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Examining the Integration of Technology in the Early Childhood Classroom

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This is to certify that the doctoral study by

Kerri Willmann

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Walden University
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Abstract

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MA, Grand Canyon University, 2011

BS, Savannah College of Art and Design, 2006

Dissertation Submitted in Fulfillment

of the Requirements for the Degree of

Doctor of Education

Early Childhood Education

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Abstract

Reading achievement scores in the United States are low and educators need more strategies to support young students in literacy. It is important to identify the technologies and implementation strategies that educators find beneficial for literacy instruction. The purpose of this qualitative study was to investigate perspectives on instructional technology and literacy strategies intended to promote student-centered learning opportunities. The conceptual framework was Bloom's mastery learning, Bransford's anchored instruction, and Piaget's constructivist theory. Each theorist encouraged exploration and hands-on interactive learning opportunities. The research questions addressed how teachers perceive the implementation of technology tools to enhance literary performance and engagement in kindergarten and first grade. A purposeful sample of 8 teachers and 4 administrators with 3+ years' experience that implemented the core reading curriculum and had access to literary technologies participated in interviews and teachers' classrooms were observed. A combination of a *priori* and open coding was used to identify patterns and themes. Participants identified technology as a positive influence on reading instruction, student performance, and engagement. They identified problems including weak technical support and insufficient time for peer support and sharing related to working with the various technologies. Further research is recommended into integration of developmentally appropriate instructional technology. This study may contribute to positive social change by providing a tool that can be used by school districts to better improve the adoption of current and future technological innovations based on teacher experience and perceptions.

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Dedication

This journey is dedicated to my husband Andrew and my two boys Nathan and Jacob. I dedicate this degree to the three of you, as you have all given me the support and motivation that I needed in order to accomplish the goal of becoming a Doctor of Education. Let this be an example of hard-work and dedication as you all work toward achieving your own goals in life. For I will be there to show you all the same support and motivation that you have given me. I love you all dearly.

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Table of Contents

List of Tables

Chapter 1: Introduction to the Study

Introduction

Technology has revolutionized the early childhood classroom. Among these technologies are educational software programs that hold great promise in helping children develop early literacy skills. While educators, organizations, and the general public may differ regarding the role that technology plays in education, a government mandate, The National Education Technology Plan (NEPT) of 2010, has aided in holding educational systems accountable for incorporating technology in early childhood classrooms. The NEPT calls for educational transformation with the recognition that technology is at the core of daily lives and work, and it emphasizes the importance of engaging and powerful learning experiences that result from the implementation of technology in the classroom (U.S. Department of Education, 2010). Using the NEPT as a foundation, in this study I focused on the technology supplements that educators and administrators' find to be engaging and successful learning tools within the reading curriculum.

In the United States, childrens' reading achievement scores strongly indicate the need for research on the impact that technology can have on reading development with a specific focus on instructional methods at the early childhood level. A mere 36% of fourth graders achieved at or above the proficient level on the 2015 National Assessment of Educational Progress (National Center for Educational Statistics, 2015). The National Center for Educational Statistics also found that over 70% of students who drop out of school report difficulties with reading. Seventy-five percent of all students recommended

for special education services are recommended because of poor reading skills (National Center for Education Statistics, 2015).

Classroom teachers are now presented with a tremendous responsibility in meeting the needs of their students. Not only must teachers instruct using the core curriculum, they must also provide differentiation and intervention strategies to those that are not meeting grade-level expectations. A necessary response to these challenges is the investigation of potential technology-based programs that can supplement teacher instruction in developing the necessary reading skills. In researching the potential that instructional technology programs have in the early childhood years, educators can begin to offer children interactive, engaging learning opportunities that promote reading development. This, in turn, can promote positive social change by ensuring that all children become successful readers and literate adults contributing to society.

Background

Throughout the course of history, people have worked toward improving instructional methods and materials, moving from black boards to interactive white boards, and from textbooks to e-books. Research studies have indicated that using any new tools in an early childhood classroom requires that educators learn how these can be used to facilitate growth in children's development (Mohammad & Mohammad, 2012). However, a gap in practice has been identified by The National Center for Educational Statistics (2015), which has shown that a mere 36% of fourth grade students achieve a proficient score on the National Reading Assessment.

In this study, I focused on teacher and administrator perspectives and the strategies that they used in implementing instructional technology to promote reading development at the early childhood level. Research has shown that while many teachers believe technology should be used for learning with young children during instructional activities, most of them only use it for personal productivity and instructional planning (Alexander, et al., 2014). Researchers have also documented that in-service teachers believe in the potential of technology to enhance student learning, yet they lack the technology skills or confidence to effectively apply it to their instruction (Alexander, et al., 2014). Literature has shown a connection between educational technology and positive outcomes for children; however, it has also indicated that the technology must be developmentally appropriate, include tools that help teachers implement technology successfully, and be integrated into the classroom and curriculum (McManis & Gunnewig, 2012). In focusing on the teacher perceptions of instructional technology and how these tools are implemented in order to promote learning mastery, I was able to identify a possible solution to the achievement gap in the area of literacy development at the early childhood level.

Problem Statement

This study addressed the problem of low reading achievement among early childhood students. The ability to read forms the foundation for learning, and to a large extent can determine future student achievement. Longitudinal studies have shown that children who do not learn to read by the end of first grade rarely catch up (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996; Juel, 1988; Shaywitz et al.,1999).

According to the 2015 National Assessment of Educational Progress (NAEP), fewer than half of fourth-grade students, a mere 36%, scored at or above the proficient level in reading. Due to the low reading achievement scores shown on the NAEP (2015), the school system that served as my research site identified the need to investigate new technology and examine the effects that learning technologies have on teachers' reading instructional methods. Educators and administrators are now equipped with many different technological tools in order to effectively educate students. School system personnel in a southeastern state in the United States invested significant funding to implement instructional technology with specific technology tools in the classrooms**.** These educational tools hold great promise in developing children's reading readiness skills.

According to a National Association for the Education of Young Children (NAEYC) representative, "Educators across the nation spend a lot of time debating whether they should embrace technology or reject it, an all or nothing approach" (Allvin, 2014, p. 62). With the advancement of technology and the tools available to increase reading achievement in the early childhood stage, educators have a potential solution to reducing the reading achievement gap identified by the NAEP. Students are experiencing increased exposure to technology, changing the ways in which they respond to instruction (Morgan, 2014). This is leading to a need for teachers to integrate digital resources in the curriculum (Morgan, 2014). The number of technology-based reading programs are increasing, leading to a need for more research to analyze the effects that these tools can have on student reading development.

Purpose of the Study

The purpose of this qualitative study was to investigate teacher and administrator perceptions regarding the use of a technology-enhanced reading curriculum. Using an instrumental case study design, I was able to gain an informed perspective on how teachers and administrators perceive the impact of technology on reading instruction in the early childhood classroom. With this study, I intended to increase awareness of the importance of technology in early literacy acquisition, specifically in relation to the Journeys guided reading program adopted by the school system where the study took place. The findings of this research may support school communities in identifying key technological components and strategies that positively impact reading instruction in the early childhood classroom, which can ultimately affect national assessment statistics and hopefully lead students to a lifelong love of reading.

I sought to determine how teachers perceive the implementation of technology tools in conjunction with the core reading program in order to enhance performance and engagement in the early childhood classroom environment. The following questions addressed the purpose of my research:

RQ 1: How do teachers use the technology in their classrooms?

RQ 2: What changes in student performance and engagement do teachers and administrators witness when technology tools are implemented?

RQ 3: How do teachers and administrators describe the implementation of technology-based strategies within the classroom environment?

Conceptual Framework for the Study

The conceptual framework for this study was based on the theoretical constructs of Bloom, Bransford, and Piaget. Each theorist presented a unique view on child development, how the environment effects this development, and how to construct meaning from early learning experiences. Bransford developed anchored instructional theory that was originally influenced by the work of John Dewey and Charles Gragg of Vanderbilt University (The Cognition and Technology Group at Vanderbilt, 1990). Bransford's anchored instruction theory suggests that instructional activities should encourage exploration by the learner and encourage hands-on interactive learning opportunities (Ouyang & Stanley, 2014). These types of instructional activities are the focus and intention of technology-based instruction.

Bloom conducted research that proved one-to-one tutoring yields higher achievement. However, it is impractical for teachers to provide one-on-one instruction to each student in the early childhood classroom (Airasian, Bloom, & Carroll, 1971). This discovery led to the development of Bloom's mastery learning theory. Mastery learning is defined as "a method of instruction where the focus is on the role of feedback in learning. Furthermore, mastery learning refers to a category of instructional methods which establishes a level of performance that all students must 'master' before moving on to the next unit" (Scootpad, 2015, p. 2). The concept of mastery learning addresses the importance of varying teaching strategies because children have varying learning styles. The mastery learning theory can be applied to technology-enhanced instruction because it allows students to use alternative materials to help grasp new concepts. Technology

applications provide students one-on-one differentiated instructional activities facilitating academic achievement. In analyzing strategies that the teachers use in order to implement these learning tools, I had the opportunity to test Bloom's mastery learning theory through the use of technology-driven tutoring programs.

Piaget's constructivist theory holds that learning is an active process where knowledge is constructed by meaningful experiences (Piaget, 1975). Technology lends itself to the constructivist theory in how it can actively engage the student in learning activities. The constructivist theory is based on the principles that children must partake in meaningful observations, hands-on learning experiences, and the opportunity to apply this knowledge within real world situations (Piaget, 1975). Piaget emphasized the importance of critical thinking skills necessary for problem solving and decision making. Researching technology programs that facilitate learning allowed me to test Piaget's constructivist learning theory by collecting educators input and expertise in how these programs promote student centered-learning and the development of critical thinking skills in the area of reading development.

My broad approach to this study was to explore the ways in which technology is used in the classroom and the perceptions that teachers and administrators have in implementing learning technologies for instructional purposes. To collect data, I conducted in-depth interviews with questions focusing on technology usage and perceptions of technology-based instructional programs. I also conducted classroom observations. I used the conceptual framework to uncover the ways in which teachers are utilizing technology to encourage student-centered learning, and how these tools promote

critical thinking skills in the area of reading. A more thorough analysis of the conceptual framework can found in Chapter 2.

Nature of the Study

For this study, I used a qualitative instrumental case study design. The aim of qualitative research is to uncover the *whys* and *hows* of a given topic or problem. Qualitative data collected for a research study is typically descriptive data collected during observations and interviews. (Creswell, 2012). In utilizing the instrumental case study approach, I was able to collect interview data from kindergarten and first grade teachers, as well as early childhood administrators working in a Southeastern U.S. school system who have implemented technology programs in their classrooms. I included early childhood administrators specifically because of the relatively recent implementation of the Teacher Keys Effectiveness System. This system requires administrators to conduct observations and formative assessments on the educators according to standards. These standards include focusing on the implementation of technology within daily lessons. The focus was on the teachers' interpretation of the technology reading programs employed, and on how the strategies were being implemented in the classroom in order to promote student-directed learning. I accomplished this through interviews to gather information pertaining to teachers' and administrators' personal experiences and opinions regarding technology reading programs employing supplemental technology.

Throughout the course of my research, I collected textual data by interviewing participants and collecting field notes through observation. This required me to transcribe these words into a computer document for analysis purposes. When the data

was transcribed, I then conducted a preliminary exploratory analysis of the data to obtain a general sense of the data, memo ideas, think about the organization of the data, and consider whether or not more data was needed (see Creswell, 2012). After completing the preliminary analysis, I then began the coding process. The goal of the coding process is to make sense out of the data by dividing it into text or image segments, labeling the segments with codes, examining codes for overlap and redundancy, and collapsing these codes into broad themes. Thus, this was an inductive process of narrowing data into a few themes (see Creswell, 2012).

Of utmost importance in qualitative research is the assurance of accuracy and credibility (Lincoln & Guba, 1985). I analyzed teacher perspectives regarding technology-based supplemental instructional tools that assured the accuracy and credibility of the research findings through the use of triangulation, as well as member checking. Triangulation is defined as the process of validating evidence from different individuals, types of data, or methods of data collection in descriptions and themes in qualitative research (Creswell, 2012). I examined each information source, including the interviews with and observations of the educators involved in the study, and identified the evidence that supported the theme of technology use in the early childhood classroom. For member checking, I had study participants review the research report in order to check for accuracy of the findings. Lincoln and Guba pointed out the importance of member checking because it not only tests the results for factual and interpretive accuracy, but it also provides evidence of credibility (Lincoln & Guba, 1985). These two methods of validation ensured the accuracy and credibility of the research study. If

discrepant cases were identified within the research data, I reviewed literature for cases that addressed the same or similar topic of study for comparison purposes; the discrepant cases were still calculated during the data analysis procedure.

Definitions

Computer-assisted instruction: Computer-assisted technology is an instructional method that presents instructional material in an interactive manner, monitoring learning and adapting itself to meet the needs of individual learners (ScootPad, 2015).

Fidelity: According to the National Center on Response to Intervention (2010), fidelity is "using the curriculum and instructional practices consistently and accurately, as they were intended to be used" (p. 3).

Mastery Learning: The theory that almost all students will be provided with successful and rewarding learning experiences, mastering what they are taught. Student learning can be promoted to the fullest development through procedures that are individualized (Airasian, Bloom, & Carroll, 1971).

Phonemic awareness: The understanding that words are made up of individual sounds. In order to develop phonemic awareness skills, the reader must be able to break the word up into sound pieces. For example, the word cat is made up of three phenomes or sounds, /c/ /a/ and /t/. (National Institute of Child Health and Human Development, 2014).

Phonics: The ability to combine letter and sound knowledge to read printed words. This is the skill of sounding out and pronouncing unknown words (National Institute of Child Health and Human Development, 2014).

Personalized learning: Personalized learning is the ability to differentiate pedagogy, curriculum, and learning environments to meet the variety of needs and aspirations of students. Typically, technology lends itself best to creating these differentiated environments (ScootPad, 2015).

Reading: The ability to look at letters, words, and symbols with understanding. The areas of focus within this study were phonemic awareness, phonics skills, and comprehension as assessed within the Student Learning Objective Assessment Tool and as presented within the Journeys reading program (National Institute of Child Health and Human Development, 2014).

