Fall 2023

ELEMENTARY TEACHERS' PERCEPTION OF DIGITAL RESOURCES BASED ON STUDENT ACHIEVEMENT

Tanya R. Small
Southeastern University - Lakeland

ELEMENTARY TEACHERS' PERCEPTION OF DIGITAL RESOURCES BASED ON STUDENT ACHIEVEMENT

By

TANYA R. SMALL

A doctoral dissertation submitted to the
College of Education
in partial fulfillment of the requirements
for the degree Doctor of Education
in Organizational Leadership

Southeastern University
October 2023

ELEMENTARY TEACHERS' PERCEPTION OF DIGITAL RESOURCES

BASED ON STUDENT ACHIEVEMENT

by

TANYA R. SMALL

Dissertation Approved:

Melinda Carver

Melinda Carver, PhD, Dissertation Chair

Susan Hicks

Susan Hicks, PhD, Committee Member

Lisa A. Coscia

Lisa Coscia, EdD, Dean, College of Education

DEDICATION

This dissertation is dedicated to my closest friends. First, to the greatest friend of all time—the one who sticks closer than a brother—Jesus Christ. I praise God for the lessons on faith and trust I have learned throughout this process. Most outstandingly, I am grateful to God for bringing me full circle in understanding the truth that "no one could ever care for me like Jesus."

To my parents, Reginald and Roslyn Hunter, how could you ever truly comprehend how the power of the prayers you draped over me would guide me to manifest the pinnacle of my full potential according to Jemiah 29:11? You instilled within me the best life source in existence—the creator of all in existence. My heart is overwhelmed with gratitude for the love you show every step of the way. Thank you.

To my sons Timothy and Tyhlr, my nephew, Rhijhaye, and my best friend, Judy, thank you for carrying me through this challenging yet refining season in my life. You were my strong towers, pillars, and rock—the physical reflection of unconditional love. Thank you for sharing my load and helping me to bear those many exigent episodes along the way. I love you forever.

Finally, to those who will remain unnamed yet have directly and indirectly inspired my natural and spiritual growth throughout this process through motivational contributions. Your life example and support of my mission continue to inspire me to aim higher and propel me to become the best version of myself. My heart is filled with joy because of your contributions.

ACKNOWLEDGMENTS

To my dissertation team and committee, with special attention to my chair, Dr. Melinda Carver, and methodologist, Dr. Susan Hicks, whose expertise and rigorous expectations governed the writing process to exemplify professionalism and integrity, I am honored for your support. To SEU veteran Dr. Sarah Yates, who navigated my development to a competent Doctor of Organizational Leadership, I am astonished at the level of support and outpouring you have bestowed upon me since the journey's start. I am thankful to every SEU faculty member who showed grace along the way and to the coolest crew of colleagues in Cohort N; I appreciate the camaraderie and motivation. To the Reverend Donald Johnson and Patian Bartley, whose contributions directly promoted this project's prosperity, I am forever grateful for your related accommodation. Last but certainly not least, I am beyond grateful for the selfless contributions of the wonderful participants, without whom this study would not be possible.

Abstract

Many factors impact teachers' decisions about when and how to implement technology during instruction. However, a gap exists in understanding teachers' motivations for technology integration and face-to-face instruction. Therefore, this qualitative case study explored how teachers' perceptions of student achievement, motivation, classroom behaviors, and digital challenges influenced their decisions about using technology or direct instruction in the classroom setting. A group of 20 teachers from two southern Florida public elementary schools completed anonymous Likert-scale surveys; six teachers participated in semi-structured interviews. The findings determined via descriptive statistics and thematic analysis revealed that teachers' inclusion of technology and traditional resources is influenced by teachers' perceptions of students' achievement, motivation, behavior, and technology challenges during instruction. To increase technology inclusion, teachers stressed the importance of a balanced and ethical learning experience that promotes students' achievement. Participants indicated that to increase teachers' technology inclusion, greater focus must be placed on resources that enhance students' learning and achievement rather than focusing on student motivation, behavior, and technology challenges.

Keywords: Teachers' technology attitudes, teachers' perception of technology, technology inclusion, student motivation, student achievement, technology integration

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

I. INTRODUCTION

Technological innovations, if fully utilized in learning (Dilling & Vogler, 2022), have the potential to enhance the educational delivery of instruction (Vincent-Lancrin, 2022). Furthermore, Vincent-Lancrin (2022) determined that innovative advancements in technology have progressed rapidly in other markets; however, slower development has been observed in the education field due to technology resistance. According to a study by Birkollu et al. (2017), a key precursor to technology adoption in instruction is a teacher's positive perception of technology inclusion. Yet, as seen in Beri and Sharma's (2019) study, a positive attitude alone is an insufficient predictor of a teacher's agreement to implement technology.

In a study of 50 teachers' attitudes toward integrating information and communication technology (ICT), Beri and Sharma (2019) concluded that educators' favorable attitude toward technology does not equate to a willingness to integrate technology in the traditional setting. Instead, the teachers' role as the decision-maker is a better indicator of whether the instruction will include the use of digital devices. Therefore, Dilling and Vogler (2022) determined that teachers, in their leading roles as lesson planners, designers, and disseminators, were the dominant determinants of the instructional content and delivery method. Consequently, as the controller of the instructional process, Ismail and Jarrah (2019) postulated that the teachers' personal preferences also influenced their inclusion practices.

According to Ismail and Jarrah (2019), personal preferences for traditional versus digital

instructional methods are another key indicator of teachers' agreeableness to the incorporation of technology in instruction. Furthermore, teachers' technology inclusion attitudes can vary based on these preferences towards instructional delivery styles and methods even when, as seen in the Trenholm and Peschke (2020) comparative review of teaching undergraduate mathematics fully online versus face-to-face (F2F), each method can achieve the learning outcomes. Based on teachers' preferences for instructional delivery styles and methods, Trenholm and Peschke confirmed that instruction can be performed effectively through either traditional or digital methods.

Consequently, at the core of the teacher's preferential method is its impact on the students' performance in terms of their achievement, motivation, and behavior (Paul & Jefferson, 2019). Understandably, as suggested by Beri and Sharma (2019), the anxiety induced by teachers' lack of technology proficiency may impact teachers' technology confidence. However, Vincent-Lancrin (2022) indicated that teachers' technology integration is less concerned with mastering the operation of the digital resource than with including the digital resource to enhance the pedagogical quality.

Background of the Study

Conclusively, both the traditional and digital teaching pedagogies consist of similar features in the learning environment, including planning, lecturing, and assessments (Paul & Jefferson, 2019). As identified by Trenholm and Peschke (2020), each method utilizes unique characteristics and approaches to achieve successful learning outcomes. For example, to achieve the desired learning outcomes in the traditional method, the teacher, as the central conductor, organizes the various functions in the learning episode using conventional teaching tools, such as whiteboards (Trenholm & Peschke 2020) and physical textbooks (Martin-Beltrán et al., 2017).

That being said, achieving learning outcomes through digital teaching methods follows a more constructivist approach, allowing students to play a greater role as self-learners and active participants in acquiring knowledge (Trenholm & Peschke, 2020).

Strength of Traditional Instruction

The traditional method entails various strategies to enhance learning achievements. Based on Paul and Jefferson's (2019) description of the traditional classroom setting, children engage as passive respondents during direct instruction while a teacher governs their interaction and usage of instructional resources. However, there are benefits to the F2F instructional process. First, the F2F method is conducive to active communication that permits students to engage in rich collaborative discourse and extended responses using natural language in a traditional setting. Martin-Beltrán et al. (2017) determined that after reading paper-based textbooks in a traditional classroom setting, students were more likely to engage in turn and talk with peers about the book's content. Moreover, in the natural classroom setting, collaboration can be enhanced by the added features of observing secondary cues, such as body language and pauses, in dialogue throughout the communication process (Paul & Jefferson, 2019).

Another benefit of the F2F or traditional teaching method is that it promotes content understanding through student and teacher role-play. To demonstrate the relationship between innovative practices and traditional teaching, Heaysman and Tubin (2019) conducted a study with Israeli students (n = 550) and teachers (n = 60). The study demonstrated how traditional teaching methods could accommodate innovative practices through strategies such as dramatic improvisation and dialogic teaching. In the dramatic improvisation, the teacher presented theoretical content and guided students through a reenactment of the story. Playing the roles of the story characters allowed the students to apply their imagination and prior knowledge to arrive

at an understanding of the content.

Through the dialogic teaching approach in the Heaysman and Tubin (2019) study, the teachers presented a topic yet refrained from controlling the knowledge development process. As the students collaborated, the instructors made themselves less obvious to promote students' self-reliance as they deliberated for independent knowledge acquisition. Instead, the teachers played the role of observers and conducted formative assessments based on the students' discourses. The study results showed that the traditional teaching method can embrace innovative teaching strategies and provide opportunities for peer learning that are unique to the F2F method and may be missing from technology-based instruction.

Strengths of Digital Modalities

Digital teaching approaches involve web-based learning through an Internet connection (Dilling & Vogler, 2022). Communication using digital resources typically entails written discourses via email, text, and blogs, for example, and interaction with resources refers to the quality of physical engagement with the resource. During digital instruction, students can communicate through virtual platforms, such as Khan Academy (Arnavut et al., 2019). This platform allowed learners to communicate with a virtual instructor. In addition, teachers and students received instant feedback on the progress that can be used for improving performance. Hence, the software replaced the traditional formal assessment process, otherwise completed manually in a classroom setting. Although the student cannot engage in active verbal exchange, the built-in test maker assigns quizzes to assess comprehension based on the learner's performance in the lesson.

Interaction with digital resources produces similar learning outcomes as resources in traditional settings. At the elementary school level, digital read-aloud software is a common tool.

The Martin-Beltrán et al. (2017) study explored students' interaction with digital learning resources based on observable behaviors and motivation. In this study, 938 students read passages on a computer screen and tapped arrows on the screen to turn the pages back or forward. They found that although digital resources were available, they were not always used effectively. The researcher recorded that students tapped the screen excessively to see the automized rotation of the pages rather than as engagement with the text. In addition, the optional function that allowed students to return to specific portions of the text to verify answers to comprehension questions was not used. The results of the study showed that although the participants displayed preferences for different teaching methods, both the traditional and digital modalities could be used effectively in supporting commutative and interactive functions.

Student Motivation with Digital Resources

According to Gillis and Krull (2020), children were motivated by a combination of learning methods that included a blend of traditional and computer-based instruction. For example, in a recent qualitative study, Tarteer et al. (2021) explored the experience of 36 Palestinian female students taking English language courses through the Google Classroom online platform. According to the study, the students' comfort level and interest were increased by the ability to engage in a blended approach, including the interaction with the Google Classroom applications and direct communication with the teacher. However, there was an increase in motivation when the students were completing tasks on Google Classroom. Crompton et al. (2021) suggested that the proper implementation of digital resources in lessons, or e-learning success, is crucial to students' motivation.

According to Crompton et al. (2021), e-learning success refers to the proper implementation of such devices that allow for a smooth flow in the learning episode in a way

that promotes ease of using the resource. The structural design was a prominent element in e-learning instruction. Accordingly, the construction of a digital lesson required more than just posting assignments. Rather, Crompton et al. stated that the assigned tasks must be structured in a child-friendly way to promote students' engagement, attentiveness, and motivation to promote desired engagement and behavior. Thus, Crompton et al. suggested when deciding to include digital resources, educators should begin by evaluating how easy the functions are to understand and operate.

Student Behavior During Technology Integration

The Cvetković et al. (2022) study in the Republic of Serbia explored 269 teachers' opinions about the factors motivating their ICT integration. The study concluded that despite related operational obstacles such as internet interruption and equipment shortage, technology contributed to better classroom concentration and behavior. Moreover, the findings supported that technology could enhance students' focus and attentiveness, thereby minimizing distraction and time off task. Distraction, as described in the Martin-Beltrán et al. (2017) study, referred to the subsequent student engagement with a task other than that which had been assigned by the classroom teacher. Other forms of distraction in the Martin-Beltrán et al. study involved the participants looking away from or disengaging from the resource. However, the study data revealed that the animated features of the technology resulted in an increased level of the students' focus, engagement, and behavior.

Students' technology experience may contribute to the intensity of their focus while engaging with digital resources, as seen in the Tarteer et al. (2021) study. The data revealed that the Grade 11 female students with greater technology experience demonstrated increased engagement and longer focus on the digital resource activity. The findings showed that prior

experience with digital resources can impact the quality of resource engagement. Therefore, many of the students in the study reported a preference for Google Classroom presentations, while other less-digitally-experienced students encountered challenges with this learning platform. As a result, an increase in off-task behaviors was evident with less technology-experienced students. Consequently, Tarteer et al. suggested the remedy for minimizing off-task engagement is for teachers to learn to create more interesting assignments by attending professional training to foster sustained connectedness during the learning episode and establish a successful e-learning process.

In an investigation of the two modalities, Paul and Jefferson (2019) established that as far as the research is concerned, other factors may be more pressing regarding students' performance than the traditional versus digital teaching modalities. Hence, as technology benefits in education continue to increase, the discussion concerning the appropriate emphasis on traditional versus digital instructional modalities delivery will continue to unfold. Furthermore, Paul and Jefferson (2019) postulated that as instructional preferences prevail, individuals who resent the stationary posture associated with computer-based learning will continue to implement traditional practices that are conducive to socialization as seen within a natural setting. Likewise, individuals who prefer an unrestricted learning platform and paperless engagement will continue to resort to digital methods.

Today's educators embrace the principles of growth and continuous learning (Şentürk & Baş, 2021) and technology's educational contributions and benefits (Adhya & Panda, 2022). Yet, in a review of 269 teachers' attitudes towards using ICT during instruction, Cvetković et al. (2022) concluded that despite above-average ICT teacher attitudes as reported on a 5-point scale, subsequent data showed that few teachers (28.57%) implemented computer-based instruction.

Van Nest (2018) presented a possible rationale for the discrepancy between teachers' reported and actual use of technology due to the reciprocal relationship that exists between perception and behavior, as interpretations of environmental stimuli inform perceptions about appropriate responses.

A goal-oriented leader, according to Shafique and Beh (2017), demonstrates openness to experience. Furthermore, Shafique and Beh postulated that such leaders approach situations with the motivation to find solutions and sustain functionality. According to the transformational leadership theory, maintaining survivability is a primary managerial role (Mammadov et al., 2018). Hence, in observance of the theory's principles, Stein (2020) informed that educators as classroom managers can adjust their leadership styles toward emerging challenges to foster desired achievements.

Student Achievement and Learning Outcomes

Student achievement is an essential source for informing best teaching practices, education laws, and effective instructional resources (Serrano et al., 2019). According to a study by Luo et al. (2022) that investigated the factors affecting the instructional practices and data use of 243 Chinese educators, student achievement is the goal of instructional planning and design. Therefore, teachers create, modify, and differentiate lessons based on their goals for enhancing the students' learning outcomes. Furthermore, Ziernwald et al. (2022) stated that based on achievement goals, teachers structure instruction to meet students' academic needs and refine the instructional delivery process to achieve meaningful learning achievements.

Learning outcomes are critical in determining educational policies and laws. For example, the No Child Left Behind Act (2001, as cited in Heise, 2017) and the Every Student Succeeds Act (2015, as cited in Heise, 2017) were implemented as structural changes because of

low school district performances (Heise, 2017). These laws were enacted based on the state assessment data of students' performance and learning achievement.

Student achievement data can reveal teaching resources that enhance students' learning (Luo et al., 2022). A comparison of the inclusion of digital texts versus paper texts conducted by Martin-Beltrán et al. (2017) revealed that conventional teaching tools such as textbooks foster learning achievement, while Vincent-Lancrin (2022) confirmed that digital resources presented more opportunities to access knowledge beyond the classroom environment. Furthermore, technology inclusion, according to Vincent-Lancrin (2022), created an opportunity for distance learning and has given birth to global classrooms (Milicevic et al., 2021), promoting new opportunities for worldwide knowledge acquisition and exchange (Johnson et al., 2019).

Transforming Learning

In the article "Smart Technology: How It Might Transform Teaching and Learning," Vincent-Lancrin (2022) highlighted the vital role technology has played in the transformation and advancement of learning by improving classroom practices. This claim was echoed in a study by Cvetković et al. (2022) of teachers' ICT attitudes and opinions toward using information technology. The study participants reported that technology inclusion increased the quality and efficiency of their teaching by promoting quick and trouble-free access to knowledge.

Furthermore, Cvetković et al. (2022) study results supported Vincent-Lancrin's (2022) conclusion that technology integration has the potential to evolve educational practices. Vincent-Lancrin contended that the digitalization of teaching activities supported educational advancement efforts. Therefore, understanding technology inclusion in instruction is an important facet in transforming and advancing current educational practices.

Conceptual Framework

Previous studies (Adhya & Panda, 2022; Dilling & Vogler, 2022) have identified teachers' attitudes as an important factor in educational decisions concerning teaching practices and student learning outcomes. According to Dilling and Vogler (2022), teachers' attitudes play a dominant role in technology adoption and implementation, and as stated by Adhya and Panda (2022), this process relies heavily on teachers' positive attitudes toward technology. Njiku et al. (2019) highlighted the detrimental impact of negative attitudes toward technology as these attitudes extend throughout the school culture, and these attitudes result in teaching practices that could impede student learning. According to Vincent-Lancrin (2022), this impediment could have a long-term negative impact on students' ability to respond to emerging societal demands for digital skills. Nordlöf et al. (2017) introduced a holistic theoretical framework for measuring primary teachers' attitudes called "Primary Teachers' Attitude Toward Technology." According to this description, attitude develops from responses to a former stimulus.

Nordlöf et al. (2017) conducted a study of teachers' attitudes toward technology to determine its influence on teachers' technology perceptions and practice. They introduced a holistic theoretical framework to answer the research question: "How do teachers perceive self-efficacy and content dependency in teaching technology?" They indicated that self-efficacy included experience, education, interest, subject knowledge, and preparation. Context dependency included the elements of collegial support, syllabus, resources, and status. An understanding of all components is necessary for developing an understanding of teachers' decisions to incorporate technology in their instruction.

Salele and Khan (2022) studied the perceived control status among a group of 110 engineering trainee teachers from two Bangladesh institutions. The results indicated that such

factors as age, gender, and years of technology experience were strongly related to the participants' perception of control. Mainly, the findings supported that perceived control, when affected by internal and external factors, such as age, gender, and technology experience, influenced the participants' perception of the usefulness of technology, which subsequently impacted technology inclusion.

Problem Statement

Teachers' technology inclusion attitudes have been well studied regarding their impact on technology inclusion decisions, according to Scherer and Teo (2019). However, no studies are available on how teachers' technology attitudes are influenced by their perception of the impact of technology challenges and students' achievement, motivation, and behavior on teachers' instructional decisions. Because teachers' perceptions impact technology inclusion, many researchers have investigated this field. However, the current studies that explored teachers' technology attitudes focused on contributing variables such as perceived control (Nordlöf et al., 2019) and teachers' self-efficacy (Barton & Dexter, 2019) measures as predictors of inclusion. Moreover, although results from post-COVID-19 studies of teachers' technology attitudes (Adhya & Panda, 2022) provided new insight based on experience with an entire technology-based instructional process, little is known regarding the impact of student achievement, motivation, and behavior on teachers' perception of technology inclusion in classroom-based learning settings. Therefore, elementary teachers' perceptions about challenges and student achievement, motivation, and classroom behaviors when implementing digital resources in the classroom as compared to direct teacher instruction were examined.

Purpose Statement

The purpose of this qualitative case study was to develop an understanding of how teachers' technology attitudes (Nordlöf et al., 2019), as evidenced by their perceptions of the impact of student achievement, motivation, classroom behaviors, and digital challenges, influence their decisions about using technology or direct instruction in the classroom setting. The implementation of digital resources was defined as students' independent use of digital resources that replace direct teacher instruction previously provided through lectures and classroom discussions.

Overview of Methodology

The purpose of this qualitative case study was to explore the impact of digital challenges and students' characteristics, including achievement, motivation, and behavior, on teachers' decisions to include digital resources during teaching. Therefore, this study aimed to understand teachers' role in decisions to include technology in classroom instruction.

Research Question

The study procedures were navigated accordingly to answer the following research questions:

1. How does elementary teachers' perception of student achievement influence teachers' decisions about using technology or direct instruction in the classroom setting?
2. How does elementary teachers' perception of student motivation influence teachers' decisions about using technology or direct instruction in the classroom setting?
3. How does elementary teachers' perception of student behavior influence teachers'

decisions about using technology or direct instruction in the classroom setting?

