A TRANSCENDENTAL PHENOMENOLOGICAL STUDY OF THE EXPERIENCES OF SECONDARY TEACHERS' RAPID IMPLEMENTATION OF NEW INSTRUCTIONAL TECHNOLOGY DURING COVID-19 PANDEMIC

by

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Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

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Abstract

The purpose of this transcendental phenomenological study was to understand the lived experience of secondary teachers' rapid implementation of new instructional technology during the COVID-19 pandemic for faculty located in an urban area in southeast Georgia. The central research question for this study is: What are the experiences of secondary teachers who have participated in the rapid implementation of instructional technology during the COVID-19 pandemic? The theory guiding this study is Knowles's adult learning theory (1968), as it pertains to secondary teachers' lived experiences with implementing instructional technology into their classroom routines and how they approached mastering the technology. Purposeful criterion-based sampling was be used to select 10-15 participants for this study. Data was collected through individual interviews, document analysis, and focus groups. Data was analyzed using Moustakas' (1994) methods of phenomenological reduction of the data utilizing horizontalization, clustering of horizons into themes, and clustering themes into textural descriptions. The themes identified through data analysis were the significant challenges in adapting to new instructional technologies and the resilience displayed by educators in integrating these technologies into their teaching practices. Findings indicated that while teachers faced hurdles related to their beliefs, self-efficacy, and access to professional development, their ability to adapt and effectively use technology highlighted a need for personalized, flexible professional development programs aligned with adult learning principles. Implications for research suggest that understanding the long-term impact of these rapid technology integrations and developing strategies to maintain effective technology use post-pandemic are crucial. Recommendations for future research include further exploration of comprehensive support

systems to overcome barriers to technology integration and foster continuous learning and adaptation.

Keywords: Instructional Technology, Implementation, Qualitative, Instructional Strategies, Adult Learning Theory, Andragogy

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Dedication

This work is lovingly dedicated to the five pillars of my life, without whom this journey would have been unthinkable.

To my father, Cecil Smith, my unwavering beacon, who instilled in me the value of education and relentlessly pushed me to reach for the highest echelons of knowledge. His faith in my abilities has been my fortress, providing strength in moments of self-doubt.

To my mother, Kyle Smith, the architect of my character, who labored tirelessly to shape me into the person I am today. Her constant reminder that the fruits of hard work are the sweetest has been an enduring source of motivation.

To my beloved wife, Jacqueline Smith, my companion in this journey, whose love and support have been my sanctuary. Her unwavering faith and patience have been the rock upon which I stood in the face of challenges.

Lastly, to my two precious children, Abigail and Katherine Smith, my life's greatest gifts, who have been both my inspiration and motivation to embark and persevere on this journey. It was for the two of you that I pursued this degree. I hope that this achievement serves as a testament to the fact that any dream can be realized through dedication and hard work.

This achievement is as much yours as it is mine. May it serve as a beacon guiding you all on your own paths and know that I love you all very much.

Acknowledgments

Thank you, God, for granting me the ability and perseverance to complete this journey. The road was hard, and I felt like Job running from your call for so long. Everything kept going wrong as my health deteriorated after recovering from COVID. Thank you for watching over me while I recovered from heart surgery and helping me find my way back onto the path to complete this endeavor. You have taught me an important lesson, while the goal is why we start, it is the journey that teaches us who we are and how to become the man you know us to be.

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Institutional Review Board (IRB)

CHAPTER ONE: INTRODUCTION

Overview

The COVID-19 pandemic presented educational institutions with a unique challenge and an opportunity to change the traditional classroom experience into a distance learning platform, powered by instructional technology (Kim & Asbury, 2020). Teachers were presented with difficult challenges from basic communication, to overcoming socio-economic short-comings as students were presented with challenges in connecting to their classrooms (Bagoly-Simó et al, 2020). These new challenges presented teachers with opportunities to utilize their past experiences, training, and a plethora of new instructional technology to assist in the educational process, while also challenging traditional beliefs held by teachers (Bowman et al, 2020; Shukla, 2020). The adoption of distance learning models required students to take on the central role in their education and teaching strategies evolved to meet the current needs of students in a distance learning environment (Vázquez et al., 2018; Yurtseven Avci, 2020).

Based on Knowles' Adult Learning Theory (1968), the study examines how the implementation of new instructional technology during the COVID-19 pandemic was guided by secondary teachers' beliefs and training. The content in this chapter provides a brief background of instructional technology, the purpose of the study, guiding questions for the research, the significance of the study, and key terms and definitions.

Background

The COVID-19 crisis changed the landscape of secondary education by rapidly accelerating the transition from traditional classrooms to a distance learning model. The primary goal was to present students with an equivocal level of educational instruction while keeping

isolated during the crisis. Instructional technology, distance learning strategies, and training were provided to assist teachers as schools evolved to support the changing needs of students.

Historical Context

The history of instructional technology is an interesting, but often misleading topic. The common understanding of the term is to relate the term to recent technology that is being utilized for instruction such as computers and internet-based distance learning applications (Solomon, 2000). According to Solomon (2000), alternative perspectives and broader interpretations of technology encompass all sources of organized knowledge which incorporates not only physical technology but also strategies in its use. Instructional technology in educational theory dates to the early 1920s with institutions incorporating visual instructional materials and film into classroom instruction (Dorris, 1928). Instructional technology developed from early uses of film and visual aids to incorporating audio recordings to assist teachers in their instructions (Starnes, 1937). The 1950s-1970s saw further developments in instructional technology as radio and televisions developed to become incorporated into classroom educational tools (DeKieffer & DeKieffer, 1970). During the 1980s and 90s computers started to be intergrated into classroom educational practices requiring educators to be both proficient in their subject area and technology delivery devices (Ramaligela, 2020;2021). By the early 2000s, teacher preparation programs began to require pre-service teachers to complete credit hours devoted to the understanding of instructional technology and utilizing it in classroom instruction (Kay, 2014; Li et al., 2018; 2019). While preservice training programs began to incorporate technology into the curriculum, inservice teachers underwent expedited onsight training that left teachers with insufficient or meaningful understanding of the technology they were to utilize (Williams, 2019).

Social Context

In recent years technology has been developing at increasingly faster speeds than the year before making it harder to maintain an instructional edge in the classroom (Alam, 2022; Fletcher, 2016). The rate at which technology is implemented and replaced in classrooms has had negative impacts on teachers' mental states as they struggle to keep up with the constant change (Apple & Robbins, 2022; Bahçivan et al., 2018; Li et al., 2019). The constant change has led some teachers to develop mental barriers toward instructional technology that attribute to their ineffective use in classroom instruction (Bahçivan et al., 2018; Khong et al., 2023). These barriers make it pose a problem in gauging the effectiveness of instructional technology as data is compromised due to ineffective implementation of the technology in the classroom setting (Khong et al., 2023; Li et al., 2019;). Understanding this issue can help educators develop effective training measures to help prevent teacher burnout and negative connotations toward instructional technology (Apple & Robbins, 2022; Khong et al., 2023; Lee and Lee, 2014).

The COVID-19 pandemic impacted teachers' teaching methods by changing the nature of the classroom from a classroom-based teacher-centered model to a distant learning student-centered model (Jaoua et al., 2022). The rapid change brought on by the pandemic highlighted issues with school technology infrastructures, student accountability for attendance and work, teacher stress levels with longer hours, and increased hours workloads (Bauler et al., 2022;2021). Teachers struggled with keeping students engaged in the new online environment as previous strategies failed to translate into the online medium (Boltz et al., 2021). While the transition added additional responsibilities for many teachers, it also provided a unique opportunity for educators to expand their abilities with innovative teaching methods and new instructional technologies (Bowman et al., 2022;2020). While the COVID-19 pandemic was difficult for teachers, some took the opportunity to build on their teaching experiences and continue

providing online education for students even after schools reopened their doors (Midcalf & Boatwright 2020).

On the other side of the COVID-19 impact are the parents and students who were required to participate in online classrooms shortly after school closures. While many secondary students were able to make the transition, many students were stranded with inadequate technology at home, or a poor understanding of how to utilize the technology to sufficiently access their online classrooms (Bauler et al., 2022;2021). The shift to online classrooms placed the student at the center of their learning experience which required a higher level of maturity and self-motivation (Jaoua et al., 2022). Researchera hasve shown that students in an online learning environment perform significantly better when they are consistently engaged in the lessons being taught (Tomasik et al., 2020;2021). Teachers turned to parents to help enforce classroom participation which was not always possible when parents were not working from home (Midcalf & Boatwright 2020). While distance learning presents a new set of challenges to overcome, some parents found that the experiences provided their children with fewer distractions and allowed for an increase in their focus and understanding of the material that could have been lost in a traditional setting (Beardsley et al., 2021; Midcalf & Boatwright 2020; Tomasik et al., 2020;2021).

Theoretical Context

Since the public adoption of the Internet, educators have been experimenting with the use of online platforms as a medium to reach students outside a traditional classroom (Kurzman, 2013). Before the COVID-19 pandemic, research on distance education for secondary students had been relegated to relatively small-scale programs and individual needs with the pandemic providing opportunities to study the effects on a large sample of students (Commodari, 2021).

Numerous new studies have begun to emerge from the wake of mandated home-based distance learning which are providing unique insights into the various effects that this period has had on education.

Bowman et al. (2022) focused on the relationship between teachers' exposure to professional development and the quality of instructional technology integration into their teaching behaviors. The desire to adapt to the rapid influx of instructional technology and embrace the new educational environment are key components of a teacher's success during the COVID-19 pandemic (Hughes et al., 2020; Tomasik et al., 2020; 2021). Preexisting mental barriers toward technology have a corresponding negative impact on teachers' adoption of new instructional technology when not properly addressed with quality professional development to assist teachers in embracing a distance learning module (Bahçivan et al., 2018; Bowman et al., 2022; Daffin 2022; Li et al., 2019).

The COVID-19 pandemic left a significant impact on the digitalization of education with the mass transition to distance modules in the wake of school closures (Barjesteh et al., 2022;2021). Boltz et al. (2021) noted that before the transition there had been little focus on preparing teachers to teach online and noted a lack of adequate resources to support high-quality remote learning. According to Gopalakrishnan et al., (2019) distance learning requires instructional technology to provide teachers with the tools to assist students regardless of their geographic location. Distance learning shifts the focus of the learning process from the teacher to the student, placing the student's motivation in a larger role in their education (Moore & Schemberger, 2019). A core tenet of Knowles's Adult Learning Theory (1968) is that the student and their motivation are the driving force in their success as a learner (Merriam, 2001). Providing teachers with teaching strategies that utilize distance technology and empower

students' self-motivation enhances their ability to progress through the curriculum in a digital environment (Yurtseven Avci et al., 2020). This study examined the current research that has been done to investigate teachers' adoption of instructional technology and their use of online-based instructional strategies. The research expands the current body of knowledge related to the digitalization of education in the wake of the COVID-19 pandemic by exploring how secondary teachers transitioned from traditional educational environments to digital classrooms.

Problem Statement

The problem is determining how secondary teachers assign significance to new instructional technology that was rapidly deployed with minimal training during the COVID-19 pandemic (Archer et al., 2014; Bahçivan et al., 2018; Bradshaw et al., 2023; Kay, 2014; Khalaf et al., 2022; Kostas et al., 2023; Li et al., 2019; Ochieng & Waithanji Ngware, 2022; Phuntsho, 2022; Sharifi et al., 2017). The influx of new instructional technology has increased significantly over the years prompting schools to expedite classroom implementation at the cost of effective teacher training (Bahçivan et al., 2018; Bradshaw et al., 2023; Khalaf et al., 2022; Kostas et al., 2023; Li et al., 2019; Phuntsho, 2022). The lack of proper training has led some teachers to resent new instructional technologies that enter their classrooms which potentially increases the possibility that the technology is ignored or abandoned (Bahçivan et al., 2018; Bowman et al., 2022; Bradshaw et al., 2023; Daffin 2022; Kostas et al., 2023; Li et al., 2019). The lack of proper training leads to difficulty tracking instructional technologies' effectiveness as inconsistent data is retrieved (Kale, 2018; Kostas et al., 2023). Instructional technology that appears to be ineffective often gets replaced leading to further disillusionment as the process restarts leading teachers to assign less significance to the technology and strengthening mental barriers (Bradshaw et al., 2023; Er & Kim, 2017; Khalaf et al., 2022; Phuntsho, 2022).

While recent research covers individual aspects of the problem, a lack of research exists identifying the lived experiences of teachers who experience regular technology turnover and how it impacts their views on instructional technology. This study provides school districts with research to support decisions to continue or adjust consistent instructional technology implementation. Utilizing a qualitative phenomenological approach provided a voice for secondary teachers who undergo rapid instructional technology shifts (Creswell & Poth, 2018).

Purpose Statement

The purpose of this transcendental phenomenological study is to describe the lived experiences of secondary teachers who have undergone rapid instructional technology turnover in the transition from a traditional classroom environment to a digital secondary classroom during the COVID-19 pandemic in an urban area in southeast Georgia. The rapid instructional technology turnover is be generally defined as the swift transition and integration of various new instructional technologies into the classroom environment in response to the digital shift in secondary education brough on by the COVID-19 pandemic. The theory guiding this study is Knowles's adult learning theory (1968) as it relates to the lived experiences of secondary teachers implementing new instructional technology into the classroom and the perceived impact on teaching practices and beliefs. Adult learning theory synergizes well with this study as teachers' motivations direct their focus and learning approach toward each new technology that enters their classroom (Knowles, 1968).

Significance of the Study

This transcendental phenomenological study has theoretical, empirical, and practical significance for educational stakeholders and decision-makers. This study contributes to the existing literature by providing the lived experiences of the secondary teachers and their

perceptions and beliefs about instructional technology implementation during the COVID-19 pandemic. The following sections address the study's significance in each of the three areas in further detail.

Theoretical Significance

This study draws on the principles of Malcolm S. Knowles' (1968) Adult Learning Theory. According to Knowles's adult learning theory, adults take a fundamentally different approach to learning as opposed to their child counterparts (Knowles, 1968). Knowles acknowledged that adults' pursuit of learning took a more self-motivated approach that should be addressed to optimize learning potential (Merriam, 2001). Knowles used the term andragogy to describe both the learning practices and characteristics of the adult learner (Knowles, 1984). Since its conception Adult Learning Theory has been utilized by adult education to promote self-directed and experiential learning which has meshed well with workplace learning (Clapper, 2010). According to Jaoua et al. (2022) and Tomasik et al. (2020;2021), successful distance learning classrooms utilize strategies that build student motivation. This study could lead to a deeper understanding of the lived experiences of teachers as they transform their face-to-face classrooms into successful online classrooms with student-centered strategies.

Empirical Significance

The empirical studies on teachers' perceptions of instructional technology implementation focus on preexisting beliefs, training, and teaching strategies (Anderson et al., 2017; Bahçivan et al., 2018; Bowman et al., 2022; Daffin, 2022; Kale et al., 2018; Kay, 2014; Li et al., 2019; Saritepeci et al., 2016; Sharifi et al., 2017). Other research has pointed to instructional teaching strategies as the primary contributor to teachers' acceptance of instructional technology into daily routines (Dräger, 2017; Hagen et al., 2016; Cheung Ruby

Yang, 2017). While these approaches provide specific insight into key aspects of successful instructional technology implementation, there is a lack of empirical studies on the lived experiences of teachers undergoing consistent instructional technology implementation which this study seeks to provide. According to Yurtseven Avci (2020), further research is needed on effective approaches to technology integration and teacher training. Deng et al., (2019) indicate a need for further research into the development of negative attitudes towards instructional technology. Brown (2016) noted a lack of curriculum designed to integrate instructional technology teaching strategies and gaps in related research. This study seeks to address these concerns by providing a voice to the lived experiences of teachers undergoing instructional technology implementation.

Practical Significance

Successful learning in an online environment requires specialized resources and strategies that before the COVID-19 pandemic were not widely available to stakeholders (Boltz et al., 2021; Daffin, 2022; Tomasik et al., 2020;2021). This study helps educators, administrators, and educational stakeholders in understanding the potential impact of rapid changes in instructional technology and the impact on teachers' beliefs and motivation. Successful instructional technology implementation requires school districts to invest both human and financial resources (Boltz et al., 2021). During the first stages of the COVID-19 pandemic, there was not enough time to implement a planned transition, resulting in rapid changes (Bauler et al., 2022;2021). The aim of this study is to improve the transition to online learning by providing the lived experiences of teachers during this period. Hopefully, by identifying common themes from successful transitions, stakeholders can improve plans and benefit from the experiences outlined in this study.

Research Questions

In accordance with Creswell and Poth (2018), the research questions used for this study are broad in nature to provide participants the opportunity to expand upon their motivations and experiences when integrating instructional technology into their classroom routines. This study focuses on one central research question and three sub-questions. The questions are designed to explore the perceptions and experiences of the participants and the impact on their motivations and beliefs.

Central Research Question

What are the experiences of secondary teachers who have participated in the rapid implementation of instructional technology during the COVID-19 pandemic?

Sub-Question One

How do secondary school teachers perceive the effectiveness of instructional technology in enhancing student engagement and learning outcomes?

Sub-Question Two

What challenges do secondary school teachers encounter when incorporating instructional technology into their classroom routines?

Sub-Question Three

How do secondary school teachers' attitudes and beliefs towards instructional technology influence their adoption and implementation in the classroom?

Definitions

1. *Andragogy* – The methods and practiced used by educators to teach and train adult learners (Knowles, 1971)

2. *E-portfolio* – A collection of assignments and other electronic evidence kept and maintained on the internet (Galustyan et al. 2019)
3. *Flipped Classroom* – An instructional strategy that focuses the student to complete introductory assignments and readings prior at home allowing class time to be devoted to hands-on problem solving (Anderson et al., 2017)
4. *Instructional Technology* – The combined use of educational theory, computer hardware, and software that is utilized to facilitate learning through practice. (Resendez, 2019)
5. *Pedagogy* – The methods and practices used by educators to teach and train children (Merriam, 2001)
6. *Emergency Remote Teaching* – A temporary shift of instructional delivery to an alternate, fully remote, delivery mode due to crisis circumstances. (Bradshaw et al., 2023)
7. *Technology self*-efficacy – An individual's belief or confidence in their ability to successfully use and engage with technology or technological tools. (Cataudella et al. 2021)

Summary

The mass school closures in the wake of the COVID-19 pandemic highlighted how ill-prepared the education system was for converting to a wholly digital model and provided the perfect opportunity to study online education for secondary students on a wide scale (Barjesteh et al., 2022;2021; Bauler et al., 2022;2021; Boltz et al., 2021). In the scramble to provide teachers with adequate technology to convert their classrooms to digital mediums, key aspects such as vetting, planning, and training were rushed to meet the unexpected needs of stakeholders (Barjesteh et al., 2022;2021; Bowman et al., 2022; Tomasik et al., 2020;2021). Adopting new instructional technologies into classroom routines is generally a slower process, with time

allowed for teachers to train and acclimate to the new resource (Kim & Asbury, 2020). Adequate training can help address barriers such as teachers' negative preconceptions towards new instructional technology increasing both its effectiveness and use in the educational environment of the classroom (Bahçivan et al., 2018; Li et al., 2018;2019). Shifting to a digital medium required teachers to adapt their teaching strategies to meet the new student-centered environment (Pelikan et al., 2021). This study seeks to explore the experiences of secondary teachers who transitioned from traditional face-to-face classrooms to an online distance module during the COVID-19 pandemic. It is the hope of this study that their lived experiences will help enrich the research by providing insights into their struggles and successes during this chaotic time.

CHAPTER TWO: LITERATURE REVIEW

Overview

A systematic review of the literature was conducted to explore how teacher training, mindsets, and instructional strategies influence successful instructional technology integration. This chapter presents a review of current related to the focus of the study. The first section will establish an understanding of the theoretical frameworks that are used for this qualitative study. Next, an exploration into how teachers are trained and prepared to use instructional technology within their classroom settings. Emerging literature also indicates that teachers' attitudes and mindsets influence how instructional technology is utilized within the classroom setting. The final section will examine current and emerging instructional strategies that teachers are using to maximize instructional technology in their classrooms. In the end, the three sections should show gaps in the literature that this study will attempt to address.

Theoretical Framework

The theory guiding this study is Malcolm Knowles's adult learning theory (1968) in relation to the experiences of secondary teachers implementing instructional technology. Knowles's adult learning theory helps explain how the brain prefers to learn after it has matured allowing teachers to utilize teaching strategies that better suit their students. The base ideas of adult learning theory are drawn from Jean Piaget's constructivism theory. Constructivism focuses on how the brain develops information by using previous experiences and incorporating them into new experiences. These theories are outlined in more detail below in order to act as a focal lens for the main subject of this review.

Theory of Adult Learning

Knowles' theory on adult learning was first proposed in the Adult Leadership Journal in 1968 and introduced the idea of andragogy which is the art and science of helping adults learn (Knowles, 1968). Knowles felt that adults approached learning in a different manner than children, and as such, required a different approach to teaching. Knowles identified four characteristics that distinguished adult learners from their adolescent counterparts. Self-concept, learning experience, readiness to learn, and orientation to learning were the original characteristics that defined adult learners. In 1984, Knowles would add a fifth assumption that defined the adult learners' motivation to learn (Merriam, 2001). This addition of a fifth assumption would also coincide with Knowles altering his stance on what constituted an adult learner. The theory originally took a rigid stance on what constitutes an adult learner, but this would later change as Knowles softened his views after years of criticism (Merriam, 2001). The theory adopted and incorporated specific situations that could define a learner as an adult. This change helped soften the criticism for assuming all adults learned the same way (Clapper, 2010). While the theory criteria for an adult learner adapted to incorporate a larger audience, the core concepts remained intact.