Response to intervention (RTI): According to the Department of Education (2011), RTI is, "The process of teachers changing their instruction based on how well the students responded to it" (p. 3). This process includes teachers implementing research-based instruction, identifying student needs through progress monitoring, and implementing individualized interventions through a tiered system for students who continue to experience learning difficulties.

Assumptions

In this study, I used a qualitative design to determine the effects of supplemental technology programs on reading instruction for early childhood students at the kindergarten and first grade levels. In this study, I assumed that the students at my research site received similar instruction in reading using the core reading program adopted by the school system along with supplemental technology programs. It was also assumed that the educators provided students with computer access and had a positive

perception about incorporating technology within their general curriculum. My final assumption was that the educator and administrator participants responded to the interview questions honestly.

Scope and Delimitations

The scope of this study included teacher perceptions and the strategies that they used in implementing technology programs in conjunction with the core reading instructional program. During the process of this research, I interviewed teachers about their perceptions of technology programs and how they implemented the programs in their daily instruction. These educators were also questioned about the strategies identified for increasing student development with the use of these technology programs.

This study was restricted to a Southeastern U.S. school system. The schools in this system are characterized as Title 1 and have a high percentage of students receiving free or reduced lunch. Findings from this study may not be easily generalized to the larger population due to the small sample size and the specific focus on kindergarten and first grade teachers. Kindergarten and first grade are the grade levels in which the foundational reading skills are developed; therefore, identifying strategies and programs that are effective at the kindergarten and first grade levels will, in turn, aid in the development of a strong reading foundation in order to promote positive social change in reading achievement scores.

Limitations

Limitations within a research study are potential weaknesses or problems identified by the researcher (Creswell, 2012). The limitations of this research study included:

- A limited number of participants from the kindergarten and first grade levels.
- A limited number of administrators who are employed at the elementary school level.
- Gender demographics. The participants of this study include 11 women and just 1 man.
- The school system's exclusive use of the McGraw Hill Journeys reading program for its core read curriculum.
- The technology study participants used was limited to that purchased by the school system.

In this qualitative case study, I identified challenges in terms of the results, such as the credibility and accuracy of the data collection and analysis process. Given the limitations described above, it may prove difficult to transfer my findings to other school settings.

Significance

Reading is an essential skill that provides children with a solid and critical foundation for learning throughout their education. My ultimate goal in this study was to improve reading instruction at the early childhood level with the implementation of technology-based supplemental instructional tools. My research on the ways that

technology can positively impact literacy development will benefit many professionals in the early childhood field, including curriculum directors, literacy specialists, educators, and students. The results of this study can enhance knowledge in the areas of technology-assisted instruction, research-based interventions, and the acquisition of reading skills. Such that, in turn, will promote positive social change by affirming that educators have the ability to develop a better understanding of how technology can be used to enhance teaching methods and reading development at the early childhood level by learning from others successes.

Summary

In this chapter, I have provided an overview of a qualitative instrumental case study in which I explored the effectiveness of technology programs in the kindergarten and first grade curriculum. With the advancement of technology, research is warranted in focusing on teacher perceptions of the instructional technologies, as well as the strategies that these teachers use to improve reading instruction. This study were intended to provide an in-depth analysis of teacher perceptions and strategies, and to inform further research on computer-based reading supplements for beginning readers.

Chapter 2 includes a discussion of the current literature that establishes the relevance of instructional technology in early reading instruction, discusses the building blocks of reading, and addresses the link between mastery learning, constructivism, anchored learning, and technology integration. In addition, I review findings from studies addressing computer-based instruction and reading achievement, as well as research on teacher perceptions and strategies in implementing technology programs.

Chapter 2: Literature Review

Introduction

School systems have invested substantial amounts of funding toward reading instruction. However, far too many U.S. students remain poor readers, with fewer than half of fourth grade students achieving at or above the proficient level on the NAEP (Cheung & Slavin, 2013). Due to the low reading achievement scores shown on the NAEP (2015), a small school system in the southeastern United States has identified the need to investigate new technology and examine the effect that these tools have on early childhood reading instruction. The purpose of this qualitative study was to determine if reading instruction is affected by the implementation of technology tools in the early childhood curriculum through perceptions regarding the use of a technology-enhanced reading curriculum.

In this chapter, I review relevant research on the use of technological supplements in reading. In the first section of the literature review, I focus on the conceptual framework made up of theories developed by Bloom, Piaget, and Bransford, and discuss how these theories correlate to the development and use of technology in the reading curriculum. In the next section of the literature review, I provide an overview of teacher perceptions of and strategies for using technological supplements in their reading curriculum. In the final sections of this chapter, I review research on computer-assisted instruction and the effects it has on student achievement.

Literature Search Strategy

I conducted this literature review using the research databases available through the Walden University Library. The materials I examined throughout this literature review include peer reviewed journal articles, books, conference presentations, and dissertations. The search engines and databases that I used included: Education Research Complete, ERIC, Google Scholar, ProQuest, and ProQuest Dissertations and Theses. The keywords and phrases I used to search for these resources included: *early childhood education*, *common core state standards*, *instructional technology*, *reading software*, *reading readiness programs*, *teacher perceptions*, *early literacy*, *mastery learning theory*, and *computer-based instruction*. Some of these terms were used in combination in order to locate desired material. These combinations included: *use of technology by early childhood teachers* and *technology in kindergarten classrooms*.

Conceptual Framework

Predictability has been evident in classrooms for centuries (Guskey, 1997). Teachers can identify both high functioning and low functioning students in a classroom through observations during daily lessons and activities. However, one can argue that this determinism of educational ability can be altered. Research has shown that there are ways to intervene in the educational process in order to defy the predictability of learning outcomes (Guskey, 1997). Within traditional classroom settings, all students are provided with an opportunity to learn and the same quality instruction. However, when teaching and learning proceed in this manner, not all students grasp the concepts being

presented. Bloom conducted research that proved one-to-one tutoring yields higher achievement. This discovery led to the development of Bloom's mastery learning theory.

I included Bloom's theory of mastery learning in the conceptual framework of this study. Mastery learning is an educational philosophy and instructional strategy that suggests all students can achieve the same level of mastery with a focus on instructional methods rather than student ability. Several studies have shown that when students are taught in a way that is appropriate to their needs, and when they receive help in overcoming individual learning difficulties, virtually all of them learn well (Airasian, Bloom, & Carroll, 1971). The concept of mastery learning addresses the importance of varying teaching strategies because children have varying learning styles. Many studies have been conducted to determine the effects that mastery learning has on student achievement across the entire range of grade levels (Guskey, 1997). For instance, Puleo conducted a study on the application of mastery learning in full- and half-day kindergarten settings. Another significant study is that of Rachal (1991), who studied the effects of mastery learning in an educationally disadvantaged area. This study showed consistent positive gains in academic performance of disadvantaged students.

The mastery learning theory developed by Bloom can be applied to technology-enhanced instruction because it allows students to use alternative materials to help grasp new concepts. The continuous advancement of technology-enhanced instructional tools is making it possible to provide children with personalized learning opportunities. Many of these programs, including ScootPad, ABC mouse, and raz-kids to name a few, provide teachers and students with a technological learning platform that incorporates research-

based strategies in order to promote the highest level of student achievement (ScootPad, 2015). These reading supplement programs are equipped with personalized learning paths, data-driven insights and reinforcement, as well as immediate feedback. These programs lend themselves to Bloom's mastery learning theory in providing students with individualized, one-on-one instructional opportunities. This leads to another learning theory that focuses on student-centered learning opportunities.

Anchored instruction is a learning theory developed by the Cognition and Technology Group at Vanderbilt University under the leadership of John Bransford. Bransford's anchored instructional theory suggests that instructional activities should encourage exploration by the learner and encourage hands-on interactive learning opportunities (Onyang & Stanley, 2014). The three main principles of anchored instruction include centering lessons on a specific concept, allowing the learner to explore the concept, and encouraging the use of multimedia programs to support the exploration.

The most current technology programs now offer engaging activities that focus on specific content or subject areas. This lends itself to the anchored instructional theory in how the teacher can identify the specific technology-enhanced instructional tool that concentrates on the content of focus. The anchored learning theory expresses the importance of learner-centered exploration. In using technology-enhanced instructional tools, the learner can be provided with one-on-one exploratory opportunities focused on the specified content knowledge. According to Pappas (2015), Bransfords anchored

instructional theory follows a constructivist discovery learning approach that is strongly recommended to teachers implementing technology in the classroom environment.

Piaget's constructivist theory is another theory that lends itself to the conceptual framework of this study. Constructivism is a theory about knowledge and learning (Ultanir, 2012). Piaget's constructivist theory holds that learning is an active process where knowledge is constructed by meaningful experiences (Piaget, 1985). Technology lends itself to the constructivist theory in how it can actively engage the student in learning activities. In a constructivist-based classroom, the teacher is a facilitator or guide who encourages learners to question and challenge throughout the learning process. This theory requires the learner to actively engage in activities to develop understandings. Given the engagement opportunities presented by technology-enhanced instructional tools in today's classrooms, the constructivist learning theory lends itself to technology enhanced instruction.

According to Soujah (2014), the teacher's role in a constructivist classroom is to scaffold student learning by introducing the element of inquiry through the use of technology. Piaget's constructivist theory situates the learner as the most significant component in the learning process. In other words, the learner must be actively involved in the learning process. Technology gives learners the opportunity to be actively involved through the use of interactive activities. As mentioned above, programs such as ABC mouse, Raz-Kids, and ScootPad, allow the learner to enthusiastically engage in technology-based activities that promote understanding of content. Therefore, this study benefits from the constructivist learning theory.

Literature Review Related to Key Variables and Concepts

Technology as a Learning Tool

The effects of technology in education have been studied since the beginning of the 1970s when educators where becoming convinced that computer technology could support students in formal education (Drigas & Kokkalia, 2014). Driggas and Kokkalia conducted an in-depth literature review focusing on the ways in which technology can contribute to early learning skills beginning at the kindergarten level. These researchers found that technology can contribute to three main areas of learning including: social and emotional development; language, problem solving, reasoning, and creative development; and operational and motor skills.

According to Steffens et al. (2014), lifelong learning is becoming increasingly important. Digital technologies are also increasing in importance as these tools have entered many aspects of our lives, including education (Steffens et al., 2014). However, the advancement of these tools at such a quick rate requires continued research into how the interactive technologies can lend themselves to improving student motivation and achievement. Lee and Wei (2015) described interactive technology in the classroom as a means to avoiding distraction. These tools can be used to help children concentrate on interests, rather than interactions with people. Child-computer interaction is a learner-centered approach where children can take the initiative to explore and learn a multitude of information in many subject areas. These multimedia tools equip teachers and students with animation, digital photography, and videos that Lee and Wei have proven to improve motivation and interests of students at the early childhood education level.

Young children in today's society are described as the generation of digital natives (Hsin, Li, & Tsai 2014). The rapid development of technology has changed the ways in which children learn. These changes have urged the rethinking of learning theories and curricula. This has raised questions as to whether or not these instructional technology tools are developmentally appropriate for children in the early childhood setting. Hsin, Li, and Tsai (2014) conducted an in-depth literature review of 87 articles in order to uncover the influence of technology on children's learning. They identified many different themes in relation to technology. The themes of focus included children's age, experience, and gender; adult facilitation, integration, and perception; and technology teaching and learning approaches. The theme Li et al. identified that is particularly related to this study is that of the adult's perception of technology and strategies used to implement these tools. The articles I reviewed showed researchers' mixed feelings about technology; some believe it supports learning, while others believe that it can impede development. Therefore, conducting a study that focuses on teacher perceptions and strategies can help identify effective tools that can produce positive results.

According to Slutsky, Slutsky, and DeShelter (2014), play is arguably the most important and fundamental experience in a child's life. Many early childhood learning environments are described as play-based learning facilities. However, these researchers went on to state that the ways in which children play are changing to more technology-driven experiences. Research on the topic of technology has shown both positive and negative results. Slutsky, Slutsky, and DeShelter discussed both the negative and

positive aspects, identifying the need for a balance between traditional play and technology experiences. The researchers stated that in using technology as a supplement rather than a replacement of instructional methods, learning experiences in the early childhood years allow children to extend thinking and provide a robust learning experience that adds to the interest of students.

On the contrary, there are studies that have been conducted that do not support technology as a form of development and learning in the early childhood curriculum. Edwards (2013) conducted a study that focused on the importance of play-based learning. The researcher expressed the need for play-based learning in early childhood curricula because technology has not been identified as relevant at the early childhood level. Despite the rapid advances of technology, there is still a gap in the research distinguishing between play and technology. Focusing on more current research will hone in on children's digital play and create a balance in incorporating technology tools and historical means of learning in order to promote socialization and cognitive development within the early years.

With children becoming familiarized with technology at increasingly early ages, it is imperative that researchers uncover the effects that these tools have on emergent literacy development. Researchers Bus, Takacs, and Kegel (2014) conducted a literature review focusing on the strengths and limitations of electronic storybooks for young readers. They found that although many e-readers increase engagement due to the animations and sound effects, these tools have a tendency to diminish children's abilities to make sense of the stories. The animations draw attention to the wrong aspects of the

story. Although these enhancements increase motivation, too many irrelevant visualizations have been founded to impair learning at the early childhood level.

Common Core Standards and Reading Instruction

Digital technology has changed the ways that readers and writers interact with text. The printed page is no longer the dominant form in the classroom environment, with digital tools creating opportunities to read text with color, sound, imagery, and video (Colwell & Hutchison, 2015). Due to these changes and possibilities, digital technology has been recognized to the extent of being integrated within the Common Core English Language Arts Standards. Being literate today suggests that a reader is digitally literate; however, according to the researchers, there is little to no information provided about how teachers are to accomplish this goal.

The Common Core State Standards (CCSS), have taken effect in most states within the U.S. According to the International Reading Association, these standards require that all students be held to the same standards for literacy achievement, no matter the range of abilities and needs of the students. The challenge for teachers is to implement instructional supports for these ranges of abilities and needs within the classroom to support struggling readers required to achieve the standards set by the CCSS (International Reading Association, 2014). The Common Core standards integrate technology in the standards of learning so that students will be well prepared for the literacy demands of the 21st century (McDormett & Gormley, 2015). Therefore, the necessity lies in examining the technology tools required by the CCSS that will enhance reading development in support of struggling readers at the early childhood level.