4. What are elementary teachers' perceptions of the challenges of using digital resources?

Research Design

Case study research is a method for exploring a concrete entity in a real setting bounded by space and time (Creswell & Poth, 2018). In an instrumental case model, a specific area of concern is illustrated through a bounded case. In this qualitative study, the instrumental case study is intended to investigate teachers' technology decision-making agency based on their judgment and interpretations of student characteristics. Therefore, this study explored teachers' agencies in technology inclusion as a common phenomenon presented by the participants in this qualitative case study. This qualitative study design reflected two phases, including an anonymous survey and an interview phase.

Phase 1 of the data collection process entailed an anonymous 16-question survey based on the variables to be examined in this study. Possible participants received an invitation containing a link to the anonymous Likert scale survey. No identifying information or IP addresses were collected. Data from the survey were categorized, and descriptive data, including means, were calculated. Data were displayed using stacked bar graphs.

Phase 2 utilized semi-structured interviews with open-ended questions to gather descriptive responses for the study. Confidential interviews with a few willing participants of Phase 1 were used for comparison with the Phase 1 data set and for assistance with the interpretation of both data sets. During each 30-minute interview, the researcher used a 20-question interview guide to gather information in the least distracting place, whether face-to-face or via Google Meet. Responses were transcribed, coded, and combined into themes.

Data Collection

Teachers' technology inclusion attitudes were the unit of analysis in this study. The data collection process aimed to gather thick and rich details to supplement the survey responses. Details about the study were posted on the Facebook social media page to gather interest. The two-phase data collection process proceeded after receiving approval from the Institutional Review Board (IRB) of Southeastern University, and interested participants followed instructions to access the study information.

A password-protected computer was used to record the interview and survey data so that the two data sources could provide for triangulation of the data. Additionally, field notes were collected throughout the interviewing process to identify emerging thoughts and themes. The data were analyzed according to the thematic analysis process, including sorting and organizing the data, generating themes, forming interpretations, and presenting the data through memoing (Creswell & Poth, 2018).

Procedures

This study was conducted once IRB approval was received from Southeastern University. Following the IRB approval, the researcher posted details about the study to attract interested candidates and collect email addresses. The participants included male and female teachers in southern Florida elementary schools. Study information, including the study purpose and a request for personal consent to participate in this study, was emailed to the email address provided by the participant. Ethical principles guided the process of gathering the study participants. All pertinent details were provided to the participants, including their rights to the study material and their option to withdraw at any time.

A Likert scale survey link was emailed to interested participants in Phase 1 of the data

collection process. The completed survey responses were downloaded to an Excel spreadsheet and analyzed, leading into the second phase of the data collection process. Based on the data collection pattern from the Nordlöf et al. (2017) study, the interviewing process in this study proceeded through the Google Meet online forum with teachers in their chosen location of comfort, whether at home or their place of employment. The researcher, using the interview protocol as the guide, began each session by informing the participant of the intention to digitally record the interview. The interview response data were coded through the thematic analysis process to inform the research questions.

Overview of Analyses

The categorical responses from the anonymous Likert scale survey were downloaded onto an Excel spreadsheet. The mean of each category was calculated. Means were compared using stacked bar graphs so that the importance of each factor (i.e., technology challenges, student achievement, student motivation, and student behavior) could be compared. This comparison allowed the researcher to discuss the importance teachers place on each factor when making instructional decisions.

Following the Nordlöf et al. (2019) model and Creswell and Poth (2018), the interview data in this study were analyzed by the qualitative thematic process, inclusive of transcription, analysis, coding, and categorizing. After the interviews were transcribed, the transcripts were shared with the participants for member checking to establish the credibility of the data (Yasir et al., 2019). Member-checking involves reviewing the transcript for accuracy and missing information. Similarly, transcription of the data entails reading and rereading the transcript. Each read consisted of the addition of descriptive notes based on deductive and inductive reasoning of explicit submissions and the nuances. Subsequently, the data were analyzed for patterns, then

coded and sorted accordingly as themes emerged. In the next step, the emerging themes were sequenced and set as headings to conceptualize the unfolding story of the participants' lived experiences.

By comparing the themes to the framework construct (Nordlöf et al., 2017), the memoing process evolves, further narrowing the themes to more concise interpretations. The themes were organized within the framework to accommodate the categories of student achievement, motivation, and behavior to allow the retelling of the participants' shared experiences of their attitudes toward implementing technology resources.

Limitations

There are certain limitations in this study. For example, this study was conducted with a small sample of teachers in southern Florida. As such, the target group may not be representative of the population of teachers beyond southern Florida and the United States (Nichols et al., 2021). Furthermore, this study may not be representative of teachers in higher learning institutions beyond the primary learning environment. Moreover, the findings may not apply to technology teachers whose instructional episodes consist entirely of digital mediums. In addition, the qualitative data were used more extensively in this study. According to Akbarilakeh et al. (2019), a qualitative approach is a prudent method to studying teachers' technology attitudes.

Minimum quantitative descriptive data were generated from the survey results. Because participation was not random and responses were collected from a group of participants who expressed interest in the topic, the responses might not be reflective of the teaching population. Another factor of limitation may exist in the neglect of rigor inclusion provided through a third reader to trace the methodological sequences governing the decision process in this study (Johnson et al., 2020).

Definition of Key Terms

The following definitions are useful for the comprehension of the terms included in this study and to promote a unified understanding of the context in which the term is used.

- **perception**: a psychological process of assigning understanding to an external stimulus based on prior experience and the collective input of the five senses (Erin & Maharani, 2018).
- **teacher perception**: the conscious or unconscious display crafted in a teacher's mind about their students, formed from prior knowledge and life experiences; views influenced by family, culture, or education (Moran et al., 1998).
- **attitude**: a multidimensional psychological construct consisting of one's evaluative interpretations of an object in terms of good and positive or bad and negative (Van Aalderen-Smeets et al., 2012).
- **teacher's attitude**: a teacher's personal or professional attitude toward an object (Van Aalderen-Smeets et al., 2012).
- **personal attitude**: an individual's non-profession-related interpretation of an object or context (Van Aalderen-Smeets et al., 2012).
- **professional attitude**: an individual's profession-based interpretation of an object of context (Van Aalderen-Smeets et al., 2012).
- **technology**: a tool for enabling innovation and promoting the efficiency of activities (Crompton et al., 2021).
- **digital resources**: technology such as computers, computer software, internet, and non-internet-based programs used in the learning process for teaching,

communicating, formal assessments, completing assignments, conferencing, and analyzing data (Crompton et al., 2021).

- **teacher technology attitude**: a teacher's belief about the usefulness of a digital resource towards their instructional outcomes (Teo & Huang, 2018).
- **self-efficacy**: the belief a person has regarding their ability to perform an identified level of action (Nakaue et al., 2019).
- **perceived self-efficacy**: people's beliefs about their abilities to generate desired outcomes (Bandura, 1977).
- **personal efficacy**: a teacher's confidence regarding the attainment of the appropriate skills and experience to resolve students' learning difficulties (Tschannen-Moran et al., 1998).
- **behavior**: the product of the bidirectional interaction between personal, behavioral, and environmental factors (Bandura, 1977).
- **achievement**: the grasping of learning objectives based on the collective applications of teaching and curriculum (Nwosu et al., 2018).
- **traditional teaching**: the physical gathering of the real-time instruction of students in a face-to-face classroom setting using non-digital resources (Paul & Jefferson, 2019).
- **digital teaching**: the inclusion of internet-enabled resources to deliver instruction to students (Paul & Jefferson, 2019).
- **motivation**: a forceful internal drive toward an activity due to its inherent pleasure, interest, and enjoyment (Ryan & Deci, 2017).
- **teacher perception of student achievement**: the interpretation of students' understanding of concepts and attainment of learning objectives based on assessment

performance and outcomes (Basera, 2019).

- **e-learning**: learning through digital resources (Akbarilakeh et al., 2019).

II. REVIEW OF LITERATURE

The rapid increase in ICT demands in everyday life warrants the inclusion of technology resources to develop students' competence in the skills necessary for the digital age (Lawrence & Tar, 2018). This study aims to understand how external factors like student achievement, motivation, behavior, and technology challenges inform teachers' attitudes regarding the inclusion of digital learning resources. It is imperative to consider other extraneous factors that influence technology attitude formation to achieve a thorough grasp of teachers' technology attitudes. Therefore, this chapter will present the related concepts, theories, and findings from previous studies to support this study. Beginning with an overview of research on various factors impacting technology attitudes and then proceeding to factors that restrict the adoption and inclusion of technology, this section will analyze the findings to identify their relevance to this study.

Technology Attitudes

Intrinsically motivated teacher educators with positive technology-enabled learning attitudes can influence future educators to embrace technology usage. Therefore, it is important to examine how various factors, including teachers' technology efficacy, perceived control, and perception of institutional support, affect teachers' motivation and ICT attitudes. According to Akbarilakeh et al. (2019), teachers' self-efficacy is a critical factor in the success of electronic

learning (e-learning). Optimally, educators' perspectives on technology relevance in teaching impact their level of inclusion.

In an analytical cross-sectional study, Akbarilakeh et al. (2019) explored the perspectives of a stratified sample of 334 Shahid Beheshti University of Medical Sciences faculty members using a 19-item Likert-scale questionnaire. Descriptive analysis of mean and frequency was used, and correlations between the domains and questions were determined using the Pearson correlation coefficient.

Based on the results of Akbarilakeh et al.'s (2019) study, educators' satisfaction with e-learning practices received the highest score, and the intentions to implement e-learning had the highest Cronbach's alpha coefficient of .895*,* confirming teachers' self-efficacy toward integrating technology was high. Moreover, the findings showed that the correlation of perceived enjoyment with self-efficacy was .44, indicating that participants with a low sense of technology enjoyment were less likely to implement digital media during instruction, but faculty with high technology efficacy were more likely to include technology. Furthermore, the results showed that a strong correlation between attitude and intention to use technology resulted in higher technology integration.

Similar findings were reported in a study by Alghasab et al. (2020), who found that teachers who believed in the effectiveness of technology were more motivated to integrate technology during teaching. The focus of the descriptive study was to explore the attitudes of 55 foreign language instructors in government primary schools in Kuwait to determine the factors that influenced their technology resources inclusion decisions. Through a survey questionnaire and semi-structured interviews, the participants, who were selected through the convenience

sampling method, provided self-reported data regarding the factors that motivate or restrict their inclusion attitudes.

The results of the Alghasab et al.'s (2020) study showed that regarding technology inclusion, 100% of Kuwaiti teachers were favorable towards technology, 96.4% of the respondents claimed to enjoy the flexibility and variety in presenting lessons through technology, and 90.9% reported an improvement in teaching practices when technology was used. Hence, the findings revealed that the opportunities for pedagogical innovation and creativity and students' educational gain were the main motivators in teachers' decisions to implement technology. Nevertheless, the findings also revealed that time constraints were the leading obstacle regarding technology integration, which limited the inclusion in instructional practices.

Time constraint in management was found to be a limiting factor in teachers' technology attitude in a cross-sectional case study conducted by Rolle-Greenidge and Walcott (2020). Data were collected from a convenience sample of 54 primary teachers in the Dominican Republic through surveys and usage-capacity data through interviews. Through content analysis, Rolle-Greenidge and Walcott's (2020) conclusions were formed regarding the factors that restricted more frequent use of computers in instructional practices. Based on the teachers' attitudes towards technology scale ranging from 1 to 4, anxiety was a predictor of the infrequent technology integration in lesson planning and delivery ($M = 4.12$). Therefore, educators in urban and rural schools within the Dominican Republic used computers for creating exams and taking attendance; however, an additional reported hindering factor was that the inability to fully monitor students' computer activities presented an obstacle to teachers' classroom use of computers for more than general word processing tasks. Teachers' attitudes towards computer-

based instruction were impacted by the lack of management and control of students' computer interactions.

Managing students' interaction with technology in a physical education setting can be challenging, according to the results of Hill and Valdez-Garcia's (2020) study of 201 physical education instructors in the Southwestern United States. The study aimed to understand secondary school educators' perceptions of technology availability, support, and integration in their instructional practices. According to the study, technology integration in physical education classes allows students to develop lifelong skills in health monitoring using digital resources.

Using a survey, Hill and Valdez-Garcia (2020) asked randomly selected public-school teachers to describe specific hindrances that restricted the integration of available technology during lessons. In addition to class management challenges experienced while students were engaged with the technology (66.7%), a lack of computer operating skills among the respondents (68.5%) was also found to be a limiting factor in the inclusion of digital resources in the physical education classroom activities.

Technology Adoption and Integration

Regarding classroom management, the size of the class can impact the ability to control technology interaction during implementation, according to findings in an exploratory study conducted by Waller et al. (2022). The study investigated the perspectives of 253 primary and secondary physical education teachers in Georgia regarding the restraints to integrating technology resources during instruction. Data were collected through Likert and open-ended survey response items and were analyzed using one-way analysis of variance.

The results of Waller et al.'s (2022) study revealed that although the teachers had positive attitudes towards technology inclusion, great numbers of students in one class made it difficult to

supervise students engaged with the technology. Moreover, the amount of available technology was insufficient to adequately distribute among the students. Therefore, the study showed that class size (70.8%) and limited resource availability (64.7%) were the leading factors that prevented the employment of technology during instruction.

In contrast to the Waller et al. (2022) study, a study by Lawrence and Tar (2018) found that educators' lack of technical skills, rather than limited resources, was the leading hindrance to computer-based instruction. Lawrence and Tar conducted an explorative, descriptive study of factors limiting the adoption and integration of technology. The study aimed to analyze the impact of technology-related challenges on teachers' decisions to implement technology in their educational practice. Four Nigerian instructors ranging in age from 38 to 52 years participated in semi-structured interviews regarding the factors and challenges that prevented ICT adoption and integration.

Lawrence and Tar (2018) structured the study according to theory-based approaches to ICT adoption and inclusion, including diffusion of innovation theory and the technology acceptance model. The study organized the factors restricting ICT adoption and integration and traced their degree of impact. Lawrence and Tar determined that the complexity of technology operation was a challenge impacting teachers' decisions to incorporate technology. Furthermore, a lack of skills in computer etiquette further restricted the integration of technology during learning.

A lack of technology etiquette and skill and overall acceptance was consistent with Jahanban-Isfahlan et al.'s (2017) mixed-method study that explored the technology attitudes of 120 randomly selected Iranian instructors. Through a cross-sectional self-reporting categorical questionnaire with a scale ranging from 1 through 5, the researchers explored the perceived

competence of secondary school educators, focusing on the relationship between their perception of competence and actual implementation.

Jahanban-Isfahlan et al.'s (2017) data analysis showed a reported mean on the 1 through 5 scale and standard deviation (M = 3.94; SD = 0.88). According to the mean and standard deviation, Iranian educators have a positive attitude toward the use of instructional technology yet lack sufficient competence to adequately include computerized resources during teaching. As depicted through a mean of 2.60 (SD = 0.92), a lack of understanding of technology resources impeded Iranian educators' use of technology and learning and restricted the integration of digitalized educational resources. Additionally, the findings revealed, based on a mean of 2.64, that the Iranian instructors had a low perception of technology as a useful teaching mode. These findings mirrored the results in the Muhazir and Retnawati (2020) study, which found that insufficient skills to operate computer applications were the main factor obstructing frequent technology incorporation in math lessons.

Muhazir and Retnawati's (2020) qualitative case study of 12 rookie math teachers from multiple regions of Indonesia within their first three years as educators collected data through two questionnaires regarding their technology experience and technological pedagogical content knowledge. The question to be answered concerned the limiting factors in the teachers' intention to apply technology-driven instruction. According to Muhazir and Retnawati (2020), Indonesian math teachers possess a low level of digital resources competence resulting mainly from self-taught interactions. Consequently, Muhazir and Retnawati (2020) showed that incompatibility between the concept and the technology application and the necessary digital competence and students' digital proficiency presented unintentional obstructions that interfered with the learning pace. Furthermore, teachers had insufficient technology experience, which could impact their

attitudes toward the importance of computer-based applications in math education.

A lack of technology competence correlates to inexperience with computer-based resources, as seen in Onivehu et al.'s study (2017), which was designed to understand the attitudes of special needs teachers regarding technology inclusion. Through purposive sampling, the technology attitudes and level of competence of 100 Nigerian special needs teachers were analyzed using a descriptive survey. Onivehu et al. determined that meeting the demands of special needs learners with specific learning disabilities required the use of assistive technology equipment. Furthermore, teachers of special needs learners require sufficient experience to adequately manipulate the appropriate resources to maximize the learning experience.

Onivehu et al. (2017) determined, using a scale ranging from 1 through 5, that the Nigerian teachers in their study had a favorable perception of the role of technology in education ($M = 3.35$). Moreover, participants indicated a favorable perception of technology's ability to allow for differentiation of instruction based on student needs ($M = 3.36$), enhancement of the instructional delivery episode ($M = 3.48$), and increasing the performance of special needs learners ($M = 3.35$). However, additional findings indicated that teachers found that technology inclusion was stressful ($M = 2.89$), complicated ($M = 2.89$), and time-constraining ($M = 2.85$). Additionally, the mean score of 1.98 showed that the educators lacked competence in the application of assistive technology resources. Consequently, the study showed that although Nigerian teachers were accepting of technology adoption and integration in learning, their insufficiencies in technology competence were barriers that restricted their inclusion of assistive technology applications. Therefore, the researchers suggested that the teachers receive training to enhance their technology competence.

In contrast to the Onivehu et al. (2017) study, Ardiç (2021) suggested that training alone was insufficient in improving technology integration in a secondary Turkish school. Ardiç's mixed-method study assessed the opinions and attitudes of 57 secondary Turkish educators regarding the importance of technology in mathematics education. A convenience sample from 22 high schools completed opinion forms and the Scale of Attitudes Toward Technology. According to the researcher, pursuing the opinions and attitudes of educators was essential to understanding the factors that promoted or restrained their technology inclusion decisions. The primary data analysis sources included descriptive content analysis and the Scale of Attitudes Toward Technology.

Based on the summative mean of 3.86 of teachers' attitudes reported on a scale ranging from 1 through 4 in Ardiç's (2021) study, Turkish educators had positive opinions regarding the inclusion and benefits of technology-based learning in math; however, the attitude did not translate into full implementation. Accordingly, 49 educators implemented digital media in math lessons at varying degrees, and based on additional data, more than 50% of the respondents considered technology integration to be nonrelevant and inconducive in many math contexts and a constraint on instructional time.

Consequently, Ardiç's (2021) study reported that most of the teachers implemented technology at a minimal level, including using the smartboards to present in a traditional direct instructional style, but did not utilize more in-depth applications that fostered students' physical interaction with the technology. Furthermore, the data showed an inconsistency in the usage frequency among teachers, with some not using technology at all. An observation from the Ardiç's (2021) study revealed that training did not enhance the frequency of implementation as suggested in the Onivehu et al. (2017) study.

As reported in the Ardiç's (2021) study, additional training did not increase technology integration. Therefore, additional potential technology-restricting factors were explored by Ergado et al. (2022) in a qualitative case study of 26 educators about the factors that contributed to technology inclusion in Ethiopian higher learning institutions. Data were analyzed according to the technology acceptance model, which explained the relationship between the educators' perception of technology usefulness; technology ease of use; and the intention to accept, include, and manage technology in teaching practices.

Basic computer skills are necessary for reducing the perceived complexity of technology integration, according to Ergado et al. (2022). Based on Ergado et al.'s findings, the limited technology resources in Ethiopian secondary schools were insufficiently utilized by the educators and were consequently perceived as inadequate in supporting learning. Moreover, the data expressed the participants' frustration with the frequency of technology changes and top-down mandates, further exposing participants' perceptions regarding traditional infrastructure. Hence, in line with the technology acceptance model framework and the respondents' data, the perception of technology usefulness and technology ease of use resulted in low competence, resistance to change, and the perception of ICT as a burden to implement. The results conclusively supported a lack of technological confidence among educators due to a negative perception of computer-based learning.

A quantitative study by Koh et al. (2022) described an educator's resistance to change as a disposition toward technology that discouraged the acceptance of digital resources in learning. Singaporean physical education teachers ($N = 11$) were surveyed and interviewed about the factors limiting the optimal implementation of technology resources in-class activities.

Additionally, the study's 13-item questionnaire explored the various teaching beliefs, pedagogies, and hindrances that influenced technology integration decisions.