Historically, pedagogical teaching strategies have dominated secondary classrooms (Blevins et al., 2020; Gutek, 2012). These strategies are supported by an ample amount of research and are familiar to many within the teaching profession (Merriam, 2001). Adult learning strategies, or andragogical strategies revolved around the central idea that as an adult, information is processed differently and are more self-centered learners (Knowles, 1971). While pedagogical strategies can be effective ways to teach adult learners, they would not be efficient as andragogical strategies (Knowles, 1984). Over the next few decades, andragogical teaching strategies would be utilized by a niche audience until the early twenty-first century, when the

increase in instructional technology allowed for an expansion of distance and technology-assisted learning (Clapper, 2010). The following literature focuses on the historical emergence of andragogical teaching strategies and their relationship with instructional technology.

While Malcolm Knowles is looked on as the founder of adult learning theory and the concept of andragogy, it is Merriam's work in 2001 that connected andragogy teaching strategies to the potential of instructional technology (Clapper, 2010). Merriam set out to analyze andragogy and pedagogy teaching strategies and their potential for the growing field of adult education. Andragogy tended to create situations that propelled learners to become more self-directed, which was an essential aspect of Knowles's original findings. Merriam (2001) concludes that although self-directed learning is an aspect of andragogical teaching strategies, they are still two separate entities that she refers to as the pillars of adult education. This conclusion is pivotal to defining a boundary and establishing adult education as its own unique concept (Merriam, 2001). This research also provides a foundation for further studies into the field of andragogy and its potential to bolster instructional technology..

Related Literature

Moore's Law states that computer technology is doubling every two years (Fletcher, 2016). The exponential growth that this leads to can make it difficult to envision what the world will look like in the next ten to twenty years. Similarly, the educational field is evolving with a near-constant stream of instructional technology entering classrooms each year. The speed at which instructional technology is entering the classroom has only accelerated over the last two decades (Sharifi et al., 2017). Teachers around the world are finding their classrooms filled with instructional technology that is designed to help the teacher impart their knowledge and connect with students. The downside to this influx of resources is that teachers are often left untrained in

their use or how to properly utilize them within lesson plans. This issue has left many teachers to either use the instructional technology ineffectively or abandon its use entirely in favor of more traditional instructional practices. This issue can make studying the effectiveness of instructional technology a complicated endeavor as the data might not accurately be reflected. The following sections will highlight the current literature related to these topics and show why there is a need for further documentation.

Adult Learning Theory and Technology Integration

The integration of Malcolm Knowles' Adult Learning Theory, otherwise referred to as andragogy, has provided profound contributions to our comprehension of how adult learners, particularly educators, assimilate and adjust to the infusion of technology in their pedagogical methodologies (Diep et al., 2019; Merriam, 2001). This theory puts emphasis on the value of the process of learning and advocates for techniques that are problem-centered and experiential rather than purely content-oriented, which is key in technology assimilation (Merriam, 2001). The theory aligns with the pedagogical shifts toward personalized learning, driven by technology, offering educators the framework to tailor instruction to individual learning needs and styles (Picciano, 2021). The immediacy of application, a key feature of adult learning, comes into play as teachers tend to seek and adopt technologies that can be quickly integrated into their existing practices to meet immediate instructional challenges (Cahapay & Anoba, 2021; Kuo & Belland, 2019; Malureanu et al., 2021). These principles, given the rapidly evolving technological landscape, offer significant insights that can guide professional development programs for teachers, aiming for effective technology integration that enhances teaching and learning outcomes (Malureanu et al., 2021; Yurtseven Avci et al., 2020).

While Knowles' adult learning theory accentuates the autonomy and self-direction in learning, it is also crucial to note that adult learners, including teachers, bring with them a rich tapestry of experiences that shape their engagement with new learning situations, including technology integration (Cahapay & Anoba, 2021; Ching & Roberts, 2020). This pre-existing knowledge and experience serve as a resource for new learning but can also pose challenges if prior beliefs and practices are not aligned with technology-enhanced pedagogies (Ananga, 2020; Barton & Dexter, 2020). For instance, a teacher's proficiency, or lack thereof, with a specific technology tool can significantly influence their willingness to use that tool in their classroom instruction (Cooper et al., 2020). Therefore, professional development initiatives must consider these variations in teachers' experiences and competencies and provide differentiated support to cater to individual learning paths (Ananga, 2020; Paulus et al., 2020). Such an approach respects the principle of adult learning where learners have the freedom to influence the learning objectives, methods, and pace based on their unique contexts and needs (Ananga, 2020; Ching & Roberts, 2020; Paulus et al., 2020).

An important aspect of Knowles' Adult Learning Theory is that learning is problem-oriented and relevant to the immediate context of the learner (Cahapay & Anoba, 2021; Kuo & Belland, 2019). When viewed in the context of technology integration in education, this principle suggests that teachers are more likely to embrace and effectively use technology tools when they see a direct connection between technology and their instructional challenges (Taghizadeh & Hasani Yourdshahi, 2020). Professional development that merely focuses on technology skills without connecting them to the curricular goals and instructional needs of teachers often falls short of promoting meaningful technology integration (Cahapay & Anoba, 2021; Kuo & Belland, 2019). To make technology learning relevant and immediately applicable, technology training

should be designed around actual classroom scenarios, instructional problems, and curriculum content (Ananga, 2020; Ching & Roberts, 2020). Also, the integration of technology should not be an end but should be driven by pedagogical goals and learner needs (Ching & Roberts, 2020; Sen & Yildiz Durak, 2022). This way teachers are not just learning to use a technology tool but are learning how to transform their teaching practices through the effective use of technology (Ching & Roberts, 2020; Malureanu et al., 2021;).

Knowles' Adult Learning Theory asserts that adult learning is largely driven by internal motivations (Merriam, 2001). This idea aligns with research on technology integration, which highlights the role of teachers' self-efficacy and beliefs in influencing their use of technology (Barton & Dexter, 2020). Studies have found that teachers with higher self-efficacy beliefs about technology are more likely to integrate it into their classrooms in meaningful ways (Yildiz Durak, 2021). Teachers' beliefs about the relevance and effectiveness of technology in enhancing student learning can significantly affect their willingness to adopt new technologies (Şen & Yildiz Durak, 2022). In fostering effective technology integration, it is crucial to address not just the skills and knowledge aspect, but also teachers' beliefs and attitudes towards technology (Barton & Dexter, 2020; Ewing & Cooper, 2021; Şen & Yildiz Durak, 2022). This could involve creating successful experiences, providing peer support, and presenting evidence of the impact of technology on student learning to increase teachers' confidence and motivation in using technology (Ewing & Cooper, 2021; Paulus et al., 2020).

Despite the theoretical alignment and potential benefits, integrating technology in education is not without its barriers, which can significantly impede the effective application of adult learning principles (Almusharraf & Khahro, 2020; Cooper et al., 2020). A significant barrier lies in the teachers' perceived lack of competency and the fear of failure when using new

technologies, often attributed to insufficient training and support (Barton & Dexter, 2020; Cooper et al., 2020). This situation may lead to a lack of self-efficacy, which could hamper their motivation to adopt technology (Cahapay & Anoba, 2021). Further, constraints such as time, resources, and the absence of institutional support can also deter technology integration (Almusharraf & Khahro, 2020). Teachers may also face difficulties in applying learned technical skills to their unique classroom context due to the lack of practical and relatable training scenarios (Ewing & Cooper, 2021). Thus, while Knowles' principles provide a guiding framework, these barriers underline the need for strategic and context-specific support for teachers to translate adult learning principles into effective technology integration (Paulus et al., 2020).

The principles of Malcolm Knowles' Adult Learning Theory serve as a powerful guiding framework for understanding the process of technology integration in education from the perspective of teachers as adult learners (Almusharraf & Khahro, 2020; Merriam, 2001; Yurtseven Avci et al., 2020). Recognizing the importance of self-direction, practical experience, readiness to learn, problem-oriented learning, and internal motivation provides avenues to design effective professional development programs for technology integration (Yurtseven Avci et al., 2020). However, it is critical to be cognizant of the barriers that might hinder the application of these principles (Almusharraf & Khahro, 2020). Overcoming these barriers will require a commitment to continuous support, creating practical learning scenarios, fostering a culture of experimentation and risk-taking, and aligning technology integration efforts with teachers' needs and contexts (Almusharraf & Khahro, 2020; Ewing & Cooper, 2021). By doing so, it is possible to create a conducive learning environment where teachers can transform their teaching practices through the meaningful use of technology, ultimately benefiting the learners they serve

(Almusharraf & Khahro, 2020; Ewing & Cooper, 2021; Malureanu et al., 2021; Yurtseven Avci et al., 2020).

Technology integration can be optimized when teachers are empowered to take charge of their learning process (Picciano, 2021). This means moving away from one-size-fits-all professional development programs towards more flexible and personalized learning experiences (Ananga, 2020; Malureanu et al., 2021). For instance, the use of self-paced online learning platforms, blended learning formats, and communities of practice can provide opportunities for teachers to explore, learn, and reflect on their use of technology at their own pace and according to their individual needs (Ananga, 2020; Paulus et al., 2020). Such approaches allow teachers to experiment with technology tools, exchange ideas and experiences with their peers, and get real-time feedback, all of which can enhance their competence and confidence in using technology in their practice (Ewing & Cooper, 2021; Malureanu et al., 2021).

Professional development programs can leverage action research and reflective practice approaches to foster teachers' learning about technology integration (Malureanu et al., 2021; Merriam, 2001). In this process, teachers can be guided to identify problems or challenges in their practice, explore potential technology solutions, implement these solutions, and reflect on their impact (Cahapay & Anoba, 2021; Ching & Roberts, 2020; Malureanu et al., 2021). This cycle of action and reflection not only makes learning more relevant and contextualized but also fosters a deeper understanding of how technology can enhance teaching and learning (Ananga, 2020; Barton & Dexter, 2020). By doing so, teachers are not just passive recipients of knowledge, but active agents in their learning, engaging in a process of inquiry and improvement that is closely tied to their daily practice (Cooper et al., 2020).

An integral part of Knowles' Adult Learning Theory is the understanding that the readiness to learn often comes when the learner acknowledges the relevance of the learning to their life or work context (Merriam, 2001). In the case of teachers, readiness for technology integration could be triggered by the acknowledgment of the changing educational landscape and the potential role of technology in enhancing their instruction and students' learning outcomes (Diep et al., 2019; Malureanu et al., 2021). Professional development programs that highlight the role of technology in addressing contemporary educational challenges and its relevance in the preparation of students for the 21st-century digital world could invoke such acknowledgment (Diep et al., 2019; Malureanu et al., 2021; Paulus et al., 2020). This includes showcasing successful case studies of technology integration, involving teachers in dialogues about the future of education, and creating opportunities for them to experience the potential benefits of technology-enhanced instruction firsthand (Diep et al., 2019; Paulus et al., 2020). However, care must be taken to ensure that technology is presented not as a panacea for all educational problems, but as a tool that, when used strategically and thoughtfully, can complement and enhance existing teaching and learning practices (Barton & Dexter, 2020; Ewing & Cooper, 2021). By doing so, teachers' motivation and readiness to learn about and adopt technology can be increased, paving the way for effective technology integration (Diep et al., 2019; Malureanu et al., 2021).

Teacher Self-Efficacy

Teachers’ self-efficacy, as grounded in Albert Bandura's Social Cognitive Theory, encapsulates a teachers’ conviction in their ability to successfully plan and implement strategies required to navigate future pedagogical scenarios, including technology integration (Bandura, 1977). This potent belief system holds substantial sway over a teacher's attitude toward

technology, readiness to incorporate technology into their educational strategies, and resilience in overcoming technological obstacles (Tschannen-Moran & Woolfolk Hoy, 2001). Self-efficacy dramatically influences teachers' level of effort, tenacity towards obstacles, and resilience in addressing technology-related difficulties, thus occupying a crucial position in orchestrating successful technology integration into both teaching and learning environments (Tondeur et al., 2017). Research suggests that higher levels of self-efficacy can foster a positive attitude toward change and innovation, making teachers more willing to experiment with new technologies in their classrooms (Choi et al., 2019; Yang, 2021). Additionally, enhancing teachers' self-efficacy can lead to a more innovative and proactive approach to adopting technology, which is a critical factor in transforming educational practices to meet the demands of the 21st century (Kozikoğlu, 2019).

Examining the role of teachers' self-efficacy in the specific context of technology integration reveals interesting dynamics. Teachers who exhibit high levels of self-efficacy towards technology are more likely to integrate digital tools into their teaching and take risks with new technologies (Kasalak & Dagyar, 2020; Tschannen-Moran & Hoy, 2001; Weißenfels et al., 2022). This willingness to experiment can lead to the discovery of innovative teaching strategies that leverage technology to enhance student learning outcomes (Choi et al., 2019; Kozikoglu, 2019). Moreover, high self-efficacy can foster a growth mindset, encouraging teachers to continually adapt and learn in the rapidly evolving landscape of educational technology (Culp-Roche et al., 2021; Yang, 2021). Their confidence also influences their ability to manage the complexities of technology, using it as a tool to facilitate collaborative, student-centered learning environments (Cataudella, 2021; Pellerone, 2021). Conversely, teachers with lower self-efficacy may hesitate to use technology or use it in more traditional, teacher-centered

ways, rather than exploring the potential of technology to transform their teaching practices (Pressley, 2021). Therefore, fostering teachers' technological self-efficacy can empower them to move beyond merely using technology to replicating traditional teaching methods, towards embracing the pedagogical changes that technology can enable (Taimalu & Luik, 2019).

Bandura (1997) emphasized the importance of recognizing that self-efficacy is not a fixed trait but a dynamic construct that evolves over time and varies across different tasks and contexts. Consequently, teachers' technology self-efficacy can be influenced and developed through appropriate interventions and experiences (Culp-Roche et al., 2021; Taimalu & Luik, 2019). For instance, successful experiences with technology, or 'mastery experiences', are considered the most effective way to build self-efficacy, as they provide authentic evidence of capability (Tschannen-Moran, & Hoy, 2001; Yang, 2021). Providing teachers with opportunities to experiment with technology in a safe and supportive environment, where they can learn from both successes and failures, can enhance their self-efficacy beliefs (Ma et al., 2021). Similarly, 'vicarious experiences' or observing other teachers successfully integrating technology can also increase self-efficacy, especially if the observer identifies closely with the model (Bandura, 1997). Thus, creating a collaborative culture where teachers can share their technology integration practices and learn from each other can be a powerful strategy to boost technology self-efficacy (Ma et al., 2021; Pressley, 2021).

Positive reinforcement in the form of 'verbal persuasion' or feedback can also bolster teachers' self-efficacy (Bandura, 1997). For instance, constructive feedback from peers or supervisors on their technology integration efforts can make teachers feel more competent and confident (Tondeur et al., 2017; Yang, 2021). Fostering an environment that acknowledges and celebrates the successful implementation of technology by teachers, thereby promoting a culture

of recognition and affirmation, can markedly bolster their self-efficacy. (Kasalak & Dagyar, 2020; Ma et al., 2021; Tschannen-Moran & Hoy, 2001). Moreover, this has a rippling effect, inspiring other educators to experiment with technology integration (Kasalak & Dagyar, 2020; Pellerone, 2021). Additionally, studies have shown that teachers' physiological and emotional states can influence their self-efficacy (Kasalak & Dagyar, 2020; Ma et al., 2021; Pressley, 2021; Pellerone, 2021; Taimalu & Luik, 2019; Yang, 2021). If teachers associate technology use with positive emotions and reduced stress, they are more likely to feel efficacious (Tschannen-Moran, & Hoy, 2001; Bandura, 1997). Introducing mindfulness and stress management practices into the professional development structure can help alleviate technology-related anxiety and enhance self-efficacy (Ma et al., 2021). Providing emotional support to teachers, especially when they are facing challenges or experiencing anxiety about using technology, can contribute to improving their self-efficacy (Weißenfels et al., 2022). Teachers' self-efficacy is multi-faceted and influenced by a range of factors, all of which need to be considered when designing professional development programs or interventions aimed at fostering technology integration (Pressley, 2021; Culp-Roche et al., 2021).

The influence of teachers' self-efficacy on technology integration also extends to their interactions with students (Bandura, 1997; Tondeur et al., 2017). Research indicates that teachers with high self-efficacy are more likely to foster positive learning environments that encourage student autonomy, creativity, and critical thinking (Choi et al., 2019; Kozikoglu, 2019; Weißenfels et al., 2022). Technology integration includes creating a student-centered classroom where technology is used as a tool for active learning, problem-solving, collaboration, and knowledge construction (Cataudella, 2021; Pellerone, 2021). Teachers with high self-efficacy can better guide students in using technology safely and responsibly, contributing to

their digital citizenship (Kozikoğlu, 2019; Yang, 2021). Teachers with high self-efficacy in technology integration often lead by example, modeling effective digital practices that students can emulate in their own learning pursuits (Pressley, 2021; Culp-Roche et al., 2021). These teachers also tend to demonstrate greater adaptability in meeting diverse learner needs, harnessing technology to provide differentiated instruction and personalized learning opportunities (Taimalu & Luik, 2019; Ma et al., 2021). They set high learning expectations and standards, which can motivate students to fully leverage technology resources for their learning (Tschannen-Moran & Hoy, 2001; Weißenfels et al., 2022). Teachers' self-efficacy not only affects teachers' technology integration practices but also shapes students' learning experiences and outcomes in a technology-rich environment (Choi et al., 2019; Yang, 2021).

In today's educational landscape where technology is continuously evolving, it's imperative for teachers to not only stay current with the latest technological tools but also to feel confident in their ability to integrate these tools into their classroom practices (Pellerone, 2021; Weißenfels et al., 2022; Yang, 2021). High self-efficacy can equip teachers to cope with these rapid technological changes and instigate a proactive approach toward their professional growth in the area of technology integration (Yang, 2021). Teachers' self-efficacy functions as a self-renewing propellant that can drive lifelong learning and continual skill enhancement (Kasalak & Dagyar, 2020; Yang, 2021). Teachers with high self-efficacy in technology are more likely to independently seek out and participate in professional development opportunities, network with other educators to exchange best practices, and stay abreast of emerging technologies that could potentially enhance their pedagogy (Kasalak & Dagyar, 2020; Pellerone, 2021). This continuous learning attitude, fueled by self-efficacy, can ensure that teachers are not left behind in the digital

age but rather, are at the forefront of driving educational innovation through technology integration (Weißenfels et al., 2022; Yang, 2021).

Teachers with a strong sense of self-efficacy regarding technology integration are often regarded as change agents within their schools (Ma et al., 2021; Pressley, 2021). They tend to influence and motivate their colleagues, fostering a community of practice that encourages technology adoption and innovation (Ma et al., 2021). This influence extends to how the school as a whole approach's technology integration, shaping the culture and climate toward a more digitally-inclusive and innovative environment (Kasalak & Dagyar, 2020; Pellerone, 2021). Teachers, confident in their ability to navigate technological landscapes, are likely to take on leadership roles in technology-related school initiatives, thus further propagating the successful integration of technology across the curriculum (Cataudella et al., 2021; Pellerone, 2021). They can provide peer coaching and mentoring, making significant contributions to the professional development of their colleagues (Pellerone, 2021; Yang 2021). Additionally, their success stories serve as potent testimonials that break down barriers of apprehension and resistance towards technology, bolstering the collective self-efficacy of the staff (Yang, 2021). Thus, cultivating high teachers' self-efficacy in technology can be a strategic move to accelerate school-wide technology adoption and innovative pedagogical practices (Ma et al., 2021; Pellerone, 2021; Pressley, 2021).

The COVID-19 pandemic, with its seismic shift to remote and blended learning models, has further underscored the importance of teachers' self-efficacy in technology integration (Ma et al., 2021; Pellerone, 2021; Pressley, 2021; Yang, 2021). As the need for technology-enabled instruction became indispensable overnight, teachers with high self-efficacy in technology were often better equipped to adapt to the new learning environment (Bahçivan et al., 2018;Ma et al.,

2021; Pressley, 2021). Their confidence in their ability to effectively use and troubleshoot technology became instrumental in navigating the pedagogical challenges imposed by the pandemic (Pressley, 2021). They were able to pivot seamlessly to online instruction, leveraging various digital tools to maintain the continuity of learning (Cataudella et al., 2021). Moreover, these teachers were more successful in creating engaging and interactive online learning experiences for their students, minimizing the impact of the sudden transition on student learning outcomes (Cataudella et al., 2021; Pellerone, 2021). Conversely, the pandemic significantly challenged those with lower self-efficacy in technology, exacerbating feelings of stress, anxiety, and inadequacy, which underscored the necessity of self-efficacy support structures during such tumultuous periods (Cataudella et al., 2021).

The Role of Beliefs in Educational Technology Integration

When considering the integration of technology in education, it is essential to recognize the profound influence of teachers' beliefs on this process (Bahçivan et al., 2018; Farjon et al., 2019). Teacher beliefs encompass their attitudes and perceptions about teaching, learning, and technology and can serve as facilitators or barriers to successful technology integration (Taimalu & Luik, 2019; Nelson et al., 2019). These beliefs can impact a teacher's competency, willingness to access technology, and overall experience with technological tools in the classroom (Farjon et al., 2019). The COVID-19 pandemic brought these beliefs to the forefront, influencing the adoption and usage of online learning technologies (Dong et al., 2020). Consequently, understanding and addressing teacher beliefs is pivotal in the successful implementation of educational technology, ensuring that the instructional technology is utilized effectively to enhance teaching and learning experiences (Bahçivan et al., 2018; Tondeur et al., 2019). Additionally, these beliefs can shape teachers' expectations of student abilities and how

effectively students can use technology as part of their learning process (Bedir, 2019). These beliefs don't just catalyze the initial step of adopting technology in teaching but also fortify teachers' long-term commitment to sustain its use in their instruction (Li et al., 2019).