Colwell and Hutchison (2014) recognized that the adoption of the common core state standards remains a heavily debated topic in education. Nonetheless, teachers are still being asked to revise their instructional methods to target the Common Core instructional demands. The researchers conducted an in-depth literature review to identify viable options for teachers to integrate digital tools into the classroom as a bridge to meeting the standards targeting multiple literacy skills. These options include skills, strategies, and communication between the educator and the students for successful implementation. The study emphasized that digital tools have the potential to transform instruction, aligning the instruction to promote the demands of the common core standards.

Robertson, Dougherty, Connors, and Paratore (2014) pointed out that raising the bar for the literacy achievement of students through the common core state standards also raises the bar for educators. Teachers must now focus on the methods and tools necessary to support struggling readers in achieving the required common core state standards. The researchers in this article pointed out three distinct ways to accelerate literacy learning. These include motivation and engagement, instructional intensity, and cognitive challenge. The focus must now turn to whether or not technology supplements can be utilized in the early childhood classroom in order to achieve these three literary acceleration techniques.

Hiebert and Mesmer (2013) examined the potential impact of the common core state standards on young readers within the U.S. The common core state standards have been adopted by forty-six of the fifty U.S. states. These standards have raised the

complexity of the texts that are required for students to read on grade levels. Herbert and Mesmer agreed that addressing the complexity of texts is central to ensuring that students attain the levels of literacy necessary within the digital-age society. On the contrary, the researchers expressed concerns with the potential effects of the complexities and accelerations at the primary grade range. Herbert and Mesmer also pointed out that motivation and engagement in reading has been a long-standing area of concern in the U.S. A nationally represented sample in 2001 showed that the U.S. ranked thirty-third in an index of students from thirty-five countries in the area of reading motivation. That same sample also showed the U.S. ranked as thirty-fifth out of thirty-five countries in attitudes toward reading. With these statistics in mind, will raising student expectations and increasing challenges within the primary grade levels solve this pattern of disengagement with literacy? The question remains as to how teachers will raise engagement and student achievement in literacy development and if technology will aid in this area of concern.

Reading Instruction and Technology

Ensuring the development of proficient readers through effective classroom instruction is a critical issue in early childhood education (Carson, Gillon, & Boustead, 2013). Statistics identifies by Carson, et al. (2013), suggests that one in three children struggle with the development of basic reading and writing skills. One way teachers are working toward closing this gap is through effective and efficient classroom instruction in phonemic awareness. Phonemic awareness has been identified as an early predictor of reading success; therefore, focusing on syllables, on-set rhymes, and letter name and

sound fluency will lead to a strong foundation for early learners. With this in mind, attention needs to be turned to how teachers can implement effective instruction in this area and can technology aid in the development of phonemic awareness skills that are essential to reading success.

Reading is an essential skill that is developed during the early childhood years (Keyes, Cartledge, Gibson, & Robinson-Ervin, 2016). Due to the rapidly changing and developing technologies, traditional literacy classrooms are becoming a thing of the past. Spencer and Smullen (2014) conducted research discussing the impact that Kindle e-readers and iPads can have on reading instruction. In these studies, the students were empowered with the ability to choose reading material, which in turn provided the students with the skills required to become productive and self-equipped learners (Spencer & Smullen, 2014). Spencer and Smullen stated that the utmost benefits of implementing the technology tools into the reading curriculum included motivation and engagement.

Robertson (2015) conducted a study using digital technology to engage students in raising reading achievement scores. The school in which the study took place began with a significant number of students eligible for pupil premium support, with a National Leader in Education appointed to improve the school due to the 2010 below floor target scores. The National Leader appointed in the school pointed out the necessity for a range of reading opportunities and consistency of approaches. Guided reading became a daily requirement in this school utilizing First Words, which uses a kinesthetic approach to learning reading. Technology tools were also implemented alongside the guided reading

scheme as a supplement to the reading program. According to Robertson, the implementation of iPads and the Accelerated Reading program in this school to promote reading instruction and development allowed this school to be identified as the UKLA Literacy School of the Year in 2013. In aligning strategies and the implementation of technology tools in the reading curriculum, this school was able to raise reading achievement scores.

According to Oktay (2013), brain-based learning occurs when it is appealed to the senses, therefore more permanent learning will occur. Oktay concluded, the effective use of technology appeals to multiple senses and if used correctly in the classroom, will lead to more permanent learning. Oktay conducted a study using the theme force and motion with the brain-based learning approach and technology support. The quasi-experimental study resulted in post-test scores showing a significant difference between the control group and experimental group within the study. According to the research conducted, the experimental group receiving the technology supplements retained information at a more successful rate. This study displayed the significance of incorporating technology-enhanced instructional tools in an educational program to raise student achievement scores. If this success can be achieved in the science curriculum, then these results may be replicated and acquired in reading instruction with the implementation of technology-enhanced instructional tools.

In further researching the impact that technology can have on student reading achievement, one must consider the tools that can boost early literacy development. The importance of implementing developmentally appropriate technology in the early

childhood environment has been identified as a concern. Thompson (2014) has identified three technological tools that have proven beneficial in boosting early literacy skills. These tools include Footsteps2Brilliance, iPads, and Raz-Kids. Footsteps2Brilliance gives students access to on-line libraries of interactive books that are engaging to students. The iPads provided students with an interactive interface that gave the children the opportunity to explore and practice reading readiness skills. Raz-kids is a technology program that allows students to receive differentiated instruction with a focus on comprehension. Thompson pointed out that boosting literacy through technology is still a relatively young pursuit, as technology continues to advance at a rapid rate, however, the study results are favorable in boosting student reading achievement.

Keyes, Cartlidge, Gibson, and Robinson-Ervin (2016) conducted a study that examined the effectiveness of a supplemental repeated reading intervention delivered through instructional technology focusing on reading fluency and comprehension. For struggling readers, schools often try to provide students with intervention opportunities, commonly known as Response to Intervention (RTI), however, if the staffing is not available to provide this support, teachers must find other ways to provide instruction. The researchers conducted a sixteen-week study, the participants being six early childhood students. The students received computer-assisted instruction, the Read Naturally Software Edition (RNSE), and all participants showed significant increase in fluency yet comprehension displayed mixed results. If these results in reading achievement can be attained through the use of this program, researchers must continue

to study other available technology programs that may provide higher achievement scores.

Muis, Ranellucci, Trevors, and Duffy (2015), conducted two studies focusing on kindergarten students and their perceptions of digital technology. These researchers also focused their attention on whether the immediate feedback provided by these technology supplements played a role in the attitudes, engagement, and learning outcomes of the students within the study. Student achievement in this study did increase; however, the researchers found that some tasks were too difficult for students in using the technology and at the kindergarten level, the children had not yet learned to regulate their learning based on the feedback from the digital tools. Therefore, more research is needed at this grade level to find tools that will allow the children to regulate their learning in a productive and successful manner by initiating a self-regulatory process.

According to Cheung and Slavin (2013), students who cannot read well at the early childhood level have a tendency to perform poorly in later grades, display emotional and behavioral problems, and may drop out of school altogether. Due to these concerns, Cheung and Slavin conducted a review of the literature examining the effectiveness of educational technology in improving literacy skills of struggling readers at the early childhood level. Having reviewed twenty high-quality studies, the researchers concluded that technology can enhance the reading achievement of struggling students; however, the technology will not produce significant results if it is not paired with teacher-directed whole group instructional methods. The researchers emphasized the importance of using the instructional technology as a supplemental tool rather than a

replacement for formal reading instruction in order to achieve the most significant results in raising achievement scores. Twenty studies reviewed in this research article is merely skimming the surface in this area of concern; therefore, Cheung and Slavin point out the importance of continued research, as technology continues to advance over time.

Classrooms are now infused with technology and has changed the ways in which children access information (Hess, 2014). According to Hess, the forefront of research is focused on disengaged readers and how technology can enhance student experiences to increase reading motivation. Hess conducted a study that focused on e-readers in an early childhood classroom. The researcher identified that e-readers did increase reading motivation; however, teachers from the study did report that it was difficult due to the limited number of e-readers in the classroom and it took time away from instruction to help the students learn to use the technology in a productive manner. After these skills were developed, the positive outcomes outweighed the negative aspects. The teachers who participated in the study continued to use e-readers on a daily basis after the study was completed due to the positive impact it had on the students.

The Teacher's Role

Education has evolved in many ways with the development of instructional technologies as learning tools in the early child classroom (Kirschner, 2015). This evolution has led to mandating teachers to integrate technology within the core curriculum as a normal part of their competencies and not an add-on. Children learn in multiple ways including auditory, tactile, and visual. Although many studies have argued that technology applications can meet the needs of all learners, Kirschner expressed the

importance of a balance between the ‘old’ kinds of learning and the use of technology-enhanced instructional tools. In creating a balance between the ‘old’ methods of teaching and implementing the new technologies as a supplement to these learning styles, improved academic results can be achieved.

According to Blackwell, Lauricella, and Wartella (2014), teachers and policy makers have valued the potential of technology to revolutionize early childhood education. The researchers went on to emphasize that teachers act as the mediators of technology’s impact on student learning. However, there is a gap in the research in identifying if teachers are effectively implementing these technology tools. Although technology access has increased in the classroom environment, there is no guarantee that teachers are able to use the technology for teaching and learning purposes. Therefore, it is important to turn the focus toward the teacher’s role in implementing these tools.

Many teachers implement some form of reader’s workshop within their classrooms. According to Fowle (2014), many teachers find it difficult to balance what is most important and how to teach these skills in the small amounts of time allotted. The model of reader’s workshop that Fowle focused on included a mini-lesson, workshop time, and a share time. Focusing on the workshop time, teachers are expected to conduct small group sessions or rotations. This form of instruction requires the children to work independently in groups. The question remains as to whether or not technology supplements can aid in the students’ ability to work independently and more productively based on further research efforts.

Schools have taken on the responsibility for preparing students to become digitally literate (Queensberry, Mustian, & Clark-Bischke, 2015). Queensberry et al. stated that technology-based learning and assessment programs will be pivotal in improving student learning and generating data. Therefore, Queensberry, et al. emphasized the importance of schools and teachers to focus on the ways to support student learning through the use of technology-enhanced instructional tools. After conducting a study on how teachers can implement technology at the early childhood level, the researchers concluded that social skills can be developed through three steps. These steps included planning and technology selection, introducing the technology, and evaluating the effectiveness of the technology. The teachers from the study used tools such as the interactive white board, computers, and tablets.

In focusing on technology in the classroom, one must identify how these technologies are implemented. Simon, Nemeth, and McManis (2013), conducted a survey focusing on the ways teachers use technology in the classroom environment. The researchers concluded that many teachers thought of classroom technology as simply using their cell phones to take pictures of learning activities and using this tool to send to parents as well. On the contrary, other teachers in this study spoke of using interactive white boards and computers. This gap in knowledge, technologies, and the implementation requires more research to be conducted in helping teachers successfully implement effective tools at the early childhood level.

Staying on the topic of teacher implementation, I reviewed a similar study by Nager, Firstater, and Schwasbky (2013). This study concluded that positive attitudes of

teachers toward computer literacy and technology implementation has a crucial influence on the effectiveness of these tools. With the changing needs of the 21st century students, teachers are expected to successfully implement technology into everyday lessons, beginning at the early childhood level of education. Nager, et al. identified skills necessary for the educator to successfully implement technology in the classroom. These skills included familiarity of the tools, data analysis, implementing developmentally appropriate technology tools, knowledge of early childhood learning theories, as well as the integration and adaptation of these tools to meet student needs. These skills concur with the skills that were identified by Queensberry (2015).

Manessis (2013) emphasized that educators are the primary agents of educational innovation; therefore, the success of learning with computer technology depends greatly on the attitudes of teachers. If teachers do not embrace technology and willingly implement these tools into daily instruction, they will not prove to be successful learning tools. After researching teachers' attitudes toward technology in the classroom, Mannesis concluded that most teachers feel comfortable implementing technological games with educational features at the kindergarten level. Manessis also concluded that kindergartners from the study were perceived as computer literate and competent. This study uncovers the factor that technology can be used at the kindergarten level; however, further research is needed in identifying which technologies create the most significant impact on student learning.

Fenty, Mulcahy, and Washburn (2015) conducted a quasiexperimental study which they challenged the difference between teacher led instruction and computer

instruction with at risk early childhood reading students. Fenty, et al. found that traditional teacher-led instruction often occurs in small groups, involving turn taking. This presents a problem for readers who are experiencing the most significant reading deficits because they receive less direct practice with texts, hindering reading achievement. Throughout the course of the study, the researchers discovered that computers provided students with increased opportunities to interact with texts in meaningful ways. Advancements in technology continue to increase rapidly, causing researchers to further investigate the impacts that technology can have on reading development, although this study continues to fall into the same pattern as past studies focusing on the impacts of computer-based instructional supplements.

According to Spencer and Smullen (2014), "When integrating new technologies within a reading classroom, there is a risk of not creating enough change in practices to make the potential benefits of the technology worthwhile" (p. 28). The researchers went on to discuss that technology must not be simply integrated into the classroom without the consideration of the benefits it can provide to students. Within the digital age, educators must move from simply using electronic texts and programs in the same manner as they would a paper copy of a book. The researchers discussed that the teacher's role in implementing instructional technology is embracing what these programs have to offer and allowing these programs to aid in empowering the young readers.

With the ample amount of technologies available, early childhood teachers are expected to do more with technology in their classrooms (Suh & Gerson, 2013).

Research has proven that small group and one-on-one instruction are the most beneficial forms of instruction; however, many teachers find it difficult to provide these types of instruction with the large class sizes allotted in today's school systems. Suh and Gerson conducted a study researching the benefits of computer phonics instruction in the classroom to aid teachers in providing the desired small group instruction. This study allowed the teachers to incorporate a balance between reading instruction and technology supplements, which in turn enhanced the learning process. Suh and Gerson did emphasize the importance of teacher instruction and that technology is not a replacement, but a supplemental tool to enhance learning in the classroom.