Koh et al.'s (2022) study suggested that an open mind and self-efficacy were the necessary characteristics for improving technology attitudes. Therefore, influenced by the concept that attitude shapes perception and, subsequently, disposition, the study aimed to explore the crucial elements involved in stimulating the acceptance and integration of technology. This research proposed that students' learning could be maximized in terms of their cognitive outcomes (Koh et al., 2022). As evidenced by the results, teachers' self-efficacy and disposition played a critical role as key influencers in technology behaviors.

Therefore, the teachers who believed that insufficient knowledge of digital applications and inexperience in basic computing skills were limitations to integrating technology also embraced a disposition that the benefits of technology inclusion were overemphasized and that integration imposes a time constraint during instruction (Koh et al., 2022). Consequently, 30% to 40% of the participants reported technical challenges as factors that influenced the adoption of computer-based media in lessons (Koh et al., 2022).

Through thematic analysis, the study's findings revealed that attitudes about inclusion benefits were the key hindering factors to technology integration among physical education teachers (Koh et al., 2022). Hence, a low technology inclusion disposition could be interpreted through the participants who reported an expectation that including technology had a high propensity to result in lesson disruptions in terms of connectivity or forgotten password challenges (Koh et al., 2022). Nevertheless, Koh et al.'s (2022) results showed that a positive attitude, self-efficacy, and an open-mind to technology-assisted instruction were the key factors in fostering the highest cognitive outcomes for physical education students.

Regarding cognitive outcomes, Hatzigianni and Kalaitzidis (2018) reported that some early education teachers (51%) had reservations regarding the possible impact of premature interaction of young children with technology resources. The study collected data from surveys and interviews on the attitudes of teachers regarding technology interaction and factors that resist technology inclusion for children less than 3 years old. The convenience-based sample included 203 Australian educators who worked with infants and toddlers.

Teachers' beliefs in the Hatzigianni and Kalaitzidis (2018) study regarding the appropriate age for children to engage in technology-based learning were found to be the most significant factor impacting the teachers' attitude and implementation of technology. Educators believed that although children's brains were receptive to digital stimulations, premature exposure to technology could restrict the necessary physical activities essential for motor development. Based on the self-reporting survey outcomes, most teachers reported above-average ratings (213) of their digital ability from a scale range of 37 to 313. The study revealed mixed attitudes concerning early childhood interaction with technology, with only 32% of the teachers in support. However, most of the participants (74%) agreed that age-appropriate technology interaction was beneficial for promoting creativity in young learners.

Again, age was a restricting factor in attitudes toward technology inclusion in Asbulah et al.'s (2022) study of 36 randomly selected Arabic language instructors. Data were collected using a two-part survey questionnaire to explore the attitudes and perspectives of Malaysian educators toward implementing augmented reality technology to teach the Arabic language. Descriptive data analysis reflected a mean range of 3.28 to 3.44 that the respondents had a moderate attitude ($M = 3.36$) towards technology inclusion, although the younger teachers had greater technology experience and enthusiasm and attained adequate operational skills.

Based on Asbulah et al.'s (2022) study, educators' age was a restricting factor in the acceptance of augmented reality and had an impact on their disposition toward overall technology inclusion. Consequently, the teachers in Asbulah et al.'s study evidenced an overall moderate perception regarding technology's ability to improve the teaching and learning quality (44.4%), students increased their level of Arabic proficiency (38.9%), and teachers viewed technology as a suitable instructional aid (33.3%). Younger educators were more experienced with technology due to increased interaction with emerging technology. According to the study, age played a role in the levels of augmented reality technology experience, attitude towards implemented augmented reality, and technology effectiveness scores (Asbulah et al., 2022).

The role of technology experience on the integration attitudes of 428 special education teachers was assessed in a mixed-method study conducted in Oman by Mohamed (2018). To assess the attitudes of special education teachers toward technology implementation and to explore the role of experience on the attitudes, participants completed a 55-item questionnaire and participated in interviews. Furthermore, the statistical significance between subscales was identified using one-sample *t* tests. Technology competence had a strong impact on the successful implementation of technology in learning.

Mohamed (2018) conducted a study in Oman to determine teachers' attitudes toward technology usage in special education-inclusive classrooms. The study investigated whether experience impacted technology integration attitudes. The results showed that special education teachers had a positive technology inclusion attitude. However, the educators were limited in their experience with computers as an instructional method. Approximately half (48.5%) of the teachers reported confidence in word processing applications, but only (8.58%) used technology for innovative activities such as graphic designing and simulations.

Nicolas (2018) gathered data regarding teachers' perspectives on technology's benefits in education. In a mixed-method study of 41 high school teachers in Lebanon, data were collected using interviews and a 15-item, forced-choice response questionnaire. The study investigated the attitudes of teachers toward technology, determined the capacity of technology integration, and analyzed the perceived obstacles to incorporating technology in their classrooms.

Nicolas's (2018) study used an interpretive framework to understand the nature of technology integration as fostering rather than replacing the traditional pedagogical format. The results showed that 90% of the respondents acknowledged an acceptable presence of available technology, and 67% supported sufficient training opportunities. However, 27% of the respondents reported a lack of technology operating knowledge as the primary factor that restricted the inclusion of technology in classroom practices. Moreover, in response to the study question regarding the perceived greatest barrier to technology integration, 57% of the participants reported the educational infrastructure was the main hindrance. In other words, the educators believed that the educational setting was not conducive to technology-based instruction and learning.

Ergado et al. (2022) postulated that a deficiency in basic computer operating skills could lead to teachers interpreting general technology integration as a complex task. Consequently, these findings proved true in a qualitative study of 15 Palestinian educators conducted by Khlaif (2018). Technology competence resulted in an increased acceptance of technology inclusion and benefits. Through weekly lesson plans and semi-structured interviews, the study identified factors that hindered the acceptance and adoption of technology in a private middle school in rural Palestine.

Khlaif's (2018) study explored teachers' perceived advantages of educational technology

compared to their level of reception or resistance toward the inclusion of mobile tablet devices. The thematic analysis showed that 73% of the instructors had positive attitudes toward the acceptance of tablets as instructional devices due to the ease of maneuverability and convenience of the digital features. Moreover, 60% of the teachers emphasized the usefulness of technology in stimulating collaboration of learning concepts, which enhanced the learning experience. Based on Khlaif's study, a positive or negative perceived attitude toward the educational benefits of digital media had a strong role in the decision to embrace or avoid technology.

Teacher disposition may result from a struggle for agency, according to a study by Kramer et al. (2021), which investigated a purposive sample of faculty members' perspectives of technology-led instruction and learning. In a mixed-method study, 15 respondents from four 2-year colleges in Tennessee provided information regarding their perceptions about a mandated institution of a technology-based mathematics curriculum. A survey and interviews served as the main data collection sources. Through the phenomenological approach, teachers reported that the forced technology inclusion mandate challenged teachers' philosophical views of how instruction must be structured to maximize students' learning. Respondents viewed traditional instructional practices as adequate teaching methods. The results showed that the educators viewed technology challenges as the factor limiting technology acceptance. Based on the findings, the instructors believed that technology integration initiatives should be based on teachers' personal preferences, technology experiences, and comfort levels.

Relationship Between ICT and Student Achievement, Motivation, and Behavior

Several studies (Juhaňák et al., 2019; Park & Weng, 2020; Xiao et al., 2019) examined the relationship between ICT-related factors and student achievement, motivation, and behavior. However, these studies have explored the impact of ICT inclusion as an independent variable on

students' performance and have reported variations in the findings ranging between significant, mixed significance, and no significance.

In a recent study, Park and Weng (2020) investigated the impact of ICT factors on student achievement. Six thousand, four hundred ninth-grade students participated in the multi-region and multi-country study. Previous studies had examined the relationship between students' ICT engagement but not the effect of such engagement on student achievement. Park and Weng's (2020) study extended the variables to include student achievement using a questionnaire and a two-level structural equation. Their results showed a positive relationship between ICT factors and student performance. Furthermore, the findings revealed that academic achievement was increased by ICT-related factors such as student interest, autonomy, and ICT knowledge.

A framework for how teachers evaluate student characteristics was essential to determine how student characteristics influence teaching practices. Therefore, Zhu and Urhahne (2021) provided a framework for an appropriate measure of how educators determine students' outcomes. The study by Zhu and Urhahne (2021), although it excluded an ICT reference, provided relevant findings related to Chinese teachers' judgment of 326 sixth-grade students' mathematics achievement and motivation in the traditional learning setting. The study examined the consistency in teacher-judgment accuracy over time by having students complete a personality questionnaire and a standardized math test.

The teachers in the Zhu and Urhahne (2021) study analyzed the students' motivation based on the ULM motivational assessment scale designed to assess students' characteristics based on five components: expectancy for success, level of aspiration, self-efficacy beliefs, learning effort, and academic self-effort concept. The scale employed a 9-point Likert scale ranging from 1 (*extremely low*) to 9 (*extremely high*). Based on the comparative data from the

standardized math test and the personality questionnaire, the teachers had to predict the students' outcome on a subsequent math test twice within a four-week grace period. The use of elapsed time between responses prevented teachers from memorizing their previous responses while still being short enough to compensate for any potential changes in the students' personalities.

Zhu and Urhahne's (2021) study investigated the temporal stability of teacher-judgment accuracy over time. A structural equation was used to measure variance in teachers' repeated assessment of students' characteristics on the same criteria. Based on the results of the test-retest, teachers predicted students' achievement with high accuracy ($M = 21.05$; $M = 20.06$; $p = .001$) and students' motivation with middle to high accuracy ($M = 7.22$; $M = 7.29$). However, students' emotions were harder to predict and revealed that the teachers' judgments were at a low level of accuracy. Zhu and Urhahne's (2021) study highlights the importance of teachers' judgment in determining the students' characteristics that influence their technology inclusion attitudes.

Summary

The pervasive expansion of technology's role in education demands the development of digital competence as the appropriate response for optimal outcomes in teaching and learning. This chapter presented a thorough representation of previous studies' findings related to the purpose and problem of the present study to understand the impact of external factors, such as student achievement, motivation, behavior, and technology challenges, on teachers' attitude formation and consequent technology integration.

This chapter describes past research on teachers' attitudes and technology integration and their impact on its adoption. As determined through past studies, educators embrace a positive attitude regarding the benefits of technology to enhance learning outcomes yet remain hesitant to fully utilize technology applications or transform traditional pedagogies.

Based on the findings from previous studies regarding the hindrances and obstacles impacting teachers' technology attitudes and interactions, extraneous factors, such as self-efficacy, insufficient competence in basic computer literacy skills, lack of training and experience, age and agency, and time constraints, are defined as major barriers to adoption and integration. Therefore, this chapter has presented the related concepts, theories, and findings from previous studies, beginning with an overview of research on various factors affecting technology attitudes and then proceeding to factors that restrict the adoption and inclusion of technology. Furthermore, this section analyzed previous findings to examine their relevance to this study's purpose.

III. METHODOLOGY

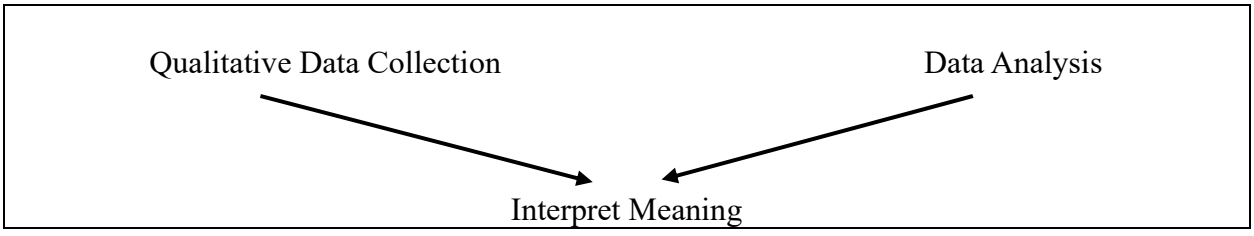
The purpose of this qualitative case study was to develop an understanding of teachers' self-efficacy and context dependency (Nordlöf et al., 2019) as evidenced by their perceptions of digital challenges and the impact of student achievement, motivation, and classroom behaviors on their decisions about using technology or direct instruction in the classroom setting. The implementation of digital resources was defined as students' independent use of digital resources that replace direct teacher instruction previously provided through lectures and classroom discussions.

Description of Research Design

Qualitative research designs are inductive and gather text-based data that reflect experiences. In a qualitative case study, the researcher maintains an emic approach or insider position, assigning the researcher as a data-collection tool. (Terrell, 2016). An interpretive research paradigm consists of the collection and interpretation of qualitative data to construct meaning of a common experience that is shared by a group of people.

Figure 1

Interpretive Research Paradigm (Terrell, 2016)



The use of the qualitative interpretive design in the present study allowed for descriptive data collection while allowing the researcher to get close and gather insider details to enrich the interpretations. Therefore, the present study implemented the interpretive approach to gather more informed data to answer the research questions and obtain a better understanding of the researched phenomenon (Terrell, 2016).

This qualitative case study design is appropriate for exploring information gathered from participants through surveys and interviews. The process consisted of identifying information through data collection sources, analyzing the data, interpreting the data, and presenting results. This qualitative, case-study design consisted of two phases: an anonymous survey phase and an interview phase. Qualitative data (open-ended) were analyzed via open, axial, and selective coding. Descriptive data (closed-ended) were analyzed through descriptive statistics and frequency counts (Creswell, 2016).

Research Context

Due to Florida's new Parental Rights in Education bill (2022), representing parents' rights to be informed regarding all aspects that may impact their children, schools have heightened their policies for gaining access to the public-school setting. This new Florida law limits access to schools for research purposes and has, therefore, restricted the ability to reach a broader base of district schools and educators. Consequently, acquiring a sample from within the public schools had become more challenging. Therefore, another site was chosen for accessing the educators. A local church congregation that is the place of worship for 30% of the 66 teachers within the two schools was used to gain access to the target population.

Participants

The sample selected for this study is convenient and purposive, as it included teachers actively teaching in one of two rural, Title 1, public elementary schools in southern Florida and having agency in accessible technology inclusion in their teaching environment. Based upon the information provided by the online sample-size calculator (Calculator.Net, 2023), the intended sample aimed to include 20 male and female elementary teachers in one of two schools in southern Florida. Of the 20 elementary teachers, six were invited to participate in a 30-minute, semi-structured interview.

As a member of a large worship organization where a proportion of the parishioners reflect the demographics of the educators in the local community schools, the researcher of this study accessed potential participants through digital announcements on the church's private social media sites. Following the Nordlöf et al. (2017) model of ethical practices for gathering a sample, the researcher included only participants who indicated their interest by interacting with the announcement and providing contact details.

Considering that 30% of the teachers in two public elementary schools in southern Florida attended the same local church, these church members/teachers made up the study population. The composition of this group reflects the schools' teaching population regarding race, age, and cultural views. Furthermore, the demographics of the teachers were represented within 30% of the schools' teaching staff who live, work, and worship in the same area as the schools.

The rationale for limiting the respondents to two schools is demonstrated in the ability of the schools to represent the overall demographics and, hence, the views of the target populations. The schools are identified as School A and School B to protect their privacy and are in a rural

municipal area. Both schools are classified as Title 1 and serve students in kindergarten through fifth grade. School A has a total enrollment of 660, where 67 students identify as Black or African American, 259 students identify as Hispanic, and 334 identify as White; 611 students are eligible for free-and-reduced lunches. Thirty-seven teachers are employed in this K-5 setting.

School B has a total enrollment of 631 students, where 55 students identify as Black, 198 students identify as Hispanic, and 320 students identify as White; 303 students are eligible for free and reduced lunches. Twenty-nine teachers are employed in this K-5 setting. These schools were specifically chosen because they represent the demographics and characteristics of the elementary public schools in southern Florida.

Perspective participants were recruited through two methods. First, the researcher approached and explained the research details to known educators in the congregation and requested their participation in the study. Second, the researcher advertised the research study details on the church's private Facebook page, with a specific invitation to join the study. All members had access to the advertisement, and the educators who met the criteria of teaching within the two identified public schools had an equal opportunity to show their interest and respond to the message. The included message instructed interested individuals to click a link leading to a survey (see Appendix A for the invitation to join the study).

An anonymous Likert-scale survey link was posted on the church's social media webpage to allow interested individuals to obtain further information about the study and access the survey. The individuals who completed the surveys became the participants in the present study. Based upon the information provided by the online sample-size calculator (Calculator.Net, 2023), the intended sample aimed to include 20 male and female elementary school teachers employed in one of two public schools in southern Florida. Sim et al. (2018) described a sample

as one that adequately informs a study's purpose. Of the 20 elementary teachers, six were invited to participate in a 30-minute, semi-structured interview.

Survey participants were invited to participate in an interview until six volunteers were reached. The volunteering participants completed an informed consent to be interviewed and recorded. For the second phase of the study's recruitment process, the interview data were used to generate a resource for the triangulation of data. Maximum variation sampling was used to reflect the diversity of genders, teaching experiences, and teaching levels of the educators.

Role of Researcher

The researcher's role was limited to that of observer, interviewer, and data collector. The researcher does not have any evaluative or supervisory role in relation to the participants. Kekeya (2021) suggested that participants are likely to share more knowledge as their perception of comradery with the researcher increases. Moreover, participants' willingness to share unfiltered information is based on their perception of the presence or absence of honesty and transparency. As in the case of human interaction (Kekeya, 2021), the researcher of the present study acknowledged the tendency for bias through reflexivity and intersubjectivity as the participants' testimonies triggered emotional cues linked to the researcher's personal experiences.

The researcher of the present study was not able to evaluate or supervise any of the participants. Instead, to build trust, the researcher's role aligned with that of the participant (Kekeya, 2021). Every effort was made to generate trust and respect to ease any apprehension and stimulate unfiltered contributions. Therefore, during the interview, the researcher established a rapport with the participant to establish comfort and trust. Furthermore, the researcher dedicated time to the field, emphasizing respect for the individual and setting.

Using the semi-structured interview protocol, the researcher selected the question order and follow-up questions as deemed necessary to obtain a level of detail desired to adequately inform the study purpose (see Appendix B for interview protocol). All measures of confidentiality were imparted to ensure the participants' dignity and security (Kekeya, 2021).

Ethical Considerations

According to Kekeya (2021), trustworthiness is a critical aspect of a study's ethical implications throughout the research process. Fundamentally, the level of ethics perceived by the participant drives the integrity of the shared data. Kekeya (2021) further asserted that as participants share details of a private nature, it is ethical that researchers maintain the highest level of respect for the information entrusted to them by ensuring accurate recording and confidential handling. Ethical considerations include attaining approval from Southeastern University's IRB before beginning any data collection. For online participants, a paragraph was included at the top of the survey informing them that completion of the survey indicated their agreement to participate in the study. Additionally, all individuals were made aware of their rights, including protection from physical and psychological harm. Survey participants were informed of their right to remain confidential and retain an untraceable identity. Both the survey and interview participants received an explanation about their right to withdraw at any point throughout the study. Furthermore, as human subjects, each participant was informed of their position as respected decision-makers throughout the process (Creswell, 2016).

Each interview participant was required to sign an interview consent form (see Appendix C) prior to their scheduled interview. Further, at the start of each interview, each participant was informed that the interview would be recorded. To ensure that all ethical measures were applied throughout the study, the researcher informed the participants of their voluntary role and right to

refuse the invitation to participate or to withdraw from the study at any time. The purpose of the study, use of the results, and length of the study were disclosed to the participants. All data were collected and stored on a password-protected computer, and every effort was made to maintain transparency throughout the entire study.

Research Questions

Data were collected to answer the following research questions:

1. How does elementary teachers' perception of student achievement influence teachers' decisions about using technology or direct instruction in the classroom setting?
2. How does elementary teachers' perception of student motivation influence teachers' decisions about using technology or direct instruction in the classroom setting?
3. How does elementary teachers' perception of student behavior influence teachers' decisions about using technology or direct instruction in the classroom setting?
4. What are elementary teachers' perceptions of the challenges of using digital resources?

Data Collection

The participants in this study were 20 teachers from two elementary schools in southern Florida. Purposive sampling was used to attain a representative sample that sufficed the study's purpose. Data collection methods included two phases: a survey and an interview. The study followed all ethical measures, beginning with the researcher acquiring permission (Creswell, 2016) to gather research data through valid and reliable instruments to conduct meaningful sampling and data storage.