Teacher beliefs can be broadly categorized into two types: pedagogical beliefs and technological beliefs (Li et al., 2019). Pedagogical beliefs pertain to the teacher's perspectives on teaching and learning, which are often ingrained during their initial teacher education and can be hard to change (Tondeur et al., 2019; Nelson et al., 2019). These beliefs can significantly influence how teachers perceive the role of technology in the classroom and the value they place on technology integration (Farjon et al., 2019; Li et al., 2019). Teachers who hold constructivist beliefs, favoring student-centered teaching methods, are often more receptive to technology integration as they view technology as a tool that can foster active, collaborative, and personalized learning (Li et al., 2019; Bedir, 2019). Such pedagogical perspectives dovetail effectively with their technological beliefs, which pivot around their perceptions and attitudes toward technology itself (Farjon et al., 2019). Their belief in their technological competency, also known as technological self-efficacy, which can greatly influence their willingness to integrate technology (Kwon et al., 2019). If teachers believe they lack the necessary skills or knowledge to use technology effectively, they are less likely to attempt to integrate it into their teaching, even when provided with access to resources and training (Farjon et al., 2019; Liu et al., 2020). Understanding these two types of beliefs - pedagogical and technological - and how they interact, is crucial in developing effective strategies for technology integration in education (Bahçivan et al., 2018; Taimalu & Luik, 2019).

In the face of the dynamic educational landscape, it is vital for teacher beliefs to be adaptable and flexible, especially with the rapidly evolving state of technology (Bahçivan et al.,

2018; Tondeur et al., 2019). The recent global shift to remote learning during the COVID-19 pandemic, for instance, underscored the need for teachers to reassess their pedagogical and technological beliefs and adapt to the challenges of online instruction (Dong et al., 2020; Khatoony & Nezhadmehr, 2020). This unprecedented situation necessitated a reevaluation of long-held beliefs about the feasibility and effectiveness of online learning (Bernacki et al., 2020). Some teachers who had previously been reluctant to integrate technology found that they could effectively engage students and deliver instruction online (Khatoony & Nezhadmehr, 2020). Teachers who had positive beliefs about technology but lacked sufficient training or resources faced difficulties in adapting to the online learning environment (Bahçivan et al., 2018; Dong et al., 2020). The transition highlighted the importance of not only fostering positive beliefs about technology but also equipping teachers with the necessary skills and resources to enact these beliefs (Szymkowiak et al., 2021). It reinforced the idea that teacher beliefs, while influential, are just one piece of the puzzle in effective technology integration (Bernacki et al., 2020; Liu et al., 2020).

Addressing the nuanced relationship between teachers' beliefs and technology integration requires thoughtful strategies that foster conditions conducive to change (Tondeur et al., 2019; Taimalu & Luik, 2019). One of the most effective avenues for this is through teacher education and professional development programs (Tondeur et al., 2019; Bond & Bedenlier, 2019). These programs must strive to do more than simply enhance technical proficiency; they must also address and potentially reshape any entrenched beliefs that may hinder the full integration of technology into teaching practices (Li et al., 2019; Bedir, 2019). By offering opportunities for teachers to personally witness and appreciate the benefits of technology integration, such programs can foster more positive attitudes and beliefs (Taimalu & Luik, 2019; Bond et al.,

2019). School leadership plays a critical role in influencing the school's culture and resource allocation for technology integration, which indirectly shapes teachers' beliefs and attitudes (Nelson et al., 2019; Liu et al., 2020). Nurturing a supportive environment that encourages teachers to experiment, learn, and grow with technology can catalyze the evolution of their beliefs, and ultimately, the successful integration of technology in education (Farjon et al., 2019; Bond & Bedenlier, 2019).

Considering these considerations, the integration of technology in education is a complex process, influenced by a myriad of factors (Farjon et al., 2019; Tondeur et al., 2019). Teacher beliefs play a significant role, but they are intertwined with other elements such as technological competence, access to resources, the school's culture and leadership, and the availability and quality of professional development opportunities (Nelson et al., 2019; Kwon et al., 2019). As educational technology continues to advance, it is critical to take a holistic approach that considers all these factors (Bernacki et al., 2020; Liu et al., 2020). Therefore, to effectively integrate technology into teaching and learning practices, efforts must be made to not only develop teachers' technical skills but also to nurture positive and flexible pedagogical and technological beliefs (Bond & Bedenlier, 2019; Granić & Marangunić, 2019). In doing so, we can better equip teachers to harness the potential of technology and create meaningful learning experiences for their students (Szymkowiak et al., 2021; Bond et al., 2019).

As the COVID-19 pandemic transforms education, teachers are becoming vital agents in mediating the relationship between students and technology (Cataudella et al., 2021; Culp-Roshe et al., 2021). It's therefore imperative to explore teachers' beliefs about technology from a fresh perspective (Khatoony &Nezhadmehr, 2020). A teacher's confidence in navigating technology, shaped by their technological self-efficacy, heavily influences the meaningful integration of

technology into their curriculum (Kwon et al., 2019; Li et al., 2019). In line with this, teacher education and professional development programs should include components designed to bolster teachers' technological self-efficacy, making them not just technology users but technology leaders (Tondeur et al., 2019; Bond & Bedenlier, 2019). This leadership can inspire students, fostering a sense of curiosity and adaptability toward technology that mirrors their teachers' attitudes (Li et al., 2019). Moreover, teachers with a high level of technological self-efficacy can encourage students to leverage technology as an active tool for learning, promoting the development of digital literacy and critical thinking skills (Li et al., 2019; Bedir, 2019). Teachers' technological beliefs not only shape their teaching strategies but also significantly influence student outcomes in the digital era (Nelson et al., 2019; Liu et al., 2020).

The COVID-19 pandemic presented an unforeseen challenge to teachers worldwide, requiring a sudden shift to online learning (Dong et al., 2020; Bernacki et al., 2020). This situation spotlighted the role of teachers' beliefs in shaping the integration of technology into instruction (Szymkowiak et al., 2021). For some teachers, the necessity of using digital platforms for remote teaching resulted in a positive change in their attitudes toward technology, challenging long-held beliefs about the effectiveness of online learning and fostering a deeper appreciation for its potential (Khatoony & Nezhadmehr, 2020). However, for others, the transition illuminated gaps in their technological competency, exacerbating their anxieties about technology use and posing barriers to effective teaching (Dong et al., 2020). The transition underscored the importance of technological self-efficacy and how it influences the success of rapid technology integration, particularly in crisis situations (Cataudella et al., 2021). The pandemic made it clear that fostering adaptable and resilient beliefs about technology among teachers is crucial to navigating the evolving landscape of education (Liu et al., 2020; Bernacki

et al., 2020). It served as a powerful reminder that teacher education and professional development programs need to continually focus on enhancing technological self-efficacy and ensuring teachers are equipped with the skills to adapt to changing technological demands (Cataudella et al., 2021; Ma et al; Pressley, 2021).

Professional Development and Adult Learning

In the field of education, professional development is an invaluable tool that cultivates the growth of teaching skills and practices, and the digital revolution has increasingly prompted a shift toward online professional development programs (Bragg et al., 2021; Powell & Bodur, 2019). These programs are devised to enrich teachers with the requisite knowledge, skills, and attitudes that facilitate effective instruction within a perpetually evolving educational setting (Ovcharuk et al., 2022; Ramos et al., 2022). The design and execution of online professional development programs, however, require meticulous planning to accommodate the diverse needs and preferences of adult learners (Curran et al., 2019). In the context of integrating technology into teaching and learning, the challenge intensifies due to the broad spectrum of teacher beliefs, pedagogical strategies, and varying levels of technological proficiency (Bragg et al., 2021; Diep et al., 2019). Admittedly, successful professional development programs must extend beyond mere knowledge transfer; they must also consider how adult learners' perceptions of self-directed learning and their usage of digital technology influence the learning process (Curran et al., 2019). Furthermore, these programs must strive to build a bridge between pedagogical theory and practice, ultimately leading to transformative changes in teachers' instructional methods, and fostering an environment conducive to the effective application of technology in education (Allen et al., 2022; Martin et al., 2019).

While professional development programs provide an avenue for teacher learning and growth, understanding how adult learners perceive and utilize these opportunities is crucial (Curran et al., 2019). Adult learners often exhibit a heightened desire for self-directed learning and autonomy in their educational pursuits, a factor that professional development programs must account for (Allen et al., 2022). Digital technology is frequently used to support self-directed learning, offering adult learners' flexible access to resources and allowing them to customize their learning trajectories (Curran et al., 2019; Diep et al., 2019). However, the successful use of digital technology by adult learners is dependent on several factors, such as their comfort level with the technology, its ease of use, and its perceived relevance to their professional development (Diep et al., 2019; Ovcharuk et al., 2022). Therefore, the design of professional development programs should carefully consider how digital tools and platforms can support self-directed learning while also being accessible, user-friendly, and aligned with teachers' professional growth needs (Shamir-Inbal & Blau, 2022).

While adult learners' perceptions and utilization of technology play a crucial role in their learning process, it's equally important to examine the design and delivery aspects of online professional development (Bragg et al., 2021). Research suggests that successful programs often incorporate interactive, collaborative learning experiences, which foster a sense of community among learners and enhance knowledge construction (Powell & Bodur, 2019; Chaipidech et al., 2022). Such programs also tend to leverage technology to facilitate engagement and participation, utilizing multimedia resources, discussion forums, real-time feedback, and other digital tools (Bragg et al., 2021; Ramos et al., 2022). Furthermore, they often incorporate personalized learning strategies to cater to the diverse needs, preferences, and competency levels of adult learners (Diep et al., 2019; Chaipidech et al., 2022). This adaptability is key to

promoting an inclusive learning environment that resonates with all participants and propels their professional growth (Bragg et al., 2021; Chaipidech et al., 2022). The thoughtful integration of these design elements is essential for fostering a meaningful and effective online professional development experience (Bragg et al., 2021; Chaipidech et al., 2022; Ramos et al., 2022).

Teacher engagement in professional development is not a one-size-fits-all process; it evolves dynamically, influenced by various personal and contextual factors (Yoon & Kim, 2022). These may include socio-demographic characteristics, self-efficacy beliefs, job satisfaction, and the developmental stage in their teaching career (Yoon & Kim, 2022). The recognition of these factors is essential when designing and delivering professional development programs (Diep et al., 2019; Yoon & Kim, 2022). Taking a one-size-fits-all approach can lead to disengagement or ineffective learning, as it fails to address individual differences and specific needs among adult learners (Allen et al., 2022; Diep et al., 2019). Hence, professional development initiatives should incorporate differentiated strategies to cater to the distinct learning needs of different subgroups of teachers (Allen et al., 2022; Martin et al., 2019). Such an approach would improve the relevance of the learning experience for individual teachers and increase the likelihood of meaningful application in their teaching practice (Martin et al., 2019; Yoon & Kim, 2022).

Adult learning theories are crucial for professional development, as their application can significantly enhance the effectiveness of learning among teachers (Allen et al., 2022). Such theories posit that adult learning is most effective when it is problem-centered, contextually relevant, and leverages the existing experiences of learners (Allen et al., 2022; Schmidt-Lauff & Bergamini, 2022). These theories suggest that professional development programs should address practical teaching challenges and encourage teachers to draw on their professional

experiences in the learning process (Allen et al., 2022; Huet & Casanova, 2022). This approach can facilitate a deeper understanding of the concepts and practices being learned and can foster a stronger link between theory and practice (Huet & Casanova, 2022). Incorporating opportunities for reflective practice within the professional development process can facilitate the integration of new learning with existing knowledge and practice and enhance the transformation of teaching practice (Martin et al., 2019; Schmidt-Lauff & Bergamini, 2022). By applying these principles of adult learning, professional development programs can better support teachers in their ongoing learning journey and enhance the effectiveness of their instructional practices in a technology-integrated classroom (Allen et al., 2022; Martin et al., 2019).

With the incorporation of adult learning principles, the integration of digital tools in professional development takes on additional dimensions (Allen et al., 2022; Diep et al., 2019; Schmidt-Lauff & Bergamini, 2022). Digital tools not only provide flexible access to learning materials, but also present opportunities for collaborative learning and the co-creation of knowledge, aspects that align with the active, collaborative, and constructive nature of adult learning (Bragg et al., 2021; Ovcharuk et al., 2022; Shamir-Inbal & Blau, 2022). The benefits of digital tools are especially evident in instances where technology facilitates video-supported collaborative learning, enabling professional development to extend beyond traditional boundaries and offering a platform for teachers to share, reflect upon, and learn from each other's practices (Ramos et al., 2022). Digital tools can provide teachers with immediate and interactive feedback, further bolstering their learning process (Powell & Bodur, 2019). Therefore, effectively utilized, digital tools can enhance the professional development of teachers, fostering an environment conducive to adult learning and transformative changes in teaching practices (Shamir-Inbal & Blau, 2022).

The unprecedented global shift to remote teaching and learning caused by the COVID-19 pandemic has highlighted the acute necessity for well-designed online professional development programs (Bragg et al., 2021; Powell & Bodur, 2019). As teachers had to quickly adapt to a new educational paradigm, the demand for training in digital pedagogy, online engagement strategies, and technical troubleshooting surged (Allen et al., 2022; Shamir-Inbal & Blau, 2022). Simultaneously, educators' experiences with technology, their pedagogical beliefs, and their self-efficacy greatly influenced their adaptation to these challenges (Diep et al., 2019; Ovcharuk et al., 2022). The professional development offered during this time needed to be highly individualized, allowing teachers to navigate their unique challenges and build on their individual strengths and competencies (Ramos et al., 2022; Yoon & Kim, 2022). Additionally, the need for community and collaboration was heightened, as teachers sought to share experiences, strategies, and support each other in a landscape of common challenges (Martin et al., 2019; Schmidt-Lauff & Bergamini, 2022). Professional development programs that were contextual, problem-centered, and based on real-life teaching experiences proved particularly effective in supporting teachers during this difficult transition (Allen et al., 2022; Huet & Casanova, 2022). The COVID-19 pandemic, while fraught with challenges, underscored the potential of digital tools to facilitate meaningful professional development and the critical role of adult learning principles in navigating times of rapid change and uncertainty (Bragg et al., 2021; Ramos et al., 2022).

The COVID-19 pandemic created a unique opportunity to reassess and recalibrate the design and implementation of online professional development programs (Chaipidech et al., 2022; Shamir-Inbal & Blau, 2022). Learnings from the experience of navigating the crisis can be applied to enhance the resilience and adaptability of these programs in the face of future

uncertainties (Allen et al., 2022; Ovcharuk et al., 2022). Notably, the emphasis on flexible and individualized learning paths, which proved critical during the pandemic, should be retained and further developed (Diep et al., 2019; Shamir-Inbal & Blau, 2022). Moreover, technology's potential to facilitate collaborative learning and the co-creation of knowledge has been underscored and provides a promising avenue for future development in professional learning (Ramos et al., 2022; Bragg et al., 2021). As educators worldwide continue to integrate technology into their instructional methods, ongoing research and feedback are essential to continuously refine these professional development programs (Bragg et al., 2021). The ongoing feedback ensures they remain responsive to evolving needs and are positioned to effectively support the teachers they serve, fostering an environment conducive to ongoing learning and transformative change in teaching practices (Martin et al., 2019; Yoon & Kim, 2022).

The onset of the COVID-19 pandemic necessitated rapid and extensive shifts in education, amplifying the role of professional development in fostering adult learning competencies, particularly in the digital realm (Allen et al., 2022; Diep et al., 2019). Adult learning theories, with their emphasis on self-directed and experiential learning, proved invaluable as educators worldwide grappled with transitioning to online teaching (Schmidt-Lauff & Bergamini, 2022; Huet & Casanova, 2022). Professional development programs responded by ramping up support for digital pedagogy, encouraging teachers to draw on their experiences, experiment with new technologies, and engage in reflective practice in an online environment (Martin et al., 2019; Yoon & Kim, 2022). This situation underscored the transformative potential of technology-integrated professional development when aligned with principles of adult learning, fostering resilience and adaptability among educators in a rapidly evolving educational landscape (Allen et al., 2022; Shamir-Inbal & Blau, 2022).

Barriers to Technology Integration and Adult Learning

Despite the multitude of opportunities that technology integration affords in adult learning and professional development, it's important to acknowledge and address the potential barriers that may hinder successful adoption (Valtonen et al., 2022). These barriers can be multifaceted and complex, encompassing personal, contextual, and systemic factors (Bedir, 2019; Schmitz et al., 2022). Personal barriers often stem from teachers' beliefs, attitudes, and perceived competencies concerning technology use in education (Bowman et al., 2022). Contextual barriers may arise from the learning environment itself, such as access to resources, institutional support, and the quality of available professional development opportunities (Bedir, 2019; Gonzales et al., 2022). Systemic barriers, on the other hand, relate to broader issues like policy decisions, infrastructure availability, and societal norms (Valtonen et al., 2022). Understanding these barriers is crucial for designing strategies and interventions to mitigate their impact and promote the successful integration of technology in adult learning and professional development (Bowman et al., 2022).

Personal Barriers

Personal barriers to technology integration are often deeply rooted in individual beliefs and attitudes, which may influence teachers' willingness and confidence to adopt and effectively use technology in their practice (Bowman et al., 2022). These barriers can include a lack of self-efficacy in using technology, resistance to change, or the belief that traditional teaching methods are superior (Bedir, 2019; Farjon et al., 2019; Lai et al, 2022). Furthermore, teachers' perception of the relevance and applicability of technology to their teaching contexts can also act as a barrier (Akhter et al., 2022). Teachers that perceive technology as adding to their workload without clear benefits may be less inclined to integrate it into their practice (Bowman et al.,

2022). Similarly, uncertainty or lack of clarity about the expectations and responsibilities associated with technology use can lead to reluctance and resistance (Draxler-Weber et al., 2022). Addressing these personal barriers requires concerted efforts to shift beliefs and attitudes, increase self-efficacy, and establish clear expectations about the role and benefits of technology in teaching and learning (Bowman et al., 2022; Lai et al., 2022).

Structural Barriers

Structural barriers within the educational system often significantly impede technology integration (Schmitz et al., 2022). These can include insufficient technology infrastructure, inadequate technical support, and a lack of time for teachers to learn and experiment with new technologies (Bastos et al., 2022; Draxler-Weber et al., 2022). In many cases, despite having access to technology, teachers may lack reliable internet connections or necessary hardware, which can severely limit their ability to integrate technology into their teaching practice (Gonzales et al., 2022; Qazi et al., 2022). Furthermore, without ongoing technical support, teachers may struggle to troubleshoot problems or update their technology skills, which can discourage their use of technology (Schmitz et al., 2022). The pressure of the demanding teaching workload often leaves little room for the extra time needed to explore and integrate technology effectively into teaching and learning (Bastos et al., 2022). Therefore, to overcome these structural barriers, there is a need for well-resourced and sustained support at the institutional level (Schmitz et al., 2022; Draxler-Weber et al., 2022).

Pedagogical Barriers

Pedagogical barriers are also pivotal when discussing obstacles to technology integration in education (Valtonen et al., 2022; Qazi et al., 2022). These barriers are rooted in teachers' pedagogical beliefs and their knowledge and understanding of how to effectively incorporate

technology into teaching and learning processes (Lai et al., 2022). Teachers may understand how to use technology in isolation but integrating it into their pedagogy in a way that enhances learning can be a significant challenge (Valtonen et al., 2022; Tomé & Coelho, 2023). In some instances, teachers may revert to traditional teaching approaches when using technology, thereby missing opportunities to leverage the transformative potential of digital tools for learning (Valtonen et al., 2022). Therefore, it is important to focus on technical skills and the development of teachers' Technological Pedagogical Content Knowledge (TPACK), which is the interplay of technology, pedagogy, and content in educational contexts (Lai et al., 2022). Overcoming pedagogical barriers, therefore, requires targeted professional development and ongoing support that helps teachers to understand and apply the principles of effective technology integration into their pedagogy (Tomé & Coelho, 2023; Qazi et al., 2022).

Socio-cultural Barriers

Alongside personal, structural, and pedagogical barriers, socio-cultural barriers can also impact the integration of technology into teaching and learning processes (Shagiakhmetova et al., 2022). These include the norms, values, and attitudes toward technology present within the school culture, community, or wider society that can either facilitate or hinder technology adoption (Lai et al., 2022). For instance, a school culture that emphasizes traditional teaching methods and does not value the use of technology can act as a significant barrier (Shagiakhmetova et al., 2022). Societal attitudes toward technology, including concerns about screen time, privacy, or the digital divide, can also impact teachers' willingness and ability to integrate technology (Gan & Sun, 2022; Klosky et al., 2022). Overcoming socio-cultural barriers requires a shift in attitudes and values towards technology at multiple levels, from the individual teacher to the school, community, and society at large (Bastos et al., 2022). This might involve

strategies such as fostering a supportive school culture, involving parents and the community in technology initiatives, and addressing broader societal concerns about technology use (Gan & Sun, 2022; Shagiakhmetova et al., 2022).

Training and Development Barriers

Training and development barriers often represent a critical bottleneck in the process of technology integration in education (Haleem et al., 2022; Qazi et al., 2022). Often, teachers receive inadequate training on how to use digital tools or are not provided with training that is customized to their unique needs and contexts (Draxler-Weber, Voigt, & Blömer, 2022). Moreover, professional development opportunities may not adequately address the principles of adult learning, which emphasize the importance of self-directed and experiential learning, relevance to professional practice, and opportunities for collaboration and reflection (Bowman et al., 2022; Bastos et al., 2022). Without effective, ongoing, and contextually relevant training, teachers may struggle to understand and adapt to the rapid pace of technological change, hindering their ability to integrate technology effectively into their teaching practice (Haleem et al., 2022; Qazi et al., 2022). Therefore, it is essential that professional development efforts be designed with an understanding of the unique needs and contexts of adult learners, and with a focus on building not just technical skills, but also pedagogical understanding and the capacity for ongoing learning and adaptation (Bowman et al., 2022; Bastos et al., 2022).