Evans, Hawkins, and McCrary (2014) discussed the importance of continuously reaching and teaching students in a more effective manner. Technology is one way in which teachers are attempting to overcome this challenge. According to the researchers, many teachers have implemented computers within the classroom setting, yet younger children require an abundance of guidance and structure when using these tools in an effective manner. The researchers discuss the ways in which early childhood teachers can effectively use technology at the early childhood level. These include individualizing instruction, data collection, student engagement, and home-school connections. Individualized instruction can be achieved using technology-enhanced instructional tools by allowing educators to use small group instruction. Technology cannot replace traditional, research-based methods in the early childhood classroom, but used as a supplement, these tools can create an engaging classroom environment in which students can reach higher levels of achievement.

Teacher Strategies

Recent research studies have focused on the positive impact that technology can have on student achievement, as well as the importance of effective classroom implementation. It is equally important to focus on the teacher perceptions of technology programs and the strategies that they use to effectively implement these tools in their daily lessons. According to Boschman, McKenney, and Voogt (2014), many teachers are acting as designers of technology for their classrooms. Technology innovation and progression leads to increased technology integration, professional development opportunities, and the production of material that is in line with classroom practice.

Belo, McKenney, Voogt, and Bradley (2016), conducted a literature review to examine teacher knowledge in using technology to foster early literacy development. These researchers discovered that the integration of technology in the daily classroom routine is a complex and challenging task, as many teachers are not able to use technology to its full potential (Belo, et al., 2016). Teacher competence has been identified as a key success factor in implementing technology in the classroom environment. After reviewing forty-six studies, the researchers determined the tools that teachers found to impact student achievement in a positive manner. These tools include electronic storybooks, computer-based phonics instruction, and early literacy software. The electronic storybooks had a significant effect on children's book orientation and comprehension skills. The computer-based phonics instruction displayed significant effects on phonemic awareness skills. These programs were also identified as being used as a replacement for direct teacher instruction.

Many researchers have studied the impact that teachers can have on student development through designing their own technology tools. Kali, McKenney, and Sagy (2015) conducted a study focusing on this specific area. The researchers concluded that teachers who chose to design their own technology enhanced activities can provide resources for learners that are tailored to specific needs, which improves student learning. However, many teachers have not taken on this task due to the high-quality support necessary for design success. Nevertheless, teaching is quickly transitioning to being viewed as a design profession. This label is due to the teachers' ability to work out creative and evidence-based ways of improving instruction and student learning in the classroom through personally developed technology enhanced activities.

Kayalar (2016) identified teachers' skills and abilities as the most important factor of technology integration. With technology as a curriculum requirement, teachers must shape educational technology activities to fulfill student needs. According to this study, the integration of technology in the classroom is not focusing on operating computers, but focusing on technology usage as a tool for learning. Teachers at the early childhood level must practice modeling technology usage by not only using the technology often, but also applying it across the curriculum and facilitating collaboration among students using the technology supplements.

The educational community has been affected by technology in numerous ways. Khatib (2013) concluded that the use of the internet has educators rethinking the way instruction is administered to students. According to this research study, students are now able to interact with internet-based learning combined with teacher-led instruction.

Technology-enhanced instructional supplements can act as an intervention tool that can overcome the barriers that some students face within a traditional classroom setting. The teacher's role in effectively implementing technology supplements include careful planning, design, implementation, and evaluation.

The teacher's role in creating and facilitating learning in technology-rich environments is important in supporting early literacy development (Cviko, McKenney, & Voogt, 2013). These researchers conducted a study focusing on teachers as executors of technology programs, redesigners, and co-designers. The executers of technology and redesigner roles raised concern on the practicality of the technology programs. However, in the co-designer cases, where the teachers were able to design their own activities, had the highest technology integration rates. Therefore, according to this study, when teachers have the opportunity to work with the technology and develop their own activities, they are more apt to implement these tools in a more successful manner.

Cviko, McKenney, and Voogt (2015), conducted another similar study to that of Kali, McKenney, and Sagy. These researchers focused on teachers as designers of technology-rich learning activities to boost early literacy skills. After conducting a case study of seven kindergarten teachers, the researchers could conclude that teachers as co-designers of technology supplements led to significant learning outcomes and gains in the area of early literacy development. The teachers in the study acted as co-designers utilizing the program pictopal. Like the results of previous studies, the experimental groups that participated in the technology enhanced activities showed greater gains than those within the control group, whom did not receive the technology enhanced activities.

When teachers are involved as co-designers, their role and the feeling of ownership added to the positive influence of the early literacy activities.

Ruggiero and Mung (2015) discussed the fact that technology is not a cure all for improving classroom instruction. Educators must be able to use the technology and connect these tools to the content being taught. Now that ninety-seven percent of teachers employed in state funded schools are connected to the internet, accessibility has become less of a barrier since the year 2005. In preparing students for the 21st century, technology has become more prevalent in the classroom. The 2010 National Education Technology Plan, the 2008 International Society for Technology in Education, and the 2011 National Council for Accreditation of Teacher Education call for technology as an integral part of education in today's classrooms. Teachers are responding to these demands and although many studies have shown that teachers are struggling in incorporating these tools, the support and encouragement from curriculum designers, principals, and teaching teams continuously increase to provide students with the best education possible.

Barriers Impacting Technology Integration

According to Hammonds, Matherson, Wilson, and Wright (2013), children in today's society are thought of as digital natives having grown up immersed in technology. On the other hand, many teachers are considered digital immigrants because they are having to play catch-up as technology continues to advance each year. According to Hammonds, et al., many teachers have displayed reluctance in incorporating technology in their classrooms due to the mindset of losing the authority.

Also, with the implementation of the common core standards, teachers see technology as, yet another requirement. For true change to take place, teachers must work toward overcoming these barriers for technology tools to reach their fullest potential in raising student achievement.

Many barriers have been identified that limit educators' use of technology (Yu, 2015). Research has indicated that educator use of technology is limited to learning games, drill and practice, or occasional word processing. According to Yu, this has led to a lack of technology integration, which displays the inadequacy of technology integration for student achievement. After conducting an in-depth study of teacher perceptions and barriers on technology integration, Yu concluded that teachers show much enthusiasm in integrating these tools; However, the research also pointed out that a lack of knowledge has prevented teachers to successfully implement the technology in early childhood education.

Hsn (2016), conducted a similar study that focused on barriers that teachers face when implementing instructional technology. After conducting s survey of four hundred teachers, Hsn found that nearly eighty percent of teachers had technology available to them, yet about a quarter of these respondents expressed frustrations about barriers that hinder effective technology integration. These barriers are identified as lack of technology skills, lack of support, the lack of time to use the technology, and the lack of technical support. Unfortunately, it has been identified that teachers tend to use technology for low-level tasks rather than to its fullest potential.

According to Hutchison and Woodward (2014), teachers continue to struggle with incorporating digital tools into literary instruction. Hutchison and Woodard had found that eighty-two percent of surveyed teachers believed that a lack of meaningful professional development acted as a barrier to successful technology implementation. However, unlike many other studies, these researchers worked toward developing a guide to help teachers integrate technology into literacy instruction in meaningful ways through a cycle that can be relevant for professional development needs. This plan was identified as the Technology Integration Planning Cycle. This cycle emphasizes the importance of aiming to teach both traditional and digital literacy skills through a sphere of reflection. This sphere of reflection requires teachers to plan, engage within instruction, and reflect on the success of the implementation and student understanding.

Although many studies have displayed the positive effects of technology usage, many teachers face barriers in implementing these tools in their daily classroom routines. Blackwell, Lauricella, Wartella, Robb, and Schomburg (2013) conducted a research study to uncover these barriers and gain a deeper understanding of why schools have increased access to technology, yet seems to be under-used for instructional purposes. This study pointed out the potential negative impacts that technology can have on child development as identified by the American Academy of Pediatrics that recommends no more than two hours of screen time a day for early childhood children. Another potential barrier is that of personal beliefs and knowledge play a role in the under-use of technology in these environments. Although many studies point out the positive factors of technology use, it is imperative that we become aware of the barriers as well to fully understand the

implementation of technology and the effects it can have on student academic development.

Soujah (2014), posed the question, have schools over invested in technology and underprepared their teachers in implementing them? Technology education has grown to be just as important as reading, writing, and arithmetic in the digital aged society. Soujah pointed out that teachers tend to use technology as a privilege that does not translate well into student learning. The availability in the classroom today causes one to misunderstand the scope in the classroom. True integration is that of active student participation. According to Soujah, the teacher's role in a technology rich classroom is to scaffold student learning by using technology as a facilitator.

McDermott and Gormley (2015) conducted a study focusing on teachers use of technology during reading instruction. The researchers found that many teachers used the technology instructional tools to "…display multimedia content, generate interactive learning activities, focus student attention, display texts for shared reading, and individualized learning activities" (McDermott & Gromley, 2015, p. 121). The researchers found that the technology instructional tools offered teachers many resources and allowed for lessons to run smoothly; however, the researches felt that there was room for higher-level and creative thinking activities that were not present during the observations conducted.

The use of technology continues to evolve throughout the years and have been identified as having a significant role in improving education at the early childhood level. Safitry, Montoro, Ayu, Mayumi, Dewanti, and Azmeela (2015), conducted a survey to

uncover teacher perspectives and practices in relation to the classroom technology producing these improved results. The research suggests that teachers with over ten years' experience are lacking the skills and training necessary to implement these technology-enhanced instructional tools in a successful manner (Safitry, et al., 2015). It has been identified that technology implementation has failed due to teacher beliefs, skills, and attitudes toward the technology.

Children hold a great interest in technology. According to a teacher/researcher, Baker (2014), technology correspond with improvement in the areas of social-emotional and academic progress. However, many teachers still display strong feelings toward these tools. According to Baker, teachers believe that they spend more time instructing young children how to use the technology devices than using them. Others expressed concerns that children are spending too much time in front of a screen, when they can learn the information from a person. With many conflicting opinions on the topic of instructional technology tools, researchers are uncovering that teachers are not prepared to implement technology to its fullest potential in the classroom. With the amount of research displaying the positive effects that these tools can have on student achievement, it is imperative that further research be conducted to influence teachers to implement them in the classroom.

According to the International Reading Association, technology is redefining the nature of reading, writing, and communication (Fenty & Anderson, 2014). The study conducted by Fenty and Anderson uncovered mixed emotions when examining educator's knowledge, beliefs, and practices in using technology with young children.

This study indicated that teachers believe in the importance of integrating technology in daily lessons; however, findings also indicated that teachers have the feeling of inadequacy in their preparations to incorporate these technologies in a successful manner. With these mixed emotions being evident in the research, one can conclude that technology is not being used to its fullest potential to raise student achievement. Further research must be conducted to uncover the ways in which we can equip our teachers with the skills necessary to successfully implement the tools that are proving to be beneficial to student learning.

Li, Worch, Zhou, and Aguiton (2015) took a different approach in uncovering the barriers to technology use. These researchers focused on the digital generation of student teachers to uncover whether their technology use differed from that of teachers who grew up with less exposure. Li, et al. discussed the great potentials and accessibility of technology in schools, yet teachers have a strong tendency to display reluctance and skepticism in integrating these tools into daily lessons. After conducting surveys and interviews of digital-aged student teachers, the researchers found that their use of technology did not yield significantly different results from that of historical research. The barriers of technology use correlated with past findings showing that teachers computer skills, access to technology, technical support, and self-efficacy effected their technology usage. Although younger teachers entering the profession have had more exposure to the tools available in classroom settings, their usage in the classroom runs parallel to that of teachers already in the school systems.

Many articles have displayed the barriers that teachers face when integrating technology into daily classroom instruction. Wang, Hsu, Reeves, and Coster (2014) concluded that technology integration is all too often teacher-centered and is used as a 'learn from' tool like the way that students learn from a classroom teacher. When technology is used in this manner, the technology supplements yield a low or no significant impact on student learning outcomes. Educational technology has been developed as a student-centered 'learn with' tool. If the student-centered approach is not adopted by educators, then the barriers that have been identified in so many historical studies will continue to prevail. Wang, et al. conducted a study providing teachers with professional development opportunities to overcome the implementation barriers. The study concluded that with the professional development, teachers could create lessons that positively impacted student achievement. Therefore, this research study shows that with the appropriate support, teachers can begin to overcome these barriers and provide successful learning opportunities for students.

Summary and Conclusions

The effects of technology in education have been studied since the beginning of the 1970's when educators where becoming convinced that computer technology could support students in formal education (Drigas & Kokkalia, 2014). Over the course of the years, technology has evolved and continues to advance. However, the research on technology as a learning tool has been mixed when focusing on early childhood education. Although technology tools have been proven in many studies to improve student motivation and achievement, other studies contradict these results. These studies

argue the importance of traditional play and historical instructional methods (Edwards, 2013). With technology taking over so many aspects of our daily lives, the researchers argue that a balance must be created to achieve the maximum learning capacity. More research is needed to confirm the positive effects of technology on student motivation and achievement, as well as the impact that these tools have on child development.

The research focusing on the Common Core State Standards adopted by forty-eight of the fifty states in the U.S. has also projected mixed results. The Common Core State Standards require teachers to implement technology into instructional activities across the curriculum. Focusing on literacy development, the Common Core State Standards require learners to engage in lessons within complex texts. With the higher standards of achievement, teachers are challenged to meet higher standards as well. Therefore, research is identified as a need in finding how teachers are meeting these higher standards. Research is also needed to determine how teachers are meeting the demands of technology integration. What tools are these teachers utilizing and which ones are proving successful in helping students meet the higher standards of achievement?

Ensuring the development of proficient readers through effective classroom instruction is a critical issue in early childhood education (Carson, Gillon, & Boustead, 2013). Statistics identified by Carson, et al. (2013), suggests that one in three children struggle with the development of basic reading and writing skills. In researching the literature, it has become evident that technology-enhanced instructional tools have aided in raising reading achievement at the early childhood level. One concern that has been

raised within the research is the teacher's ability to adjust instructional methods to successfully implement technology-enhanced reading instructional tools. The literature also expresses a concern of the time that it takes to train early childhood students to use the technology programs appropriately. Another concern that has been raised in the research is the ongoing advancement of technologies. With the continuous advancement of technology, research must continue to be conducted to keep current data on the most effective reading supplement tools in raising reading development at the early childhood level.