Instruments Used in Data Collection

In Phase 1 of the data collection process, descriptive data on teachers' attitudes toward students' achievement, motivation, classroom behavior, and technology challenges when deciding whether to use direct or digital instruction were collected using the 16-item, anonymous Likert-scale survey. Stacked bar graphs were used in Phase 1 to display categorical responses from the Likert surveys (see Appendix D for survey questions).

As modeled by Adhya and Panda (2022), Google Forms can effectively be used as a data-collection medium. For the present study, the links to the brief survey, structured to be completed within a 20-minute timeframe (Teo & Huang, 2018), were presented to the educators who completed them electronically. Each survey consisted of 16 Likert-type statements relating to the impact of student achievement, motivation, behavior, and technology challenges on instructional decision-making. Response options ranged from *strongly disagree*, *disagree*, *neutral*, *agree*, and *strongly agree* (Tyagi & Misra, 2021). The anonymous survey functioned as a source to gather a general sense of the participants' perception of the availability and usefulness of technology as a teaching resource.

The surveys were constructed using the survey-maker program in the Google forms platform. Permission to post the survey on a local church website was sought and granted. A survey link was created and posted on the church website that could be accessed through Facebook's social media site. Through a church announcement, interested candidates were made aware of the study and how to learn more by visiting the digital announcement posted on the church's online site. Following the announcement instructions, interested participants engaged with the online link to gain access to the survey. The completed surveys were automatically uploaded to the Google Form that was visible only to the researcher. Phase 1 data collection

concluded once the desired number of surveys were received.

This study supplemented the quantitative survey data in Phase 2 of the data collection process through semi-structured, open-ended interview questions to generate thick and rich qualitative descriptions of the effects of student achievement, motivation, behavior, and technology challenges on teachers' attitudes toward the use of instructional digital resources. Six participants who completed the survey participated in semi-structured interviews. Agazu et al. (2022) described the interviewing process as the most common form of qualitative research data collection.

According to Yasir et al. (2019), the qualitative research process is conducive to the investigation of a phenomenon. Moreover, the qualitative method is a suitable approach to support a better understanding of empirical evidence (Agazu et al., 2022). Furthermore, other studies, such as the one conducted by Adhya and Panda (2022), collected data by surveying the participants to capture their perceived attitudes. Each participant responded to 20 questions that were digitally recorded. The interview responses provided the data for Phase 2 of the study.

The semi-structured interviews were limited to 30 minutes and included both central and follow-up questions according to an interview protocol (Nordlöf et al., 2017; Yasir et al., 2019). The central question focused on the teachers' attitudes toward digital teaching resources based on their perception of students' performance in achievement, motivation, and behavior. Subsequent questions were inquired about the participants' comparative perceptions regarding the students' engagement during direct instruction with traditional resources, such as textbooks versus digital instruction via an internet connection (Dilling & Vogler, 2022; Martin-Beltrán et al., 2017).

Validity and Reliability of Survey

Statistical validation and reliability measures of surveys are unnecessary, as gathered expert opinions confirm the credibility of surveys as an appropriate data collection instrument (Korkmaz & Toraman, 2020).

Permission to reuse previously published questions was requested and approved by emailing the researchers of previously published studies (Cvetković et al., 2022; Teo & Huang, 2018) and those questions were implemented in the present study in alignment with the guidelines of the granted permission. Therefore, the present study implemented similar questions that were explored by Cvetković et al. (2022) and Teo and Huang (2018) regarding teachers' ICT attitudes and teachers' intentions to use technology in instruction, respectively.

Teo and Huang (2018) previously confirmed the reliability and validity of the survey utilized in their study of teachers' intention to implement technology during lessons. According to reliability limits of .70 and convergent validity of .50, Teo and Huang used composite reliability and average variance extraction to determine the reliability and convergent validity of the tested variables. A correlation shown between the constructs was used to identify the measurement tool as having sufficient discriminate validity to be a qualified measuring tool.

Reliability and validity procedures were not explicitly detailed in the Cvetković et al. (2022) study. Instead, the reliability and validity of the measurement tool used in the study were determined through the statistical test of the parameters. The Kolmogorov-Smyrna test to examine the instrument's clarity and suitability resulted in a .01 statistical significance and indicated no vertical deviation from the normal distribution.

Therefore, the reliability and validity of the present study's survey were supported by the previous publication of similar questions in other studies. Additionally, the validity of the survey

to assess the intended sampling and content area (Creswell, 2016) was confirmed through a peer review process entailing the examination of the instrument by a professor who is familiar with the present research (Habibi et al., 2022).

Validity and Reliability of Interview Protocol

In qualitative research studies where the researcher represents a data collection tool (Creswell, 2016), taking an objective approach throughout collaboration enhances the validity and reliability of the data. The interview protocol was peer-reviewed by a professor and dissertation team who were familiar with the present study and research process. Each question was examined for clarity, relevance, and simplicity in the validation process. The reliability of the interview protocol was determined by a team of expert educators, including a dissertation chair and a methodologist.

Procedures

This study consisted of two phases. In Phase 1, a survey link to access a 16-question Likert survey was distributed to 20 potential participants via a social media site (Dilling & Vogler, 2022). The link led to an interest form and the survey on a social media website. The electronic survey began with implied consent, where participants indicated their willingness to participate by completing the survey. The collection and analysis of the surveys marked the conclusion of the first phase, and the interviewing process was Phase 2.

The recruitment process for the present study was initiated following Southeastern University IRB approval, targeting elementary public-school teachers fitting the specified inclusion criteria of a public elementary school teacher actively teaching in one of two southern Florida public elementary schools. The sampling process for Phases 1 and 2 was based on established inclusion criteria associated with the purposive sampling method. This study aimed

to understand how students' achievement, motivation, behavior, and technology challenges impact teachers' attitudes toward technology inclusion. Hence, the optimal informants were anticipated to have some degree of experience teaching with and without technology resources in the traditional classroom setting. The inclusion criteria for this study entail teachers with and without technology training (Teo & Huang, 2018) actively serving in the role of a teacher in one of two public southern Florida elementary schools.

The interested parishioners who responded to the posted invitation to join the study followed the instructions provided in a posted message. The message included detailed information regarding the study's purpose, the intended use of the results, measures to ensure participants' anonymity or confidentiality, methods for privacy protection and affirmation of their voluntary participation, and the link to the anonymous survey. The survey included an informed consent statement where individuals indicated their consent and willingness to participate in the study by completing the survey via the anonymous survey link.

The sampling procedures in Phase 1 of this study replicated those used by Johnson et al. (2020). Due to the inability to access the entire population of southern Florida elementary school teachers, a target population of 20 teachers fitting the study's description was considered and contacted. The sample size was determined based on the study's objective to understand the experience of a small group of educators.

The number of observations was determined using a sample-size calculator to indicate statistically the number of observations necessary to generate variability within the study. Based on the sample-size calculator, 20 individuals were required to complete surveys to produce a 70% confidence level that the findings of the survey tool reflect a precision value within ±5% of the margin of error. Therefore, at the 95% confidence level, repeated assessment of the same

sample would produce reliability of similar findings in the probability of the accuracy of the inferences made regarding the larger population.

An adequate sample is a quality indicator in qualitative studies based on Sim et al. (2018), although an exact method for identifying precise samples is nonexistent. Mocănașu (2020) was astute in that while some researchers emphasize that the adequacy of the sample size determines the research quality in terms of its reliability, other researchers denounce the relevance of the sample size to research quality standards. Moreover, in the absence of a consensus regarding the appropriate sample-size selection, each researcher must rely on their unique guidelines based on the interpretation of their study's needs (Mocănașu, 2020).

Hence, determining the proper size of a sample depends on the consideration of the researcher (Mocănașu, 2020) concerning whether a small or large sample will effectively fulfill their study's needs and provide data saturation (Johnson et al., 2020). In a contribution to the nature of appropriate sample size, Sandelowski (1995) confirmed that a small sample is normal in qualitative studies, and results based on a small number of respondents (Litchman, 2010) can provide feasible data (Mocănașu, 2020).

The sampling procedures in Phase 2 of this study modeled the Johnson et al. (2020) study. According to Johnson et al., the appropriate sample size depends on the nature of the units of analysis to provide data saturation in that no new ideas, codes, or themes emerge with successive readings. Johnson et al. (2020) further accentuated the point of data saturation as a "standard of rigor" (p. 141) in qualitative studies. Hence, a conclusive determinant for the appropriate sample size is the sufficiency of the sample to produce information to adequately inform the research purpose (Sim et al., 2018) to saturation (Johnson et al., 2020).

Based on Mocănașu (2020), accessibility and convenience of attaining participants is a concern in qualitative studies that determine the final sample size. In the field of education, gaining access to people and the nature of that access becomes a challenge that restricts the researchers' desired sample size achievement. Furthermore, the ability to achieve individuals who can both inform the study's questions and are willing to engage as participants is impacted by external factors, such as time commitments and communication constraints.

Johnson et al. (2020) stated that achieving saturation in studies relating to educational improvement is threatened by the constant emergence of progressive transformations. Moreover, in some instances, such as the present study, where data saturation may be an unreachable goal due to a small sample, the study can still offer benefits that aid in furthering the area of research for future studies.

In the case of educational research, especially involving the interviewing method, Adler and Adler (2012) suggested that most small-scale studies include six to 10 respondents on occasions where volunteer accessibility is of concern. Therefore, based on recommendations (Adler & Adler, 2012), an accessible group of six teachers matching the inclusion criteria of the present study was approached through the purposeful maximum variation sampling method.

The purposeful maximum variation sampling method was selected due to the flexibility of obtaining an intentional selection of participants who are most qualified to answer the research question with thick and rich information (Johnson et al., 2020). Moreover, based on the purpose of this study to obtain meaningful insights based on the perspectives of 20 elementary teachers, a purposeful sampling method is the appropriate medium (Luo et al., 2022) and increases sampling credibility and transferability to the present study (Johnson et al., 2020).

In Phase 2 of the data collection process, six participants who had indicated their

willingness to participate in the interviews were contacted. Maximum variation sampling based on gender, years of teaching experience, and level of teaching experience was considered when identifying the six participants who responded. The interviews were conducted through the Google Meet online platform and lasted approximately 30 minutes. Using two forms of data provided an opportunity for triangulation of the data through the examination of multiple data sources to produce a more precise interpretation of a proposed condition (Kekeya, 2021).

The interviewing process proceeded according to the process used by Nordlöf et al. (2017). Teachers were informed that the interviews would be digitally recorded and that the questions would be presented from the interview protocol one at a time. The researcher paused after each question during the interview to allow the participants to share information uninterrupted and to encourage the expression of any additional ideas. The observations of nonverbal gestures and cues provided an additional source of triangulation through the manual notations of subtle nuances (Johnson et al., 2020). Additional follow-up questions were asked if further explanations were warranted. The process was repeated for each participant to examine their motivations for actions (Delve & Limpaecher, 2022). The qualitative responses to the questions in the interview questions were analyzed using open, axial, and selective thematic coding using an inductive process.

The study included male and female participants ranging in the number of years of teaching experience and subject areas taught to provide maximum variation in the interviews. The survey collected data from 20 state-certified elementary teachers from two elementary schools in southern Florida who have experience teaching regular education students using classroom technology.

Data Analysis

The data collected in Phases 1 and 2 were analyzed, interpreted, and summarized to inform the conclusions and assertions in the present study. The quantitative data analysis revealed answers to the 16-item Likert survey. The qualitative data analysis findings revealed related themes based on teachers' perceptions of student achievement, motivation, behavior, and technology challenges.

The data in Phase 1 were analyzed using descriptive statistics related to frequencies and means. Therefore, data from all completed surveys were exported and recorded on an Excel spreadsheet. Following the survey verification, the scores were computed using frequency and mean calculations. Data were entered into the Social Science Statistics website, which was used to calculate descriptive data, including question response means and frequency. This information allowed for comparison between answers using stacked bar graphs.

The data in Phase 2 were analyzed using thematic analysis consisting of qualitative coding. Coding in thematic analysis is a sequential process of organizing and structuring data in a way that provides transparency and rigor. Moreover, the dissection of the non-numerical data adds validity to the data and generates a more credible representation of the findings. Thematic analysis is best suited for qualitative research and fosters reflexivity, insight, and interpretations that are transferable and repeatable. The process of coding is beneficial in answering research questions and leads to the development of sensible theories that apply to future contexts (Delve & Limpaecher, 2022).

The first step in the analysis process was to convert the digital interview files to transcripts and thoroughly read through the notes, allowing the ideas to emerge in the inductive coding method. Concurrently, a copy of the transcripts was provided to the interviewee for

verification and affirmation of content correctness. Member checking is a crucial step in ensuring the participants have an opportunity to confirm that their contributions were captured meaningfully (Johnson et al., 2020). The following step entailed the open coding sequence, which involved dismantling the information into manageable portions. Descriptive labels were affixed to each small portion of data based on the features of the content. Consequently, similar content was listed under the same labeling (Delve & Limpaecher, 2022).

After a second read-through and additional simplifying of the data into controllable snippets, correlations were identified that generated links between the data parts. Related data pieces were chunked according to the interconnected ideas to form a more inclusive group in the axial coding step (Delve & Limpaecher, 2022).

In the selective coding step, the isolated chunks formed categories of similar themes and ideas. Subsequently, the codes, themes, and categories were examined, and any data lacking sufficient strength were purged (Delve & Limpaecher, 2022). Finally, the data were examined and interpreted to generate a rich narrative leading to the results of the present study.

Summary

This chapter explored teachers' attitudes toward technology inclusion based on their judgment and interpretations of student characteristics. Only willing participants participated in this qualitative case study to inform the study questions and contribute to an understanding of teachers' self-efficacy and context dependency (Nordlöf et al., 2019) as evidenced by their perceptions of digital challenges and the impact of student achievement, motivation, and classroom behaviors on their decisions about using technology or direct instruction in the classroom setting. Data for this study were collected using a purposeful sample of teachers in two southern Florida elementary schools through an anonymous Likert survey and an interview.

The researcher of the present study conducted the study procedures according to verified validity and reliability confirmation of the data collection tools and ensured all ethical considerations were observed throughout the study. The data were organized, cross-checked for accuracy, and prepared for analysis through the thematic analysis process.

IV. RESULTS

The purpose of this qualitative case study was to develop an understanding of teachers' self-efficacy and context dependency (Nordlöf et al., 2019) as evidenced by their perceptions of digital challenges and the impact of student achievement, motivation, and classroom behaviors on their decisions about using technology or direct instruction in the classroom setting. The implementation of digital resources was defined as students' independent use of digital resources that replace direct teacher instruction previously provided through lectures and classroom discussions. The last chapter described a qualitative case study research process that explored teachers' agencies in technology inclusion as a common phenomenon.

This chapter includes the 16-item anonymous Likert survey results for the 20 survey participants. It also includes the qualitative findings, which generated themes, and examines the recurring themes that emerged after triangulating the quantitative and qualitative data.

As discussed in Chapter 3, means and stacked bar graphs were utilized to illustrate the categorical responses collected from the Likert surveys and to assess results for the overarching question: "How does an elementary teacher's perception of student achievement, motivation, behavior, and technology challenges influence teachers' decisions about using technology or direct instruction in the classroom setting?

This study examined the impact of teachers' perceptions of student achievement, motivation, behavior, and technology challenges on teachers' decisions to implement digital or

traditional instruction. Chapter 4 is divided into three sections. The first section presents an overview of the data collection process. The second section presents an overview of the sample characteristics. The third section presents the analysis of the data collected.

Research Questions

Survey data were collected to answer the following research questions:

Research Question 1

How does elementary teachers' perception of student achievement influence teachers' decisions about using technology or direct instruction in the classroom setting? This question was answered by survey Items 1 through 4 and interview Items 1 through 6.

Research Question 2

How does elementary teachers' perception of student motivation influence teachers' decisions about using technology or direct instruction in the classroom setting? Insight for this question was gathered from survey Items 5 through 8 and interview Items 7 through 10.

Research Question 3

How does elementary teachers' perception of student behavior influence teachers' decisions about using technology or direct instruction in the classroom setting? This question was answered by survey Items 9 through 12, and interview Items 11 through 14.

Research Question 4

What are elementary teachers' perceptions of the challenges of using digital resources? This question was answered by survey Items 13 through 16 and interview Items 15 through 20.

Methods of Data Collection

Data were collected using a 16-item anonymous Likert survey and a 20-item semi-structured interview protocol. The survey collected quantitative information regarding teachers' perspectives of students' achievement, motivation, behavior, and digital challenges when teaching with digital resources versus teaching through direct instruction with traditional resources. The survey served the dual purposes of gathering demographic and descriptive responses to confirm or dispute the themes identified through the qualitative interviews. Means and stacked bar graphs were utilized to illustrate the categorical responses collected from the Likert surveys. Quantitative survey responses were collected from 20 elementary school teachers employed in two southern Florida schools during the 2023/24 academic year.

Semi-structured, open-ended interviews were used to collect qualitative data from six volunteers regarding teachers' attitudes toward technology inclusion as influenced by students' achievement, motivation, behavior, and technology challenges. The interviewer used this information to complement the survey data. The acquired qualitative data were enriched using the quantitative data to produce a hearty and thick qualitative and thematic analysis.

Qualitative data were collected through the semi-structured interviews that were transcribed and then thematically analyzed through open, axial, and selective coding processes. Through the open coding process, the data were disassembled into smaller units to allow for labeling and repositioning according to coding properties. Similar codes were categorized under the same subject and formed a code of related elements (Delve & Limpaecher, 2022). Axial coding consisted of furthering the open coding process by identifying relationships between the independent codes. Combined codes were categorized to form a condensed class of related ideas. In the selective coding process, a broader boundary was generated to capture the recurring

themes within the classes. Consequently, the data parts that captured the rich and thick data were connected.

Following the triangulation of the strands, several themes emerged relating to the research questions and study focus. Triangulation contributed to the narrowing of initial impressions, themes, and central messages to foster inter-strand data connections. Furthermore, the quality of responses was enhanced due to triangulation that informed data trimming and purging. Developing patterns generated a oneness and tunnel view to unite the strands according to the interpretive paradigm.

Study Sample

To acquire participants, the researcher approached the administration officers of a local church, which represented the place of worship for a large portion of the population of interest. Approval to conduct the study was granted by the church board, and the study announcement was posted on the church's social media website by the designated IT representative.

In addition to the digital display of the study invitation, the researcher informed participants who were perceived to meet the criteria regarding the announcement location. The interested parishioners accessed the study by visiting the social media site and following the announcement instructions for accessing the link that activated the survey.

Demographic data were collected from each participant. Twenty male or female elementary teachers from two schools in southern Florida responded to the study invitation and were included as the study participants. The sample was composed of voluntary participants who were interested and employed as elementary teachers in a southern Florida public school. The demographic data revealed that of the 20 participants, 19 identified as female and one as male. Years of experience teaching ranged from 1 to more than 11 years.

The majority of the participants had more than 11 years of teaching experience (55%), and 50% of the sample taught Intermediate Grade Levels 3 through 5. Participants taught a variety of subject areas, including reading, math, art, music, and special education. However, two of the participants taught math and science exclusively. The largest group of participants taught all subjects in the K-5 setting (35%), while the rest of the participants taught just one or two subjects.

Table 1 presents the demographic information provided by the 20 survey participants. The majority (95%) of the sample classified themselves as females who teach third to fifth grade and have more than 11 years of teaching experience.

Table 1

Number of Survey Participants in each Demographic Category

Category	*n*
Gender	
Male	1
Female	19
Years of experience	
1-3 years	2
4-7 years	3
8-11 years	4
11+ years	11
Level taught	
Pk-K	7
1st–2nd	4
3rd-5th	9

In addition, six participants were invited to provide supplemental information through semi-structured interviews to enrich the data. Table 2 provides the demographic information about each of the interview participants.

Table 2

Interview Participants' Demographic Characteristics

Participant	Years of teaching experience	Level taught
1	27	3-5
2	13	3-5
3	15	K
4	18	K-5
5	35	3-5
6	21	3-5

Note. All interview participants were female.

The first interviewee was an intermediate mathematics instructor with more than 27 years of teaching experience. Referred to as a technology trailblazer by her peers, she embraced her digital competence. Participant 1 could be described as a well-versed educator who embraces teaching through traditional means while acknowledging the benefits of digital modes. She is an advocate for technology inclusion yet emphasized that technology as a substitute for a classroom teacher was unethical.

Participant 2 is a math teacher in the Intermediate Grades 3-5. She is a firm believer in the benefits of technology inclusion but emphasized that there is no replacement for the classroom teacher.