Summary

This research is deeply rooted in the exploration of adult learning theory and its intersection with technology integration, examining the integral role educators play in shaping and implementing the digital learning landscape (Allen et al., 2022; Merriam, 2001; Schmitt-Lauff & Bergamini, 2022). Adult learning theory posits that adults learn most effectively when

learning is self-directed, experiential, and relevant to their context (Merriam, 2001). These principles align with the opportunities that technology integration brings to the table - offering flexible access to resources, opportunities for collaborative learning, and platforms for the co-creation of knowledge (Ananga, 2020; Barton & Dexter, 2020; Diep et al., 2019; Yurtseven Avci et al., 2020). Technology becomes a tool that fosters autonomy, allows educators to leverage their experiences, and facilitates learning that is immediately applicable to their teaching practice (Ananga, 2020; Ching & Roberts, 2020; Paulus et al., 2020; Taghizadeh & Hasani Yourdshahi, 2020; Yurtseven Avci et al., 2020).

The research further underscores the significance of teachers' self-efficacy in successful technology integration (Choi et al., 2019; Kasalak & Dagyar, 2020; Tschannen-Moran & Hoy, 2001; Weißenfels et al., 2022; Yang, 2021). Teachers' self-efficacy - the belief in one's capability to perform specific teaching tasks effectively - significantly influences teachers' willingness to adopt and integrate technology (Bandura, 1977; Choi et al., 2019; Kasalak & Dagyar, 2020; Yang, 2021). From the perspective of adult learning theory, higher self-efficacy tends to align with a proactive, self-directed approach toward learning (Ma et al., 2021; Merriam, 2001; Pressley, 2021; Taimalu & Luik, 2019). Educators with higher self-efficacy are often more equipped to navigate the complexities of technology use, actively seeking solutions to challenges and experimenting with novel pedagogical strategies bolstered by technology (Kasalak & Dagyar, 2020; Ma et al., 2021; Tschannen-Moran & Hoy, 2001; Weißenfels et al., 2022; Yang, 2021).

The role of beliefs in technology integration also plays a substantial part in this study. Teachers' beliefs about teaching, learning, and technology considerably shape their decisions to adopt technology (Farjon et al., 2019; Li et al., 2019; Nelson et al., 2019; Taimalu & Luik,

2019). From an adult learning perspective, these beliefs are often a product of accumulated professional experiences (Bedir, 2019; Farjon et al., 2019; Li et al., 2019; Merriam, 2001; Nelson et al., 2019). Positive beliefs about technology can lead to a greater willingness to integrate technology into teaching, fostering a transformative learning environment (Bedir, 2019; Farjon et al., 2019; Li et al., 2019; Liu et al., 2020). Conversely, negative beliefs can serve as a hindrance, undermining technology's potential to enhance learning (Bedir, 2019; Farjon et al., 2019; Li et al., 2019; Liu et al., 2020; Szymkowiak et al., 2021).

Professional development, in alignment with adult learning theory, is highlighted as a critical mechanism to equip teachers with the knowledge and skills necessary for effective technology integration (Bragg et al., 2021; Ovcharuk et al., 2022; Powell & Bodur, 2019). Professional development programs designed with adult learning principles in mind not only enrich teachers' pedagogical repertoire but also promote an inclusive learning environment, resonating with teachers' varied needs, preferences, and competency levels (Allen et al., 2022; Curran et al., 2019; Diep et al., 2019). The COVID-19 pandemic's impact further accentuated the importance of these programs, signaling a need for robust initiatives that can swiftly respond to changes in the educational landscape (Huet & Casanova, 2022; Ramos et al., 2022; Yoon & Kim, 2022).

Finally, the literature shows that barriers to instructional technology integration and adult learning are bolstered by a lack of technological resources, inadequate training, and negative attitudes toward technology (Draxler-Weber et al., 2022; Schmitz et al., 2022; Qazi et al., 2022). Overcoming these barriers requires an understanding of adult learners' characteristics and needs (Bastos et al., 2022; Lai et al., 2022; Shagiakhmetova et al., 2022. The research suggests a comprehensive approach that incorporates improvements in infrastructure, promotes digital

literacy, and encourages technology design centered around accessibility and user-friendliness (Bastos et al., 2022; Bowman et al., 2022; Haleem et al., 2022; Qazi et al., 2022). The researcher aims to augment the existing body of literature on instructional technology integration in the context of the COVID-19 pandemic, with the potential to inform and shape effective, forward-thinking strategies for integrating technology in education in the future.

CHAPTER THREE: METHODS

Overview

The purpose of this transcendental phenomenological study is to describe the lived experiences of secondary teachers who have undergone rapid instructional technology turnover in the transition from a traditional classroom environment to a digital secondary classroom during the COVID-19 pandemic in an urban area in southeast Georgia. The educator experiences were defined as perceptions and beliefs of teachers towards new technology entering the classroom. The theory guiding the researcher is Knowles's adult learning theory (1968) as it is related to the experiences of secondary teachers' motivations, beliefs, and past experiences and the perceived impact on the implementation of instructional technology into classroom routines. This chapter identifies the study's design, research questions, setting, participants, procedures, researcher's role, data collection, data analysis, trustworthiness, and ethical considerations taken by the study.

Research Design

This qualitative study utilizes transcendental phenomenological research design to describe the lived experiences of secondary teachers' involvement in instructional technology integration and their experiences' perceived impact on the technology's assigned significance. The lived experiences of secondary teachers' participation in instructional technology integration are a phenomenon that can be observed but not measured quantitatively leading to the selection of a qualitative research method. Qualitative research utilizes multiple approaches, such as interviews, documentation, and a focus group to understand social phenomena through the participants' lived experiences (Moustakas, 1994). I approached this research with assumptions and used the theoretical framework guiding this study to assess the meanings that participants

articulate from their experiences. Utilizing a qualitative research approach allowed me to address a gap in the literature on the rapid integration of instructional technology and its impact on secondary teachers' perceptions of instructional technology. The desire was for implications of best practices to be drawn from these experiences and a better understanding of potential supports that could benefit schools as they implement instructional technology into classrooms.

The study utilized a phenomenological design approach as outlined by Moustakas, (1994) to provide a voice for the lived experiences of secondary teachers who have participated in instructional technology integration. This approach is favored due to its inherent capacity to capture the essence of subjective human experiences in all their richness and complexity. By focusing on the participants' personal narratives, it aims to understand the phenomena from their unique perspectives, thereby adding depth and context to our understanding of instructional technology integration (Moustakas, 1994). The phenomenological design approach is also chosen for its potential to reveal nuances, inconsistencies, and paradoxes within these lived experiences, which often remain hidden in more conventional, quantitative research designs (Moustakas, 1994). In essence, the phenomenological design allows for deeper insights into the authentic experiences, emotions, perceptions, and motivations of secondary teachers as they navigate through the process of instructional technology integration.

A transcendental phenomenological design was selected to capture the wholeness of the lived experience rather than the objects or parts (Moustakas, 1994). This design choice centers on the intention to deliver a comprehensive account of participants' experiences with instructional technology integration, without the potential influence of the researcher's preconceived notions or biases. According to Moustakas (1994), transcendental phenomenology is an approach that attempts to eliminate everything that could be interpreted as preexisting

judgment to create a state of openness to capture the habits of the natural world or everyday experiences. The thoughts and intents of a phenomenon's participants are the focal point of transcendental phenomenology (Moustakas, 1994). By utilizing the transcendental phenomenological design, the researcher aimed to shed light on the lived experiences of secondary teachers in their pursuit of instructional technology integration, thereby unveiling insights that are deeply rooted in their personal perspectives and narratives.

This research design stems from the philosophical tradition of phenomenology, which has roots in the works of Edmund Husserl (Moustakas, 1994). Transcendental phenomenology, developed by Husserl in the early 20th century, emphasizes the exploration of phenomena from the perspective of the individual's own consciousness (Moustakas, 1994). According to Moustakas, the design incorporates the processes of epoché, phenomenological reduction, imaginative variation, and the synthesis of meanings and essences, enabling the exploration of diverse experiences associated with a particular phenomenon.

Research Questions

Listed below are the central research question and three related sub-questions that serve as a guide for the study. The information gathered in the methods of data collection was aligned to these questions for the purpose of reporting findings in the following chapters.

Central Research Question

What are the perceptions and experiences of secondary school teachers when integrating instructional technology into their classroom practices?

Sub-Question One

How do secondary school teachers perceive the effectiveness of instructional technology in enhancing student engagement and learning outcomes?

Sub-Question Two

What challenges do secondary school teachers encounter when incorporating instructional technology into their classroom routines?

Sub-Question Three

How do secondary school teachers' attitudes and beliefs towards instructional technology influence their adoption and implementation in the classroom?

Setting and Participants

In the realm of qualitative research, scholars immerse themselves in real-life settings to dissect and comprehend the intricacies of societal issues (Busetto et al., 2020). This approach, rather than just answering questions or recording events, dives deep into the human experiences, exploring their manifold dimensions (Biddix, 2018; Creswell & Creswell, 2018). The aim is not merely to observe but to understand, shedding light on the significance of experiences within cultural groups (Gerber et al., 2017; Gill & Baillie, 2018). Consequently, the setting of this study has been purposefully chosen, residing in the heart of the phenomenon being explored. The study focuses on the lived experiences of secondary teachers during the transition to a digital classroom setting. In alignment with the recommendations of Creswell and Poth (2018), the research relies heavily on the perspectives of the participants, with interviews being the primary source of data collection. Pseudonyms are used to safeguard the anonymity of the secondary teacher participants involved. Their narratives offer crucial insights into how rapid instructional technology turnover in the transition from a traditional to a digital secondary classroom impacts their teaching practices and beliefs.

Site

An urban high school was selected from a location in southeast Georgia with a population of 147,780 according to the U.S. Census Bureau (2020). The high school currently serves 773 students with a 12 to 1 student-teacher ratio. The racial breakdown for the school is 88.5% African American, 5% White, 3.6% Hispanic, and 2.2% Asian, and .7% other. Seventy three point two percent of students that attend the school receive free or reduced lunch, and the school is currently ranked 340th out of the 438 public high schools in the state of Georgia. The school operates on a semester system, with students taking four 120-minute classes per semester with two instructional semesters in a year. The school is one of 16 high schools located in the Champaign metropolitan area and is in an economically disadvantaged community. The school is overseen by a local school board and county officials with a standards internal organizational structure which allows for one assistant principal per four hundred students. Due to the recent pandemic, the school has been functioning utilizing a distance learning model with students attending classes through online mediums (Georgia School Reports, 2020).

An urban high school was chosen for the recent conversion to a distance learning model and the subsequent implementation of various instructional technologies to assist teachers with distance learning. The alteration has caused the teachers to utilize instructional technology to facilitate an online learning environment. While teachers are incorporating multiple distance learning and instructional technologies, only a few were presented to the staff for training purposes. Further changes were made as new instructional technology was made available to teachers as it became clear that the distance model would be longer than originally desired. While instructional technology was being deployed, little to no training was provided on how to incorporate the technology into classroom routines. This inconsistency in teacher preparation has presented the perfect environment for this qualitative study.

Participants

In a transcendental phenomenological study, the focal points are the experiences, thoughts, and intents of participants who experienced the phenomenon (Moustakas, 1994). I used criterion sampling to determine participants in order to focus on the phenomenon. Participants in this study were from both core and elective content areas who taught during the COVID-19 transition with a minimum of three years of teaching prior to the phenomenon. Twelve participants were chosen based on their potential to enhance comprehension of the study's research problem and overarching phenomenon (Creswell and Poth 2018). All participants for this study were state-certified teachers who worked at the site from January 2020 to December 2021 and participated in the transition to a distance learning module due to the COVID-19 pandemic. I used maximum variation sampling to ensure diversity in gender, age, and ethnicity (Creswell and Poth 2018).

Researcher Positionality

As a qualitative researcher and seasoned educator, I approached this study with a unique blend of knowledge, curiosity, and deep personal investment. Over my twenty-year career, my lived experiences in the education sector have significantly shaped my beliefs about the power and potential of teaching and learning, thus, influencing my perspective toward this research (Patton, 2015). The central goal of this study was derived from observations and discussions with teachers about how instructional technology was constantly being installed in the classroom. My observations noted that while the instructional technology was being deployed into classrooms, teachers received little training on how to best utilize the technology to improve student performance. Moreover, the drive to utilize instructional technology was often abandoned in favor of a new initiative. This constant bombardment of instructional resources appeared to have

a negative effect on teachers, who seemed to adopt a negative connotation towards new technology. These observations coupled with my current studies into adult education and instructional technology led to the formation of this study to discern the impact this phenomenon has on the educational process. I am driven by the motivation to understand and provide insights that could have implications for future disruptions in the education sector. This research is further enriched by my set of philosophical assumptions that underpin and guide my investigation.

Interpretive Framework

The interpretive framework of social constructivism guides this research, which resonates with my years of experience as an educator and my current pursuit as a researcher. As delineated by Creswell and Poth (2018), social constructivism encourages an individual to seek and interpret the world they inhabit and the professional sphere they navigate. Having donned multiple hats within the education system—as a student, teacher, and now a researcher—I lean on the framework of social constructivism to explore and understand the nuanced experiences of secondary teachers dealing with rapid instructional technology turnover.

Social constructivism illuminates the subjective meanings formed by individuals based on their experiences. In the context of this study, social constructivism helps to uncover the manifold realities associated with the phenomenon of instructional technology turnover (Creswell & Poth, 2018; Egbert & Sanden, 2018). Social constructivists perceive learning as a byproduct of interactions within the environment and as a cognitive reconstruction process sparked by self-discovery (Warin et al., 2011; Ahlin, 2017). This paradigm resonates with my study's focus on teachers' interactions with new instructional technology and their evolving teaching practices, beliefs, and experiences. As the research unfolds, I aim to reflect on and

incorporate these subjective experiences and interpretations, acknowledging my own biases while aiming for an authentic representation of the participants' perspectives.

Philosophical Assumptions

As a qualitative researcher, my perspective and approach to the study are inherently shaped by specific philosophical assumptions. These assumptions serve as the lens through which I perceive the world and subsequently frame my research. The three key philosophical dimensions that underpin my outlook are ontological, epistemological, and axiological. These dimensions not only guide my research decisions but also inform the methods I employ to gather and interpret data. These assumptions aid in ensuring that my research remains congruent with my foundational beliefs and values.

Ontological Assumption

The ontological assumption pertains to the conception of reality and its nature (Creswell & Poth, 2018). This assumption grants authenticity and tangibility to the data through the emergence of themes. Given the subjective nature of human experience, interpretations of data and outcomes can vary among individuals. Grounded in my faith, my primary ontological standpoint posits that a singular reality exists, which is the reality as shaped by God. In this world, no one but God is perfect, and people perceive the world through their imperfections, which results in a myriad of perceived individual realities. As a researcher, I recognize and respect the diversity of realities presented by the individuals participating in the study, considering these multiple perspectives as a pathway to a richer understanding of the phenomenon under study.

Epistemological Assumption

The epistemological assumption is concerned with what constitutes knowledge, how such knowledge claims are validated, and the association between the research subject and the researcher (Creswell & Poth, 2018). This assumption in the realm of qualitative research compels the researcher to develop a close relationship with the study participants. Within the context of this study, my epistemological stance holds that participants' detailed descriptions of their experiences are the fundamental sources of knowledge. I pursued qualitative research techniques to collect and evaluate data, making an effort to lessen the gap between myself and the participants, thereby gaining a profound comprehension of their experiences to accurately portray them. On a broader scale regarding my epistemological assumption, I subscribe to a Biblical worldview and believe that the primary route to truth is of spiritual origin. As a researcher, the closer I am to my subjects, the more detailed and accurate the knowledge base obtained. In this study, I am a peer among the participants, holding no authoritative role over the participating teachers.

Axiological Assumption

The axiological assumption in qualitative research is associated with the recognition and acknowledgment of the values that researchers bring to the study (Creswell & Poth, 2018). My axiological assumptions are founded in my years of teaching and a lifetime spent in the educational realm. From this, I hold fast to a value system that asserts each student is entitled to an education and that certain core tenets such as leadership, community, and personal responsibility are integral to the learning process. Drawing from my extensive experience as an educator, I have formed viewpoints concerning the roles and duties of both teachers and students. I hold a firm belief in the power of education and advocate for the universal right to education. As a researcher from a Christian background, my values and biases inevitably influence the

interpretation and explanation of the data. Thus, it is of utmost importance that these values and biases are acknowledged and accounted for to ensure the credibility and trustworthiness of the study.

Researcher's Role

In this study, I gathered information utilizing both biased and unbiased data collection procedures to accurately reflect the phenomenon as it pertains to the population. I served as the human instrument in this study (Creswell & Poth, 2018), as I collect and analyze data for it. I bracketed my experiences in order to minimize my own assumptions and biases (Creswell & Poth, 2018). I bracketed out my experience as a secondary teacher in an urban high school and my understanding of best practices in teaching from my long career. I also bracketed out any working relationships with the participants as we share commonalities as employees of the local school system. I do not hold an authoritative role over the participants and seek to conduct this study in an unbiased manner.

Procedures

To initiate this research project, the priority was to secure permissions from relevant authorities. The study commenced by seeking approval from the principal and superintendent to conduct the research at a high school in an urban area in southeast Georgia (refer to Appendix B). A formal application along with the requisite documents, was submitted to the Institutional Review Board via Liberty University for further approval (refer to Appendix A). Following the acquisition of all necessary approvals, the process of participant recruitment begin. I used a combination of criterion sampling and maximum variation to select both core and elective teachers from the site in order to understand the phenomenon and research question (Creswell & Poth, 2018). This covers the core tenants of phenomenology by drawing from multiple

individuals' experiences of a shared phenomenon while improving transferability by utilizing maximum variation sampling to record variables such as gender, age, and ethnicity (Creswell & Poth, 2018). The selection process was based on administrator recommendations. Prospective participants who meet the criterion received personalized letters, detailing the purpose and significance of the research, and inviting them to participate in the study (refer to Appendix C) and complete the consent forms (refer to Appendix D).

Upon receipt of completed consent forms and questionnaires from participants, I reached out to each participant individually to arrange an interview, ensuring that the process respects their convenience and comfort. After conducting the first interview, I critically reviewed the transcription and promptly sought feedback from the participant to verify the protocol's credibility and enhance its effectiveness. Any necessary modifications to the interview questions were minor and did not affect the interview’s substance. Following each interview, participants were provided with a transcript as part of a member check process to guarantee accuracy, thereby reinforcing the credibility of the data collection process (Creswell & Poth, 2018).

Besides interviews, which serve as the primary data source in a phenomenological study, the study also employ documentation and focus groups data collection methods (Creswell & Poth, 2018; Moustakas, 1994). The purpose of incorporating these varied sources is to enable data triangulation, a technique that enhances the validity of research by cross-verifying from multiple sources (Creswell & Poth, 2018; Moustakas, 1994). I compared evidence gathered from all three data sources, interviews, documentation, and focus groups, to identify recurring themes and further strengthen the research findings. Member checks were used to ensure the transcripts' accuracy from focus groups, supporting the overall integrity and reliability of the data collected (Creswell & Poth, 2018; Moustakas, 1994).

For the analysis of the collected data, I employed a comprehensive method that aligns with Moustakas' (1994) guidelines for phenomenological research. This involved the utilization of epoché, phenomenological reduction, imaginative variation, and the synthesis of structural-textural elements. To uphold the integrity of the study, I identified and bracketed my personal biases, a practice emphasized in both Moustakas' (1994) and Creswell & Poth's (2018) works. A significant part of this process involved constructing a robust textural description, encapsulating the essences of the phenomena by applying phenomenological reduction (Creswell & Poth, 2018; Moustakas, 1994). This helped distill the raw data into critical and meaningful elements (Creswell & Poth, 2018; Moustakas, 1994). I then used imaginative variation to create structural descriptions, offering deeper insights into the experiences of secondary teachers engaged in instructional technology integration (Moustakas, 1994). These two steps, in combination, provide a holistic picture of the phenomenon under study, revealing both its manifest details and underlying structures (Creswell & Poth, 2018; Moustakas, 1994).

Permissions

Permission to conduct the research for this study is represented first by the IRB approval letter once obtained (see Appendix A). I also requested site permission from the school district (see Appendix B). Finally, a copy of the consent form sent to participants in the appendix has been included (See Appendix D).

Recruitment Plan

Teachers were recruited from the site and drawn from every department, including the Career and Technical Agricultural Education, Math, English, Science, and Social Studies. The teachers were recruited with the use of a recruitment letter (Appendix C), which described all requirements. Criterion sampling was used to identify the participants. The criterion for the

participants is they must have taught at the site and experienced the transition from classroom to distance educational module during the 2020-2021 school year. 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). The researcher anticipated between 10 and 15 participants once approval was achieved. Participants signed consent forms prior to any data collection (Appendix D).

Data Collection Plan

This qualitative study utilized a transcendental phenomenological research design to depict the lived experiences of secondary teachers who have participated in the implementation of instructional technology into classroom routines. The qualitative data for this transcendental phenomenological study was collected primarily through individual interviews and triangulated with document analysis and focus groups.

Individual Interviews Data Collection Approach

Transcendental phenomenological studies are intrinsically centered around capturing the lived experiences of participants which is not easily quantifiable (Creswell & Poth, 2018; Moustakas, 1994). Qualitative studies can utilize many different approaches but all center around the gathering of data through interviews with the participants (Creswell & Poth, 2018; Moustakas, 1994; Quay, 2016). To capture the lived experiences of participants, qualitative interviews should emphasize open-ended communication structure to allow participants to convey their perspectives, understanding, and beliefs (Merriam, 2016). A semi-structured interview method was selected for this study to allow the participants to explore their thoughts, feelings, and beliefs about the phenomenon Creswell & Poth, 2018; Merriam, 2016; Moustakas, 1994).

The individual interviews took place remotely utilizing distance communication software to allow the participants a comfortable, safe location free of interruptions that is suitable for confidentiality. Interviews were conducted with Microsoft Teams software which provided the researcher with audio and video recordings of the interview. The recording were transcribed in verbatim and stored on a hard drive for the duration of the study. A member check was performed by providing participants with a copy of the transcription of their interview to verify the transcription of the interview. The following questions were used as a guide for the semi-structured interview.