In focusing on the teacher's role in implementing instructional technology, the research indicated that teachers act as the mediators of technology's impact on student learning. However, there is a gap in the research in identifying if teachers are effectively implementing these technology tools. Ruggiero and Mung (2015) discussed the fact that technology is not a cure all for improving classroom instruction. Educators must be able to use the technology and connect these tools to the content being taught. The literature review exposed numerous studies that displayed a commonality of barriers that are keeping teachers from successfully implementing these tools. These barriers included the lack of professional development opportunities, as well as the lack of technical support within the school systems. With the ample amount of research focusing on the barriers, it is imperative that research begin to focus on the teachers with successful experiences in implementing these technology-enhanced instructional tools. If the focus is turned towards successful implementation, teachers and researchers can support those who strive

to improve their ability to implement technology-enhanced instructional supplements to improve student development at the early childhood level.

My study focused on teacher implementation of technology-enhanced instructional tools that support reading development at the early childhood level. A number of studies have been conducted focusing on the barriers that teachers face in implementing technology-enhanced instructional tools in the classroom; however, additional research was needed to focus on how teachers have overcome these barriers. How are teachers successfully implementing technology reading supplements? What is the effect that these tools have on student motivation and reading development? Chapter 3 describes the research and design methodology for the instrumental case study that examined teacher perspectives and strategies used to improve the reading instructional methods in early childhood education.

Chapter 3: Research Method

Introduction

In this chapter, I describe the research methodology for the qualitative instrumental case study that conducted to investigate teacher perceptions of the use of technology-enhanced curriculum and how the technology is used to enhance reading instruction. In the United States, reading achievement scores of children strongly indicate the need for research on the impact that technology can have on reading development. A mere 36% of fourth graders achieved at or above the proficient level on the 2015 NAEP (National Center for Educational Statistics, 2015). Using a qualitative instrumental case study, I identified teacher perceptions of technology-enhanced instructional tools and the strategies they used to improve reading instruction at the early childhood level.

In this chapter, I provide a description of instrumental case study research, and offer my rationale for choosing the design. I further explain the participants chosen for the study, and discuss the recruitment process and the procedures for gaining access to the chosen participants. I also describe the instrumentation chosen to conduct the case study, as well as my role as researcher. The trustworthiness and ethical procedures are addressed through a descriptive account of how I analyzed, coded, triangulated, and measured data to ensure credibility, and through a discussion of how participant identities were protected throughout the case study.

Research Design and Rationale

Through my research, I sought to determine how teachers and administrators perceive the implementation of instructional technology tools in conjunction with the core reading program in order to enhance performance and engagement in the early childhood classroom environment. The following questions addressed the purpose of my research:

RQ 1: How do teachers use technology in their classrooms?

RQ 2: What changes in student performance and engagement do teachers and administrators witness when technology tools are implemented?

RQ 3: How do teachers and administrators describe their implementation of technology-based strategies within the classroom environment?

These elements were best determined through a qualitative case study. Qualitative research requires the researcher to use strategies such as inquiry, data collection, and analysis to provide a descriptive view of the problem based on the perceptions of the participants.

Qualitative research is described as inductive and interpretive, and was a method that allowed me to report teacher and administrator perspectives on implementing instructional technology in the general reading curriculum and on the impact instructional technology can have on student reading development (Lincoln & Guba, 1985). A qualitative study supports the selection of a small purposeful sample to learn and understand the perceptions, practices, and strategies of teacher participants as a product of qualitative inquiry. The focus of the study was on teachers' interpretation of the

technology-enhanced reading instructional programs employed and how the strategies were being implemented in the classroom in order to promote student-directed learning. Therefore, the product of this qualitative inquiry is richly descriptive, using words and tables to present what has been learned about the phenomenon being studied (see Creswell, 2012). Specifically, I selected an instrumental case study approach. An instrumental case study is defined as a study of a specific issue (Creswell, 2012). This type of study allowed me to provide insight into a particular issue, utilizing a case to illustrate the issue.

A qualitative research framework was best suited for studying the perceptions of individuals. Lincoln and Guba (1985) stated that case study research is conducted in a manner that requires the generalization of results. This requires the comparison of similarities and differences within a case, serving as the discovery of general law that serve as an explanation or prediction in a study. When examining contemporary events, case study methodology is preferred and is commonly used in the field of education (Creswell, 2012). By employing case study research, I was able to collect multiple forms of data including observational field notes and interviews beyond what might have been available in a historical study. When considering experimental research, I determined that the manipulation of the setting and behaviors would not have provided me with a true and accurate account of the phenomena. For these reasons, I chose an instrumental case study research design to analyze and describe the perceptions of teachers regarding technology-based reading supplements, and to document the ways in which the teachers

implement these tools in the instructional setting. This type of study proved to be more appropriate than a quantitative research design.

Role of the Researcher

The primary data collection instrument in qualitative research is the researcher. Creswell (2012) explained that personal biases and assumptions can affect the study. These effects included how data is collected, analyzed, and interpreted; however, these conditions are not necessarily considered detrimental to a qualitative study. In fact, these conditions have the potential to enhance the researcher's awareness of the context of the study, providing greater insight on patterns emerging from the data being collected (Lincoln & Guba, 1985). In this qualitative study, I had to collaborate with participants, make interpretations of data, and validate the findings addressing the specific research questions. I also formulated a method to separate personal impressions and interpretations from the descriptions provided by participants as data were collected. The practice of coding information, including bracketing in field notes and using a research journal, allowed me to effectively distinguish between personal biases and views. I bracketed opinions in the field notes so that my biases would not affect the data collection or evaluation process.

With an interest in technology-based instruction as a means of improving reading instruction at the early childhood level, I had identified a degree of personal bias in my study. With over 10 years of employment in the public-school system at the early childhood level, and having seen first-hand how teaching continues to evolve, I have developed a personal view of how 21st century teaching and learning should evolve.

These personal views and experiences aided in recognizing patterns and differences among the participants of the study relating to their perceptions and current technology use in the classroom environment.

Methodology

Participant Selection

A qualitative study requires the selection of a small purposeful sample to learn and understand the perceptions, practices, and strategies of teacher participants. Purposeful sampling refers to selecting information-rich cases for in-depth study in order to learn a great deal about the central issue of importance (Creswell, 2012). My research site has been the beneficiary of a significant gift which has been used to provide the kindergarten and first grade teachers with kindles, SMART boards, SMART document cameras, thin client computers, laptops, and more. Along with these technologies, this school system also has access to programs such as Brain pop, ScootPad, Raz-Kids, and ABC mouse. My criteria for teacher participant selection at the chosen site required that they were early childhood educators who (a) had three or more years teaching experience, (b) had been implementing the core reading curriculum adopted by the school system since the adoption year of 2013, and (c) had access to the purchased technologies and had been implementing these technologies in the reading curriculum. The principal and assistant principal of the research sites participated in the interview process. The principals were also asked to provide a list of potential participants who met the inclusion criteria.

Creswell (2012) explained the importance of studying small numbers of individuals in qualitative research given the overall ability of the researcher to provide an in-depth study. There were 12 participants in this study: 4 kindergarten teachers, 4 first grade teachers, 2 principals, and 2 assistant principals. If a larger number of individuals were chosen for the study, the results could have displayed superficial perspectives and become unwieldly (Creswell, 2012). The participants chosen for the study were provided with written information describing why their site was chosen for the study, what was to be accomplished during the research study, how the results were to be utilized and reported, and what the individuals could gain from the study.

Procedures for Recruitment and Participation

Prior to initiating the research study, the research proposal and plans were reviewed by Walden University's Institutional Review Board (IRB). This review assessed any potential risks that could impact the participants of the study. When IRB approval was granted, I provided the school district, specific sites, and the participants with an informed consent form. This form was a statement that the participants were required to sign before taking part in the research study. It informed the participants of the purpose of the study, the right to withdraw, procedures within the study, their rights to ask questions, obtain results, and anonymity, and the risks and benefits of participation.

The participants had the opportunity to participate in the study in a manner that was convenient in terms of time and place for the interviews and observational opportunities. Information was not attained in a manner that interfered with the participants' daily routine or responsibilities. I encouraged the participants to seek

clarification throughout the course of the study, and provided them with my complete contact information. I protected the identity of the participants by using pseudonyms in field notes and data reports. I maintained the anonymity of the participants, the school, and district throughout the study.

Instrumentation and Data Collection

The aim of qualitative research is to uncover the *whys* and *hows* of a given topic or problem. Qualitative data collected in a research study is typically descriptive data collected through the use of observations, interviews, questionnaires, and more (Creswell, 2012). For the purposes of this study, I collected the data over a 6-week period via face-to-face interviews and classroom observations. Creswell (2012) explained the importance of using multiple sources of data to strengthen case study research. The level of involvement of the researcher in relation to the participants also adds to the quality and quantity of data collected during a study. It was imperative that the data I collected provided me with an abundance of information so that I could identify patterns pertinent to the purpose of the study.

I conducted observations in the first 2 weeks of the data collection period. Lincoln and Guba (1985) described observations as the opportunity to grasp motives, beliefs, concerns, and interests in a here-and-now in-depth experience. I acted as a non-participant observer, collecting descriptive and reflective field notes throughout the observation process. Creswell (2012) defines descriptive field notes as portrayals of what happened in the environment being studied. Reflective field notes relate to the researcher's personal thoughts and insights developed throughout the observation

process. I collected these field notes using an observational protocol. This allowed me to acquire first-hand information on how technology is being implemented within the different classrooms, as well as what tools are being used while conducting two hour-long observations in each individual's classroom environment. When the field notes were reviewed, I was able to identify themes that emerged within the different cases.

I conducted semiformal face-to-face interviews during the third and fourth weeks of the 6-week data collection period in order to develop an understanding of the participants' experiences and their personal perspectives regarding the use of supplemental reading technology programs. According to Lincoln and Guba (1985), interviews permit researchers to reconstruct the past, interpret the present, and predict the future. I developed two sets of interview questions (Appendix A & B) that were administered to all teacher and administrator participants in an attempt to collect the most comparable data possible. This data was collected using an interview protocol that contained instructions for the process of the interview, the interview questions, and an area for my notes pertaining to the responses of the participants. The structure of the interviews was semi-formal in order to allow me to interject additional questions to the participants to add depth to the collected data. I read the collected data several times in order to uncover categories and themes that emerged as the main focus. Creswell (2012) explained that when interviews are conducted in an unobstructed manner, they can reveal significance and meanings of artifacts collected in the field.

Field notes were compiled in an electronic research journal during and after the interviews were conducted. These field notes included descriptions of contexts,

conversations, and actions including descriptive details and were written immediately following the interactions with the participants to preserve preliminary interpretations and impressions perceived during the interview process. Bracketing was used within the field notes to separate potential biases such as my personal impressions and feelings. This allowed me to separate these aspects from the information obtained from the participants.

Through the use of observations and interviews I uncovered how technology is used in early childhood classrooms in order to promote reading development. I addressed performance and engagement through the three distinct groups of participants; kindergarten teachers, first grade teachers, and administrators. All of the data that was collected specific to the study was triangulated in order to validate the findings. According to Creswell (2012) drawing information from multiple sources ensures the accuracy of the study, leading to a developed report that is credible and accurate. I had the participants in the study determine if the findings were accurate, through the process of member checking.

Data Analysis Plan

According to Creswell (2012), data analysis requires understanding how to make sense of text and images in order to uncover how teachers implement technology tools in conjunction with the core reading program to enhance literacy development in the early childhood classroom environment. For each data collection method, I conducted a preliminary exploratory analysis of data collected in order to gain a general sense of the data and determined whether or not more data was needed. Once determined, I then began a coding process focusing on perspectives held by the subjects, dividing data into

segments and labeling these segments with codes. These codes were then narrowed down into a few themes that supported the research questions. In focusing on each individual case, I was able to formulate codes to identify concepts, themes, and patterns that emerged within each individual case. After the themes were identified, I interpreted and summarized the findings.

Transcriptions from face-to-face semi-structured interviews were transcribed and placed into an electronic field journal directly after the conducted interviews. The transcribed notes were shared with participants for member checking purposes, which ensured the validity. Field notes were transferred into an electronic format that allowed me to identify common themes in how teachers are implementing technology tools within the reading curriculum. Discrepant cases that surfaced during the data analysis process were described as contradictory information that emerged providing me with a variant perspective (see Creswell, 2012). It was important that I work toward not clinging to an initial hunch and examine any counter evidence that surfaced during the data analysis process; Therefore, discrepant cases were included within the results of my study.

Trustworthiness

Lincoln and Guba (1985), defined trustworthiness criteria within qualitative research as internal and external validity, reliability, and objectivity. In order to assure the accuracy and validity of the findings, multiple sources of data were collected. The multiple sources of data that were collected throughout the duration of my study included face-to-face interviews with educators, face-to-face interviews with administrators, and observations for the purposes of data triangulation. Triangulation is the process of

analyzing the data collected in search of evidence to support a common theme. This process ensured the accuracy and credibility of the data due to the drawing of information from multiple sources (Lincoln & Guba, 1985).

In order to assure the reliability of the study, I provided a detailed account of the focus of the study, the role of the researcher, the participants position and the basis for the selection of these participants, as well as the context from which the data was gathered (see Creswell, 2012). Member checking was also utilized in order to distinguish inferences on my part (see Lincoln & Guba, 1985). This allowed for more accurate interpretations, as the participants examined and concurred that the findings were indeed accurate. Member checking aided in assuring the reliability of the study.

Summary

This chapter has provided a rationale and justification for the use of a qualitative case study in order to uncover teacher perspectives in using technology-enhanced reading instructional tools at the early childhood level. A detailed description of the methodology was used to explore the research questions including the design and approach, setting and sample, data collection and analysis procedures, and the validation and reliability considerations have been provided.

Chapter 4 focuses on the implementation of the study and the results that were attained. The chapter includes a detailed analysis of the data collected using the methods described in Chapter 3. Chapter 4 presents the results of the study in addressing each research question. Codes, categories, and themes are identified with the use of tables to

depict the results more clearly. The evidence of trustworthiness is addressed in Chapter 4 as well.