Participant 3 is a kindergarten teacher who is very passionate about helping her students succeed. She acknowledged the benefits of incorporating digital resources but, because of her protectiveness toward her little ones, emphasized leveraging technology at an age-appropriate level.

Participant 4 teaches music across all K-5 grade levels. She views technology inclusion as especially significant because she has a unique situation where she travels to classrooms to

deliver music lessons. She faces the challenge of not knowing what to expect as she enters classrooms from one day to the next. Therefore, having personal digital resources as a Plan B is particularly important for her.

Participant 5 is a seasoned educator who has worked with all age groups and subjects. Although she supports technology as a resource, she acknowledged the importance of age-appropriate interaction. A sense of respect for technological benefits is evident in her responses. Still, she believes that teachers are threatened by the forced integration of technology in exclusion of teachers' preferences.

Participant 6 teaches Intermediate Grades 3-5. In addition to her clear appreciation of technological benefits that made her job easier, she was perceived to be an educator who upholds many traditional classroom values. She believed that educators should rely on the previous work of former teacher veterans rather than attempt to "reinvent the wheel."

Findings by Research Questions

This section presents the research findings by research question and discusses the data collected through the interviews and surveys. Furthermore, the data analysis procedures are described and reported according to each research question.

Research Question 1

The first question asked: How does elementary teachers' perception of student achievement influence teachers' decisions about using technology or direct instruction in the classroom setting? This question was answered by survey Items 1 through 4 and interview Items 1 through 6.

Analysis

The data collected from the semi-structured interviews were transcribed and loaded into the online Delve and Limpaecher (2022) software for thematic analysis support. After multiple readings of the narrative, the sorting of concepts was initiated, and labels were incorporated as ideas emerged. Related labels were categorized by codes, and related codes were combined to generate themes. A frequency of themes was identified, and the leading themes were developed to answer the first research question.

Qualitative Findings

Participants were asked to examine their perceptions of students' learning and achievement and to explore how these perceptions influenced their decision to initiate direct versus digital instruction. To properly address this question, the participants defined their concepts of student achievement as students' learning gains acquired through an ethical educational experience that was fair and advantageous to developing content understanding. Therefore, any inclusion that increased students' understanding of the learning content was perceived to benefit students' achievements and to impact teachers' decisions regarding instruction methods.

In their unique ways, the participants expressed how their perceptions of students' achievements impacted their decisions to implement technology or traditional instructional resources. Within each of their individually analyzed statements were three themes that were the most frequently recurring themes: enhancing teaching and learning, maximizing resources, and optimizing formative assessments. No participant discussed every theme. The number of the six participants who discussed each theme is included in Table 3, illustrating the relative importance of each theme.

Table 3

The Number of the Six Participants Who Discussed Each Student Achievement Theme

Achievement themes	*n*
Enhancing teaching and learning	6
Maximizing resources	4
Optimizing formative assessment	3

Enhancing Teaching and Learning. Teachers based their decisions to implement digital or direct instruction on factors related to instructional enhancements provided through technology resources. Based on the collective responses gathered through the analysis, all six teachers perceived technology as a resource for enhancing teaching and learning objectives. Participant 2 discussed her perception of her students' decreased achievement during whole-group direct instruction that encouraged her to implement technology. She explained that during direct instruction, students' access to textbook content was restricted by their physical distance from the traditional resource. However, by implementing the smartboard to display the instruction on a larger screen, more students were able to interact with the material and increase their understanding of the objectives. This experience influenced her decision to implement technology in subsequent whole-group lessons as a means of increasing the students' achievement.

All six teachers identified the advantage of digital resources to enhance instruction and achievement by providing greater opportunities for skills practice. Practice is a crucial component in achievement and directly impacts students' academic growth, according to Participant 6, who advocated for increased practice to maximize learning. She emphasized that "the more students know the more they grow," and indicated that technology presented

opportunities for practice that led to increased academic growth. Participant 1 echoed the impact of practice on achievement. “It [digital instruction] provides good practice,” she stated. Furthermore, the additional practice strengthens desired competencies by increasing student content contact time.

Four teachers based their decision to include technology during instruction as a method for adapting the content to individual learning styles and abilities. The responses showed that teachers viewed direct instruction alone as restrictive, but technology inclusion increased achievement by adapting the instruction to suit all learners. Participant 1 stated, “This is especially the case with adaptive technology, which tailored student learning to their unique level of knowledge.” According to Participant 2, technology inclusion offered multiple accommodations to meet the academic needs of all students, including those with physical disabilities. Participant 4 added, “Technology helps to hit all the modes of learning, including visual and auditory, and provides a more effective means for individual learning.” Participant 4 indicated that she relied heavily on technology to enrich her content delivery. She explained that digital music videos helped to increase her students’ understanding of many skills and stressed the benefits of technology to aid in musically adapting her instruction to address her students’ preferred learning mode. She explained that she enjoyed singing with her students, and technology provided a venue for converting her instruction to a musical format that enhanced her students’ comprehension of the standards:

> We do a lot of dancing in my class. I would have to say that it’s a big deal because we are using our speakers in our room, so that’s technology. They’re looking at our overhead projector to follow along with the dances. So, the whole class is having a good old time versus like, they don’t have anybody to see. But not having, our enhancement in our

classroom, it wouldn't be kind of like the same impact because it's, you know, kind of like no DJ versus a DJ type of thing.

Conclusively, the participants viewed technology as making learning more inclusive and equitable for all students.

Maximizing Resources. Two-thirds of the interview participants stressed the role of digital resources in helping to expand learning. The teachers indicated that their decisions were influenced by their positive perceptions about the ability to expand learning due to plentiful digital resource options. Two participants described digital resources that allowed them to increase instruction and achievement, including smartboards for whole group content, Chromebook computers that provided learning access at school and home, and customizable learning software with programmed lessons.

Participant 1 indicated that technology permitted absent students or those desiring enrichment to extend their learning. Participant 2 indicated, "I consider technology a resource that can take on various forms such as videos and computer-based games." She added, "And it's great because there are so many different resources out there." The participants indicated that technology allowed educators to extend learning and instruction beyond the traditional classroom confines, hence maximizing the students' achievement. Furthermore, Participant 3 described the advantage of numerous resources to stretch the instructional efforts: "It's kind of like another type of tutoring program on the side." These participants felt technology furthers the instructional reach, even sometimes beyond the classroom setting.

Returning to the idea of expanding student achievement, Participant 5 identified the advantages of digital resources over traditional learning materials. She believed that although textbooks are rich in content and knowledge, digital resources could promote more extensive

learning due to being more current. She explained, “Compared to traditional textbooks that are updated many years after their original published date, technology is more accurate and up to date. So, you’re getting the most current information.”

An appreciation of direct, traditional instruction was evident in every participant’s interview, yet the benefit of digital materials to expand resource availability was a strong decision-making factor.

Optimizing Formative Assessment. Half of the educators commented that providing the most effective learning experience informed by formative assessments was important. The educators indicated that their decisions to implement technology were partially due to the convenience of digitally monitoring students’ achievement through ongoing formative assessment. Technology inclusion increased student achievement by allowing educators to monitor and track students’ progress throughout the instruction. Three participants indicated that digital resources were a good source for conducting formative assessments. Participant 3 stated: “It lets us know where our students are in regard to the data.” These participants felt that resources provide digital data that display how they are doing in their achievements. Teachers were able to assess their students’ performance to inform instructional practices to enhance their students’ achievement using digital formative assessment.

One example shared by three participants described the formative assessment function of the IXL learning software that presents real-time performance levels to inform instruction. The digital dashboard displays numerical values such as percentages, the number of problems mastered, and the number of problems attempted. As stated by Participant 6, “This data helps the teacher to be able to actually see each student’s struggle.” Furthermore, the automized formative assessment expedites the regular formative assessment process required in the traditional setting.

An added benefit is that children can see and manage their achievements through the digital features of technology. Participant 6 stated, “The children can see their score calculations formulated on the computer. They can see whether their scores were going up or going down.” She believed that this data display was helpful to the students to see their growth.

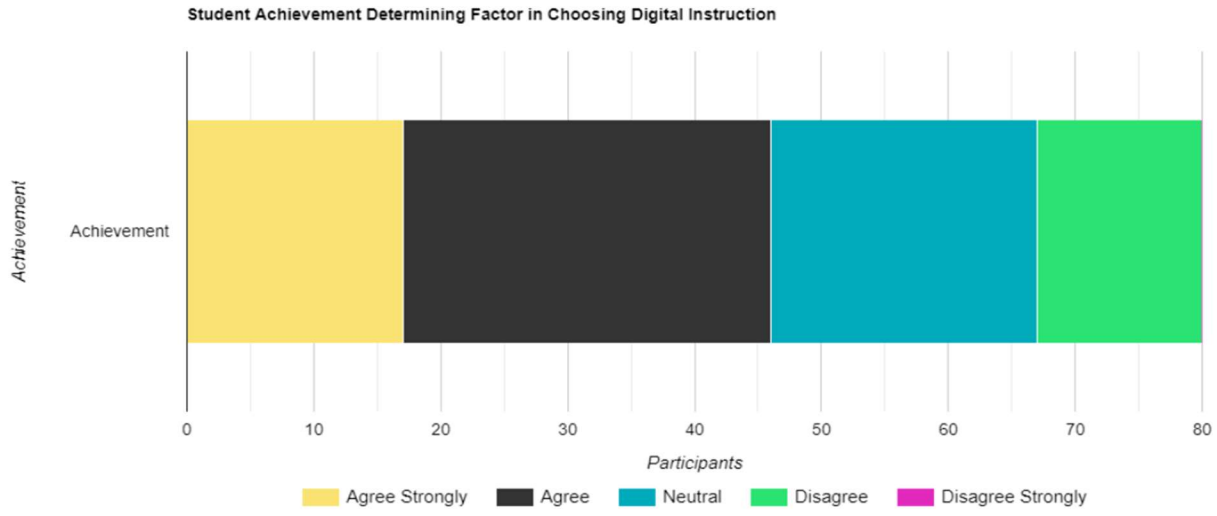
According to the participants’ responses, teachers made their decision to implement digital or direct instruction based on technology’s contribution to enhancing instruction, expanding resources, and improving formative assessments.

Quantitative Findings

The 20 survey participants answered four questions related to the impact of student achievement when deciding what instructional method to implement. Figure 2 presents the analysis as a bar graph.

Figure 2

Bar Graph of Survey Participants’ View of Student Achievement



The bar graph for the total responses from all 20 participants on the four questions indicates that teachers viewed student achievement as an important consideration. Of particular

interest is the fact that no participants disagreed strongly on any of the four questions; only 13 of the possible 80 responses were in the disagree area, and 45% of the responses were either in the strongly agree or agree categories. The means for three of the four questions were between neutral and agree; however, the mean for achievement, the most important factor to consider, was in the agree range. Table 4 indicates the mean of each of the four questions in the student achievement section.

Triangulation

The means support the identified interview themes and indicate that teachers felt that student achievement was the most important characteristic to consider when using digital resources. However, they did not necessarily feel that using technology resulted in improved student achievement, which seems to contradict the information about improved teaching and learning from the interviews.

The quantitative data from the survey supports the recurring themes identified from the interviews about the impact of student achievement on teachers' instructional decisions. The survey and interview responses both indicate that student achievement is an important consideration in determining when to use digital resources rather than direct instruction.

Table 4

Means for Each Student Achievement Question

Question	Mean
Teacher technology competence	3.95
Technology achievement better	3.15
Achievement most important factor	4.10
Student achievement better	3.55

Note. The means were calculated based on a 5-point Likert scale: 1= *disagree strongly*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, and 5 = *agree strongly*

Research Question 2

The second research question asked: How does elementary teachers' perception of student motivation influence teachers' decisions about using technology or direct instruction in the classroom setting? Data for this question were gathered from survey Items 5 through 8 and interview Items 7 through 10.

Analysis

The data collected from the semi-structured interviews were transcribed and loaded into the online Delve and Limpaecher (2022) software for thematic analysis support. After multiple readings of the narrative, the sorting of concepts was initiated, and labels were incorporated as ideas emerged. Codes categorized related labels, and related codes were combined according to generated themes. A frequency of themes was identified, and the leading themes were developed to inform the analysis of the research question.

Qualitative Findings

According to the analysis of the interview data, teachers did not base their teaching mode decisions on their perception of student motivation as compared to their perception of student achievement. In their interview responses, each participant described their perception of students' motivation. According to Participant 5, classroom enthusiasm and an eagerness to come to class was an indication of student motivation. Participant 2 explained:

> I determine my students' motivation during my lessons based on student engagement and the percentage of students that complete the lesson. So, of course, engagement can be just wanting to participate with me or with their peers. That's typically how I determine their motivation.

From the analysis, three themes were identified most frequently. The three themes

captured the teachers' perception of the impact of student motivation on their teaching decisions. The themes were that motivation was not the primary deciding factor, digital resources increased motivation through extrinsic factors, and motivation increases when technology usage is balanced. Table 5 provides the number of participants who discussed the three motivation themes.

Table 5

The Number of the Six Participants Who Discussed Each Motivation Theme

Motivation themes	Number of participants discussing theme
Motivation not teachers' primary deciding factor	6
Increased motivation through extrinsic factors	3
Motivation requires a balanced technology usage	3

Note. The means were calculated based on a 5-point Likert scale: 1= *disagree strongly*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, and 5 = *agree strongly*

Motivation Not Teachers' Primary Deciding Factor. The interview participants stressed the importance of using technology to motivate their students; however, they indicated that digital content quality and rigor, not motivation, were more important. The teachers' decisions to implement digital versus traditional resources were influenced by the nature of the resource, not by student motivation. All six teachers indicated they were comfortable motivating their students using a variety of teaching modes. However, more than just for motivating students, four of the teachers indicated technology deepens students' focus. Additionally, two teachers stressed the importance of focusing on the desired learning outcomes as the key informant for the inclusion of digital resources. Rather than prioritizing the motivational value of technology to drive their decisions, Participant 5 stressed, "We use technology to help motivate." However, she felt that technology cannot replace the more

important interpersonal relationships that develop naturally between students and teachers. Achievement and relationships were viewed as more important than motivation.

Participant 6 stated, “If it’s motivating them to learn and want to grow, why wouldn’t you want to continue to do something that’s going to help them…to make sure that they are getting the results that’s needed?” Participant 2 supported the notion of technology motivation by stating, “Technology lessons seem to capture more students’ engagement with less teacher effort, and more students typically can complete the lessons that involve the technology.”

Participant 1 explained, “Concept acquisition might be aided better using technology, not really motivation.” She indicated that technology should be used primarily as a source to promote learning and not as a motivational resource. Therefore, the teachers’ decisions were most influenced by resources that promote student learning rather than focusing on student motivation.

Increased Motivation Through Extrinsic Rewards and Presentation. Watching their students become excited while learning had a strong impact on the teachers’ decisions regarding the resources to include in instruction. Participant 6 said, “I believe that the visuals, videos, and music all help to motivate them in a way that they want to do it.” The additional modalities available through digital features motivated the children to want to learn. Participant 3 stated: “We have a program like Starfall. If they’re doing their best, it does motivate them to do better because, as an incentive, the program automatically rewards them with educational games.”

All six participants acknowledged the positive impact of technology on students’ motivation; however, three participants identified their students’ preference for extrinsic motivational factors provided by the technological resources. Participant 2 explained, “I notice that typically they tend to be more enthused about technology lessons than they

probably are in direct instruction." The students' technology obsession was a key factor for Participants 5 and 6. "It's what they enjoy," Participant 6 shared. Participant 5 confirmed, "You know, it's always been where teachers have to compete with digital devices for students' attention." Participant 4 summarized students' technology passion by stating, "Children of all ages love technology, and that is a solid reason why I've included digital learning in my instructions." Participant 6 added, "The privilege of being on the computer gives them more motivation." Regarding student motivation, Participant 6 stated, "My confidence in technology is high due to its ability to engage my students' interest." The teachers recognized the students' preference for technology-related motivation.

Motivation Requires a Balance of Direct Instruction and Technology. Although the teachers perceived students demonstrated greater motivation when engaging with technology, the same teachers denied that the technological impact was greater than that of traditional instruction. Participant 1 stated, "Technology definitely has its place, but student motivation is not tied to my technology use." She explained the need for a balanced approach to generating students' motivation. "Not every lesson needs technology to motivate students," she indicated. She continued, "Taking students outside to do a scavenger hunt can sometimes have the exact same effect or motivational impact as playing a game of Kahoot online." She concluded by stating, "The careful examination of the use of all resources can make learning fun." A complementary notion was submitted by Participant 5, who discouraged the use of technology simply to increase engagement. She commented that the motivation for learning does not come from random interaction with technology. Furthering this notion, Participant 5 expressed a precaution against the undesirable consequences that can develop through the exclusive use of technology as a motivational driver. She explained, "Technology inclusion for the sake of

motivation could help children to make gains when it is used properly or harm motivation if it is abused." According to Participant 6, intrinsic motivation is an alternative factor she considers when deciding whether to implement digital devices or traditional methods.

The teachers' perceptions of students' body language directly inspired their choice of instructional methods. Participant 3 enjoyed watching her students engaging in lessons and explained that, at times, choosing between digital and traditional resources is "tricky." However, she chose the option that would allow more of her students to participate concurrently. She shared a classroom experience: "So, we're doing our C-V-C words and kind of like speeding through our little spelling game where everybody can write and erase the board at the same time. And everybody's participating and are all having a great time."

The interview data showed that teachers believed increased extrinsic motivation can occur using technology. However, they indicated that increasing student achievement was a more important deciding factor than student motivation. The participants indicated that using technology to motivate students in a fair and balanced learning experience means implementing technology-inclusive instruction to promote learning while supporting motivation using a balance of technology and direct instruction.

Quantitative Findings

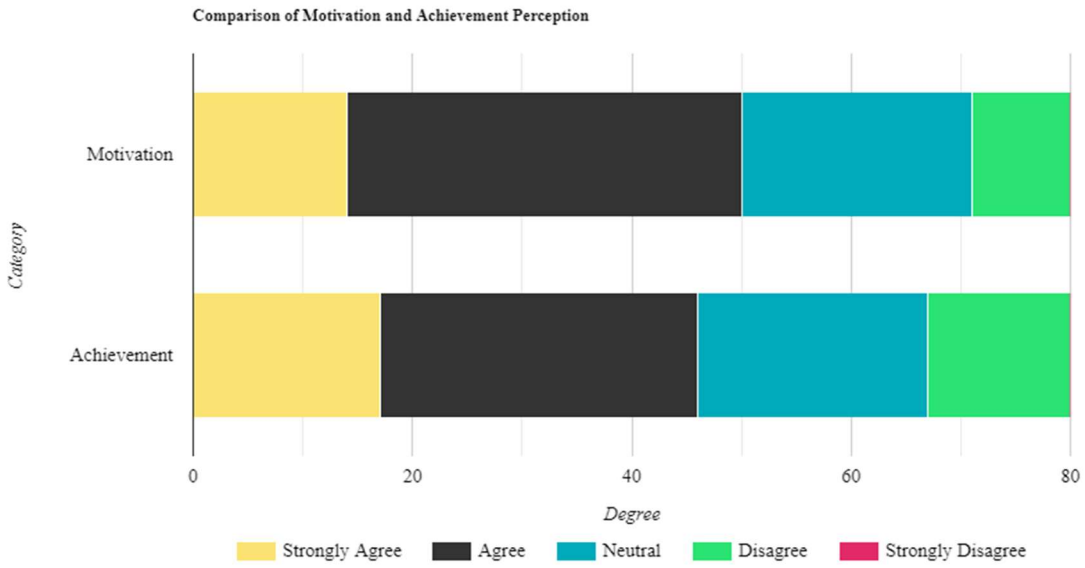
The survey participants answered four questions on the online survey related to the impact of motivation when deciding what instructional method to implement. However, all the interview participants agreed that both traditional and digital resources can effectively motivate students; 70% of the participants reported in the survey responses that their students demonstrated better motivation using technology. Nevertheless, in a subsequent question, 35% of the surveyed teachers did not agree that student motivation using technology was better

than during direct instruction.

Figure 3 presents the stacked bar graph (comparison) for the total responses from all 20 participants on the four questions. The graphs indicate that student achievement is a more important consideration than student motivation. This supports the themes from the interviews. Of particular interest is the fact that some participants disagreed on the questions related to motivation.

