom:

Student Engagement in 10 min increments:

(Students actively engaged in activity at hand)

1:

2:

3:

4:

Notes:

Appendix H

Audit Trail

Audit Trail		
Date	**Title**	**Description**
5/9/22	Proposal Development	Begin proposal
5/23/22	Paired with Dissertation Chair	Dr. Renner
9/28/22	Paired with Final Dissertation Chair	Dr. Janet Deck
10/27/22	Secured Methodologist	Dr. Susan Stanley
11/28/22	Proposal Defense	Passed
11/28/22	Certified IRB Application	Certified by Dr. Janet Deck
11/29/22	Submitted IRB Application	Initial Application submitted
12/30/22	IRB Application Returned for Revisions	IRB email for revisions
1/2/23	Certified IRB Application	Certified by Dr. Janet Deck
1/2/23	Re-Submitted IRB Application	Revised Application submitted
1/16/23	IRB Approval Received	E-mail Notification
11/22/22	Site Approval Reviewed	Approval letter received from site principal.
01/17/223	Participant Recruitment begun	Recruitment letter sent through e-mail to all site teachers (44, secured 10)
1/20/23	Teacher 1 Individual Interview	Teacher Participant individual interviews, transcribed by Otter. Ai
1/23/23	Teacher 2 Individual Interview	Teacher Participant individual interviews, transcribed by Otter. Ai
1/25/23	Teacher 3 Individual Interview	Teacher Participant individual interviews, transcribed by Otter. Ai
1/25/23	Teacher 4 Individual Interview	Teacher Participant individual interviews, transcribed by Otter. Ai
1/25/23	Teacher 6 Individual Interview	Teacher Participant individual interviews, transcribed by Otter. Ai
2/2/23	Teacher 5 Individual Interview	Teacher Participant individual interviews, transcribed by Otter. Ai
1/25/23	Teacher 9 Individual Interview	Teacher Participant individual interviews, transcribed by Otter. Ai
1/26/23	Teacher 4 Non-Participant Observation	Non-Participant Observations completed in Teacher Participant classroom, transcribed by Otter. Ai

2/2/23	Teacher 7 Individual Interview	Teacher Participant individual interviews, transcribed by Otter. Ai
1/27/23	Teacher 8 Individual Interview	Teacher Participant individual interviews, transcribed by Otter. Ai
2/3/23	Teacher 8 Non-Participant Observation	Non-Participant Observations completed in Teacher Participant classroom, transcribed by Otter. Ai
2/3/23	Teacher 10 Individual Interview	Teacher Participant individual interviews, transcribed by Otter. Ai
2/3/23	Teacher 9 Non-Participant Observation	Non-Participant Observations completed in Teacher Participant classroom, transcribed by Otter. Ai
2/3/23	Teacher 10 Non-Participant Observation	Non-Participant Observations completed in Teacher Participant classroom, transcribed by Otter. Ai
2/6/23	Teacher 1 Non-Participant Observation	Non-Participant Observations completed in Teacher Participant classroom, transcribed by Otter. Ai
2/6/23	Teacher 7 Non-Participant Observation	Non-Participant Observations completed in Teacher Participant classroom, transcribed by Otter. Ai
2/6/23	Data Analysis Individual Interviews Completed Coding	Coding completed with Delve, exported to excel
2/8/23	Teacher 2 Non-Participant Observation	Non-Participant Observations completed in Teacher Participant classroom, transcribed by Otter. Ai
2/8/23	Teacher 3 Non-Participant Observation	Non-Participant Observations completed in Teacher Participant classroom, transcribed by Otter. Ai
2/8/23	Teacher 5 Non-Participant Observation	Non-Participant Observations completed in Teacher Participant classroom, transcribed by Otter. Ai
2/8/23	Teacher 6 Non-Participant Observation	Non-Participant Observations completed in Teacher Participant classroom, transcribed by Otter. Ai
2/16/23	Focus Group Teacher 1-Teacher 10	Focus Group conducted through Zoom, transcribed by Otter. Ai

2/11/23	Data Analysis Non-Participant Observations Completed Coding	Coding completed with Delve, exported to excel
2/16/23	Data Analysis Focus Group Completed Coding	Coding completed with Delve, exported to excel
2/17/23	Data Analysis-II, NPO, FG coding combined	Codes combined to develop themes in excel-201(601 snippets) = 5
2/17/23	Chapter 4 Drafted	Draft of chapter 4
3/2/23	Chapter 4 Approved	Dr. Janet Deck Approved
3/2/23	Chapter 5 Drafted	Draft of
3/6/23	Chapter 5 Approved	Dr. Janet Deck Approved
03/07/22-03/11/23	Chapter 4 and 5 Second Reader	Dr. Susan Stanley reviewed and provided feedback on chapters 4 & 5
3/13/23	Dissertation Sent to Research Director	Emailed to review by Dr. Janet Deck
3/14/23	Dissertation Approved	Dissertation Director approved dissertation
3/28/23	Dissertation Defense	Successful Dissertation Defense