Chapter 4: Results

Introduction

The purpose of this qualitative study was to investigate teacher and administrator perceptions of the use of a technology-enhanced reading curriculum. My goal for the study was to increase awareness of the importance of technology to early literacy acquisition, specifically through the use of technology within the *Journeys* guided reading program adopted by the school system where the study took place. The following questions addressed the purpose of my research:

RQ 1: How do teachers use the technology in their classrooms?

RQ 2: What changes in student performance and engagement do teachers and administrators witness when technology tools are implemented?

RQ 3: How do teachers and administrators describe the implementation of technology-based strategies within the classroom environment?

This chapter includes the findings of this qualitative instrumental case study in which I investigated the perceptions of teachers and administrators regarding the use of instructional technology alongside the reading curriculum. The chapter is organized into six sections including descriptions of the setting, data collection, data analysis, the results of the study, evidence of trustworthiness, and a summary conclusion. In the data collection and analysis sections I offer an in-depth descriptive account of how the data was analyzed, coded, triangulated, and measured.

Setting

The research study took place in two elementary school settings in a school district in a Southeastern state. The research schools are identified as Title I schools' due to the percentage of students from low-income families. Title I schools receive federal funds through the Department of Education to ensure that all children meet the challenging state academic content and achievement standards. The two schools in this study have 63.2% of students receiving free and reduced lunch; this number is slightly higher than the state average. The principals of the two sites in this study informed me, as the researcher, that the funds supplied through Title I are used for tutoring services for struggling students, additional instructional resources, including technology, and additional teachers to lower class sizes.

The focus of this qualitative case study was on kindergarten and first grade use of instructional technologies with the adopted *Journeys* reading program. The participants in this study included four kindergarten teachers, four first grade teachers, two principals, and two assistant principals. All of the teacher participants recruited for this study were women and had 10 to 15 years of experience in the classroom. All the participants had access to the following technologies: SMART boards, Google Chromebooks, Kindle Fires, SMART Document cameras, Red Cat microphones, and thin client computers. The teachers were also equipped with the following programs: Renaissance Learning, ScootPad, ABC Mouse, Starfall, Reading A to Z, and Think Central. The administrators recruited for this study consisted of three women and one man. All the administrators had over 15 years of experience in the school system.

Data Collection

I contacted the county board of education by email (see Appendix C) to request permission to conduct my study in their school system. The superintendent of the schools provided me with a signed letter of cooperation, which I provided to Walden University's IRB in order to gain approval to conduct research. After receiving confirmation from the IRB on February 28, 2017 (approval # 02-28-17-0492545), I sent an email that also doubled as the consent form (see Appendix C) to the four administrators of two elementary schools, and to ten kindergarten teachers and seven first grade teachers employed in these two schools. On March 2, 2017, a total of four administrators, four kindergarten teachers, and four first grade teachers had replied to the email, agreeing to participate in the study. Upon receiving a reply to the invitational emails with the indication of willingness to participate, I immediately responded requesting the best times, dates, and locations for the observations and interviews to take place.

Table 1 shows demographics of each participant for comparison purposes throughout the analysis process. This table follows the participant code that will remain the same throughout the analysis and results sections of this research study.

Table 1

Participant Demographics

Participant Code	Position	Gender	Years' Experience
	Teacher		
Participant 1	K	F	11
Participant 2	K	F	14
Participant 3	K	F	17
Participant 4	K	F	12
Participant 5	1	F	14
Participant 6	1	F	13
Participant 7	1	F	10
Participant 8	1	F	16
	Administrator		
Participant 9	Principal	F	22
Participant 10	Assistant Principal	F	29
Participant 11	Principal	M	24
Participant 12	Assistant Principal	F	19

Table 1 not only displays the positions of the teachers and the administrators, but also incorporates the number of years' experience these participants have in the school system, with all having ten plus years' experience.

Data for this study was collected through the use of interviews and observations. I conducted the interviews with the administrators in the front conference room of the school sites between March 6th and March 10th, 2017. Each administrator participated in

one interview, and the interviews ranged between 45 minutes to 1 hour. The interviews consisted of seven open-ended questions (see Appendix B), focusing on the participant's perspectives on technology use in the classroom, their perspective on developmentally appropriate practices observed in the classrooms, and how these perspectives impact their decisions on what technologies and applications should be purchased for their teachers.

The teacher participants for this study participated in both observations and interviews between March 6th and March 17th, 2017. The observations took place in each teacher's classroom for the duration of reading instructional time. Each observation lasted approximately one hour. After the observations were conducted, I interviewed those teachers after school hours the same day. This allowed me to ask any follow-up questions that I had concerning the observations that I had conducted, and to incorporate the open-ended questions (see Appendix A) that focused on teacher perceptions, strategies, and use of technology within the reading curriculum. The interviews ranged between 45 minutes and 1 hour for each participant.

In order to ensure validity and reliability, I audio-recorded each interview and transcribed each audio recording using a personally developed interview protocol. The participants were each provided with a copy of the findings from their own data within 2 to 3 days of their initial interview and/or observation for member checking purposes via email. The four administrators did not make any changes or comments to their interview transcript. Seven of the eight teachers did not require any changes to be made in the observation and interview data protocols. One participant did, however; point out a few typos within the protocols and I was able to provide clarification in the observational

data. None of the participants in this study requested follow-up interviews or conversations pertaining to the study.

Data Analysis

Once an interview or observation took place, I began to analyze the collected data. Although I continuously revisited my data as it was being collected, the analysis was not fully shaped and did not take form until the data was processed in its entirety. Creswell (2012) advised researchers to look at data interpretation and analysis as an ongoing process that entails continuous reflection. The analysis process is also described as the process of organizing data in a manner that allows researchers to uncover patterns, themes, relationships, explanation development, interpreting, or generating theories (see Creswell, 2012).

Interview Analysis

Analysis of the interview data consisted of transcribing the audio recorded interviews into a Word document using the interview protocol. These files were saved according to a participant code that was numbered from 1 to 12. After the interviews were transcribed into the Word document, I then created an Excel document to facilitate the discovery of patterns within and between categories. The categories were created in relation to the research questions, the literature review, and the conceptual framework. Creswell (2012) encouraged this step in qualitative data analysis, noting that as data is organized into categories, patterns between the categories can then be uncovered. The categories that evolve can then be used to support the central phenomenon.

The categories and themes that were uncovered throughout the interview process included the impact that technology has on student performance and engagement, positive or negative perceptions regarding technology use, and the tools and strategies used in each classroom to promote reading development at the early childhood level. These categories were identified by analyzing each participant's interview responses and highlighting common phrases and statements.

Observation Analysis

I also conducted observations as a form of data collection. Lincoln and Guba (1985) described observations as the opportunity to grasp motives, beliefs, concerns, and interests within a here-and-now in-depth experience. I acted as a non-participant observer collecting descriptive and reflective field notes throughout the observation process in a spiral bound notebook. I then transcribed my observational field notes into the observation protocol in a Word document. The observation process allowed me to acquire first-hand information on how technology is being implemented within the different classrooms, as well as what tools are being used. When the field notes were reviewed, I identified themes that emerged within the eight different cases. These themes and categories included the purpose of technology use, the types of technology being used, and whether or not teacher experience in other grade levels impacted the use of technology at the kindergarten or first grade levels.

Discrepant cases that surface during the data analysis process are described as contradictory information that emerges, providing the researcher with a variant perspective (Creswell, 2012). It is important that researchers work to not cling to an

initial hunch and examine any counter evidence that surfaces during the data analysis process; however, there were no discrepant cases identified within the results of this research study.

Results

The research questions for this study were designed with the goal of understanding administrative and teacher perceptions regarding technology-enhanced reading supplements implemented within reading instruction. Through the data analysis process, the exploration and coding of data yielded patterns and connections between categories, providing insight on each research question.

Research Question 1

The first research question (RQ1) stated: How do teachers use the technology in their classrooms? According to the data collected, three common themes were uncovered during the data analysis process. The first common theme identified during the analysis process was the integration of the technology. All of the participants for this study use technology daily in their classrooms. However, the purpose and the types of supplemental programs varied between the participants. The data revealed in Table 2 displays the purpose of technology use in each classroom.

Table 2

The Purpose of Technology Use in the Classroom

Participant Code	Differentiation/ Remediation	Assessments	Small Group Instruction	Whole Group Instruction
Participant 1		X	X	X

Participant 2		X	X	X
Participant 3		X	X	X
Participant 4		X	X	X
Participant 5	X	X	X	X
Participant 6	X		X	X
Participant 7	X	X	X	X
Participant 8	X		X	X

Table 2 displays the importance of technology tools in the daily lessons of the participants. However, this table also uncovers the importance that technology plays in the assessment of kindergarten students rather than for remediation and differentiation purposes. Participant 1 explained:

> "Our kindergarten team uses the ESGI assessment software program. This is a technology based supplement that allows us to assess our students one-on-one using our laptop computers. This program generates data to share with parents and administrators by keeping progress monitoring data on each individual in our class. When I use technology within my small reading groups, it really works as a tool to keep a group engaged and quiet in order for me to focus on my personal reading group."

This statement provided by Participant 1 supports what I observed in the kindergarten classrooms. An excerpt from my observational protocol is noted as follows:

> "The teacher had four reading group rotations that consisted of a teacher instructed table, a paraprofessional instructed table, a Google Chromebook

> station, and an independent journal writing table. The teacher had a PowerPoint displaying the names of the students in each group. This PowerPoint would chime when the eighteen-minute rotation was complete. The children would gather their materials and approach their next reading center. At the Google Chromebook center, I observed the children using ABCMOUSE.com. The children had free choice of the activities that they played on this website. At the teacher instructed table, the teacher had the students working in pairs to practice sight words. During this time, she pulled each individual student to assess them on their sight word knowledge using a software program called Educational Software for Guiding Instruction (ESGI). This program required the teacher to click yes or no depending on the student's accuracy of reading the words. When a student completed the assessment, the teacher allowed me to see the pie graphs that were created to show the percentage of accuracy."

Therefore, the data in Table 2 further explains what I observed in the kindergarten classrooms along with what was indicated through the interview process, that the technology-enhanced instructional tools at the kindergarten level are engaging, entertaining, and an excellent assessment tool rather than being used as a supplement to enhance reading instruction at this level. A similar study conducted by Evans, Hawkins, and McCrary (2014) focused on the implementation of technology at the early childhood level. According to Evans, et al., many teachers have implemented computers in the classroom setting, yet younger children require an abundance of guidance and structure when using these tools in an effective manner. Due to the importance of teaching and re-

teaching the proper use of technology tools, the participants in my study are not using these supplemental technologies to their fullest potential in boosting academic development. However, when using the technology in this manner, the participants are able to achieve individualized instruction by implementing small group instruction (Evans, Hawkins, McCrary, 2014).

The first-grade teacher participants displayed a different use of technology as a remediation and differentiation tool in their reading instructional time. An excerpt from my observation protocol when observing Participant 6 was as follows:

> "Participant 6 used the interactive SMART Board to present a 'Hunks and Chunks' PowerPoint to the students. The students repeated rhymes that taught them sounds and spelling rules. After completing this activity, the teacher asked the students to go to their small reading group stations. Some students left the classroom to go check out a new book from the library. Other students logged in to the Accelerated Reader program where they took a five-question comprehension quiz on their current library book. The teacher informed me that the students have been assigned a Lexile level and can only check out books that are on that level. This assures that the students can read the text independently and take the quiz successfully building independent learning strategies. There were students who also logged into a program called Think Central. This is the Journey's reading program technology supplement. The students had their own account for this program that they were able to log in to. The students then completed reading passages and comprehension activities that the teacher

> assigned to them according to their current reading level. The teacher referred to this activity as their 'learning path' that the students can continue to progress to harder tasks as they complete each activity."

As displayed in Table 2 and in my observational notes, Participant 5, Participant 6, and Participant 8 each used the Journey's online reading instructional tool to enhance teacher instruction. During the interview process, Participant 5 stated:

> "I use the technology component in Journey's reading series by Hough Mifflin. The students enjoy taking tests using their chrome book. I am able to design a comprehension test about our anchor text for the week. The program also allows teachers to isolate certain skills that the student may need additional support to master. It is useful for students needing interventions and the beginning reader because they are able to have the text read to them. There are many parts to this program that help provide differentiated instruction. There are many useful reports that can be generated to help the teacher isolate specific strengths and weaknesses of the students."

This statement, along with the data collected through observations in the other first grade classrooms displays the necessity of this program to enhance the differentiated reading instruction at this level. In comparison, during the interview process, Participant 8 stated:

> "I have differentiated instruction by assigning reading passages within the Journey's program at different levels to best meet the needs of my students. The students use this technology to listen/read assigned texts and then use technology to answer text based questions."

Both participants expressed the importance of this program in differentiating instruction for the learners.

Evans, Hawkins, and McCrary (2014) discussed the ways in which early childhood teachers can effectively use technology at the early childhood level. These included individualizing instruction, data collection, student engagement, and home-school connections. Individualized instruction can be achieved using technology-enhanced reading supplements by allowing educators to use small group instruction. Technology cannot replace traditional, research-based methods in the early childhood classroom, but used as a supplement, these tools can create an engaging classroom environment in which students can reach higher levels of achievement. In interviewing and observing my participants, I have documented the effective use of technology in relation to the research-based methods identified by Evans, Hawkins, and McCrary (2014).

The next common theme that was uncovered through data analysis, in relation to research question one (RQ1), was that of developmentally appropriate technological supplements. Table 3 displays the different programs that the teachers used in their reading lessons during my observations.

Table 3

Technology Program Usage

Participant Code	Accelerated Reader	Journeys Think Central	MyOn	Reading A to Z	Scootpad	ABC Mouse	Stafall
Participant 1			X	X	X	X	X

Participant 2			X	X	X		X
Participant 3				X			X
Participant 4					X	X	X
Participant 5	X	X		X	X		
Participant 6	X	X			X		
Participant 7	X		X	X	X		
Participant 8	X	X	X		X		

When focusing on the information displayed in Table 3, it is apparent that kindergarten teachers lean toward certain programs in comparison to the first-grade teachers. The kindergarten teacher participants were observed using programs such as ABCMouse.com, Starfall.com, and Readingatoz.com. The first-grade teacher participants were observed using programs such as Accelerated Reader and the Journeys technology-enhanced reading program. The one program that was most commonly used throughout both grade levels was Scootpad. Participant 2 stated:

> "ScootPad is an excellent source for differentiation of all English, Language Arts skills. This program has a placement test in order to assure that an individualized learning path is developed. The teacher can set up assignments for each student according to the concepts that we are teaching. Data is generated as each task is completed within the program and we can intervene according to how our students perform on tasks."