Figure 3

Comparison of Teacher Perceptions of Achievement and Motivation



Slightly more than half (65%) of the 20 surveyed teachers reported student motivation as the most important factor they considered when deciding whether to implement technology or traditional resources in instruction. Moreover, three-fourths (75%) of the survey participants reported feeling more confident in increasing student motivation using technology. The remaining 25% of the teachers supported the idea of using other motivational

strategies because they believed, as stated by Participant 1, “There are other ways to motivate children in the classroom.” Therefore, the teachers’ perspectives of students’ motivation were important but moderated by their view of student achievement.

Table 6 indicates the mean of each of the four questions from the survey in the student motivation section. The means for each question were between neutral and agree. No means were strong enough to reach the agree level. The means indicate that teachers did not necessarily feel that using technology resulted in improved student motivation, which seems to support the information about motivation from the interviews.

Triangulation

The quantitative data from the survey support the recurring themes identified from the interviews about the impact of student achievement on teachers’ instructional decisions. The survey and interview responses both indicate that student motivation is an important consideration in determining when to use digital resources rather than direct instruction, yet not the leading consideration. Implementing a balanced learning opportunity was a more critical factor than student motivation in the teachers’ decision-making.

Table 6

Means for Each Student Motivation Question

Question	Mean
Student motivation using technology	3.85
Technology increases motivation	3.30
Motivation most important factor	3.75
Student motivation better	3.85

Note. The means were calculated based on a 5-point Likert scale: 1= *disagree strongly*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, and 5 = *agree strongly*

Research Question 3

The third research question asked: How does elementary teachers' perception of student behavior influence teachers' decisions about using technology or direct instruction in the classroom setting? This question was answered by survey Items 9 through 12, and interview Items 11 through 14.

Analysis

The data collected from the semi-structured interviews were transcribed and loaded into the online Delve and Limpaecher (2022) software for thematic analysis support. After multiple readings of the narrative, the sorting of concepts was initiated, and labels were incorporated as ideas emerged. Codes categorized related labels, and related codes were combined according to generated themes. A frequency of themes was identified, and the leading themes were developed to inform the analysis of Research Question 3.

Qualitative Findings

Based on the results from the analysis of the interview participants' responses regarding the impact of technology on students' behavior during instruction, teachers indicated that they considered several components when deciding the best method for producing students' on-task behavior. First, teachers considered whether digital resources would increase their students' ability to focus rather than increasing distractions. Next, teachers considered the increased demands on their time spent monitoring students' behavior when involved with digital resources. Hence, the development of two themes: technology behavior distractions and increased demands for teacher behavior management. Table 7 presents the number of participants who discussed each behavior theme.

Table 7

The Number of the Six Participants Who Discussed Each Behavior Theme

Behavior Themes	Number of Participants Discussing Theme
Technology behavior distractions	4
Increased demands for teacher behavior monitoring	3

Technology Behavior Distractions. The interview participants shared their perceptions of students' behavior during direct teaching and digital instructional modes. The teachers' collective perspective revealed they viewed technology as having both positive and negative impacts on behavior. The interview participants indicated that they were able to maintain desired behavior during technology-based instruction to limit distractions; however, technology distraction did occur, which caused students to demonstrate negative behaviors. Participant 2 described students' disengagement while using technology: "You can tell when they're checking out. Their body language shows if they seem to be disengaging with what is going on." Participant 1 gave a description of technology distraction that can derail expected behaviors: "Students have been known to go to other websites or activities instead of focusing on the lesson at hand." Participant 3 went further by identifying the need for behavior redirection as an additional concern when using technology: "A lot of times they want to veer off, but as [an] educator, you have to bring them back." When discussing technology's influence on student behavior, Participant 2 shared, "You wonder whether they are just clicking through and having fun with just being on the computer versus whether they were really reading, learning, and understanding."

Participant 1 emphasized the additional factor of students' off-task behaviors during technology usage. She discussed students switching to unassigned activities or visiting websites

that posed a threat to learning.

Increased Demands for Teacher Behavior Monitoring. When using technology, additional teacher effort was required to monitor and control students' behavior. Furthermore, Participant 5 expressed concern about blocking inappropriate sites: "Sometimes that can be a challenge as well because if they're using a school device, of course, we try to, you know, put blocks on it, and we try to control the security of it so that they don't go into inappropriate sites."

The emerging themes identified the need for teachers to spend increased class time on behavior management when using technology. Managing technology interaction meant becoming classroom detectives to monitor students' interaction with the resources. Participant 2 described her process for behavior management while using technology by stating, "So, again, you look for those signs" that signal disengagement, which are sometimes difficult to recognize when students are highly digitally competent. Therefore, Participant 3 provided the following suggestion: "Teachers have to prepare themselves to become more tech-savvy because students must be kept guessing."

Inappropriate student interaction with technology can taint engagement; therefore, the teachers identified the need to redirect behavior as a part of technology management. The educators identified the behavioral benefits of direct instruction with a lesser need to monitor student behavior. Participant 3 indicated a preference for live engagement over seeing her students "sitting and staring at a computer screen."

Participant 3 shared her perception of students' behavior during digital instruction. She explained that a computer cannot detect positive and negative behaviors like a teacher can during direct instruction. Furthermore, she added that behaviors like frustration and indifference can be distinguished during direct instruction but not by a digital device. She indicated, "A live

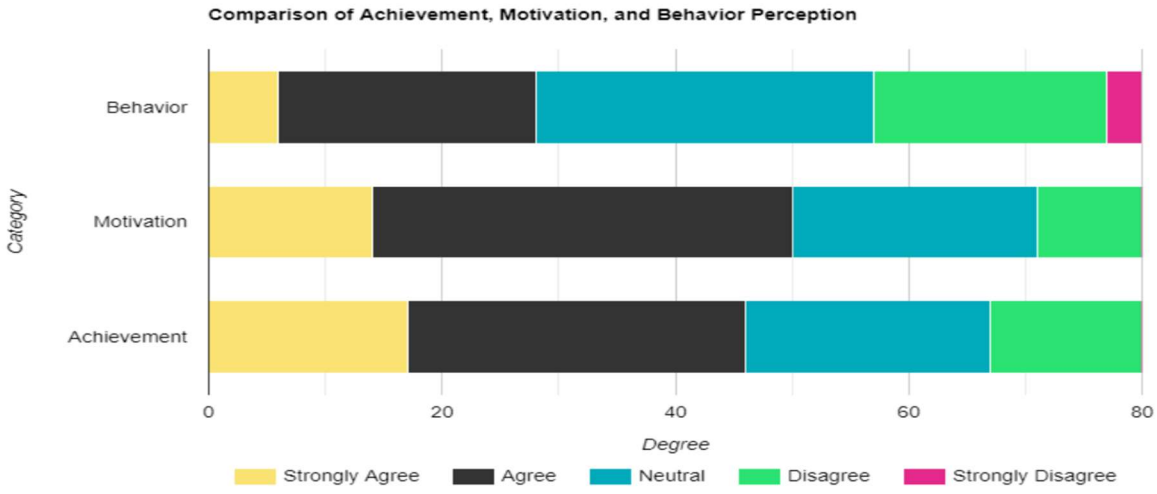
instructor is more versatile in the sense that they can pick up all of what is happening mentally and psychologically to the learner." Her preference for more direct instruction formats was evident in her comment, "It is during direct instruction that the most effective behavior directives can be implemented."

Quantitative Findings

The participants answered four questions on the online survey related to concerns about student behavior when deciding what instructional method to implement. Figure 4 presents a comparison of teacher perceptions of achievement, motivation, and behavior.

Figure 4

Comparison of Teacher Perceptions of Achievement, Motivation, and Behavior



The stacked bar graph for the total responses from all 20 participants on the four questions indicates that student behavior is an important consideration. The data revealed that 50% of the teachers interviewed agreed that technology can positively influence behavior; however, only 35% agreed that behavior was better during technology usage. In addition, less than 30% of the survey participants reported that student behavior was a target element in

considering digital inclusion.

Based on the stacked bar graph, the behavior questions were the only categories to receive responses in the "strongly disagree" area on the 5-Likert scale. Therefore, as evidenced by the data, behavior was a less important decision-making factor than achievement or motivation. This observation correlates with the interview data describing the teachers' self-efficacy in handling tech-related behavioral challenges. Therefore, behavior was not considered a significant factor in resource inclusion decisions.

Table 8 indicates the mean of each of the four questions in the student behavior section. The means indicate that teachers felt that student achievement was the most important characteristic to consider when using digital resources, but they did not necessarily feel that using technology resulted in improved student achievement, which seems to contradict the information about improved teaching and learning from the interviews.

Triangulation

The quantitative data from the survey supports the recurring theme identified from the interviews about the impact of student achievement on teachers' instructional decisions. The survey and interview responses both indicate that student behavior was not a significant consideration in determining when to use digital resources rather than direct instruction. Instead, the correlated data from the qualitative and quantitative strands revealed the teachers' competence in managing the increased demand for monitoring technology-related behaviors.

Table 8

Means for Each Student Behavior Question

Question	Mean
Technology behavior competence	3.5
Technology behavior better	4.0
Behavior most important factor	3.5
Student behavior better	4.0

Note. The means were calculated based on a 5-point Likert scale: 1= *disagree strongly*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, and 5 = *agree strongly*

Research Question 4

The fourth research question asked: What are elementary teachers' perceptions of the challenges of using digital resources? This question was answered by survey Items 13 through 16 and interview Items 15 through 20.

Analysis

The data collected from the semi-structured interviews were transcribed and loaded into the online Delve and Limpaecher (2022) software for thematic analysis support. After multiple readings of the narrative, the sorting of concepts was initiated, and labels were incorporated as ideas emerged. Codes categorized related labels, and related codes were combined according to generated themes. A frequency of themes was identified, and the leading themes were developed to inform the analysis of Question 4.

Qualitative Findings

This question was intended to determine how the availability of traditional and technological resources influenced teachers' decisions to use technology or direct instruction. The evolving themes from the analysis included digital resources readily available, digital

challenges impact instructional design, students' digital efficacy, and teacher knowledge not a challenge. Table 9 provides a summary of the number of participants who discussed each technology challenge theme.

Table 9

The Number of the Six Participants Who Discussed Each Technology Challenge Theme

Technology challenges themes	Number of participants discussing theme
Digital resources readily available	5
Digital challenges impact instructional design	6
Students' digital efficacy challenges	6
Teacher knowledge not a challenge	4

Digital Resources Readily Available. Five of the interview participants reported having sufficient traditional and digital resources available at their schools; however, Participant 6 indicated more limited digital resources. According to Participant 1, her school had a variety of digital devices available. She explained that her school provides a personal internet-ready computer to each teacher and student, and every classroom has a smartboard. Participants 2 and 3 indicated there was a balance of traditional and digital resources available. A one-to-one student-computer ratio is being worked on in the school where Participant 4 teaches, but she shared that each child had some form of a digital device, whether a Chromebook or some other electronic resource.

Digital Challenges Impact Instructional Decisions. During the interviews, digital challenges generated the highest level of emotion and proved to have an impact on participants' instructional decisions. Throughout the interviews, teachers' postures changed as they evidenced their distaste for technology that disturbed their classroom flow. Technology challenges due to

malfunctions were perceived as the epitome of distractions and a direct offense to the ethical delivery of instruction. Teachers had a low tolerance for any form of obstruction that intruded on their ability to deliver fair and balanced instruction. Participant 5 stated that there is only so much time in an instructional session, and if half of that time is spent trying to fix a learning tool, you have lost valuable instructional time. She reflected on times when more than half of the instructional time was allocated to correcting a technology-related malfunction. In fact, she shared that there were times when the entire lesson was prevented due to a downloading error.

According to Participant 3, challenges when teaching with technology are inevitable, and she responded to these challenges by always having alternative plans. “Not everything goes as planned,” she stated. “Have a Plan A, Plan B, and even a Plan C. Sometimes we must play magician and pick things out of the hat, and if you’re confident, the kids won’t know.” She added that the children will not realize that something is wrong if they are learning and having fun.

Aside from Wi-Fi and internet issues such as glitches and random disconnection, the participants reported other challenges. They discussed digital issues caused by viruses and power disruptions due to natural factors like stormy weather. In addition, “Sometimes there is a problem with the physical operation of the technology that results in restricted function of sound, camera, and downloading,” stated Participant 3. However, digital challenges caused by technological issues were not the only concerns.

Students’ Digital Efficacy Challenges. Other types of challenges that are present during digital instruction involve students’ technology efficacy. Students’ and teachers’ digital efficacy were areas that posed additional challenges. Participants discussed the impact of slowing the instructional pace due to technology challenges involving low student digital competence. Participant 5 stated, “They do not always know their passwords.” Participant 1 added, “It slows

you down."

Participant 4 understood how technological challenges can increase based on student characteristics. She explained that technology challenges are especially difficult because she is not guaranteed to have the same environment from one day to the next. Participant 4 explained that students forgetting to bring their digital devices to class presented additional challenges. Other challenges, as described by Participant 2, were geared more toward the learners' digital incompetence. She explained that sometimes, the complexities arise because the children are not familiar with the program and require assistance. Participant 2 added: "Sometimes it's a simple task like dragging and dropping or maneuvering the laptop without a mouse, but if they don't know how to perform the task, it creates a different type of complexity."

Teacher Technology Knowledge Not a Challenge. Teachers may also face technology challenges. Participant 5 rated her competence level as average because technology is constantly changing, either through updating or being replaced. Teachers' digital efficacy was not a factor that impacted their technology inclusion. Participant 1 rated her technology knowledge as a 9 on a 1 to 10 scale. As a trailblazer for technology infusion in her district, she had an active role in promoting technology integration throughout her school. She said, "I keep myself aware of the latest digital resources and techniques used through professional and social media. I subscribe to educational journals that are on the cutting edge of proven strategies that may be implemented in the classroom." Furthermore, she is known among her co-workers and administrators to be an advocate for innovations in her classroom.

Participant 2 felt sufficiently competent in maneuvering within digital resources, including helping to orient her struggling students. She stated that she was confident in helping her students to log into programs and access assignments. Therefore, the technology was helpful

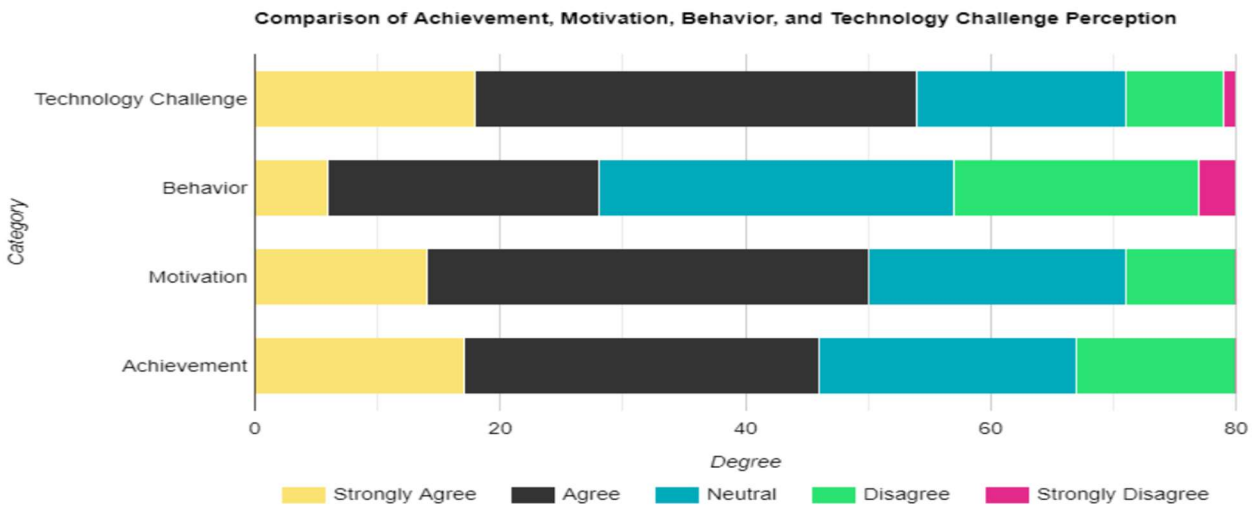
in allowing her to enlarge her computer screen by displaying it on the smartboard to simulate processes for students when necessary. Consequently, based on the data, the teachers were competent in maneuvering their students through digital challenges experienced during instruction.

Quantitative Findings

The quantitative data supported the interview findings. Based on the survey data, teaching resource availability was not a significant determinant in the teachers' decision of appropriate implementation because 11 teachers reported having sufficient teaching material available to meet their instructional needs. Therefore, resource availability was not a restricting factor of teachers' technology inclusion decision in the present study; however, technological challenges were reported to have an impact on their decision by 35% of the participants. Moreover, the quantitative data supported that 90% of the participants felt confident using digital resources during instruction. Figure 5 presents the comparison of teacher perceptions.

Figure 5

Comparison of Teacher Perceptions of Achievement, Motivation, Behavior, and Challenge



Technology challenges were an important aspect of the decision to implement supplemental instructional resources. According to the data, all teachers acknowledged the presence of technological difficulties in their instruction. However, the challenges were not related to teachers' low digital efficacy. Instead, the technology challenges were related to elements beyond the educator's control, such as the students' inadequate digital proficiency and acts of God (disconnectivity, storm-related outages). The data show that achievement and motivation, more than behavior and challenges, are the leading determinants in the teachers' decisions of resource inclusion to enhance instruction. Consequently, technology challenges did not significantly impact the teachers' resource inclusion decisions because they could not command the unexpected. Table 10 presents the means for each technology challenge.

Triangulation

The quantitative data from the survey supports the recurring theme identified from the interviews about the impact of student achievement on teachers' instructional decisions. The survey and interview responses both indicate that technology challenges were an important consideration in determining when to use digital resources rather than direct instruction. However, the findings showed that technology availability and teachers' digital competence were not significant factors in inclusion decisions.

Table 10

Means for Each Technology Challenges Question

Question	Mean
Teachers' confidence using technology	5.0
Technology availability for instruction	5.0
Teachers' technology challenges	4.5
Student technology competence	4.5

Note. The means based on a 5-point Likert scale: 1 = *strongly disagree* to 5 = *strongly agree*.

Evidence of Quality

Validation and quality assurance for the present study were incorporated according to Creswell and Poth's (2018) recommendations. IRB request and approval from Southeastern University preceded all data collection efforts. An announcement about study details was posted on a social media site, and interested candidates received access instructions. Quality was established through several means. Member checking was used by providing a transcript of the interview to each interviewee to review for accuracy, submit feedback, and extend approval. Furthermore, all data collection and analysis were reviewed by the dissertation committee.

The collected data were securely stored in a password-protected computer to which only the researcher had access. According to the recommendations for the respectful handling of data (Creswell & Poth, 2018), the analysis proceeded with transcription, sorting, and thematic organization.

Summary

Technology has made a place for itself in education, and although it is a potent advocate for enhancing student achievement, motivation, and behavior, teachers perceived that a moderate implementation of multiple teaching modes will produce the most productive and ethical learning experience. The analysis revealed that student motivation is an important factor in teachers' decision-making regarding resource implementation because technology enhances achievement, increases motivation, and impacts student behavior. Technology challenges are inevitable; however, teachers perceived that having a backup plan and relying on multiple methods of instruction help to provide a healthy balance in the educational process.

V. DISCUSSION

The purpose of this qualitative case study was to develop an understanding of teachers' self-efficacy and context dependency as evidenced by their perceptions of digital challenges and the impact of student achievement, motivation, and classroom behaviors on their decisions about using technology or direct instruction in the classroom setting. Per Akbarilakeh et al. (2019), a combined quantitative and qualitative approach was implemented to capture rigorous methodology and research findings. The present qualitative study applied the quantitative aspect through a 16-item anonymous survey and the qualitative feature via semi-structured interviews.

Methods of Data Collection

Using an anonymous 16-item survey with a 5-point Likert scale, 20 volunteer participants provided descriptive information to foster the study inquiry. Subsequently, a 20-item interview protocol was used to gather supplemental data to enrich the study findings. The survey was advertised via a church social media site announcement, where the study instructions and an embedded link generated access to interested individuals.

Discussion by Research Question

Research Question 1

How does elementary teachers' perception of student achievement influence teachers' decisions about using technology or direct instruction in the classroom setting?

The perceptions of teachers in the present study revealed that student achievement was highly significant in informing the implementation of instructional resources. Students' achievement was prioritized by 80% of the participants above all other factors, evidenced through the survey questions regarding the most important factor teachers consider during inclusion. According to the analysis, the evolving themes included enhancing teaching and learning, maximizing resources, and optimizing formative assessment.