Individual Interview Questions

1. Please introduce yourself.
2. Please inform me about your professional experiences as a secondary educator. For example, what programs of study do you teach, how long have you been teaching as secondary educator, and what additional experiences or responsibilities do you provide as part of your job duties?
3. Provide some examples of the types of instructional technology you use in your classroom? (SQ1)
4. How do you believe these technologies have affected student engagement? (SQ1)
5. Share a specific instance where you noticed a significant improvement in student engagement or participation due to the integration of a specific technology? (SQ1)
6. What changes, if any, have you observed in students' learning outcomes since you began integrating technology into your teaching? (SQ1)
7. In what ways has the use of technology influenced students' understanding of the subject matter, if at all? (SQ1)

8. What challenges did you initially face when you started integrating technology into your teaching? (SQ2)
9. Describe any ongoing difficulties you experience with using technology in your classroom? (SQ2)
10. Describe any technical issues or obstacles you've encountered while using technology in the classroom? (SQ2)
11. How have these challenges influenced your routine or teaching methodology? (SQ2)
12. What supports or resources do you wish were available to help overcome these challenges? (SQ2)
13. How would you describe your personal attitude towards integrating technology into teaching? (SQ3)
14. In what ways, if any, has this attitude changed over time? (SQ3)
15. What beliefs or principles guide your approach to using technology in your classroom? (SQ3)
16. Share a memory of a specific situation where your belief system influenced your decision to use, or not use, a certain technology in your classroom? (SQ3)
17. How does your belief in the potential of technology for learning influence the type of technologies you choose to use in your teaching? (SQ3)
18. Describe your overall experience with integrating technology into your classroom practices? (CRQ)
19. How do you perceive the role of technology in contemporary teaching and learning? (CRQ)
20. What motivates you to integrate technology into your teaching? (CRQ)

21. When has there been a time when technology integration didn't go as planned in your classroom? If so, could you describe what happened and how you handled it? (CRQ)
22. How do you think your experiences and perceptions of instructional technology have influenced your overall teaching practice? (CRQ)
23. What else would you like to contribute to this study?

The interview questions prepared for this study are meticulously designed to deeply explore the experiences and perceptions of secondary school teachers when integrating instructional technology into their classroom practices. The first five questions primarily aim to gauge the teachers' perceptions of the effectiveness of instructional technology in enhancing student engagement and learning outcomes. The following five questions, from six to 10, delve into understanding the challenges that these educators encounter when incorporating instructional technology into their daily classroom routines. This section of the interview intends to extract valuable insights into the practical difficulties faced by teachers on the ground, giving us a clear picture of the barriers to effective technology integration. Questions 11 through 15 specifically probe the attitudes and beliefs of teachers towards instructional technology and how these shape their decisions on technology adoption and implementation in the classroom. These questions aim to bring out the individual thought processes and convictions that significantly influence the educational use of technology. Lastly, questions 16 to 20 are structured to shed light on the overall experiences and perceptions of teachers when integrating technology into their pedagogy, thus capturing the comprehensive scope of the central research question. The final question, seeks to gain an understanding of how teachers' perceptions and experiences have impacted their teaching practices at large. Altogether, these questions constitute a comprehensive

investigative tool for illuminating the multifaceted phenomenon of instructional technology integration in secondary school classrooms.

Individual Interview Data Analysis Plan

Data collection was subjected to a thorough analysis using a phenomenological process inspired by Moustakas (1994). This process incorporated the epoché, a phenomenological reduction technique involving horizonalization, clustering and thematizing horizons, and the creation of individual textural descriptions that reflect participants' experiences. The practice of imaginative variations helped to identify potential meanings and structural qualities, ultimately leading to individual structural descriptions. This culminated in a composite description capturing the core experiences of the group.

When I initiate the epoché process, I considered my position with the school district and study participants and reflect upon my own experiences as a teacher. In order to prevent my personal perspective from influencing the data, I kept a reflexive journal throughout the data collection and analysis stages of this study. It is essential for the success of epoché that preconceptions are suspended, allowing new knowledge to unfold (Moustakas, 1994).

The transcripts were subjected to a constant comparative analysis, which involved open and axial coding. The initial stage saw me examining each transcript to designate an initial set of codes and assign conceptual labels. As certain concepts started recurring, they were treated as emerging themes (Moustakas, 1994). I was also vigilant for horizons, excluding any expressions that are repetitive, overlapping, or vague, and paying attention to the invariant constituents that remain (Moustakas, 1994). After identifying these invariant constituents or horizons, recurring themes were labeled, clustered, and categorized during the axial coding process. Axial coding helped highlight concepts that may not be fully substantiated, enabling a decision on whether to

discard the data or gather more. The primary objective of axial coding is to achieve data saturation, ensuring all pivotal information is brought to light during coding. The insights gathered through coding and horizonalization were subsequently employed to formulate focus group questions for future discussions.

Document Analysis Data Collection Approach

The second data collection method I employed in this study was document analysis, which is a valid data source for a phenomenological research study as per Creswell and Poth (2017). The value of document analysis lies in its multifaceted potential: it can elucidate the context, stimulate the formulation of pertinent questions, supplement the research data pool, enable tracking of progress over time, and serve as a tool for evidence verification (Bowen, 2009). I requested each participant to contribute lesson plans and data-driven instruction (DDI) forms, which allowed me a window into their application of instructional technology in the classroom. These documents reinforced and validated the findings from the interviews (Creswell & Poth, 2018), but also provide us a unique opportunity to uncover common and divergent themes. The aim is to deeply comprehend the participant experiences and derive insights on best practices for integrating instructional technology, thereby directly addressing our research questions. The collected documentation served as an essential pillar in our exploration and understanding of the pedagogical landscape shaped by instructional technology.

Document Analysis Data Analysis Plan

I conducted document analysis to interpret documents, attributing voice and meaning to the participants' experiences in this study. According to the process outlined by Bowen (2009), document analysis necessitates a systematic procedure to evaluate documentary evidence, which calls for continual review and scrutiny of the data. This process included skimming,

comprehensive reading, and interpretation. I integrated coding content into themes by utilizing both open and axial coding methods. The analysis of documents can either corroborate or further elaborate on the findings obtained from other data sources when used in triangulation, thereby mitigating bias.

Focus Groups Data Collection Approach

Focus groups were the final method used for data collection. Focus groups allow the researcher to assume a non-directive role to facilitate discussion and interaction between participants as they share their lived experiences with the phenomenon (Quay, 2016). Focus groups provide the researcher with a way to verify data by utilizing an informal checks and balances system that allows the participants to curb extreme perspectives (Creswell & Poth, 2018; Quay, 2016). Focus groups provide an opportunity for member-checking information obtained during interviews to lend to the studies credibility (Patton, 2015; Quay, 2016). Focus groups were selected from participants of the individual interviews by the research. Focus groups aim to obtain high-quality data through a social interview setting in which participants consider their own lived experiences in context with other participants (Patton, 2015). Focus groups utilized distance communication software to allow the participants a comfortable, safe location. The software provided the researcher with audio and video recordings that were transcribed and shared with the participants for verification. The following questions were used as a guide for the focus group.

Focus Group Questions

1. In your collective experience, what have been the most noticeable changes in your classroom dynamics since the integration of instructional technology? (CRQ)
2. Share an instance where you felt instructional technology particularly enhanced

student engagement? (SQ1)

3. What improvements in student learning outcomes, if any, have you noticed as a result of using instructional technology, and could you elaborate on these improvements? (SQ1)
4. What specific educational technology tools, if any, have you found to be particularly effective in enhancing learning outcomes, and could you explain their impact? (SQ1)
5. Discuss some of the challenges you've faced in incorporating technology into your teaching practices? How have you addressed these challenges? (SQ2)
6. In what ways, if any, has instructional technology integration disrupted your established classroom routines? (SQ2)
7. How do you feel the students' reactions and interactions with instructional technology have affected your teaching practices? (SQ3)
8. How have your beliefs towards instructional technology evolved since you first started using it in the classroom? (SQ3)
9. How has your perception of the effectiveness of instructional technology in your teaching been influenced by any specific experiences or results? If so, can you provide some examples? (SQ3)
10. How have you adapted your teaching practices to accommodate the use of instructional technology? (CRQ)

The questions posed to the focus group are carefully designed to delve into the collective experiences and perceptions of secondary school teachers regarding instructional technology integration. The first question serves as an icebreaker, allowing the participants to reflect on the

overall changes they've noticed in their classrooms due to technology integration. Questions two to four target the first sub-question, probing into specific instances where technology has improved student engagement and learning outcomes. Questions five and six seek to address the second sub-question, providing the opportunity for the teachers to share their challenges and potential disruptions caused by technology integration. With questions seven to nine, we aim to shed light on the third sub-question, understanding how teachers' attitudes and beliefs towards instructional technology may have influenced their adoption and classroom implementation. The final question brings us back to the central research question, exploring how teachers have adapted their classroom practices to technological transformation. Through this focused yet comprehensive set of questions, we aim to gain meaningful insights into the complex dynamics of instructional technology integration in the secondary school classroom environment.

Focus Group Data Analysis Plan

When I analyzed the data from the focus group, I engaged in the epoché process, consciously setting aside any personal preconceptions to remain open to emergent insights (Moustakas, 1994). I plan to use the complete transcriptions when examining the data utilizing horizonalization, reduction and elimination, clustering, application validation, individual textural and structural descriptions, and culminating in a composite description that encapsulates the essence of experiences across the entire group. This method ensured a thorough and unbiased analysis of the focus group data, allowing for the most authentic findings to surface.

Data Synthesis

In this research study, our primary objective is to understand the holistic experience of secondary teachers integrating instructional technology during the COVID-19 pandemic (Creswell & Poth, 2018; Moustakas, 1994). To accomplish this objective, I drew from the three

sources of data – interviews, document analysis, and focus groups – to gather a rich array of insights perspectives of the phenomenon until the point of saturation. I began with the process of Epoché and bracketing before conducting a thorough review of the collected data to become deeply familiar with its content. I employed axial coding on the collected data, identifying recurring themes to integrate into a cohesive narrative of the phenomenon (Moustakas, 1994). I then grouped related codes together to form overarching themes that represent larger insights into the phenomenon. I synthesized the data by providing textural and structural descriptions of the participant's shared experiences. According to Moustakas (1994), textual and structural synthesis is designed to articulate the essence of the phenomenon as a whole. Using textual and structural synthesis I wrote a detailed description of the experiences of secondary teachers who underwent rapid instruction technology integration during the COVID-19 pandemic. The descriptions and themes were cross-checked through triangulation and validated through member checks. This provided participants with an opportunity to review the findings and interpretations and assist in establishing credibility.

Trustworthiness

The goal of the researcher is to provide a strong and trustworthy study. According to Creswell and Poth (2018), a study's trustworthiness is judged by a set of criteria that determines the quality of a qualitative study. This criterion requires the researcher to establish credibility, dependability, and transferability (Lincoln & Guba, 1985). Credibility refers to the establishment of trustworthiness by the data collection, analysis, and conclusions to determine the precision of the study (Creswell & Poth, 2018). Dependability is denoted by the consistencies of the findings and its ability to ensure the process can be traced and audited (Creswell & Poth, 2018). Finally, transferability requires the researcher to provide a detailed description of the site, participants,

and data collection procedures to allow other researchers to replicate the study (Creswell & Poth, 2018).

Credibility

Credibility seeks to establish the studies validity and to assure that the lived experiences of the participants is not misrepresented by the researcher (Creswell & Poth, 2018). The credibility of this study was ensured by utilizing prolonged engagement, member checks, and triangulation. According to Creswell and Poth (2018), member checks of interview transcripts and conclusions provide participants with an opportunity to review the findings and interpretations and assist in establishing credibility. Triangulation is a process that uses at least three methods of data collection to increase credibility through cross-verification allowing for a deeper understanding of the phenomenon (Creswell & Poth, 2018). The researcher utilized individual interviews, document analysis, and focus groups to allow for triangulation of the data.

Transferability

Similar to confirmability, transferability requires the researcher to provide a detailed description of the site, participants, and data collection procedures to allow other researchers to replicate the study (Creswell & Poth, 2018). Research conducted adhering to specific, valid, and ethical procedures enhances the possibility of transferability. The researcher entailed precise procedures for data collection, including individual interviews, document analysis, focus groups, and data analysis, thereby facilitating transferability. Sampling was conducted with maximum variation, acquiring data from secondary teachers across various grade levels and subjects. Each statement provided by the participants was treated with equal importance, as suggested by Moustakas (1994). The outcomes of the study hold the potential to be extrapolated to other settings that share similarities with the study's settings.

Dependability

Dependability refers to the process of ensuring that the data collection process is documented in a way that can be replicated by other researchers (Lincoln & Guba, 1985). Dependability may be established through comprehensive descriptions of the implemented procedures in the study. In order to substantiate the consistency of my findings and their potential for repetition, I provided clear descriptions of the procedures undertaken in this research (Creswell & Poth, 2018; Lincoln & Guba, 1985). As an additional method to affirm dependability, an inquiry audit that traces the research process throughout the study was conducted. This audit was carried out by the qualitative research director and the dissertation committee. Furthermore, I constructed an audit trail to chronicle the types and dates of interactions with participants throughout the research period (Creswell & Poth, 2018).

Confirmability

Confirmability refers to the process of ensuring that the study and its results can be confirmed by other researchers (Creswell & Poth, 2018; Lincoln & Guba, 1985). Confirmability requires the researcher to present their findings, data, and interpretations in a logical format to allow other researchers to follow a similar process (Lincoln & Guba, 1985). According to both Creswell & Poth (2018), and Moustakas (1994), triangulation and member checking are key methods for ensuring confirmability in a phenomenological study. To this end, triangulation was employed throughout the study to establish credibility. I compareed the evidence from the interviews, document analysis, and focus groups to establish themes as an appropriate means of establishing credibility (Creswell & Poth, 2018). I useed member checking to help ensure that the collected data is accurate which is paramount in ensuring credibility (Moustakas, 1994).

Participants were given copies of the transcripts from both the interview and focus group to assist in confirming validity and correcting any misconceptions.

Ethical Considerations

When conducting qualitative research ethical considerations should be taken into account and addressed during the course of the research study (Creswell & Poth, 2018; Lincoln & Guba, 1985). The researcher first sought approval from the IRB before any data collection occurs. Once IRB approval was obtained the researcher provided participants with consent forms to be completed and collected before data collection begins. Participants, schools, and school districts were given pseudonyms to help protect the identities and ensure confidentiality (Creswell & Poth, 2018; Lincoln & Guba, 1985). To ensure validity the researcher utilized Moustakas' (1994) method of epoché and bracketing to remove personal bias and prejudgments from the data and study. Participants were presented with the opportunity to review the findings and be allowed to remove themselves from the study at any point (Creswell & Poth, 2018; Lincoln & Guba, 1985). All paper-based data, including notes, was stored securely in a locked cabinet. Electronic data, such as informed consent forms, questionnaires, and transcripts, was saved on a personal computer with password protection, ensuring that I am the sole individual with access. In disseminating the data, utmost consideration was given to protecting the interests of the participants. Assuming no further additions to the collected data for the current study are required, all data was securely stored and then responsibly disposed of after a three-year period.

Summary

The purpose of this transcendental phenomenological study is to describe the lived experiences of teachers who have undergone instructional technology implementation and how they assign significance to the technology. The researcher chose a transcendental

phenomenological study to understand the specific phenomenon through direct investigation of the lived experiences of the participants. The chapter also included the questions provided in the interviews and questionnaires. This chapter included an overview of the research design and research methods that were utilized for this study. The methods discussed included design, setting, participants, procedures, researcher's role, data collection, analysis, trustworthiness, and considerations. Chapter four will present the findings of the study.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this transcendental phenomenological study was to describe the shared experiences of secondary school teachers with the rapid implementation of instructional technology during the COVID-19 pandemic, aiming to understand its effectiveness, challenges, and the influence of teachers' attitudes and beliefs on its adoption and implementation. The participants are first presented with descriptions, utilizing demographic information to offer a comprehensive view of the educators involved. The findings will be structured around significant narrative themes. Additionally, outlier data that diverge from common patterns will be highlighted, providing a nuanced understanding of the varied experiences. The chapter concludes by synthesizing these elements, allowing for a detailed discussion in the subsequent chapter.

Participants

A primary criterion for participant selection in a phenomenological study involves ensuring that each individual has directly experienced the phenomenon under investigation (Moustakas, 1994). For the purpose of this study, the participants comprised both core and elective teachers from an urban area in southeast Georgia, who had a minimum of three years of teaching experience prior to the COVID-19 pandemic. Each participant had firsthand involvement in the transition to distance learning modules due to the pandemic, providing a rich and varied insight into the integration of instructional technology in secondary education during this unprecedented period.

To ensure maximum variation, this study contained 12 secondary school teachers from various academic disciplines. The participant group comprised two mathematics teachers, two science teachers, two English teachers, three social studies teachers, and three elective teachers,

ensuring a comprehensive understanding across different subject areas. Additionally, the demographic makeup was diverse, consisting of four male and eight female teachers. This strategic selection provided a cohesive context to examine the phenomenon of integrating new technology into secondary education while capturing a spectrum of individual experiences and insights.

Table 1

Teacher Participants

Teacher Participant	Years Taught	Highest Degree Earned	Content Area	Age Range
Thomas	9	Master's Degree	Audio/Visual Technology	31 to 40
Allison	20	Bachelor's Degree	Business	40 to 50
Samantha	24	Bachelor's Degree	English	51 to 60
Melissa	8	Doctoral Degree	English/Dance	31 to 40
Simon	12	Bachelor's Degree	Math	40 to 50
Robert	11	Bachelor's Degree	Math	40 to 50
Clara	7	Bachelor's Degree	Music	21 to 30
Kyle	8	Bachelor's Degree	Science	21 to 30
Alice	14	Doctoral Degree	Science	31 to 40
Daniel	18	Master's Degree	Social Studies	40 to 50
Bethany	10	Doctoral Degree	Social Studies	31 to 40
Angela	17	Master's Degree	Social Studies	40 to 50

Thomas

Thomas is a dynamic educator with nine years of teaching experience and a master's degree in his field. His specialty lies in audio/visual technology, where he not only imparts knowledge but also inspires innovation and creativity among his students. Thomas oversees an afterschool program for students to create and compete in video production contests. The program also focuses on giving back to the community through community service projects, reflecting Thomas's commitment to nurturing well-rounded individuals. His approach to

education combines technical proficiency with a strong ethical foundation, preparing students for professional success and civic responsibility. He highlights the initial difficulties:

> Navigating the transition to online learning was a tough time, not just for my students but for me as well. Trying to convert your classes to an online platform while also trying to learn how to use it was not easy. Then there was the difficulty of trying to foster the same level of collaboration and engagement in a virtual setting where kids can just turn you off was difficult. Despite the initial hurdles, though, I eventually got everything sorted out.

Allison

Allison is a seasoned business teacher with 20 years of experience in the field, holding a bachelor's degree. Her teaching philosophy is grounded in efficiency and practicality, valuing straightforward methods that have stood the test of time. While not naturally inclined towards new technologies, Allison's pragmatic approach to teaching business principles focuses on the core fundamentals, preparing her students with the essential skills needed for the real world. Despite her reservations about adopting new technologies, the transition to distance education during the COVID-19 pandemic showcased her adaptability. Allison embraced the challenge, recognizing the benefits of streamlined processes and the potential for technology to facilitate learning in unexpected ways. She pointed to the benefits that instructional technology can provide:

> The shift to online learning initially felt daunting, given my traditional approach to teaching. However, I was pleasantly surprised by the simplicity and efficiency it introduced into our daily routines. It forced me out of my comfort zone, yes, but it also revealed the potential of technology to simplify tasks and focus on what truly matters in

> education. In a way, it allowed me to do more with less, though I could have used a lot more help understanding it all.

Samantha

Samantha is an esteemed English teacher with a wealth of experience, having dedicated 24 years to the profession with a bachelor's degree to her name. Her teaching journey is marked by a deep passion for the English language and literature, coupled with a firm belief in the transformative power of teacher-student relationships. Samantha's traditional approach to teaching emphasizes the richness of direct interaction, the nuance of literary exploration, and the critical importance of fostering personal connections within the learning environment. Although the rapid integration of instructional technology presented a steep learning curve for her, Samantha's commitment to her students' education remained unwavering. She tackled the challenge head-on, demonstrating a willingness to evolve alongside the educational landscape while advocating for the essence of engaged learning. Samantha shared that her main concern was maintaining the relationship between teacher and student:

> Adapting to the new digital tools was not just about mastering technology; it was about finding ways to preserve the heart of teaching—the genuine connection between teacher and student. Even as we navigated these virtual spaces, my priority remained to ensure that every student felt seen, understood, and inspired. It reaffirmed my belief that education transcends the boundaries of physical and digital classrooms, rooted in the bonds we build and the lives we touch.

Melissa

Melissa, an innovative educator with eight years of experience and a Doctoral Degree, brings a fresh perspective to teaching English and Dance. Her approach is characterized by a

dynamic integration of technology and creativity, always seeking new methods to engage her students in a deep and meaningful way. Melissa understands the challenges of capturing student attention in a digital age. She skillfully leverages the latest trends and technologies, such as competitive games and social media platforms, to enrich her curriculum. Her forward-thinking strategies make learning interactive and fun and significantly broaden her students' horizons, allowing them to explore and access a diverse array of resources and experiences. This blend of artistic expression and digital innovation defines Melissa's teaching, making her classroom a vibrant space where technology amplifies creativity and learning. Melissa noted the possibilities that technology can provide:

> The digital era has opened up unprecedented avenues for enriching education, allowing us to blend traditional learning with the captivating power of current trends. By incorporating tools like social media or competitive games into our lessons, we not only engage students but also deepen their understanding of content through the lens of their own interests. This synergy between technology and education has transformed how we teach and learn, making the classroom an exciting frontier.