Many other participants discussed the benefits of the Scootpad program. Participant 5 stated:

> "Scootpad is my 'go to' during small group instruction. It is user friendly for both my students and myself. The program has step-by-step tutorial videos that the kids can watch before completing a task and lucky for me, it provides tutorials to help me assign tasks for them as well."

Both kindergarten and first grade participants pointed out the advantages of the Scootpad program as a supplemental technology-enhanced reading program. However, this is the only program that presented a commonality between the two grade levels. The ScootPad program provides teachers and students with a technology learning platform that incorporates research-based strategies in order to promote the highest level of student achievement (ScootPad, 2015). This program is identified as being developed using Bloom's mastery learning theory, identified in the conceptual framework of my study. This theory states that learning is an educational philosophy and instructional strategy that suggests all students can achieve the same level of mastery with a focus on instructional methods rather than student ability (Airasian, Bloom, & Carrol, 1971).

The programs used by the first-grade teachers were identified as developmentally appropriate by the participants. When observing in Participant 8's classroom, I noted the following during my observation:

> "Think Central is a program that is affiliated with the Journeys Reading Program. This program had the eBooks that were assigned to the students by the teacher. The teacher reviewed the stories with the kids the first day in the hard copy basil

> reader and then the kids reviewed the story on their assigned chrome books. The story could be read to the lower functioning students or the higher functioning students were able to read it to themselves. There was a quiz assigned to them in this same program. The students answered comprehension questions that went along with their story. If the child missed an answer, the child could "expand" the question to see the correct answer."

The technology was identified as developmentally appropriate due to the way it differentiated instruction or remediation for the students by providing options for lower functioning and higher functioning students.

On the other hand, when observing in the kindergarten classrooms, my observations unveiled that technology usage was quite different from that of the first-grade classrooms. An excerpt from my observational notes taken from Participant 3's observation stated:

> "Within small group reading rotations, the teacher instructed a table using the basal reading program, Journey's. This program allowed the students to focus on sight words and comprehension knowledge. At an independent station, the teacher had her students using Google chrome books. The students were using the website ABCmouse.com. On this website, the children did not have a specific assignment that they needed to complete. The children were only asked to use the reading tab to play games related to the subject area. Although the website is strictly enhanced with educational games and activities, the activities were not reinforcing the skills that the teacher was focusing on at the instructional table."

The kindergarten teacher participants each used technology for whole group and small group instruction. The whole group instructional methods were presented using the SMART Board and SMART document cameras. This allowed the participants to model the use of technology to the students.

Participant 2 added to this topic when stating the following during the interview process:

> "I do not use the Journey's online supplemental program with my students at the kindergarten level because my students are not ready to take on such a task independently. Coming to school as nonreaders, we, as teachers must focus on learning letters and sounds, as well as sight word knowledge before we can ask these children to listen to a story independently and attempt to answer questions. Therefore, I use simple websites such as starfall.com in order to introduce them to the use of technology in a user-friendly manner that excites them. I believe that this sets up a strong foundation for them in using the technology to prepare them for first grade expectations, when the demands of learning increase."

At the kindergarten level, the data displays the importance of exposing the children to the technology tools and not necessarily using these tools to differentiate instruction. Evans, Hawkins, and McCrary (2014) discussed how many teachers have implemented computers within the classroom setting, yet younger children require an abundance of guidance and structure when using these tools in an effective manner. Spencer and Smullen (2014) conducted a similar research study discussing the impact that Kindle e-readers and iPads can have on reading instruction. In these studies, the students were

empowered with the ability to choose reading material, which in turn provided the students with the skills required to become productive and self-equipped learners (Spencer & Smullen, 2014). This explains the approach that the kindergarten teachers have taken to implement technology at this early educational stage.

Fenty, Mulcahy, and Washburn (2015) found that traditional teacher-led instruction often occurs in small groups, involving turn taking. This presents a problem for readers who are experiencing the most significant reading deficits because they receive less direct practice with texts, hindering reading achievement. Throughout the course of the study, the researchers discovered that computers provided students with increased opportunities to interact with texts in meaningful ways. Throughout my interviews and observations, I concluded that the participants in my study are providing their students with both teacher-led instruction and individualized computer-based instruction. Supporting the findings of Fenty, et al., the participants in my study are providing their students with differentiated instruction that supports reading development.

The third theme that was uncovered in relation to research question one (RQ1) relates to the experience the teacher participants have had in various grade levels. Two of the participants in this study have had teaching experience in both kindergarten and first grade. The other six teacher participants have had experience in various grade levels as well. Table 4 displays the various grade level experiences that the participants have had throughout the duration of their careers.

Table 4

Grade Level Experiences of Participants

Participant Code	Kindergarten	First Grade	Second Grade	Third Grade	Fourth Grade	Fifth Grade
Participant 1	X	X				
Participant 2	X		X		X	
Participant 3	X			X		
Participant 4	X		X	X		
Participant 5		X			X	
Participant 6	X	X				
Participant 7		X	X	X		
Participant 8		X			X	X

In taking the factors displayed within Table 4 into consideration, I could expand upon my interview questions and uncover whether teaching an upper grade level impacted their use of technology within the lower grade levels. For example, Participant 1, a kindergarten teacher who previously taught first grade, stated:

> "My use of technology changed when I moved to the kindergarten level because my students enter the classroom with zero experience in using the tools that we are supplied with. It takes time to teach the children to use the technology before they can use it in a meaningful way. I also do not use the same programs that I used with my first graders. Coming to school as non-readers, my students use

> tools such as abcmouse.com and starfall.com to develop the skills necessary to use the more intricate programs."

Participant 6, a first-grade teacher with previous kindergarten experience, expressed similar thoughts pertaining to the difference in technology usage stating:

> "I am able to incorporate more complex technology in my first-grade classroom. I use programs such as Accelerated Reader and Think Central. When I taught kindergarten, I strictly used Starfall.com. It was difficult to teach the kids to use the technology and I found it more impactful when I used the SMART board for whole group instruction in Kindergarten. A lot more modeling takes place at that level. Now that I am teaching first grade, I have found that the kids come to me with a basic knowledge of how to use computers. With this foundation, it is easier and less time consuming to teach them to use the programs that I find beneficial within my reading lessons."

Participant 8 had ten years' experience teaching at the fourth and fifth grade levels. Participant 8 has been teaching first grade for the past six years. During the interview process this participant discussed her experiences in transitioning from the upper grade levels down to the first-grade level stating:

> "… the transition to first grade was difficult. I was very much used to working with independent learners who seemed to know technology better than I did. My students and I would communicate through a Google classroom using chrome books. I could assign an essay and my students could submit these assignments to me digitally. Then, when I came down to first, it was a whole new experience.

> The kids were, what I considered, much more needy. The tools that I was used to using were not an option any longer. It was an eye opener when I changed grade levels. However, I have now grasped the concept of the tools necessary to help my little learners succeed, but it was definitely a learning process."

When addressing the age group and how the participants' technology implementation has changed due to teaching at a lower grade level, I discovered that teacher strategies change per grade level and that student experience in using these tools was the main factor for these changes. Nager, Firstater, and Schwasbky (2013) identified skills necessary for the educator to successfully implement technology in the classroom. These skills included familiarity of the tools, data analysis, implementing developmentally appropriate technology tools, knowledge of early childhood learning theories, as well as the integration and adaptation of these tools to meet student needs. It is evident in the data collected through my study that the participants are familiar with the tools and have identified the importance of adapting their use of these tools according to the grade level they are teaching.

The first research question (RQ1) stated: How do teachers use the technology in their classrooms? The data analysis shows that my research study participants use technology for whole group and small group instruction. Both the first-grade participants, as well as the kindergarten participants within my study found these technology tools to be useful for assessment purposes. Technology usage differs according to the grade level being taught. The first-grade teacher participants utilized more complex programs for differentiation purposes, while the kindergarten teacher

participants found it more beneficial to use technology supplements as a quiet center in order to facilitate teacher-led instruction during small reading groups.

Research Question #2

The second research question (RQ2) was: What changes in student performance and engagement do teachers and administrators witness when technology tools are implemented? Table 5 displays a comparison between the teacher and administrative participants and the tools that the participants identified during the interview process that enhance student performance, engagement, or both. Table 5 also identifies the Accelerated Reader Program, Journey's Think Central, and Scootpad as tools that enhance both student performance and motivation in the area of reading.

Table 5

Technology Tools in Relation to Student Performance and Engagement

Technology Tools	Performance	Engagement
	Teacher Perceptions	
Accelerated Reader	X	X
Journeys	X	X
MyOn		X
ABCMouse.com		X
Scootpad	X	X
Starfall.com		X
Reading A to Z	X	X
	Administrative Perceptions	
Accelerated Reader	X	X

Journeys Think Central	X	X
MyOn		X
ABCMouse.com		X
Scootpad	X	X
Starfall.com		X
Reading A to Z		X

As displayed in Table 5, it is evident that teacher and administrative perceptions are very similar. During the interview process, administrative Participant 9 stated:

> "Technology integration seems to increase student engagement when used with best practices in instruction… Technology has encouraged student-centered instruction within the classrooms."

This participant went on to explain that technology integration is also more effective when the teachers implement the tools that align to the reading curriculum. This statement correlates with Bransford's anchored instructional theory. Bransford's anchored instructional theory suggests that instructional activities should encourage exploration by the learner and encourage hands-on interactive learning opportunities (Onyang & Stanley, 2014). Exploration and hands-on learning experiences were observed within Participant 9's classroom as well. The following excerpt from my observational protocol stated:

> "Participant 9 had three small reading groups completing tasks. There was a teacher instructed table where the teacher was using a story out of the Journey's reading series. At one independent table, the students were using the Google

> Chromebooks. The students used headphones at this station and were using the Accelerated Reading program. This program had the children taking comprehension quizzes on their reader from the Journey's series. The children are working independently and showed excitement when they scored well on a test."

This observation relates to the anchored instructional theory in the manner that the students were utilizing a computer-based program that encouraged exploration and hands-on learning.

First grade teacher, Participant 8, expressed the importance of these tools in motivating students to improve reading skills. These technology tools have the ability to differentiate instruction, allowing students to complete tasks that are developmentally appropriate and build on prior knowledge (Scootpad, 2015). Participant 8 stated:

> "I have noticed a significant change in student motivation when incorporating technology. Due to offering individualized, developmentally appropriate tasks, technology increases motivation because the students are successful, they perceive their independence, and feel productive."

Participant 8 expressed that student self-esteem is built through the use of developmentally appropriate tools. Bloom's mastery learning theory is an educational philosophy and instructional strategy that suggests all students can achieve the same level of mastery with a focus on instructional methods rather than student ability (Airasian, Bloom, & Carroll, 1971). These reading supplement programs are equipped with personalized learning paths, data driven insights, and reinforcement, as well as immediate

feedback (Scootpad, 2015). These programs lend themselves to Bloom's mastery learning theory, in providing students with individualized, one-on-one instructional opportunities explaining how this study benefits from this learning theory.

Spencer and Smullen (2014), discussed that the teacher's role in implementing instructional technology is embracing what these programs have to offer and allowing these programs to aid in empowering the young readers. Participant 2, a kindergarten teacher, expressed this type of embracement during her interview in stating:

> "Students enjoy technology and view it as a playful tool, yet it is indeed a learning tool. Technology has changed the ways in which children learn in today's society. They are eager to learn using technology than any other means because they feel they are in control of their own learning. They are able to meet goals and get immediate feedback during activities. It is highly engaging for them and I, myself, love learning new ways to implement these tools in a successful manner to keep their interest of reading digitally growing."

Manessis (2013), also emphasized that if teachers do not embrace technology and willingly implement these tools into daily instruction, they will not prove to be successful learning tools. Participant 2 expressed her willingness in continuously learning new ways to implement these tools.

Kindergarten teacher Participant 3 expressed the importance of these tools during small group instruction. Participant 3 stated:

> "…the students enjoy getting on the Chromebook and working. I have noticed a

> decrease in the amount of talking when they are working. Students seem to be more engaged in reading activities when technology is used."

Technology is used as an incentive for promoting participation in other activities as well. According to Suh and Gerson (2013), small group and one-on-one instruction has proven to be the most beneficial form of instruction; however, many teachers find it difficult to provide this type of instruction with the large class sizes allotted in today's school systems (Suh & Gerson, 2013). The participants in this study continue to express how technology is aiding in providing students with opportunities for beneficial small group instruction.

Participant 6 discussed the fact that students are growing up in a technology driven society and the early exposure to these technologies will help prepare them for the future. Participant 6 stated:

> "The students enjoy using the Chromebooks and they are able to explore so many topics that interest them. The online reading programs such as MyOn allows my students to read books on their reading level and chose books that interest them. This program has such a wide range of stories that the children enjoy, that in turn helps develop their love of reading."

According to Steffens, Bannan, Dalgarno, Bartolome, Esteve-Gonzalez, and Cela-Ranilla (2014), life-long learning is becoming increasingly important. Digital technologies are also increasing in importance as these tools have entered many aspects of our lives, including education (Steffens, et al., 2014). Therefore, when teachers are able to

implement tools that promote student motivation, that motivation can lead to a love of learning throughout their school careers.

An administrative participant expressed the importance of technology use in the classroom to promote student motivation and engagement. Due to the Teacher Keys Effectiveness System, administrators are required to analyze teacher use of technology as part of the teacher evaluation process. Administrative Participant 11 stated:

> "Student motivation has increased with the use of technology in the early childhood classroom. It seems to better hold their attention and they love to manipulate the SMART Board. The chrome books and the kindles allow the children to work independently with little to no support from the teacher so that they can focus on other skills with little to no disruption."