Pertaining to students' achievement, teachers in the present study embraced learning resources that aided in the enhancement of teaching and learning in a way described similarly in the literature (Trenholm & Peschke, 2020) to foster self-learners and active participants in the process of acquiring knowledge. Whether digital or traditional resources, teachers were most influenced by the resource's academic propensity to generate their desired learning outcome. In most cases, the teachers found that the most potent implementation method was the dual inclusion of multiple forms of resources to enhance learning. Consequently, this result reinforced Heaysman and Tubin's (2019) study findings of the interrelation between bimodal educational resources in that traditional strategies complement innovative practices.

Moreover, having a variety of resources, whether digital or traditional, helped to maximize the available resources for increasing the students' achievement and for conducting assessments. A variety of instructional resources, such as I-ready reading and Kahoot math software, were improvised by the present study participants to increase learning and formative assessment. The teachers perceived that more learning devices created more learning opportunities. In addition, learning resources were perceived as having an advantageous impact on formative assessment when the teacher alone was limited. Participant 3 expressed that the I-Ready reading program features that help to personalize the learning experience enhanced

formative achievement because it has a built-in program to determine students' ongoing progress.

The teachers in the present study embraced the vast provision of technology and other resources to optimize their ability to track students' learning and implement remedial or enrichment practices. The schools in the present study were rich in resources, as specified by Participant 1, "Every student has a personal Chromebook." Overall, the teachers prioritized student achievement and acknowledged that their inclusion depended on maximizing learning. Participant 1 explained the justification procedures involved knowing what, when, and how to implement necessary resources to enhance learning:

> The content being taught primarily determines which type of tech and how it will be utilized. For example, if the content being taught is simple, using the flip classroom technique with video might be the best way to go. However, a more complex topic might require a combination of discovery, direct instruction, formative assessment, and computer practice.

Therefore, the findings showed that teachers' perspective of students' achievement impacted their inclusion decisions to accommodate instruments that enhanced learning, maximized resources, and optimized assessment.

Research Question 2

How does elementary teachers' perception of student motivation influence teachers' decisions about using technology or direct instruction in the classroom setting?

Motivation was not found to be the primary deciding factor concerning the implementation of the appropriate instructional resource. Instead, the teachers in the present study perceived student motivation as a secondary component of learning. Hence, in making their decisions to implement digital versus traditional instructional resources, teachers

considered increasing motivation through extrinsic factors and the balanced use of technology.

The first theme was easily developed due to the teachers' multiple references to basing their decisions on factors other than students' motivation. Although it was made clear by the participants that their students' motivation was an important factor, the same declaration was not the leading component in their instructional implementation choices. A surprising finding in an era where great emphasis is placed on technology as a critical motivator was that just 15% of the surveyed individuals strongly agreed that they felt confident increasing motivation using technology.

The data showed that the teachers in the present study, in addition to their technology appreciation, valued extrinsic sources of motivation as their implementation guide. Hence, extrinsic factors, such as interpersonal relationships between the teacher and students, were considered as valuable influencers. Participant 5 stated: "I think that if the student and the teacher have a good rapport with each other, that the child is going to be more eager [to] come to class." Therefore, the teachers believed that the best approach was a balanced implementation of both technological and traditional resources rather than a complete reliance on one method. Participant 5 added: "I don't rely on it 100%. I do a little bit of both, and I mix it because technology is not going to replace a teacher."

As in the Tarteer et al. (2021) study in which the participants reported an increase in motivation when students interacted with Google Classroom, 70% of the teachers in the present study reported agreeing that the students seemed more motivated when using digital resources. However, the teachers were more concerned about providing an ethical learning experience by focusing on a balanced approach to implementation.

Research Question 3

How does elementary teachers' perception of student behavior influence teachers' decisions about using technology or direct instruction in the classroom setting?

In other circumstances dealing with teachers' technology inclusion decisions, classroom management of students' behavior played an important role, as similarly seen in Rolle-Greenidge and Walcott's (2020) study. Participants in the present study reported a management concern about students' inappropriate interaction with technology during instruction and the increased responsibility demand to determine whether technology interaction is productive or idle.

The teachers in the present study were competent in increasing students' behavior when using technology. In contrast, 30% of the surveyed participants reported behavior was a greater concern when implementing technology versus when teaching via direct instruction with traditional resources. There was a lingering notion regarding the behavioral benefits of technology as a source for keeping more students occupied and, therefore, guarded against distracting activities. For example, Participant 1 explained this benefit when a high student-teacher ratio scenario threatens to increase behavioral distraction:

> It requires a lot more effort from the teacher and the instructor to keep them engaged. So again, you look for those signs, which is typically why I like to implement some form of technology because I can do more of a smaller whole group versus having the larger whole group by incorporating some form of technology to keep kids more engaged.

The teachers perceived technology to help minimize inappropriate behavior by distracting students with lessons, as attempted in a previous study (Martin-Beltrán et al., 2017). However, the irony of the situation is that the distraction nature is beyond the teachers' control as it consists of students straying away to unassigned sites that pose a safety threat. Consequently, there is an

increased demand for teachers to monitor the students when engaging with digital versus traditional resources. Specifically, for teachers, preventing drifting to unapproved sites via blocking proved to be an uncontrollable ordeal. This situation was a similar condition experienced by the participants in Martin-Beltrán et al.'s (2017) study, in which the educators observed the ineffective use of digital resources.

Therefore, regarding students' behavior, teachers consider the impact of the implementation on behavior and whether the increased demand for monitoring distraction will restrict their ability to conduct an ethical learning experience.

Research Question 4

What are elementary teachers' perceptions of the challenges of using digital resources?

Regarding challenges related to teachers' digital efficacy, it was refreshing to observe data that contrasted former studies (Muhazir & Retnawati, 2020) reported in the literature. In the present study, 90% of the surveyed teachers reported having access to enough technology resources in their school environment. In contrast to Waller et al.'s (2022) study finding, Participant 2 explained there was no technology shortage in her school in her statement: "We definitely have various amount[s] of technology that's provided to us through the district." Moreover, all six teachers interviewed acknowledged that they were competent in digital skills. The recurring results in other studies (e.g., Akbarilakeh et al., 2019; Ardiç, 2021) reported teachers' low digital efficacy as a significant factor in their technology attitudes. However, the unique finding in the present study was the high degree of digital competence among the educators.

Due to the availability of the resources and teachers' digital skills combined, teachers were able to assist students with low technology efficacy. In other studies, such as Akbarilakeh et

al. (2019), this concept posed a discrepancy, as the teachers in the present study were technology proficient. Furthermore, as in the Akbarilakeh et al. (2019) study, the present study found that the teachers' positive technology attitude propelled them to implement digital resources. This opposing result may reflect the age of the students in the schools used in the present study.

Consequently, teachers' perspectives were impacted by their thoughts that the lack of students' digital proficiency could reshape the intended instructional design. Instructional time was a precious commodity in the present study, as in Ardiç (2021) study. The participants considered how instructional time may be sacrificed if their time is spent dealing with technological issues versus content mastery. Furthermore, two participants emphasized that implementing digital resources with students low in digital etiquette generates an environment that is not conducive or productive. As stated by Participant 5, "If the students don't know how to use it, how is it helpful?"

Implications for Future Practice

Teachers' technology attitudes and appreciation are the key deterministic factors in technology inclusion. Therefore, understanding teachers' opinions and technology perceptions is essential to the efficacious application of technology in instruction (Ardiç, 2021). The present research serves as a guide for future technology instructional practices to inform education planners about the elements that motivate teacher resource implementation. From the findings of this study, educational leaders can be aware of the factors that elementary school teachers consider when deciding to implement direct instruction or digital devices. Moreover, teachers' inclusion decisions are not based on their perception of students' attraction to technology. Instead, teachers based their instructional decisions on a variety of considerations that best aligned with their desired outcomes.

Study Limitations

There were certain limitations in the present study. With only a small group of 20 elementary teachers from two southern Florida primary schools, the sample may not be an adequate representation of the target population. As such, the finding may not capture a comprehensive view of teachers beyond southern Florida and the United States. Responses in this study represented the views of experienced female teachers. The same responses might not have been found with a less experienced sample of teachers.

The present study focused on the primary learning setting of students in grades K-5. Hence, the findings may not be indicative of the teachers in secondary environments or higher learning institutions.

Furthermore, the findings in the present study are reflective of general education educators who use technology as a source to reinforce direct instruction versus technology as the core subject. Therefore, the assumptions generated by data produced exclusively from reading, math, and science teachers may not encapsulate the potential results of a study focusing on technology education teachers.

The generalizations in this qualitative study relied heavily on the qualitative interpretations from elementary school teachers. However, a deeper focus on the variables through a quantitative approach may generate unexplored implications regarding teachers' technology attitudes and decisions.

Another limitation of the present study is that the sample was comprised mostly of females (95%) with more than 10 years of teaching experience (75%). In addition, the interviewees were all influenced by the traditional education instructional system, which may have biased their perceptions through reflexivity and intersubjectivity (Kekeya, 2021) and,

therefore, their inclusion decisions.

Recommendations for Future Research

Conducting the study with a larger group of teachers, including a more diverse list of schools across a larger geographic area beyond southern Florida, such as secondary grades and private schools, might produce additional findings to enrich the data.

Furthermore, conducting a study utilizing technology educators could generate a comparative data analysis that is more reflective of technology teachers' perceptions of students' achievement, motivation, behavior, and challenges.

Using a quantitative approach could provide a more rigorous description of the variables beyond the mean. Consequently, repeating the study using a probability sampling method, such as random or stratified sampling, could reveal statistical relationships between the variables.

Using a younger group of teachers with less than 10 years of teaching experience and a more gender-diverse sample could generate a comparative analysis for teachers who trained according to an enhanced digital system.

Significance

Classroom teachers are focused on students' learning. Therefore, the availability of resources is appropriately incorporated to facilitate students' achievement. Technology is embraced and implemented to enhance achievement. The significance of the present study is that the data reveal that today's educators understand the impact of educational agency and make instructional decisions based on sound judgment (Zhu & Urhahne, 2021) of students' achievement, motivation, behavior, and challenges.

Conclusion

In response to demands from technology's rapidly populated role in education, teachers have enhanced their digital competence to optimize teaching and learning outcomes. This study builds upon previous studies' characteristics to understand the nature of external factors (i.e., student achievement, motivation, behavior, and technology challenges) impacting teachers' technology attitude construction and subsequent digital resources inclusion.

The review of literature conducted in the initial phase of the present study sought to examine the standing theories and concept-based findings. A thorough examination of the literature proceeded to identify the factors impacting teachers' technology attitudes and the effects on their instructional practices. The previous studies' conclusive findings identified in the early stage of the present study reported that teachers embraced a positive attitude toward technology adoption and inclusion.

Similar findings were established in the present study regarding teachers' positive technology attitudes; however, additional technology-attitude factors were discovered that distinguished findings and refined the literature.

Considering teachers' positive technology attitudes defined in previous studies, the hindering aspect of inclusion was based on extraneous factors, such as technology shortage, lack of training and digital efficacy, and administrative support. Students' age, experience, and instructional time constraints were identified as major hindrances to technology implementation.

The current literature gap consisted of a query concerning teachers' persistent hesitance to implement technology to its full capacity while acknowledging the educational benefits. The contribution of the present study compensates for this gap in the literature by identifying findings that address the existing query. In the present study, teachers' digital competence, technology

availability, and training were not inclusion barriers. Instead, the teachers' agency capacitated the leading influence. As such, teachers' perceptions of the elements that constituted a fair and ethical learning experience had the greatest impact on inclusion outcomes.

The same elements identified as teachers' resistance factors in the published literature were viewed as precautious factors by the participants in the present study. The precautious factors evolved due to teachers' agency-based judgment of student achievement. For this reason, the teachers perceive technology inclusion as more than a trend, and they base their inclusion decisions on their perception of students' achievement, motivation, behavior, and technology challenges. Hence, the indirect stakeholders' partial view as an external character in education development was not reflected in the study findings of the major influencing impact on resource inclusion decisions.

Technology alone as an exclusive instructional resource does not constitute the equality of education. As a result, the teachers supported a balanced approach to technology implementation. However, balance in the natural sense of 50/50 was not maintained in the present study as, in some cases, balancing technology with direct instruction produced a different proportion, such as 30/70, 40/40, or alternative proportions that equate to a whole.

Establishing balance required teachers to adapt their instructional inclusions through appropriate modifications, accommodations, and differentiations based on their perceived interpretations of student achievement, motivation, behavior, and technology challenges.

Regarding the concern for students' adequate preparation for the digitalized labor market, the present study has established the productive nature of the learning environment. The dual inclusion of technology and direct instruction helped to enhance digital competence while retaining human elements, such as the need to build interpersonal relationships.

References

Adhya, D., & Panda, S. (2022). Teacher educators' attitude towards technology-enabled learning and its incorporation into teaching-learning during and post-pandemic. *Educational Media International*, *59*(2), 131–149. https://doi.org/10.1080/09523987.2022.2101204

Adler, P., & Adler, P. (2012). How many qualitative interviews is enough? Expert voices and early career reflections on sampling and cases in qualitative research. In Baker, S., Edwards, R. L., & Doidge, M. *National Centre for Research Methods.* https://eprints.ncrm.ac.uk/id/eprint/2273/4/how_many_interviews.pdf

Agazu, B. G., Dejenu, A. K., & Debela, K. L. (2022). A comparative review of qualitative research: A guide to design and implementation. *The Qualitative Report, 27*(8), 1499-1508. https://doi.org/10.46743/2160-3715/2022.5748

Akbarilakeh, M., Razzaghi, A., & Delavar Pour Moghaddam, H. (2019). Attitudes of faculty members towards using e-learning. *Research and Development in Medical Education*, *27*(8), 1499–1508. https://doi.org/10.15171/rdme.2019.003

Alghasab, M., Al-Fadley, A., & Aladwani, A. M. (2020). Factors affecting technology integration in EFL classrooms: The case of Kuwaiti government primary schools. *Journal of Education and Learning*, *9*(4), 10. https://doi.org/10.5539/jel.v9n4p10

Ardiç, M. A. (2021). Opinions and attitudes of secondary school mathematics teachers towards technology. *Participatory Educational Research*, *8*(3), 136-155. https://doi.org/10.17275/per.21.58.8.3

Arnavut, A., Bicen, H., & Nuri, C. (2019). Student' approaches to massive open online courses: The case of Khan Academy. *BRAIN: Broad Research in Artificial Intelligence & Neuroscience.*, *10*(1), 82–90.

https://www.researchgate.net/publication/330925794_Students'_Approaches_to_Massive_Open_Online_Courses_The_Case_of_Khan_Academy

Asbulah, L. H., Sahrim, M., Soad, N. F. A. M., Rushdi, N. A. A. M., & Deris, M. A. H. M. (2022). Teachers' attitudes towards the use of augmented reality technology in teaching Arabic in Primary School Malaysia. *International Journal of Advanced Computer Science and Applications*, *13*(10). https://doi.org/10.14569/ijacsa.2022.0131055

Bandura, A. (1977). Social learning theory. *Contemporary Sociology*, *7*(1), 84. https://doi.org/10.2307/2065952

Barton, E. A., & Dexter, S. (2019). Sources of teachers' self-efficacy for technology integration from formal, informal, and independent professional learning. *Educational Technology Research and Development*, *68*(1), 89–108. https://doi.org/10.1007/s11423-019-09671-6

Basera, C. H. (2019). Learners' perceptions of assessment strategies in higher education. *Journal of Education and E-Learning Research*, *6*(2), 76-81. https://doi.org/10.20448/journal.509.2019.62.76.81

Beri, N., & Sharma, L. (2019). Teachers' attitude towards integrating ICT in teacher education. *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, *8*(8), 285-295. https://www.ijitee.org/wp-content/uploads/papers/v8i8/H6335068819.pdf

Birkollu, S. S., Yucesoy, Y., Baglama, B., & Kanbul, S. (2017). Investigating the attitudes of pre-service teachers towards technology based on various variables. *TEM Journal*, *6*(3), 578–583. https://doi.org/10.18421/TEM63-20

Calculator.Net. (2023). Sample size calculator. https://www.calculator.net/sample-size-calculator.html

Crompton, H., Burke, D., Jordan, K., & Wilson, S. H. (2021). Learning with technology during

emergencies: A systematic review of K-12 education. *British Journal of Educational Technology*, *52*(4), 1554–1575. https://doi.org/10.1111/bjet.13114

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). *Sage Publications*, Inc.

Cvetković, B., Arsić, Z., & Cenić, D. (2022). Attitudes of teachers to using information and communication technology in teaching–Advantages and obstacles. *International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE)*, *10*(2), 69–76. https://doi.org/10.23947/2334-8496-2022-10-2-69-76

Delve, H. L. & Limpaecher, A. (2022, February 8). How to do open, axial, & selective coding in grounded theory. *Practical Guide to Grounded Theory*. https://delvetool.com/blog/openaxialselective

Dilling, F., & Vogler, A. (2022). Pre-service teachers' reflections on attitudes towards teaching and learning mathematics with online platforms at school: A case study in the context of a university online training. *Technology, Knowledge and Learning*. https://doi.org/10.1007/s10758-022-09602-0

Ergado, A., Desta, A., & Mehta, H. (2022). Contributing factors for the integration of information and communication technology into Ethiopian higher education institutions teaching-learning practices. *International Journal of Education and Development Using Information and Communication Technology*, *18*(1), 275–292. https://files.eric.ed.gov/fulltext/EJ1345815.pdf

Erin, E., & Maharani, A. (2018). Persepsi mahasiswa pendidikan matematika terhadap perkuliahan online. *Mosharafa: Jurnal Pendidikan Matematika, 7*(3). https://doi.org/10.31980/mosharafa.v7i3.39

Gillis, A., & Krull, L. M. (2020). COVID-19 remote learning transition in spring 2020: Class structures, student perceptions, and inequality in college courses. *Teaching Sociology*, *48*(4), 283–299. https://doi.org/10.1177/0092055x20954263

Habibi, A., Razak, R. A., Yusop, F. D., Muhaimin, M., Syahrial, S., Mukminin, A., & Jamila, A. (2022). Exploring the factors affecting pre-service science teachers' actual use of technology during teaching practice. *South African Journal of Education*, *42*(1), 1–11. https://doi.org/10.15700/saje.v42n1a1955

Hatzigianni, M., & Kalaitzidis, I. (2018). Early childhood educators' attitudes and beliefs around the use of touchscreen technologies by children under three years of age. *British Journal of Educational Technology*, *49*(5), 883–895. https://doi.org/10.1111/bjet.12649

Heaysman, O., & Tubin, D. (2019). Content teaching: Innovative and traditional practices. *Educational Studies*, *45*(3), 342–356. https://doi.org/10.1080/03055698.2018.1446334

Heise, M. (2017). From No Child Left Behind to Every Student: Back to a future for education federalism. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3047994

Hill, G. M., & Valdez-Garcia, A. (2020). Perceptions of physical education teachers regarding the use of technology in their classrooms. *The Physical Educator*, *77*(1), 29–41. https://doi.org/10.18666/tpe-2020-v77-i1-9148

Parental Rights in Education, Fla. Stat. § 1557 (2022). https://www.flsenate.gov/session/bill/2022/1557

Ismail, S. A. A., & Jarrah, A. M. (2019). Exploring pre-service teachers' perceptions of their pedagogical preferences, teaching competence and motivation. *International Journal of Instruction*, *12*(1), 493–510. https://doi.org/10.29333/iji.2019.12132a

Jahanban-Isfahlan, H., Tamjid, N. H., & Seifoori, Z. (2017). Educational technology in Iranian

high schools: EFL teachers' attitudes, perceived competence, and actual use. *Education Research International*, *2017*, 1–9. https://doi.org/10.1155/2017/9738264

Johnson, L., McHugh, S., Eagle, J. L., & Spires, H. A. (2019). Project-based inquiry (PBI) global in kindergarten classroom: Inquiring about the world. *Early Childhood Education Journal*, *47*(5), 607–613. https://doi.org/10.1007/s10643-019-00946-4

Johnson, J. S., Adkins, D., & Chauvin, S. W. (2020). A review of the quality indicators of rigor in qualitative research. *The American Journal of Pharmaceutical Education*, *84*(1), 7120. https://doi.org/10.5688/ajpe7120

Juhaňák, L., Zounek, J., Záleská, K., Bárta, O., & Vlčková, K. (2019). The relationship between students' ict use and their school performance: Evidence from pisa 2015 in the czech republic. *Orbis Scholae*, *12*(2), 37–64. https://doi.org/10.14712/23363177.2018.292

Kekeya, J. (2021). Qualitative case study research design: The commonalities and differences between collective, intrinsic and instrumental case studies. *Contemporary PNG Studies*, *36*, 28–37. https://www.dwu.ac.pg/en/images/All_Attachements/Research%20Journals/vol_36/4._J. Lingawa.pdf

Khlaif, Z. N. (2018). Teachers' perceptions of factors affecting their adoption and acceptance of mobile technology in K-12 settings. *Computers in the Schools*, *35*(1), 49–67. https://doi.org/10.1080/07380569.2018.1428001

Koh, K. T., Tan, L. Q. W., Camiré, M., Paculdar, M. A. A., & Chua, W. G. A. (2022). Teachers' and students' perceptions of factors influencing the adoption of information and communications technology in physical education in Singapore schools. *European*

Physical Education Review, *28*(1), 100–119. https://doi.org/10.1177/1356336x211017949

Korkmaz, G., & Toraman, C. (2020). Are we ready for the post-covid-19 educational practice? An investigation into what educators think as to online learning. *Korkmaz International Journal of Technology in Education and Science, 4*(4), 293-309. https://ijtes.net/index.php/ijtes/article/view/110

Kramer, J. W., Cuevas, S., & Boatman, A. (2021). Faculty attitudes toward technology-driven instruction in developmental mathematics. *Education Policy Analysis Archives*, *29*(January-July), 45. https://doi.org/10.14507/epaa.29.5843

Lawrence, J. E., & Tar, U. A. (2018). Factors that influence teachers' adoption and integration of ICT in teaching/learning process. *Educational Media International*, *55*(1), 79–105. https://doi.org/10.1080/09523987.2018.1439712

Lichtman, L. (2010). Qualitative research in education: A user's guide. *Thousand Oaks: Sage Publications,* p. 179.