Simon

Simon is a math teacher with 12 years of teaching experience and a bachelor’s degree, known for his dedication and innovative approach to education. Despite initial frustrations with the minimal training provided for new technologies, Simon’s journey through the challenges of distance learning has been transformative. His initial skepticism gave way to a proactive stance on embracing new tools and methods, demonstrating remarkable adaptability and openness to change. This shift not only enhanced his teaching practices but also served as an inspiration to his students, showcasing the value of perseverance and continuous learning. Simon’s willingness

to explore and integrate technology into his math curriculum has improved his effectiveness as an educator. Still, it has also enriched the learning experience for his students, making complex concepts more accessible and engaging. Simon reflected:

> The transition to online during COVID-19 was initially daunting, but it ultimately empowered me to develop as a teacher. It taught me the importance of being open to change and the potential of technology to transform the way we teach. I embrace challenges and I try to get my students to do the same. I think we learned a lot from that time period, and it has allowed us to provide new approaches to learning for a lot of our students.

Robert

Robert is an insightful educator with a profound understanding of the transformative power of education. He holds a bachelor's degree with 11 years of teaching experience in two different countries. His teaching philosophy is centered on challenging students to step beyond their comfort zones, a belief that has guided his approach to harnessing technology in the classroom. Robert recognizes the vast potential of digital tools to broaden students' horizons, making them more aware of the world around them. His adaptability came to the forefront during the shift to online learning, where he encountered the common issue of disengagement. This challenge prompted him to innovate and adopt a student-centered approach, emphasizing active participation and personal accountability. By shifting the focus onto his students and leveraging technology, Robert not only maintained the integrity of the educational experience but also enhanced it, ensuring that each student felt involved and valued. Robert shared:

> The transition to online learning reaffirmed my belief in the importance of pushing boundaries. I realized that technology isn't just a tool for delivering content; it's a medium that has to be approached carefully. I found that given the chance, many students just

> tuned out and tried to find the fastest way to complete an assignment. Without you there to ensure they stayed on task, many fell behind. I eventually learned how to tailor my courses to be student-centric, forcing them to be the catalyst for encouraging exploration and learning.

Clara

Clara was the youngest educator with seven years of experience and a bachelor's degree in music. Initially confronted with the challenge of converting her music programs into digital mediums, Clara likened the experience to an experimental process, searching for the most efficient strategies to enhance her instructional methods. Clara advocates for comprehensive support in technology use, highlighting the need for direct IT assistance and training:

> When we pivoted to online learning, it felt like navigating a ship through uncharted waters, especially for someone relatively new to teaching. The challenge wasn't just about using technology but integrating it in a way that would engage the students. The technology was not designed for students to sing in chorus, and it was difficult to find a way to maintain the level of mastery that we had in the classroom. I felt so alone at the start, and I would have loved to have had specialized training that would address the issues I was facing. The few training sessions we had were geared to the core classes, and I needed assistance with unique problems.

Despite the overwhelming nature of this transition, Clara tackled each obstacle with determination, gradually finding her footing in the digital classroom. Her experience underscored the importance of practical training and support to empower teachers to resolve technical issues independently and efficiently. This would ensure that technology serves as an enabler of education, not a barrier.

Kyle

Kyle is an enthusiastic science teacher with eight years of experience and a bachelor's degree, whose journey in education is marked by a continuous pursuit of efficiency. This desire outlined his approach to the initial transition and the myriad of issues that followed:

> The transition to online learning highlighted the fact that many of our students held different levels of computer knowledge and access to the internet. Encountering issues like internet outages and platform glitches taught me the importance of being prepared for the unexpected and the value of patience. These challenges reinforced my resolve to ensure that every student has the opportunity to succeed, emphasizing the need for equitable access to education. Due to the quarantine, I had to redefine my expectations on a student-by-student basis because they were not all receiving an equal opportunity at an education.

Kyle's pragmatic approach to these challenges helped ensure that education remains accessible and effective, even under less-than-ideal circumstances. His experiences, particularly with issues like unreliable internet access among his students, underscore the importance of flexibility and innovation in teaching. Kyle's commitment to overcoming these barriers has not only enhanced his own skills but also ensured that his students receive a quality education, regardless of their technological limitations.

Alice

Alice is a science teacher who brings a wealth of knowledge and experience to her classroom, backed by 14 years of teaching and a doctoral degree. Known for her hard work and passion, Alice sets high standards for her students, pushing them to excel and fostering an environment where resilience and excellence are cultivated. Beyond her commitment to her

students' academic achievements, Alice is deeply involved in enhancing the professional development landscape for educators, especially in the realm of instructional technology. Recognizing the gaps in teacher readiness exposed by the pandemic, she has taken a leadership role in promoting better training and understanding of educational technologies. Alice's initiative aims to equip teachers with the skills and confidence needed to integrate technology effectively into their teaching, ensuring that educators and students are prepared to thrive in a digitally evolving educational landscape. Alice shared her thoughts on her experiences during the transition:

> It was a mess in the beginning, and once it became apparent that we were going to be isolated for a while, I knew we needed better support for our staff. I started sharing what I was doing with my department, and I realized from their feedback that they were struggling to recreate the classroom experience through digital mediums. We set up weekly meetings where we shared our successes and failures. I kept the meetings going and have been getting support to help better prepare our staff in case we have to switch to a distance model again in the future.

Daniel

Daniel is a dedicated social studies teacher, holding a master’s degree and bringing 18 years of rich teaching experience to her classroom. Her educational journey is marked by a commitment to providing a comprehensive understanding of social dynamics, history, and cultures. High expectations and a deep belief in the transformative power of education characterize Daniel’s approach to teaching. Daniel’s ability to adapt and harness the potential of digital platforms has not only maintained but enhanced the connectivity and resourcefulness of her classroom. By integrating a variety of online resources and tutorials, she expanded her

students' access to knowledge, demonstrating a proactive approach to overcoming the barriers posed by the lack of a physical classroom. Daniel shared the following about her experience with the transition:

> The transition to online learning presented an opportunity to rethink how we connect with and inspire our students. It was a journey of discovery and learning to leverage technology as a bridge to an accessible educational experience. While there were a lot of issues in the beginning, it forced me to discover new ways to reach the students. I found lots of neat resources that allowed me to present information to my students, many of which I still use now that we are back in the classrooms.

Bethany

Bethany is an exceptional social studies teacher with 10 years of teaching experience and a recent Doctoral Degree. She dedicates a large amount of her time to her work, assisting with leadership roles and after-school sports and activities. Her initial experience with the COVID-19 transition was negative, attributing the problem to a lack of a defined direction and ineffective training. Bethany's resilience and commitment to her students' learning experiences led her to seek out new ways of structuring her courses. She innovatively adopted the flipped classroom model, allowing her students to engage with materials at their own pace outside of class, thereby fostering a more dynamic, student-centered learning environment upon their return. Bethany shared her thoughts on the transition:

> Adapting to the new normal of distance learning pushed me to explore and implement innovative teaching methods. The transition was challenging, but it reinforced the importance of flexibility and the willingness to embrace change. I experimented with a variety of methods before settling on a flipped classroom model. It took a while to get the

kids to buy into the process, but they finally started to latch onto the process once they grasped how it functioned.

Angela

Angela, with 17 years of teaching experience and a master's degree in social studies, brings a realistic and critical perspective to the use of technology in education. In her classroom, Angela strives to create a balance between leveraging technology for educational benefits and fostering an environment where deep, thoughtful engagement with material is prioritized. Her approach involves both the use of digital tools and the cultivation of critical thinking and problem-solving skills, encouraging students to engage with content more meaningfully rather than resorting to superficial methods of completion. Angela talked about the many pitfalls and adjustments that needed to be addressed during the pandemic:

> The digital age has brought incredible resources to our fingertips, but it also presents unique challenges in ensuring that technology enhances rather than detracts from learning. Our students tend to gravitate to the quickest way to complete tasks when given the chance. The pandemic removed our ability to be present with the students, allowing them to circumvent the learning process for many of our lessons. It's crucial to develop strategies that encourage students to engage deeply with the material, recognizing the difference between merely accessing information and truly understanding it. As educators, we need to be mindful of the ways technology influences learning dynamics and strive to foster environments that promote genuine intellectual curiosity and engagement.

Results

This transcendental phenomenological study sought to explore and describe the experiences of secondary school teachers during the rapid implementation of instructional technology amidst the COVID-19 pandemic. Centered on the primary research question: What are the perceptions and experiences of secondary school teachers when integrating instructional technology into their classroom practices? The following supporting research questions were included to help conceptualize the experiences of the participants: 1) How do secondary school teachers' attitudes and beliefs towards instructional technology influence their adoption and implementation in the classroom? 2) What challenges do secondary school teachers encounter when incorporating instructional technology into their classroom routines? 3) How do secondary school teachers' attitudes and beliefs towards instructional technology influence their adoption and implementation in the classroom? The data analysis began with open coding, identifying key ideas and concepts that emerged from the participants' experiences. This was followed by axial coding, which helped to connect these ideas to form broader themes. This methodical approach to coding ensured a thorough exploration of the teachers' perspectives.

Theme Development

The collected data was triangulated, and themes and subthemes emerged. Three principal themes discovered in this study are as follows: (a) adaptation to rapid technology changes, (b) challenges in technology integration, and (c) impact on teaching practices and beliefs. Each theme represents a significant aspect of the teachers' experiences with instructional technology during the COVID-19 pandemic.

Table 2

Themes and Sub Themes

Theme	Aligned Subthemes	
Adaptation to Rapid Technology Changes	Learning Curve and Resourcefulness	Embracing Innovation
Challenges in Technology Integration	Technical Difficulties and Support Needs	Resistance and Acceptance
Impact on Teaching Practices and Beliefs	Pedagogical Shifts	Evolving Educational Beliefs

Adaptation to Rapid Technology Changes

During the COVID-19 pandemic, secondary teachers experienced a rapid introduction and integration of new instructional technologies as they transitioned from the classroom to a distance learning model. The sudden transition required educators to swiftly adapt their teaching methods and embrace digital tools, often with limited preparation or support. This adaptation phase was marked by a range of experiences, from initial struggles to eventual proficiency. Teachers spoke of the challenge of not only learning new technologies but also redesigning their curriculum to fit an online format. Many highlighted the need for flexibility and creativity in this process. Melissa said, “Keeping the student's attention was an issue; I started using software like Kahoot, Blockit, and other competitive games, which helped capture their interest for a substantial period.” Allison added,

> For me, it was trial and error, and sometimes it was a hot mess. For instance, I would plan around using a specific technology, and it would just not work, or half the class would be unable to access it and then I would have to pivot to keep everything going.

Similarly, Alice remembered,

> The first time I projected a lesson through Zoom, I felt like a novice all over again, fumbling through buttons and menus. It was the students who helped me get through the

> process, and with their help, we made it through that first day. I spent the whole night searching the internet to figure out how to avoid repeating that disaster. In the end, I ended up relying on my students when I ran into technical problems.

These narratives underscore the resilience and innovative spirit teachers demonstrate in the face of unprecedented educational challenges.

Learning Curve and Resourcefulness

The initial challenges teachers faced as they navigated the rapid transition to digital learning during the COVID-19 pandemic reflect their adaptability and ingenuity when confronting the myriad of new obstacles. Bethany explained, “At first, it was negative because we had so much new technology available without enough training; learning how to transition the technology into effective teaching slowly was a difficult process”. Some participants reveal a period of adjustment where educators had to balance their pedagogical objectives with the technical demands of online platforms. Over time, their persistence in overcoming technological hurdles enhanced their proficiency and fostered a sense of resourcefulness, enabling them to transform their virtual classrooms into dynamic, interactive learning environments. For example, Kyle explained, “With any new platform, there’s always some learning curve for both the students and myself. Knowing how to adjust your learning goals to equate for the obstacles was part of the initial challenge during the shift.”

Despite these obstacles, they demonstrated remarkable resourcefulness in their approach. They creatively utilized available digital tools and improvised solutions to ensure effective teaching and student engagement in the new online environment. Educators engaged in a trial-and-error process, constantly tweaking and refining their methods to discover what worked best for their students. Clara shared, “I think initially the biggest challenge was figuring out the most

efficient way to use the new technology effectively, it was just like throwing darts at the board and seeing which ones stuck for a little bit." This exploratory attitude towards teaching and technology integration underscores a significant shift from a one-size-fits-all teaching model to a more flexible, student-centered approach.

Embracing Innovation

For the teachers in this study, innovation is a dynamic process involving actively pursuing and applying new ideas and technologies to foster growth and improvement. It is not merely about adopting what is current or trendy; it's about the thoughtful integration of breakthroughs and advancements that can lead to substantial progress and efficiency. Melissa explained,

> The possibility to captivate student interest is big. Whenever I feel like I can ride that high of a current trend, I stop and plan it out. I'm going to make an entire project about TikTok dances and the viral nature of art and stuff to pull the students into the learning goals.

Embracing innovation requires a level of risk-taking and a willingness to fail and learn from those failures. The process is about fostering a collaborative environment where ideas are shared freely, and innovative ideas are encouraged and cultivated. Robert shared, "So I think it is important to push students out of their comfort zone to help transform them. Technology is helping expand students' awareness of the world, and that needs to be harnessed."

The change to a distance learning platform helped some of the teachers in this study to connect with others outside their regular network. By utilizing the available technology, educators could work together and pool their knowledge, resources, and experiences to

spearhead initiatives that transform their teaching and, ultimately, elevate their students' learning experiences. Daniel shared,

> So, the technology platforms that we were using allowed us to connect with people and students outside of our community. This allowed me to provide the students with all kinds of free resources and tutorials to help assist them due to the lack of a physical classroom.

Challenges in Technology Integration

As teachers found themselves in a new teaching paradigm, they faced the reality of integrating various platforms and applications, often without adequate training or support. This lack of preparedness sometimes led to a disjointed educational experience, both for teachers and students. Simon explained, “One of the frustrating challenges that I remember was the quality of training where they only taught us the bare minimum.” Samantha added,

> The biggest challenge was learning how to use the instructional technology because I began teaching so long ago. I find myself having to ask someone else how to use the programs they give us because I am not as fluent with technology.

Alice shared her experience,

> I spent hours preparing a project for my kids to complete, only to discover that they could not install or run the program from their school-issued Chromebooks. It never occurred to me that the computers we gave them would be unable to run a program that I was able to run on my school laptop.

Teachers also struggled to ensure instructional technology did not get in the way of pedagogical effectiveness while they mastered new technologies. Teachers had to balance their time between learning to use these tools and applying them in ways that benefitted students' learning. Robert

provided, “At first, it felt like I was becoming a part-time IT specialist instead of a teacher. I spent more time each day troubleshooting students' computer issues than I did going over the lesson.” Samantha said, “I think it takes away from student-teacher engagement because the learning process is more than just memorizing terms, strategies, and everything. I think the relationship between the teacher and students is a large part of the learning process.”

Technical Difficulties and Support Needs

While new instructional technology brings the potential for improving the learning experience, it also contains difficulties and issues that traditional classrooms normally do not encounter. This encompasses a range of issues, from software glitches and hardware failures to students affected by the digital divide, all of which present formidable obstacles in the seamless delivery of education. Kyle explains,

> While I have a working LAN connection, not all of my students do. What do you do when they do not have a working device in their home? For example, I was going to give a quiz using our technology platform when ten minutes before the quiz, a large portion of my students lost their internet access, then halfway through the quiz, the platform went down.

These challenges underscore the vulnerability of relying heavily on digital platforms, where a single technical fault can derail an entire class, highlighting the importance of having robust technical backup systems in place.

Moreover, the need for support extends beyond technical assistance to administrative and peer-based support systems. Teachers express a desire for more comprehensive training sessions that not only cover the basics of new technologies but also delve into advanced functionalities to leverage these tools in an educational setting fully. Clara stated,

> I feel like we need some classes on how to use the technology, and maybe not just classes, but full-on support where we could have IT come in and walk me through my issues and provide me with the tools, I need to fix common problems without having to wait weeks to get something working again.

Such training should be ongoing, reflecting the evolving nature of technology and its applications in education. Additionally, establishing a supportive community where educators can share insights, tips, and solutions is invaluable. This peer-based support network fosters a collaborative environment, encouraging teachers to experiment with and confidently adopt innovative teaching methods. Thomas adds,

> Having new technology is great, but I do not have enough time to teach myself how to use it. When I do receive training, it is basic general use and does not go to the depths that I would need to effectively use it in my classroom. I often learn more about the technology from different faculty than I do from the training.

Resistance and Acceptance

Resistance often stems from a natural human inclination to avoid change, especially when such change disrupts established routines and practices. This resistance is not merely a stubborn refusal to adapt but is rooted in deeper concerns about efficacy, relevance, and the potential overshadowing of traditional pedagogical methods. Teachers express apprehensions about whether new technologies can truly enhance learning outcomes or if they might inadvertently dilute the quality of education by prioritizing flashy tools over substantive content. Samantha explains,

> While technology is a wonderful tool, it kind of takes away from the relationship the teachers are able to have with the students. It also assists our children in being dishonest.

> I have had issues with students copying and sharing work through our instructional platform and claiming it was their own.

Angela added,

> They can watch these videos, but they have to answer questions and it's fantastic. And I'm like, yeah, but they're just going to skip to the question and Google the answer and then click it and then skip to the next question and Google the answer. And that's what they do, right?

However, as teachers navigate the initial phases of technology integration, their experiences contribute to a gradual process of adaptation and, in many cases, acceptance. This transition is significantly influenced by the level of support and training provided, the perceived benefits of technology for student engagement and learning, and the opportunity to experiment and witness firsthand the positive impacts of technology use in the classroom. Bethany shared,

> Eventually, I learned to embrace it. I started to have them screencast themselves, and the students were like, wow, you are really brave! I would never have been able to judge their presentation skills if I did not take that initial risk, and while it is scary each time, it did allow me to maintain a certain level of rigor that was lost with distance learning.

Impact on Teaching Practices and Beliefs

As secondary school teachers grapple with the rapid deployment of these technologies, especially during the COVID-19 pandemic, their pedagogical practices undergo substantial transformations. These changes are not merely operational but deeply influence the core beliefs and philosophies that underpin their approach to teaching. The shift to digital tools and platforms necessitates a reevaluation of traditional teaching methods, compelling educators to explore more

interactive, student-centered learning paradigms that leverage the capabilities of modern technology. Simon explains,

> Well, I think that it has encouraged me to not be afraid of new technologies but to actually be encouraged to try and to use them as best as I can. I think that it's made me a more open teacher.

Thomas adds,

> If we do not like the technology, they pick up on that vibe and it just spirals from there. To make it work, you have to have a certain level of buy-in or you are setting the technology up to fail.

Teachers' beliefs about the role of technology in education play a critical role in this transition. Those who view technology as a powerful enhancer of student engagement and learning outcomes are more likely to integrate it effectively into their teaching strategies.

However, the integration of technology also challenges deeply held beliefs about the nature of teaching and the teacher's role in the classroom. For some educators, relinquishing control and allowing students to take a more active role in their learning through technology can be a daunting prospect. This tension between traditional teacher-centered methods and the emerging demand for student-centered approaches reveals the complex interplay between technology, teaching practices, and educational beliefs. Samantha explains,

> My experience is that I need more practice, or I need more professional development with technology. In my experience, my students achieve more without it, so overall, in my classroom, technology is not a prominent thing. We use it, but we do not use it a lot.

Pedagogical Shifts

The integration of new instructional technologies into classrooms has catalyzed significant pedagogical shifts, compelling teachers to reevaluate and adjust their instructional strategies and methodologies. These changes are reflective of a broader movement towards more dynamic and interactive learning environments, where technology serves not just as a tool for information dissemination, but as a platform for fostering deep engagement and personalized learning experiences. Melissa explains, “The biggest thing I noticed that technology has assisted with is in my core subject area. The range of things that the students are able to access, see, and try has skyrocketed.” Allison adds, “I have seen growth in both the excitement and willingness to do reviews. The interactivity of the technology applications has made a notable difference in the participation of certain classroom routines.”

Teachers have increasingly moved away from traditional lecture-based methods towards more student-centered approaches that leverage technology to facilitate interactive and collaborative learning experiences. This shift has seen the adoption of blended learning models, where digital resources and online platforms complement in-person instruction, allowing for a more flexible and accessible learning environment. Bethany shared, “I started using new approaches to my classes while trying to find a way to maintain an acceptable level of rigor. One I found very useful during the pandemic was the flipped classroom model.” Robert added, “I found that my normal methods were not working when students would just leave their cameras off. I had to adopt a different approach by shifting the focus to them.”

Evolving Educational Beliefs

As teachers navigate the complexities of integrating digital tools into their classrooms, many have experienced a transformation in their pedagogical beliefs, recognizing the potential of

technology to enhance student learning outcomes and engagement. Daniel states, “Initially, I was super nervous about the instructional technology because, again, I thought my students would run rings around me with this, and that's not been the case.” Teachers who may have initially been skeptical about the effectiveness of technology in education have, through firsthand experience, come to appreciate its ability to provide diverse and dynamic learning opportunities. Allison shared,

> In the beginning, I did not think I would be able to handle the change. I did not think the tools provided would be enough, and in some ways they were not, but as it went on student engagement increased and it allowed me to explore different things.

The transition to online and blended learning environments, especially during the COVID-19 pandemic, underscored technology's capacity to maintain educational continuity and access. This experience has broadened teachers' perspectives on the indispensability of technology in fostering an adaptive and resilient educational system.

Participants noted the successful integration of technology has led to reevaluating the teacher's role in the learning process. Educators are shifting from being the sole source of knowledge to facilitators of learning, guiding students through personalized learning paths enabled by technology. This shift has fostered a more collaborative and student-centered classroom environment, where students are encouraged to take ownership of their learning, explore subjects more deeply, and develop critical thinking and problem-solving skills. Bethany explains, “The new approach allows students to engage with material at their own pace before class, promoting a more active and student-centered learning environment.” Angela added, “After researching strategies on a flipped classroom, I knew that was what I needed to do. The change increased the scope of available technology and learning opportunities.”

Outlier Data and Findings

In exploring secondary school teachers' perceptions and experiences with integrating instructional technology, most findings aligned closely with the anticipated challenges and impacts on teaching practices. However, the researcher also revealed significant outliers that demand our attention. These outliers, (a) speculations on the future of education, (b) the health implications of prolonged screen time, and (c) the ethical dilemmas surrounding academic integrity present a multifaceted view of technology's role in education. They underscore the need to consider the broader implications of digital tools on students' well-being and the integrity of the learning process, beyond the immediate pedagogical benefits and challenges.