Luo, J., Wang, M., & Yu, S. (2022). Exploring the factors influencing teachers' instructional data use with electronic data systems. *Computers & Education*, *191*, Article 104631. https://doi.org/10.1016/j.compedu.2022.104631

Mammadov, S., Cross, T. L., & Ward, T. J. (2018). The big five personality predictors of academic achievement in gifted students: Mediation by self-regulatory efficacy and academic motivation. *High Ability Studies*, *29*(2), 111–133. https://doi.org/10.1080/13598139.2018.1489222

Martin-Beltrán, M., Tigert, J. M., Peercy, M. M., & Silverman, R. D. (2017). Using digital texts vs. paper texts to read together: Insights into engagement and mediation of literacy

practices among linguistically diverse students. *International Journal of Educational Research*, *82*, 135–146. https://doi.org/10.1016/j.ijer.2017.01.009

Milicevic, J., Sremcev, N., Cosic, I., Lazarevic, M., & Tasic, N. (2021). The new role of teachers after the COVID-19 pandemic and the application of the lean concept in education. *Proceedings of the 32nd International DAAAM Symposium 2021*, 0402–0407. https://doi.org/10.2507/32nd.daaam.proceedings.059

Mocănașu, D. R. (2020). Determining the sample size in qualitative research. *International Multidisciplinary Scientific Conference on the Dialogue Between Sciences & Arts, Religion & Education*, *4*(1), 181–187. https://doi.org/10.26520/mcdsare.2020.4.181-187

Mohamed, A. A. (2018). Attitudes of special education teachers towards using technology in inclusive classrooms: A mixed-methods study. *Journal of Research in Special Educational Needs*, *18*(4), 278–288. https://doi.org/10.1111/1471-3802.12411

Muhazir, A., & Retnawati, H. (2020). The teachers' obstacles in implementing technology in mathematics learning classes in the digital era. *Journal of Physics*, *1511*(1). https://doi.org/10.1088/1742-6596/1511/1/012022

Nakaue, J., Koizumi, M., Nakajima, H., Okada, S., Mohri, T., Akai, Y., Furuya, M., Hayashino, Y., Sato, Y., & Ishii, H. (2019). Development of a self-efficacy questionnaire, 'insulin therapy self-efficacy scale (ITSS),' for insulin users in Japanese: The self-efficacy-q study. *Journal of Diabetes Investigation*, *10*(2), 358–366. https://doi.org/10.1111/jdi.12914

Nichols, B. H., Caplow, S., Franzen, R. L., McClain, L. R., Pennisi, L., & Tarlton, J. L. (2021). Pandemic shift: Meeting the challenges of moving post-secondary environmental

education online. *Environmental Education Research*, *28*(1), 1–17. https://doi.org/10.1080/13504622.2021.2007220

Nicolas, S. (2018). Obstacles and challenges to integrating technology in the classroom: Perspectives from teachers in a Lebanese context. *International Journal of Arts & Sciences*, *11*(1), 425-439. https://www.proquest.com/scholarly-journals/obstacles-challenges-integrating-technology/docview/2168816073/se-2

Njiku, J., Maniraho, J. F., & Mutarutinya, V. (2019). Understanding teachers' attitude towards computer technology integration in education: A review of literature. *Educ Inf Technol*. *24*(3041–3052). https://doi.org/10.1007/s10639-019-09917-z

Nordlöf, C., Hallström, J., & Höst, G. E. (2017). Self-efficacy or context dependency: Exploring teachers' perceptions of and attitudes towards technology education. *International Journal of Technology and Design Education*, *29*(1), 123–141. https://doi.org/10.1007/s10798-017-9431-2

Nwosu, J. C., John, H. C., Izang, A. A., & Akorede, O. J. (2018). Assessment of information and communication technology (ICT) competence and literacy skills among undergraduates as a determinant factor of academic achievement. *Educational Research and Reviews*, *13*(15), 582–589. https://doi.org/10.5897/err2018.3539

Onivehu, A. O., Ohawuiro, O. E., & Oyeniran, B. J. (2017). Teachers' attitude and competence in the use of assistive technologies in special needs schools. *Acta Didactica Napocensia*, *10*(4), 21-32. https://doi.org/10.24193/adn.10.4.3

Park, S., & Weng, W. (2020). The relationship between ict-related factors and student academic achievement and the moderating effect of country economic indexes across 39 countries:

Using multilevel structural equation modelling. *Educational Technology & Society*, *23*(3), 1–15. https://dblp.uni-trier.de/db/journals/ets/ets23.html#ParkW20

Paul, J., & Jefferson, F. (2019). A comparative analysis of student performance in an online vs. face-to-face environmental science course from 2009 to 2016. *Frontiers in Computer Science*, *1*. https://doi.org/10.3389/fcomp.2019.00007

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. [EBooks]. Guilford Press. https://doi.org/10.1521/978.14625/28806

Rolle-Greenidge, G., & Walcott, P. (2020). Assessing the attitudes of Dominican primary school teachers toward the integration of ICT in the classroom. *International Journal of Education and Development Using Information and Communication Technology*, *16*(2), 84–96. https://files.eric.ed.gov/fulltext/EJ1268808.pdf

Salele, N., & Khan, M. S. H. (2022). Engineering trainee-teachers' attitudes toward technology use in pedagogical practices: Extending computer attitude scale (CAS). *SAGE Open*, *12*(2), 215824402211024. https://doi.org/10.1177/21582440221102436

Scherer, R., & Teo, T. (2019). Unpacking teachers' intentions to integrate technology: A meta-analysis. *Educational Research Review*, *27*, 90–109. https://doi.org/10.1016/j.edurev.2019.03.001

Sandelowski, M. (1995). Sample size in qualitative research. *Research in Nursing & Health, 18*(2), 179-183. https://doi.org/10.1002/nur.4770180211

Şentürk, C., & Baş, G. (2021). Investigating the relationship between teachers' teaching beliefs and their affinity for lifelong learning: The mediating role of change tendencies. *International Review of Education*, *67*(5), 659–686. https://doi.org/10.1007/s11159-021-

09917-7

Serrano, D. R., Dea-Ayuela, M. A., Gonzalez-Burgos, E., Serrano-Gil, A., & Lalatsa, A. (2019). Technology-enhanced learning in higher education: How to enhance student engagement through blended learning. *European Journal of Education*, *54*(2), 273–286. https://doi.org/10.1111/ejed.12330

Shafique, I., & Beh, L.-S. (2017). Shifting organizational leadership perspectives: An overview of leadership theories. *International Journal of Economic Perspectives*, *11*(4), 134–143. https://www.proquest.com/scholarly-journals/shifting-organizational-leadership-perspectives/docview/2188843677/se-2

Sim, J., Saunders, B., Waterfield, J., & Kingstone, T. (2018). Can sample size in qualitative research be determined a priori? *International Journal of Social Research Methodology. 21*(5), 619- 134. https://doi.org/10.1080/13645579.2018.1454643

Stein, L. (2020). Teacher leadership: The missing factor in America's classrooms. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, *93*(2), 78–84. https://doi.org/10.1080/00098655.2020.1716671

Tarteer, S., Badah, A., & Khlaif, Z. N. (2021). Employing Google Classroom to teach female students during the COVID-19 pandemic. *Computers in the Schools*, *38*(4), 300–321. https://doi.org/10.1080/07380569.2021.1988318

Terrell, S. R. (2016). *Writing a proposal for your dissertation: Guidelines and examples*. Guilford Publications.

Teo, T., & Huang, F. (2018). Investigating the influence of individually espoused cultural values on teachers' intentions to use educational technologies in Chinese universities. *Interactive Learning Environments*, *27*(5–6), 813–829.

https://doi.org/10.1080/10494820.2018.1489856

Tschannen-Moran, M., Hoy, A. W., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, *68*(2), 202–248. https://doi.org/10.3102/00346543068002202

Trenholm, S., & Peschke, J. (2020). Teaching undergraduate mathematics fully online: A review from the perspective of communities of practice. *International Journal of Educational Technology in Higher Education*, *17*(1). https://doi.org/10.1186/s41239-020-00215-0

Tyagi, C., & Misra, P. K. (2021). Continuing professional development of teacher educators: Challenges and initiatives. *Shanlax International Journal of Education*, *9*(2), 117-126. https://doi.org/10.34293/

Van Nest, S. (2018). Sensory integration theory in psychotherapy: A case study. *Clinical Social Work Journal*, *47*(2), 167–175. https://doi.org/10.1007/s10615-018-0685-2

Van Aalderen-Smeets, S. I., Walma Van Der Molen, J. H., & Asma, L. J. F. (2011). Primary teachers' attitudes toward science: A new theoretical framework. *Science Education*, *96*(1), 158–182. https://doi.org/10.1002/sce.20467

Vincent-Lancrin, S. (2022). Smart education technology: How it might transform teaching (and learning). *New England Journal of Public Policy*, *34*(1). https://scholarworks.umb.edu/nejpp/vol34/iss1/5

Waller, S. E., McCullick, B. A., & Schempp, P. G. (2022). An exploratory study of physical education teachers' perceptions of the barriers to employing technology. *The Physical Educator*, *79*(3), 305–329. https://doi.org/10.18666/tpe-2022-v79-i3-10756

Xiao, Y., Liu, Y., & Hu, J. (2019). Regression analysis of ict impact factors on early adolescents' reading proficiency in five high-performing countries. *Frontiers in Psychology*, *10*. https://doi.org/10.3389/fpsyg.2019.01646

Yasir, R., Ammar, R., Muhammad Akib, W., Sana Sameen, S., & Ansar, W. (2019). Case study method: A step-by-step guide for business researchers. *International Journal of Qualitative Methods*, *18*. https://doi.org/10.1177/1609406919862424

Zhu, C., & Urhahne, D. (2021). Temporal stability of teachers' judgment accuracy of students' motivation, emotion, and achievement. *European Journal of Psychology of Education*, *36*(2), 319–337. https://doi.org/10.1007/s10212-020-00480-7

Ziernwald, L., Hillmayr, D., & Holzberger, D. (2022). Promoting high-achieving students through differentiated instruction in mixed-ability classrooms—A systematic review. *Journal of Advanced Academics*, *33*(4), 540–573. https://doi.org/10.1177/1932202x221112931

Appendix A

Study Announcement

ATTENTIONS TEACHERS!!!

WOULD YOU LIKE TO PARTICIPATE IN AN EDUCATIONAL STUDY?

Participants are **needed** for a study to understand what factors impact teachers' decisions to use technology in their classroom lessons. More details are below.

TITLE OF STUDY: Teachers' Perception of Digital Resources Based on Students' Achievement.

PURPOSE OF STUDY: To understand how students' achievement, motivation, and behavior affect teachers' decisions about implementing technology in instructional practices.

CHARACTERISTICS OF PARTICIPANTS: Teacher in a public elementary school in southern Florida

HOW CAN I PARTICIPATE? If you would like to be considered as a participant in this study, please indicate your interest by following the instructions below:

1. **click** the **survey link** below www.thelink.com/studysurvey **or SCAN barcode** to be taken directly to the survey.
2. Complete the survey (Anonymous – email Will not be saved)
3. By submitting the survey, you are giving consent to participate in the study.
4. At your discretion you may learn more about this study by requesting further correspondence from the researcher.

THANK YOU FOR YOUR INTEREST.

Tanya Small - Researcher

SEU Doctoral Candidate

tsmall@seu.edu

Appendix B

Interview Protocol

College of Education, Southeastern University

Tanya R. Small

Time of interview: TBA

Date: TBA 2023

Place: Google Meet and Live in teachers' classroom

Interviewer: Tanya R. Small

Interviewee: Participant 1

Position of Interviewee: Palm Beach County School Teacher

Project description: The phases of this qualitative case study will explore teachers' perceptions of student achievement when using traditional versus digital instruction methods.

Questions:

***Central Question*:** How does an elementary teachers' perception of student achievement, motivation, and behavior influence teachers' decisions about using technology or direct instruction in the classroom setting?

***Sub-questions*:**

1. How would you describe the impact of technology-driven instruction on student learning and achievement?
2. What is your perception of student achievement during direct Instruction versus their achievement while using digital resources?
3. What do you think is the significance of technology on student achievement?
4. How does student achievement impact your decision to implement technology?

5. What is your perception of the impact of technology inclusive instruction on student achievement?
6. Describe your level of reliance on digital resources to aid in student achievement?
7. Based on your concept of classroom motivation, how do you determine student motivation during instruction?
8. What is your perception of student motivation during direct instruction versus their motivation while using digital resources?
9. How does student motivation impact your decision to implement technology resources?
10. What is your belief regarding the impact of technology inclusive instruction on student motivation?
11. How do you describe appropriate student engagement and behavior during instruction?
12. What is your perception of student behavior during direct instruction versus their behavior while using digital resources?
13. How does student engagement during direct instruction as compared to their engagement during digital instruction impact your attitude toward implementing technology?
14. What is your attitude regarding the impact of technology inclusive instruction on student behavior?
15. Discuss the availability of digital and traditional resources to enhance student achievement in your school setting.
16. Explain your confidence in technological resources to enhance student achievement.

17. Discuss your competence in using traditional resources to enhance student achievement.
18. Discuss your competence in using digital resources to enhance student achievement.
19. What are some challenges in using digital resources during instruction?
20. What are your thoughts concerning technological complexities that are present during classroom instruction?
21. What additional information could you contribute toward how student achievement affects teachers' perception of technology inclusion?

Thank you for your time and generosity in participating in this study. Your personal information will remain private while informing future teacher candidates of best practices for student achievement.

Appendix C

Consent Form

CONSENT TO PARTICIPATE

TITLE OF STUDY: Teachers' Perception of Digital Resources Based on Students' Achievement.

Principal Investigator: Tanya Small

Coinvestigators: Dr. Melinda Carver and Dr. Susan Hicks

PURPOSE OF STUDY:

The purpose of this qualitative case study is to develop an understanding of teachers' self-efficacy and context dependency as evidenced by their perceptions of digital challenges and the impact of student achievement, motivation, and classroom behaviors on their decisions about using technology or direct instruction in the classroom setting.

Instructions:

Please carefully read the following details and indicate your consent to participate in the present study by marking your initials on the line preceding each of the statements below and signing the signature line at the end of this document. Please request clarification of any unclear item:

What to Expect:

The study has two phases. All participants will participate in the 16 question Likert survey in phase one of the study. Selected participants may be requested to participate in the second phase 21 question interview. The anonymous link to the survey will be emailed to you and you will be asked to indicate your implied consent by completing the survey. The survey is anticipated to take ten to 15 minutes to complete. The 30-minute interview will be digitally recorded, and a consent form will be provided to you before the start of the recording. The questions will be

asked one at a time and the researcher will pause to allow you to respond.

Risks, Benefits, and Compensations

No known risks are linked to this study that is above the minimum threshold of those experienced in routine daily activities, or different from minor risks expected with any study. As a participant, you will reflect on the ideas that influence your professional practice. There is no tangible compensation for participation in this study.

Confidentiality and Security

No identifying personal information will be collected. However, general demographic information will be requested on the anonymous survey. The information provided in the interviews will be kept confidential.

The information you provide will be protected with the highest level of respect and confidentiality. The collected data will be securely stored on a password protected computer for five years and only the research team will have access to the data during and after the study.

All data will be stored securely on a password required computer in a key-locked room. Furthermore, all data forms and digital recordings will be destroyed five years after the data collection completion.

Disclaimer to confidentiality: The researcher is by law obligated to report any claim of physical abuse to self or a child.

Participant Acknowledgements and Rights

I attest that I am at least 18 years of age. My role and rights as a participant in the present study were explained to me, including that my participation is entirely voluntary, and I may revoke my consent at any point throughout the study for any reason without penalty if I desire.

Consent Documentation

I, _____ of my own free will agree to participate in the present study and give my consent to be surveyed and interviewed. I acknowledge that my decision to participate in this study is completely voluntary and I understand my right to withdraw at any time.

Participant's Signature _____ Date: _____

Signature of Researcher Date

I attest that before requesting the participant's consent that this study has been approved by the SEU IRB board. Furthermore, this document has been reviewed and explained to the participants, and all questions answered. Therefore, per the participant's acknowledgment of the above statement, I, _____ the researcher of the present study accepts this form as consent to engage the participant in this study.

Researcher's Signature _____ Date: _____

Contact Information

For questions regarding your rights or to obtain a copy of the study results please contact the Southeastern University IRB department by emailing IRB@seu.edu

To contact the researchers of this study, send a message to the following contact:

Tanya Smalltsmall@seu.edu

Appendix D

Likert Scale Survey Questions

1. I feel more competent increasing student achievement using technology.

   Disagree Strongly Disagree Neutral Agree Strongly Agree

2. Student achievement using technology is better than during direct instruction.

   Disagree Strongly Disagree Neutral Agree Strongly Agree

3. Student achievement is the most important factor I consider when deciding whether to use technology.

   Disagree Strongly Disagree Neutral Agree Strongly Agree

4. Students demonstrate better achievement when using technology.

   Disagree Strongly Disagree Neutral Agree Strongly Agree

5. I feel more competent increasing student motivation using technology.

   Disagree Strongly Disagree Neutral Agree Strongly Agree

6. Student motivation using technology is better than during direct instruction.

   Disagree Strongly Disagree Neutral Agree Strongly Agree

7. Student motivation is the most important factor I consider when deciding whether to use technology.

   Disagree Strongly Disagree Neutral Agree Strongly Agree

8. Students demonstrate better motivation when using technology.

   Disagree Strongly Disagree Neutral Agree Strongly Agree

9. I feel more competent increasing student behavior using technology.

   Disagree Strongly Disagree Neutral Agree Strongly Agree

10. Student behavior using technology is better than during direct instruction.

Disagree Strongly Disagree Neutral Agree Strongly Agree

11. Student behavior is the most important factor I consider when deciding whether to use technology.

    Disagree Strongly Disagree Neutral Agree Strongly Agree

12. Students demonstrate better behavior when using technology.

    Disagree Strongly Disagree Neutral Agree Strongly Agree

13. I feel confident using digital resources in my instruction.

    Disagree Strongly Disagree Neutral Agree Strongly Agree

14. Sufficient digital resources are available to meet my instructional needs.

    Disagree Strongly Disagree Neutral Agree Strongly Agree

15. Using digital resources presents many challenges which impact effective instruction.

    Disagree Strongly Disagree Neutral Agree Strongly Agree

16. Students demonstrate better efficacy when engaging with technological learning devices.

    Disagree Strongly Disagree Neutral Agree Strongly Agree