S*peculations on the Future of Education*

One participant speculated on the future of education, raising poignant questions about the trajectory of technological integration in schools. A scenario where reliance on technology not only reshapes teaching methodologies but also fundamentally alters the educational landscape, potentially leading to environments where human interaction is minimized in favor of digital learning platforms. This speculation underscores a critical crossroads: the balance between leveraging technology for educational advancements and preserving the essence of traditional, interaction-rich educational environments. Kyle offered,

> Looking at what has happened, and were we seem to be going, I worry that the lack of teachers and resources will lead us to placing the students into auditoriums where they will complete their classes on Chromebooks, or similar devices.

The perspective invites a reflection on the implications of such a shift, highlighting the need for a thoughtful approach to integrating technology in a way that enhances rather than diminishes the educational experience. It also prompts a broader discussion on the sustainability of educational

models heavily reliant on technology, questioning how such shifts might impact the role of teachers, the nature of student engagement, and the overall quality of learning.

Health Implications of Screen Time

A few participants shared concerns about the health implications of screen time and shed light on an essential aspect of technological integration in education. They emphasize the potential adverse effects of excessive exposure to screens, including physical strain, diminished attention spans, and the broader impact on students' mental health. Their insights underscore the importance of finding a balanced approach to using technology in the classroom, one that maximizes its benefits for learning while minimizing negative health outcomes. Clara shared, “I worry about the amount of work that we do on computers, like students doing all their work on a screen is probably not the most healthy.” Angela added,

> So I have noticed now, that the students seem to have an addiction to their devices. For example, when you have them put them away, they pull them back out without realizing it; many of them are addicted in a way that is disturbing.

This discussion points towards the necessity of incorporating digital wellness strategies into educational planning, ensuring that technology serves as a tool for enhancing learning without compromising students' well-being.

Academic Integrity and Ethical Use of Technology

A few participants shared concerns highlighting a critical aspect of technology in education: the challenge of maintaining academic integrity in the digital age. They point to the ease with which students can access information and potentially misuse technology for dishonest purposes, such as plagiarism or cheating. Samantha explains,

> We have a problem with students having their Chromebooks, their technology, and then another big factor is the ability of students to actually be dishonest when using certain programs. Because yes, there are some programs where students are able to actually obtain answers to assignments, and so it doesn't help them to cheat, but they will.

Bethany added, “But it is also really easy to fake your way through a lot of online assignments and even writing now.” This issue underscores the need for educators to develop strategies that not only leverage technology for learning but also instill ethical practices among students.

Research Question Responses

One central research question and three sub-research questions guided this transcendental phenomenology study to explore the lived experiences of secondary teachers during the rapid implementation of new instructional technology amidst the COVID-19 pandemic.

Central Research Question

What are the experiences of secondary teachers who have participated in the rapid implementation of instructional technology during the COVID-19 pandemic? The participants’ overall perspective is that they faced a swift transition to digital platforms during the COVID-19 pandemic, requiring rapid adaptation and innovation. Their experiences ranged from initial struggles that they attributed partly to a lack of training, to eventual proficiency, highlighting resilience and a shift towards more interactive and student-centered teaching methods. Simon explained,

> The shift to online learning was like a sudden switch from football to track. Instead of strategizing as a team, we were racing against time, individually trying to figure out how to make everything work. It was challenging, but we ended up overcoming the initial hurdles. Just like in sports, we had to adapt to the new environment and learn new ways

to achieve our goals.

Despite initial challenges, many participants observed significant benefits in flexibility, access to diverse resources, and the ability to connect with students in novel ways. Furthermore, this transition has sparked a broader conversation about the future of education, encouraging educators to rethink traditional teaching methods and consider the potential of blended learning models that incorporate both in-person and digital elements.

Sub-Question One

How do secondary school teachers perceive the effectiveness of instructional technology in enhancing student engagement and learning outcomes? Participants perceived instructional technology as effective for enhancing student engagement and learning outcomes, especially when using interactive tools and games. The shift to online learning also fostered creativity and flexibility in teaching methods, contributing to a more dynamic learning environment. Many participants highlighted the importance of leveraging technology to personalize learning experiences, making it possible to cater to their students' varied learning styles and needs. For example, Melissa explained,

> The possibility to captivate student interest is big. Whenever I feel like I can ride that high of a current trend, I stop and plan it out. I'm going to make an entire project about TikTok dances and the viral nature of art and stuff to pull the students into the learning goals.

Sub-Question Two

What challenges do secondary school teachers encounter when incorporating instructional technology into their classroom routines? The main challenges included inadequate training, technical difficulties, and the digital divide among students. These issues sometimes

hindered the seamless integration of technology and impacted the educational experience, underscoring the need for better support and infrastructure. The participants expressed concerns about maintaining student engagement and participation in a virtual environment, as the lack of physical presence made it more challenging to gauge and respond to students' needs effectively. The rapid shift also highlighted the importance of digital literacy for students and educators, prompting a call for ongoing professional development opportunities focused on instructional technology. Samantha provided a prime example of this when she explained,

> The biggest challenge was learning how to use the instructional technology because I began teaching so long ago. I find myself having to ask someone else how to use the programs they give us because I am not as fluent with technology.

Balancing screen time with traditional learning methods emerged as a challenge, with teachers striving to find effective blends of digital and non-digital activities to maintain a healthy and productive learning environment.

Sub-Question Three

How do secondary school teachers' attitudes and beliefs towards instructional technology influence their adoption and implementation in the classroom? The participant's attitudes and beliefs played a crucial role in adopting instructional technology. Initial resistance due to comfort with traditional methods gave way to acceptance, and many of the participants witnessed the benefits of technology for student engagement and learning. The evolution of the participants' perspectives was often marked by a growing recognition of the potential of technology not only to supplement but also to transform educational practices, leading to more innovative and interactive teaching strategies. Furthermore, teachers who embraced a growth mindset found

themselves more willing to experiment with new tools and approaches, viewing challenges as opportunities for learning and professional development. Bethany shared,

> Eventually, I learned to embrace it. I started to have them screencast themselves, and the students were like, wow, you are really brave! I would never have been able to judge their presentation skills if I did not take that initial risk, and while it is scary each time, it did allow me to maintain a certain level of rigor that was lost with distance learning.

Summary

This chapter introduced the participants of this study and explored their experiences with the rapid implementation of instructional technology during the COVID-19 pandemic. Employing a qualitative analysis, the study identified key themes that were developed using Moustakas' (1994) transcendental phenomenological approach around the effectiveness of instructional technology in enhancing student engagement and learning outcomes, the challenges encountered in integrating these technologies into educational practices, and the pivotal role of teachers' attitudes and beliefs in adopting and implementing digital tools. The findings reveal that despite initial hurdles such as inadequate training and technical difficulties, many of the participants recognized the potential of instructional technology to foster a more interactive and personalized learning environment. A significant insight from the study is the transformation in teaching methodologies, with educators moving towards more student-centered approaches and leveraging technology for innovative instructional strategies. This shift not only addressed the central research question but also highlighted the importance of support and professional development in facilitating the effective use of instructional technology. The resilience and adaptability of teachers emerged as crucial factors in navigating the challenges presented by the

pandemic, ultimately contributing to an enhanced educational experience that could shape the future of teaching and learning in a post-pandemic world.

CHAPTER FIVE: CONCLUSION

Overview

The purpose of this transcendental phenomenological study was to describe the lived experiences of secondary teachers who had undergone rapid instructional technology turnover in the transition from a traditional classroom environment to a digital secondary classroom during the COVID-19 pandemic in an urban area in southeast Georgia. The 12 participants in this study brought forward their unique narratives, highlighting the multifaceted challenges and opportunities presented by this abrupt shift. This chapter, through meticulous analysis, interprets these findings, situating them within the broader context of educational research and practice. It is organized into five discussion subsections that encompass the interpretation of findings, implications for policy and practice, theoretical and methodological implications, limitations and delimitations, and recommendations for future research. The chapter aims to refine the study's findings, presenting a detailed discussion that bridges the gap between the lived experiences of teachers and the implications for the educational field. A final summary will conclude the chapter.

Discussion

This section begins with a comprehensive summary of the study's outcomes, aligning them with the developed themes and interpreting these considering theoretical and empirical frameworks. This analysis is grounded in the perspectives of secondary teachers, as captured through interviews, focus groups, and document analysis, providing a rich, nuanced understanding of their experiences. The themes identified reveal the complexities and challenges faced by educators, as well as the strategies they employed to navigate the abrupt transition to digital teaching platforms. The integration of Knowles's adult learning theory offers a lens

through which to view these experiences, highlighting the adaptive and self-directed learning approaches of the teachers in mastering new technologies for classroom integration.

Summary of Thematic Findings

Three themes and six subthemes emerged from this research study: (a) Adaptation to Rapid Technology Changes, including the subthemes of Learning Curve and Resourcefulness and Embracing Innovation; (b) Challenges in Technology Integration, including the subthemes of Technical Difficulties and Support Needs and Resistance and Acceptance; (c) Impact on Teaching Practices and Beliefs, produced the subthemes: Pedagogical Shifts and Evolving Educational Beliefs. Knowles's theory, which emphasizes the self-directed nature of adult learning, provided a critical lens through which to view teachers' efforts to navigate and master the demands of distance learning during the COVID-19 pandemic. The analysis highlighted that, despite initial hurdles such as inadequate training and technical difficulties, secondary educators were able to foster environments that were as engaging, interactive, and conducive to growth as traditional classrooms. This was achieved through a commitment to applying best practices, adapting teaching methods to meet the needs of the students, and ensuring active participation from all stakeholders—teachers, students, and parents alike. These conclusions are drawn from interviews, documentation, and group discussions and were further enriched by existing literature on adult learning and technology integration in education.

Adapting to rapid technology changes was a clear theme from the data analysis. The learning curve was steep as participants had to quickly learn new software and platforms, requiring a high level of adaptability. Despite these challenges, participants gradually recognized the value of digital tools, not just as temporary solutions but as lasting additions to their teaching

methods. This shift was gradual, rooted in trial and error, and reflective of a broader change towards more interactive, tech-based teaching approaches that better-met student needs.

Technology integration posed several challenges, including technical issues and the need for pedagogical and emotional support. Participants referenced technical glitches and limited access to necessary equipment, which often interrupted the learning process, underscoring the importance of comprehensive support for educators. Participants' reactions varied widely, from initial resistance due to unfamiliarity with new tools to eventual acceptance as the advantages for student engagement and learning outcomes became clear. This range of responses highlighted the overall shift in the education sector towards acknowledging the significant role of technology, spurred by the need to adjust to the unique circumstances brought about by the pandemic.

The impact on teaching practices and beliefs led to a significant shift towards student-centered learning enabled by digital tools. Participants shared their shift from traditional lectures to more interactive, collaborative teaching methods that used technology to boost student engagement and independence. This change was not just about using new tools but also about a fundamental shift in educational approaches, with a growing emphasis on adapting teaching to the current needs of the students. These changes in beliefs and practices represented a departure from traditional norms, driven by a commitment to address pandemic challenges and innovate education.

Critical Discussion of Findings

The findings of the researcher expand upon the literature by providing in-depth insights into the real-world implications of instructional technology integration during a crisis. Educators shared their experiences of adapting to new digital landscapes, highlighting the crucial role of

professional development in building technological self-efficacy and addressing barriers to technology adoption. Their stories reveal the significant emotional, psychological, and social challenges encountered, underscoring the need for a holistic approach to support that includes emotional well-being and community building. This discussion contributes to understanding how educators navigate and overcome the complexities of teaching with technology in times of upheaval, emphasizing the importance of resilience, adaptability, and innovative pedagogical strategies for engaging students remotely.

Alignment with Previous Studies

The study's findings align with established research, highlighting the significance of professional development, the intricacies of technology integration, and the application of adult learning theory in enhancing technological adoption by educators (Allen et al., 2022; Bragg et al., 2021; Curran et al., 2019; de Jong & Espadeiro, 2022; Dede, 2016;). It illustrates the pivotal role of tailored professional development in boosting educators' this section needs echnological self-efficacy and addresses the multifaceted barriers educators encounter when integrating technology, emphasizing the need for adequate resources and support. The study also confirms the effectiveness of aligning technology use with pedagogical challenges, as suggested by adult learning theory, enhancing educators' confidence, and engagement. This collective evidence underscores the necessity for professional development programs to be both comprehensive and specifically relevant, ensuring meaningful technology integration in educational settings.

Professional Development and Technological Self-Efficacy

Prior research underlines the critical role of professional development in fostering educators' technological self-efficacy and pedagogical adaptation (Choi et al., 2019; Culp-Roche et al., 2021; Kasalak & Dagyar, 2020; Tschannen-Moran & Hoy, 2001; Weißenfels et al., 2022;

Yang, 2021). Many of the study's participants expressed frustration with the lack of comprehensive training at the onset of the pandemic. The participants noted their struggles with adapting the new instructional technologies into their educational strategies, noting the necessity of trial and error to discover how to serve their students best utilizing new instructional technologies. These recounts align with past findings, showcasing the importance of implementing professional development tailored to the instructors' specific needs.

Barriers to Technology Integration

Past research shows that educators often face personal, structural, and pedagogical barriers when adopting new technologies (Akhter et al., 2022; Bedir, 2019; Bowman et al., 2022; Farjon et al., 2019; Lai et al, 2022; Schmitz et al., 2022; Valtonen et al., 2022). Participants of the study emphasized their struggles with adopting the new technology highlighting the lack of adequate resources, personal resistance to technology, and lack of technology based instructional strategies. The study participants who expressed a more positive experience indicated significantly less barriers to adopting new technologies which is in line with previous research studies (Akhter et al., 2022; Bowman et al., 2022; Schmitz et al., 2022; Valtonen et al., 2022). This correlation between resource availability and successful technology adoption underscores the need for comprehensive infrastructure and training programs tailored to educators' needs, facilitating smoother transitions to digital instruction.

Adult learning theory and technology Integration

Drawing from Knowles' Adult Learning Theory, prior research indicates that educators' willingness to integrate technology into their teaching is significantly influenced by their perception of the relevance of these tools to their instructional challenge (Cahapay & Anoba, 2021; Kuo & Belland, 2019). This principle suggests that teachers are more inclined to adopt and

effectively utilize technology when they recognize a clear link between technological tools and solutions to their pedagogical issues (Taghizadeh & Hasani Yourdshahi, 2020). Study participants expressed their increased confidence and engagement when utilizing technology that directly addressed their specific teaching needs and challenges. They noted that practical, hands-on training and examples of technology application in the classroom significantly enhanced their understanding and implementation strategies. This feedback reinforces the importance of designing professional development programs that are not only comprehensive but also contextually relevant, ensuring that technology integration is both meaningful and effective for educators.

Divergence from Existing Literature

The researcher's findings reveal significant departures from existing literature, particularly in addressing the emotional, psychological, and social challenges faced by educators during the transition to digital learning platforms. Unlike previous research that primarily concentrated on technical and pedagogical aspects, the researcher brings to light the stress, anxiety, and feelings of isolation experienced by teachers. It underscores the importance of incorporating emotional and psychological support, as well as fostering a sense of community among educators, into professional development initiatives. This comprehensive approach is essential for addressing both the tangible and intangible barriers to effective technology integration in education.

Emotional and Psychological Impact on Teachers

Previous research has focused on technology integration challenges from technical and pedagogical perspectives, often overlooking the emotional and psychological effects on teachers (Almusharraf & Khahro, 2020; Barton & Dexter, 2020; Cooper et al., 2020; Ewing & Cooper,

2021; Paulus et al., 2020). The researcher reveals that teachers experienced significant stress, anxiety, and uncertainty as they adapted to new digital teaching methods. Participants expressed feeling overwhelmed by the rapid shift to online learning and the steep learning curve. Their experiences underscore the importance of incorporating emotional and psychological support into professional development programs, highlighting a gap in current research and practice for a holistic approach to technology integration in education.

Professional Isolation and the Need for Community Support

Earlier research has often neglected the social aspects of technology use in education, focusing more on its technical and instructional impacts programs (Bragg et al., 2021; Curran et al., 2019; Ovcharuk et al., 2022; Powell & Bodur, 2019). The researcher, however, sheds light on the sense of professional isolation teachers felt while adapting to remote teaching, disconnected from their colleagues and the usual school environment. Such isolation was found to negatively impact their well-being and reduce opportunities for collaboration and support. Participants highlighted the importance of community and collaboration, indicating a need for professional development initiatives to emphasize strategies that enhance connectivity and community among educators, addressing the isolation experienced during remote teaching.

Extension of Research

This research expands upon existing studies in key areas: transitioning educational paradigms towards technology-centric pedagogy and developing innovative strategies for student engagement in remote learning. It highlights the necessity for educators to adapt their teaching practices to incorporate digital tools effectively, moving beyond traditional methods to foster interactive and engaging learning experiences. Additionally, it emphasizes the importance of creative approaches to maintain student interest and participation in remote settings,

underscoring the need for continuous innovation in pedagogical strategies to address the diverse needs of learners in the digital age.

Shift in Educational Paradigm towards Technology-Centric Pedagogy

Past research suggested that the shift towards a technology-centric pedagogy marks a transformative period in education, where digital tools are not just supplements but core components of teaching strategies (Bernacki et al., 2020; Farjon et al., 2019; Liu et al., 2020). This evolution requires educators to not only master new technologies but also to rethink their pedagogical approaches to foster a more interactive, engaging learning environment (Cataudella et al., 2021; Culp-Roshe et al., 2021). The integration of technology into curriculum design emphasizes the need for a holistic understanding of how digital tools can enhance learning outcomes, promoting a shift from traditional teaching methods to innovative, technology-driven educational models.

Innovative Strategies for Student Engagement in Remote Learning

Prior research recognizes that engaging students in remote learning environments presents unique challenges and opportunities for innovation (Dong et al., 2020; Bernacki et al., 2020; Szymkowiak et al., 2021). Strategies such as gamification, interactive multimedia content, and virtual collaboration platforms have been identified as effective means to maintain student interest and participation (Anderson et al., 2017; Barbour, 2016; Cheng, 2019; Cheung Ruby Yang, 2017; Chung, 2018; Engin, 2014; Kozikoglu, 2019). These methods underscore the importance of adaptability and creativity in lesson planning, ensuring that remote learning is not only accessible but also dynamic and engaging. The focus on student engagement highlights the necessity for educators to continuously explore and implement new strategies that leverage technology to meet the diverse needs of learners in a digital age.

Implications for Policy or Practice

This investigation has unveiled insights that carry significant implications across theoretical, empirical, and pragmatic dimensions for educators, administrators, and policymakers involved in digital education. Drawing from the collective experiences of the pandemic-driven shift to online learning, it's evident that with the right blend of support and resources, educators can effectively navigate the complexities of digital platforms to foster environments conducive to student engagement and learning (Bragg et al., 2021; Powell & Bodur, 2019). Essential to this process is the provision of continuous professional development and a supportive community that champions collaboration and shared learning among teachers (Allen et al., 2022; Chaipidech et al., 2022; Martin et al., 2019). This section delves into the policy and practice implications, informed by the data and discussions explored in this study, emphasizing the critical role of sustained support, training, and the cultivation of a collaborative educator community in realizing the full potential of digital education.

Implications for Policy

The findings of this research indicate the potential for significant impact on policy. Policies directly influence everyday educational practices and strategies, underscoring the necessity for supportive measures that enable the effective integration of technology in teaching. This research underlines the importance of crafting policies that bolster professional development and technological accessibility. The researcher found implications for school districts and higher education.

Implications for School Districts. Three main implications can be drawn from this study regarding potential school district policies on enhancing professional development. First, a comprehensive approach to professional development that includes ongoing training and support

in digital literacy and innovative instructional strategies for distance educational models is essential. All participants supported the idea of regular professional development sessions dedicated to provide instructional strategies for distance education and training on instructional platforms. Participants also supported the idea of monthly or quarterly E-Learning days to help maintain the readiness of all stakeholders. An E-learning day would allow stakeholders to practice a distance learning model and report any issues in a low-stakes environment.

Second, policies should prioritize equitable access to technology for all stakeholders. Participants also noted that while the COVID-19 pandemic had forced the district to provide a laptop to every student, it did not fully address all issues that prevented some students from accessing their classes. Three of the participants reported issues of students being unable to access digital instruction due to inconsistent internet access. Equitable access involves not just the provision of digital devices but also ensuring reliable internet connectivity and access to quality digital content. Policies should aim to eliminate the digital divide by targeting resources and support to underserved communities, thereby fostering an inclusive learning environment. Training and resources should be provided to educators to effectively integrate technology into their teaching, ensuring that all students, regardless of their background, can benefit from digital learning opportunities.

Finally, continuous evaluation and upgrading of digital infrastructure should be maintained to keep pace with technological advancements and evolving educational requirements. Policies should not only support the maintenance of digital infrastructure but also facilitate structured shifts to distance education models when necessary. This approach ensures that educational institutions can adapt quickly to changing circumstances, such as those prompted by global challenges or advancements in educational technology while addressing the

concerns of the participants. Emphasizing resilience and flexibility, these policies should encourage the adoption of cloud-based solutions, robust data protection measures, and scalable digital platforms. Engaging with the latest in educational technology and digital tools will enable institutions to offer diverse and effective learning experiences, regardless of physical location.

Implications for Higher Education. The transition to distance educational models during the COVID-19 pandemic has underscored the emergence of new teaching paradigms, necessitating a reevaluation of how pre-service teachers are prepared for their future roles. Ensuring pre-service teachers are adept at teaching in a digital environment is crucial. Policies should mandate the integration of digital educational strategies and platform proficiency into teacher training programs. This approach guarantees that new educators can effectively manage distance learning, providing a foundation for their future teaching careers. Adopting policies that broaden the curriculum to include digital educational strategies equips pre-service teachers with essential skills for engaging students in virtual classrooms. Such measures are fundamental in preparing educators to deliver quality education across various digital platforms, addressing the dynamic needs of modern learners.

Implications for Practice

The findings from this research underscore the need for teachers and administrators to actively engage in practices that support the effective integration of technology within the educational landscape. The experiences of the participants yielded insights that should have a direct influence on practical applications. The researcher found practical implications for teachers and administrators.

Implications for Teachers. Teachers who proactively seek professional development in instructional technology gain significantly by enhancing their familiarity and skills with digital

tools. This effort not only elevates their instructional capabilities but also ensures they are well-equipped to incorporate the latest technological advancements into their teaching practices. Simon shared that in the wake of the COVID-19 pandemic, he has been actively seeking seminars and learning opportunities to increase his knowledge of how to incorporate instructional technologies and distance teaching strategies into his classroom. He added, "Recently, I have been attending professional development seminars that have focused on improving our ability to assist students through digital learning platforms. Some of the things that I have learned from them have been very helpful in creating more engaging activities." All the participants mentioned their desire to improve their knowledge of how to better utilize instructional technologies. Integrating distance learning strategies into traditional classroom routines can offer teachers a versatile approach to education, maintaining a level of familiarity with digital platforms among students. By adopting such strategies, teachers can foster a blended learning environment that leverages the strengths of both in-person and online educational methods. Many shared examples of how they were incorporating instructional strategies that they learned from professional development, like the flipped classroom model, into their classrooms. The collective enthusiasm among participants to enhance their mastery of instructional technologies highlights a widespread acknowledgment of its importance in modern education. The shared experiences, particularly the application of strategies like the flipped classroom model, reflect a broader trend toward innovative teaching methodologies. These approaches not only make the learning process more interactive but also empower students to take a more active role in their education. By incorporating these strategies, teachers are not only improving their pedagogical skills but also significantly enriching the educational experience for their students, thereby fostering a more dynamic and effective learning environment.

Implications for Administrators. Administrators play a crucial role in shaping the educational landscape, especially in the context of integrating technology into learning environments. The influx of instructional technology during the COVID-19 pandemic highlighted the adaptability and resilience of educational systems, presenting administrators with an opportunity to redefine the learning experience. By integrating these technologies, administrators can facilitate a transition towards a blended learning environment that combines the strengths of both traditional and digital education. This approach not only enriches the curriculum but also offers students a more flexible and personalized learning journey, underscoring the importance of strategic leadership in navigating the complexities of modern education.

Enhancing the readiness of all stakeholders for any forthcoming shifts to distance learning models is a critical implication for administrators. This involves not only offering professional development opportunities for teachers but also creating a culture of collaboration among educators to exchange effective practices, alongside promoting innovative teaching and learning methods that incorporate technology. Implementing periodic online learning days to maintain effective practices and general readiness ensuring a seamless transition to distance learning when necessary.

Theoretical and Empirical Implications

The theoretical and empirical implications of the findings are discussed in this section. The theory that served as a framework for this study was Knowles's (1968) adult learning theory. This framework facilitates a deeper understanding of the challenges and innovations in instructional technology integration encountered by secondary teachers during the COVID-19 pandemic. Through this lens, the study not only validates the principles of adult learning in a

crisis-driven educational context but also underscores the significance of professional development in equipping educators with the necessary skills and confidence for effective technology use. This exploration contributes valuable insights into the dynamics of teaching and learning in unprecedented times, emphasizing resilience, adaptability, and the critical role of supportive educational environments.

Theoretical Implications

The research confirms and extends existing literature on the efficacy of adult learning theory in the context of professional development and technology integration. By focusing on the self-directed, experiential learning of teachers as they adapted to new technologies, the researcher corroborates findings by Merriam (2001), and others, emphasizing the critical role of self-efficacy and belief systems in successful technology adoption (Bragg et al., 2021; Choi et al., 2019; Diep et al., 2019; Kasalak & Dagyar, 2020). The study reinforces the impact of professional development on enhancing teachers' pedagogical and technological skills (Bragg et al., 2021; Ovcharuk et al., 2022). These elements not only influence teachers' willingness to integrate technology but also their capacity to leverage it in ways that enrich the learning environment, despite initial barriers and challenges.

The present study diverges from previous research by delving into the unique context of the COVID-19 pandemic, offering a fresh perspective on the rapid, compulsory integration of instructional technology. It extends the conversation around adult learning theory and technology integration by highlighting the resilience and adaptability required of teachers in an emergency remote teaching scenario. This nuanced understanding underscores the complexity of technology adoption in crisis conditions, suggesting that adaptability and resilience are as crucial as self-efficacy and pedagogical beliefs in navigating such unprecedented changes.

Empirical Implications

The empirical knowledge gained from this study emphasizes the importance of quality professional development opportunities that not only develop teachers' technical skills but also nurture positive and flexible pedagogical and technological beliefs (Bond & Bedenlier, 2019; Granić & Marangunić, 2019). Such development is crucial in fostering an environment where educators feel equipped and confident to integrate technology into their teaching practices effectively. By aligning with adult learning theory, which suggests adults learn best when engaged in self-directed, experiential, and relevant learning (Merriam, 2001), professional development programs can be designed to meet teachers where they are, respecting their knowledge and experiences while challenging them to explore new methodologies and technologies. This approach not only enhances teachers' self-efficacy in technology integration (Choi et al., 2019; Kasalak & Dagyar, 2020) but also promotes a culture of continuous learning and adaptation, which is essential in the rapidly evolving landscape of educational technology. The study's findings advocate for professional development that is collaborative, context-specific, and continuous, offering insights into how such initiatives can contribute to the creation of resilient and innovative educational ecosystems capable of navigating future challenges in technology integration and beyond.

Limitations and Delimitations

One limitation of this study is its reliance on context-specific findings that might not be universally applicable across different educational settings or during non-crisis periods. The unique conditions of the COVID-19 pandemic provided a rare opportunity to study the rapid integration of instructional technology, but the insights gained may have limited transferability to more conventional educational contexts. Another limitation stems from the potential for self-

reporting bias. Given that the data were primarily collected through interviews and focus groups, there's a possibility that participants' responses could reflect a more favorable or socially acceptable view of their experiences and capabilities with technology integration, thus affecting the authenticity of the reported findings.

Two delimitations of the study are particularly noteworthy. The first is the study's geographical focus on a single urban area in southeast Georgia. While this might seem to narrow the research scope, it allows for an in-depth exploration of instructional technology integration within a specific educational ecosystem. The study's focus on secondary teachers only, from this singular geographical location, constitutes another delimitation. This choice was made to delve deeply into the experiences and challenges unique to this demographic during the transition to digital learning environments. By concentrating on secondary education, the study aims to uncover insights relevant to the pedagogical needs and technological engagement strategies pertinent to this specific teacher and student population.

Recommendations for Future Research

Future research should continue to investigate the professional development needs of teachers in the digital age, emphasizing the design and delivery of programs that not only improve technical skills but also address pedagogical and technological beliefs. The study highlighted the critical role of support and training in enabling teachers to effectively integrate technology into their teaching practices. Further research could explore the specific types of professional development that are most effective in fostering a positive and flexible approach to technology use in education. This includes examining the impact of different professional development models, such as peer-led workshops, online courses, and hands-on training sessions, on teachers' self-efficacy and student learning outcomes.

Another critical area for future research is the exploration of digital equity and access. The study's findings point to the digital divide as a significant challenge in technology integration, particularly in urban areas like southeast Georgia. Future studies could investigate strategies for ensuring equitable access to technology and high-quality digital content for all students, regardless of their socio-economic background. This research could examine the role of school districts, government policies, and community initiatives in bridging the digital divide and creating inclusive digital learning environments.

Additionally, the study suggests the need to reevaluate instructional strategies in light of the rapid adoption of digital tools. Future research could explore innovative teaching methods that leverage technology to enhance student engagement and learning. This includes investigating the effectiveness of blended and flipped classroom models, project-based learning, and gamification in various subject areas and educational levels (Cataudella, 2021; Pellerone, 2021; Yang, 2021). Research could also examine the long-term impacts of these pedagogical shifts on students' academic achievement, social-emotional development, and readiness for the 21st-century workforce.

Finally, the study opens questions about the sustainability of emergency remote teaching practices and the future of education technology integration beyond the pandemic. Future research could explore the lessons learned from this unprecedented period and how they can inform the development of resilient, flexible, and effective digital learning ecosystems. This includes studying the potential for hybrid learning models that combine the best aspects of in-person and online education, as well as the implications of such models for teacher training, curriculum development, and educational policy.

Conclusion

The essence of this transcendental phenomenological study was to delve into the experiences of secondary school teachers as they navigated the rapid transition to online teaching amidst the COVID-19 pandemic. This exploration revealed a multifaceted narrative, highlighting the resilience, adaptability, and innovative spirit of educators faced with unprecedented challenges. At its core, the study illuminated the profound impact of rapid adaptation to technology, showcasing how teachers, despite initial trepidations, harnessed digital tools to preserve the continuity and quality of education. This adaptability was not solely a matter of acquiring new skills but also reflected a more profound, transformative process that reshaped pedagogical practices and educational paradigms (Kasalak & Dagyar, 2020; Tschannen-Moran & Hoy, 2001; Weißenfels et al., 2022). The study highlighted the influence of teachers' attitudes and beliefs on their willingness to embrace technological change. Educators who viewed technology as an enhancer of student engagement and learning were more likely to integrate it effectively into their curriculum, demonstrating the power of positive perceptions in overcoming the inertia of traditional teaching methods (Bowman et al., 2022; Draxler-Weber et al., 2022; Lai et al., 2022). The study underscored the critical need for support and professional development that is responsive to teachers' current needs and experiences. The findings advocate for training programs that are not only practical and accessible but also contextualized, enabling teachers to navigate the complexities of digital education with confidence. Such support is essential for empowering educators to exploit the full potential of online learning environments, ensuring they can deliver engaging, high-quality education in any circumstances programs (Bragg et al., 2021; Ovcharuk et al., 2022; Powell & Bodur, 2019; Ramos et al., 2022).

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Appendix A

IRB Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

November 27, 2023

Caledon Smith
Shanna Baker

Re: IRB Exemption - IRB-FY23-24-513 A TRANSCENDENTAL PHENOMENOLOGICAL STUDY OF THE EXPERIENCES OF SECONDARY TEACHERS' RAPID IMPLEMENTATION OF NEW INSTRUCTIONAL TECHNOLOGY DURING COVID-19 PANDEMIC

Dear Caledon Smith, Shanna Baker,

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).

For a PDF of your exemption letter, click on your study number in the My Studies card on your Cayuse dashboard. Next, click the Submissions bar beside the Study Details bar on the Study details page. Finally, click Initial under Submission Type and choose the Letters tab toward the bottom of the Submission Details page. Your information sheet and final versions of your study documents can also be found on the same page under the Attachments tab.

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, PhD, CIP
Administrative Chair
Research Ethics Office

Appendix B

Site Approval

[redacted]

October 10, 2023

To Whom It May Concern:
Caledon Smith has requested and been granted permission to conduct research within the [redacted] on the following topic: “A Transcendental Phenomenological Study Of the Experiences Of Secondary Teachers Rapid Implementation Of New Instructional Technology During the Covid-19 Pandemic.”
This permission has been granted by the office appointed by the Superintendent of schools to review all requests for research to be conducted within the Savannah-Chatham County Public School System. The researcher has fulfilled the application requirements and provided the documentation necessary to ensure that we understand the scope of research and the methods used to collect and present findings.
All prospective researchers must note that district approval does not guarantee participation of any site, program area, or individual. The school principal or program supervisor will make the final determination on whether research activity may proceed at the site or program level. Individual participants may decline to participate or discontinue participation at any time.
Should you have any questions regarding this research approval status, please feel free to contact me at [redacted]
Thank you,

[redacted]

[redacted]

[redacted]

[redacted]

Appendix C

Participant Recruitment Letter

Dear [Potential Participant],

As a doctoral candidate in the School of Education at Liberty University, I am conducting research as part of the requirements for a Ph. D. in Education. The purpose of my research is to describe the lived experiences of secondary teachers who have undergone rapid instructional technology turnover in the transition from a traditional classroom environment to a digital secondary classroom during the COVID-19 pandemic. My research will attempt to answer the central research question, “What are the experiences of secondary teachers who have participated in the rapid implementation of instructional technology during the COVID-19 pandemic?” additionally, three sub-questions will also be asked, “How do secondary school teachers perceive the effectiveness of instructional technology in enhancing student engagement and learning outcomes?”, “What challenges do secondary school teachers encounter when incorporating instructional technology into their classroom routines?”, and “How do secondary school teachers' attitudes and beliefs towards instructional technology influence their adoption and implementation in the classroom?”, and I am writing to invite eligible participants to join my study.

Participants must be 9th through 12th grade teachers who participated in the transition to a distance learning model during the 2020-2021 COVID-19 pandemic. Participants, if willing, will be asked to participate in an individual interview with 22 guiding questions that will take no longer than 45 minutes, one 30-minute focus group, and provide lesson plans and DDI form from the time period. Participation will be completely anonymous, and no personal, identifying information will be collected.

To participate, please contact me by email or phone.

Sincerely,
Caledon Smith
Doctoral Candidate

Appendix D
Consent Form

Title of the Project: Barriers Preventing Effective Instructional Technology Training
Principal Investigator: Caledon A. P. Smith, Ph.D. Student, Liberty University

Invitation to be Part of a Research Study
You are cordially invited to participate in a research study exploring the experiences of educators during the COVID-19 transition. To qualify for participation, you should be a teacher from either core or elective content areas who navigated the shift during the pandemic and had at least three years of teaching experience prior to this phenomenon. Additionally, all participants should be state-certified teachers who were actively engaged at the study site from January 2020 to December 2021, and have been part of the transformation to a distance learning module in response to the pandemic.

We deeply value your insights and experiences. Participation in this study is entirely voluntary, and we encourage you to read through this invitation thoroughly and pose any questions you might have before making a decision.

What is the study about and why is it being done?
The purpose of this transcendental phenomenological study is to describe the lived experiences of secondary teachers who have undergone rapid instructional technology turnover in the transition from a traditional classroom environment to a digital secondary classroom during the COVID-19 pandemic in an urban area in southeast Georgia. It is being done to find potential barriers that prevent or degrade the measured effectiveness of instructional technology in the classroom.

What will happen if you take part in this study?
If you agree to be in this study, I would ask you to do the following things:
1. Participate in a video recorded interview. (30-60 minutes)
2. Provide Lesson plans and DDI forms from the 2020-2021 school year.
3. Participate in one 30-minute focus group.

How could you or others benefit from this study?

1. Psychological or Emotional Benefits:
    - Self-awareness: Participants might gain deeper insights into their own experiences, which can lead to increased self-awareness and understanding.
    - Validation: Sharing their experiences can make participants feel validated, especially if they felt isolated or unique in their experiences before. It can be therapeutic to know that others have faced similar challenges or feelings.

- Catharsis: Discussing personal experiences, especially in a structured and supportive environment, can be cathartic for some participants, allowing them to process and release pent-up emotions or stress.

2. Learning Benefits:
    - Enhanced Knowledge: As participants engage in the study, they might become more informed about the broader themes and issues under investigation. This can lead to a more comprehensive understanding of the topic.
    - Skills Development: Participation might lead to the development of new skills, such as self-reflection, analytical thinking, or articulation of personal experiences.
    - Educational Resources: Participants will be provided with any relevant educational resources or findings from the study, ensuring they are informed of the broader implications of their involvement and the collective data.
    - Benefit to Future Actions: Understanding the broader context and the collective experiences of their peers might help participants in making future decisions related to the study's theme or in their professional life.

What risks might you experience from being in this study?
The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

How will personal information be protected?
The security of archival data in this research project is of paramount importance. To safeguard this data, a multi-pronged approach is employed. Firstly, the data undergoes encryption using advanced protocols, ensuring it remains unreadable even if unauthorized access occurs. The computer and storage devices that house the data are not only password-protected—with the password being a complex amalgamation of uppercase and lowercase letters, numbers, and symbols, updated regularly—but are also physically secured. When not in use, the computer is kept in a locked room or cabinet, and the same applies to any physical data copies. Regular data backups are performed on an encrypted external hard drive, which is also securely stored. Caution is exercised concerning data transfers, which are minimized and, when necessary, conducted over encrypted, secure channels. To further enhance anonymity, instead of using names or identifiable specifics, an anonymous coding system is applied to the data. Moreover, it is essential to keep all software, inclusive of the operating system, updated to patch potential vulnerabilities. In the rare event of a data breach, immediate measures are activated to assess the breach's extent and notify the concerned parties. Finally, after the research concludes and the need for the data ceases, it is disposed of securely. Digital data is permanently deleted, and any physical copies are shredded.

Is study participation voluntary?

Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with any institution you might be affiliated with at the present time. 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, please inform the researcher that you wish to discontinue your participation, and do not submit your study materials. Your responses will not be recorded or included in the study.

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

The researcher conducting this study is Caledon Smith. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact him at casmith30@liberty.edu. You may also contact the researcher's faculty sponsor, Dr. Baker, at snbaker@liberty.edu.

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

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

Your Consent

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

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

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

_____
Printed Subject Name

_____
Signature & Date

Appendix E
Interview Questions

1. Please introduce yourself.
2. Please inform me about your professional experiences as a secondary educator. For example, what programs of study do you teach, how long have you been teaching as secondary educator, and what additional experiences or responsibilities do you provide as part of your job duties?
3. Provide some examples of the types of instructional technology you use in your classroom? (SQ1)
4. How do you believe these technologies have affected student engagement? (SQ1)
5. Share a specific instance where you noticed a significant improvement in student engagement or participation due to the integration of a specific technology? (SQ1)
6. What changes, if any, have you observed in students' learning outcomes since you began integrating technology into your teaching? (SQ1)
7. In what ways has the use of technology influenced students' understanding of the subject matter, if at all?(SQ1)
8. What challenges did you initially face when you started integrating technology into your teaching? (SQ2)
9. Describe any ongoing difficulties you experience with using technology in your classroom? (SQ2)
10. Describe any technical issues or obstacles you've encountered while using technology in the classroom?(SQ2)
11. How have these challenges influenced your routine or teaching methodology? (SQ2)

12. What supports or resources do you wish were available to help overcome these challenges? (SQ2)
13. How would you describe your personal attitude towards integrating technology into teaching? (SQ3)
14. In what ways, if any, has this attitude changed over time? (SQ3)
15. What beliefs or principles guide your approach to using technology in your classroom? (SQ3)
16. Share a memory of a specific situation where your belief system influenced your decision to use, or not use, a certain technology in your classroom? (SQ3)
17. How does your belief in the potential of technology for learning influence the type of technologies you choose to use in your teaching? (SQ3)
18. Describe your overall experience with integrating technology into your classroom practices? (CRQ)
19. How do you perceive the role of technology in contemporary teaching and learning? (CRQ)
20. What motivates you to integrate technology into your teaching? (CRQ)
21. When has there been a time when technology integration didn't go as planned in your classroom? If so, could you describe what happened and how you handled it? (CRQ)
22. How do you think your experiences and perceptions of instructional technology have influenced your overall teaching practice? (CRQ)
23. What else would you like to contribute to this study?

Appendix F
Focus Group Questions

1. In your collective experience, what have been the most noticeable changes in your classroom dynamics since the integration of instructional technology? (CRQ)
2. Share an instance where you felt instructional technology particularly enhanced student engagement? (SQ1)
3. What improvements in student learning outcomes, if any, have you noticed as a result of using instructional technology, and could you elaborate on these improvements? (SQ1)
4. What specific educational technology tools, if any, have you found to be particularly effective in enhancing learning outcomes, and could you explain their impact? (SQ1)
5. Discuss some of the challenges you've faced in incorporating technology into your teaching practices? How have you addressed these challenges? (SQ2)
6. In what ways, if any, has instructional technology integration disrupted your established classroom routines? (SQ2)
7. How do you feel the students' reactions and interactions with instructional technology have affected your teaching practices? (SQ3)
8. How have your beliefs towards instructional technology evolved since you first started using it in the classroom? (SQ3)
9. How has your perception of the effectiveness of instructional technology in your teaching been influenced by any specific experiences or results? If so, can you provide some examples? (SQ3)
10. How have you adapted your teaching practices to accommodate the use of instructional technology? (CRQ)

Appendix G

Audit Trail

Date	Task	Notes
October 10, 2023	Site approval	I received permission to conduct research at the site from the local district
November 27, 2023	IRB approval	I received IRB approval to conduct my study.
December 4, 2023	Began recruiting potential participants	I sent emails to teachers.
December 11, 2023	Sent follow up recruitment emails to potential participants	I sent a second email to each teacher who had not already responded.
December 18, 2023	Started to send out invites for one-on-one interviews	I sent emails to the participants to begin scheduling interviews.
January 4, 2024	Began conducting one-on-one interviews	I interviewed one teacher via Microsoft Teams and reviewed my process in hopes of improving.
January 8, 2024	One-on-one Interviews	I conducted two teachers via Microsoft Teams.
January 9, 2024	One-on-one Interviews	I conducted three teachers via Microsoft Teams.
January 10, 2024	One-on-one Interviews	I conducted three teachers via Microsoft Teams.
January 11, 2024	One-on-one Interviews	I conducted three teachers via Microsoft Teams.
January 12, 2024	Sent e-mails to participants about being a part of the focus group and began to code one-on-one transcripts	I began to code interview transcripts by hand. Five participants responded to the email with three hours.
January 13, 2024	Continued to code one-on-one interviews	I spent 14 hours coding
January 14, 2024	Continued to code one-on-one interviews	I spent 10 hours coding
January 15, 2024	Completed coding one-on-one interviews	I spent 4.75 hours coding
January 22, 2024	Conducted focus group	Used Microsoft Teams for the interview, it was a fun process.
January 23, 2024	Began to code focus group transcript	I began to code the transcript by hand

January 24, 2024	Completed coding the focus group transcript	Celebrated my birthday by finishing the coding process. It was a great feeling.