Participant 11, having been in the school system for twenty-four years, expressed how impressive technology has become throughout the years. This participant went on to state:

> "In the initial classroom setting during my first year of teaching, first grade students had 4 computer work stations in each classroom. The computers were not connected to the Internet, but students interacted with programs that were installed on a very basic school server. They were not diagnostic or integrated with the curriculum other than they were geared toward basic reading skills. From 2000-2004, our local county engaged in a teacher training initiative named In TECH with the goal of training every teacher to integrate technology. That was the beginning of the integration of technology in to content presentation. In the

> years following this initiative, SMART boards, projectors and suites of computers connected to the Internet were installed in classrooms. In the last 5 years, we have pursued a 1-to-1 ratio of students to devices in grades 1-12. All classrooms have SMART boards, projectors, speaker systems, and a suite of technology options."

Administrative Participant 11 was able to share the changes that have taken place as teachers move to a more digital aged practice of instructional methods. These changes included the movement from computers with no internet access, to four computers per classroom, the implementation of technology training, to the present with teachers being equipped with multiple tools, resources, and internet access.

After researching my participants' perceptions on whether instructional technology programs enhance student motivation and achievement, I can conclude that all of the participants in this study expressed the positive impact that technology has had throughout the years. According to Soujah (2014), the teacher's role in a constructivist classroom is to scaffold student learning by introducing the element of inquiry using technology. Piaget's (1985) constructivist theory illuminates the learner as the most significant piece within the learning process. In other words, the learner must be actively involved in the learning process. All the participants expressed the belief that the technology advances provide teachers with tools that promote student performance and engagement leading to student-centered learning. In answering RQ2: the tools that my participants identified as the most beneficial include the Accelerated Reader Program, Journey's Think Central, Reading A to Z, and Scootpad in enhancing both student performance and motivation in the area of reading.

Research Question #3

The third research question (RQ3) stated: How do teachers and administrators describe the implementation of technology-based strategies within the classroom environment? The category that emerged through data analysis of the interviews in relation to research question three (RQ3) were teacher and administrator perceptions of the technology. As displayed in Table 6, this data showed mixed results between the administrator and teacher participants. This data was further analyzed to compare the positive and negative perceptions from each participant.

Table 6

Teacher and Administrator Perceptions on Technology

Participant Code	Positive	Negative	Both
	Teachers		
Participant 1	X		
Participant 2			X
Participant 3			X
Participant 4			X
Participant 5			X
Participant 6	X		
Participant 7			X
Participant 8	X		
	Administration		
Participant 9	X		
Participant 10			X
Participant 11	X		

Participant 12	X

Table 6 displays that most of my participants' display mixed emotions in relation to technology integration. In further analyzing the data collected through interviews, I was able to identify the key components that have initiated these feelings.

Participant 10, an administrative participant, expressed more negative perceptions toward technology stating:

> "I used to feel that any and all technology needed to be used in the classroom, but now I feel we need to choose our tools a little more wisely. Instead of throwing everything at every student and just seeing what "sticks" we need to try to customize certain tools for our students. Not everyone learns through technology and we should not punish those who do not."

However, on the contrary, Participant 9, the administrator within the same school building, stated:

> "My core beliefs regarding the potential of technology have not changed over time. I continue to believe that technology integration is a promising practice for increasing student achievement."

Participant 11, an administrative participant, displayed only positive perceptions in relation to the implementation of instructional technology in the early childhood classrooms. During the interview process, Participant 11 stated:

> "My beliefs remain the same pertaining to technology as a teaching tool. It is an absolute must to utilize it every day. In order to remain on point and in the loop

> of life itself and to be aware of your surroundings mentally, physically, emotionally, technology is the key to success. We are in the midst of a technology driven world and the earlier we begin preparing our young students for this type of society, the better equipped they will become."

The administrator within the same school as Participant 11, Participant 12, displayed mixed emotions about the implementation of instructional technology. Participant 12 stated the following during the interview process:

> "Technology has greatly expanded the number and types of content resources available to students. Both students and teachers have immediate access to a wide variety of print options. This helps teachers align content to multiple standards and student interests. Assessment resources help support differentiation and narrow instructional focus to meet the needs of students. However, the most significant limiting factor is whether or not the technology is up and running and fully functional. In order to be integrated into instruction, technology has to work reliably. Teachers cannot afford to stop instruction to troubleshoot multiple issues. Time in the classroom is precious.

A majority of the teacher participants identified both positive and negative perceptions in relation to the implementation of technology. In focusing on the positive perceptions, Participant 1 stated:

> "I feel strongly that all teachers should use technology based instruction to enhance reading instruction. I think teachers that do not allow students access to technology-based instruction are doing a disservice to their students. I am not sure

> why any teacher would not enhance reading instruction by providing the use of technology."

Many of my participants expressed the importance of integrating technology within daily lessons because technology is an integral part of our daily lives. Participant 3 went on to state:

> "I believe that learning in a technology based classroom is the future for our children. The world we live in is technology-based, so we should be teaching them to be prepared for life with technology."

According to Blackwell, Lauricella, and Wartella (2014), teachers and policy makers have valued the potential of technology to revolutionize early childhood education. The researchers went on to emphasize that teachers act as the mediators of technology's impact on student learning. Most teacher participants in my study have embraced technology and recognize the positive impacts it has having within their classrooms.

Participant 6 conveyed her positive perceptions on technology implementation when stating:

> "I believe that it is a valuable learning tool to enhance reading instruction. It helps keep the students engaged. It also makes it easier to differentiate in order to meet the needs of all students. It's a great resource for whole group mini-lessons as well."

Schools have taken on the responsibility for preparing students to become digitally literate (Queensberry, Mustian, & Clark-Bischke, 2015). Queensberry et al. stated that technology-based learning and assessment programs will be pivotal in improving student

learning and generating data. Participant 6 displayed a connection with Queensberry, et al. due to the use of technology for differentiation purposes to improve student learning.

Teacher participants also expressed negative concerns about technology implementation in relation to the reliability of the tools. Problems such as trouble shooting or technology malfunctions. Participant 2 expressed these concerns when stating:

> "A hindrance to the use of technology in the classroom is reliability. Sometimes, these tools have malfunctions and do not work the way you need them to. When this happens and you are left without them for whatever reason, you begin to realize how much you depend on them for your daily lessons."

Participant 5 expressed similar concerns when it comes to the reliability of the technology tools in the classroom. Participant 5 stated:

> "The most significant limiting factor is whether or not the technology is fully functional. Technology has to prove reliable in order to be integrated successfully during instructional time. I, myself, do not have the know-how to stop instruction in order to fix technology issues. I expect my tools to be dependable and if they are not, it throws off my lessons and I realize how much I truly depend on using these tools on a daily basis."

According to Li, Worch, Zhou, and Aguiton (2015), the barriers of technology use correlated with past findings showing that teachers computer skills, access to technology, technical support, and self-efficacy effected their technology usage. Technical support and reliability of the technology has been identified in many other research studies (Li, et

al. 2015). Therefore, the concern that my participants identified in relation to the reliability correlates with current research studies as well.

Participant 3 expressed a different concern from others, identifying the teacher as the main factor in either promoting or hindering the use of technology. Participant 3 stated:

> "I feel strongly that all teachers should use technology based instruction to enhance reading instruction. I think teachers that do not allow students access to technology-based instruction are doing a disservice to their students. I am not sure why any teacher would not enhance reading instruction by providing the use of technology."

Participant 4 also expressed the importance of the teacher embracing technology in order to have successful implementation. Participant 4 stated:

> "The most significant factor that hinders the use of technology in our schools is the teacher and how well he/she adapts to change. Teachers need to be open to technology for the students and be willing to change their style of paper and pencil to computers and chrome books."

In relation to my participant responses, Manessis conducted a study that displayed similar results. Manessis (2013) emphasized that educators are the primary agents of educational innovation; therefore, the success of learning with computer technology depends greatly on the attitudes of teachers. If teachers do not embrace instructional technology and willingly implement these tools into daily instruction, they will not prove to be successful learning tools. Staying on the topic of teacher implementation, I reviewed a similar study

by Nager, Firstater, and Schwasbky (2013). This study concluded that positive attitudes of teachers toward computer literacy and technology implementation has a crucial influence on the effectiveness of these tools.

Teacher and administrator participants acknowledged that there are indeed negative components in implementing technology into the reading curriculum. However, the answer to my research questions; all participants expressed the importance and significance technology has on reading instruction and that the positive components outweigh that of any negative consequences. Research has shown similar results, for example, according to the International Reading Association, technology is redefining the nature of reading, writing, and communication (Fenty & Anderson, 2014). The study conducted by Fenty and Anderson uncovered mixed emotions when examining educator's knowledge, beliefs, and practices in using technology with young children.

Evidence of Trustworthiness

Creswell (2012), defined trustworthiness criteria within qualitative research as internal and external validity, reliability, and objectivity. In order to assure the accuracy and validity of the findings, multiple sources of data were collected. The multiple sources of data that were collected throughout the duration of this study included face-to-face interviews with educators, face-to-face interviews with administrators, and observations for the purposes of data triangulation. The triangulation process consisted of analyzing the data collected in search of evidence to support a common theme. This process ensures the accuracy and credibility of the data due to the drawing of information from multiple sources (Creswell, 2012).

Member checking was also utilized to distinguish inferences on the part of the researcher (see Creswell, 2012). The member checking occurred when the transcribing, coding, and data analysis had been completed in order to assure authenticity. Each participant reviewed the documents in relation to the data collected per their interview and/or observation. This allowed for more accurate interpretations, as the participants examined and concurred that the findings were indeed accurate. Member checking aids in assuring the reliability of this study.

In order to assure the reliability of the study, I provided a detailed account of the focus of this study, the role of the researcher, the participants position and the basis for the selection of these participants, as well as the context from which the data was be gathered (Creswell, 2012). I am aware of my own bias toward technology use in the early childhood classroom. It is my belief that teachers should utilize research based and developmentally appropriate practices when implementing technology within the reading curriculum. Efforts were made in order to put aside my personal beliefs and opinions in order to avoid influencing any participants. An example of a statement that I identified as my personal belief and opinion within my observational notes was as follows:

> "It seems as though the students are not using the technology to its fullest potential due to the students having the ability to choose games that are not correlated to the lesson being presented during whole group instruction or during the small group teacher-led instructional table."

This statement was identified through the use of bracketing. This is the practice of deliberately putting my beliefs and opinions aside and increase the validity of the data collected and analyzed within this study.

Summary

The purpose of this study was to determine early childhood teachers' and administrators' perspectives on the use of technology-enhanced instructional tools within the reading curriculum. The data collected through the use of interviews and observations of teacher and administrative participants for this case study (Yin, 2013), was presented within this chapter. A description of the methods used for conducting this study, the collection of data, and the data analysis were outlined in this chapter as well. The results from the data analysis revealed themes that were presented answering the research questions developed for this qualitative case study (Yin, 2013). Finally, the evidence of reliability and validity were explained in order to display the trustworthiness of the study conducted.

Chapter 5 will present a detailed interpretation of the findings identified within chapter four. Chapter 5 will also display any limitations to the trustworthiness of this study that arose throughout the duration of this study. Recommendations for further research and the potential impact for positive social change will also be addressed in the following chapter.

Chapter 5: Discussion, Conclusion, and Recommendations

Introduction

The purpose of this qualitative study was to investigate teacher and administrator perceptions of the use of a technology-enhanced reading curriculum. By using an instrumental case study design, I was able to gain an informed perspective on how teachers and administrators perceive technology's impact on reading instruction in the early childhood classroom. My goal was to increase awareness of the importance of technology to early literacy acquisition, specifically in relation to the use of technology with the *Journeys* guided reading program adopted by the school system where the study took place.

By using the instrumental case study approach, I was able to collect interview data from kindergarten and first grade teachers, and from early childhood administrators within a Southeastern U.S. school system that implemented technology programs in its classrooms. My focus was on the administrators' and teachers' interpretations of the technology reading programs employed and what strategies were being implemented in the classroom in order to promote student-directed learning. This was accomplished through interviews that provided me with information pertaining to personal experiences and opinions regarding technology reading programs employing supplemental technology.

I collected data by individually interviewing participants and collecting field notes through observation. Once the data was transcribed, I then conducted a preliminary exploratory analysis to obtain a general sense of the data, memo ideas, think about the

organization of the data, and consider whether or not more data was needed (see Creswell, 2012). After completing the preliminary analysis, I began the coding process, making sense out of the data, dividing it into text or image segments, labeling the segments with codes, examining codes for overlap and redundancy, and collapsing these codes into broad themes. Thus, this was an inductive process of narrowing data into a few themes (see Creswell, 2012).

Of utmost importance in qualitative research is the assurance of accuracy and credibility (Lincoln & Guba, 1985). I analyzed teacher perspectives on technology=enhanced reading instructional tools, and assured the accuracy and credibility of the research findings through the use of triangulation and member checking. I examined each information source, including the interviews and observations of the educators involved in the study, and identified the evidence that supports the themes identified in Chapter 4. For member checking, I had participants review their interview transcription in order to check for accuracy of the findings. These two methods of validation ensured the accuracy and credibility of the research study.

The key finding that emerged through the research analysis process was that all teacher participants in this study use technology daily in their classrooms during reading instructional periods. However, the purpose and the types of supplemental programs varied between the participants. There was an evident difference between kindergarten and first grade in what programs the teachers found to be the most beneficial and developmentally appropriate for the grade level that they teach. Through my study, I also uncovered that grade level teaching experiences also play a role in how teachers have

changed their use of the technology with the reading curriculum. The programs Accelerated Reader, Journeys ThinkCentral, and ScootPad were the tools that the teacher participants identified within this study as the most effective programs in promoting student engagement and performance as a supplement to reading instruction. A majority of the participants in this study reported both positive and negative perceptions of technology. These findings provided an informed perspective on how teachers and administrators perceive technology's impact on reading instruction in the early childhood classroom.

Interpretation of the Findings

The research questions were designed to help me understand the perspectives of early childhood teachers and administrators in regard to technology integration in reading instruction at the kindergarten and first grade levels. The research questions were:

RQ 1: How do teachers use the technology in their classrooms?

RQ 2: What changes in student performance and engagement do teachers and administrators witness when technology tools are implemented?

RQ 3: How do teachers and administrators describe the implementation of technology-based strategies within the classroom environment?

After conducting this qualitative case study, I identified three themes related to Research Question 1, one common theme related to Research Question 2, and one common theme related to Research Question 3. These themes included: the purpose of technology use in the classroom, technology program usage, grade level experiences of participants, technology tools in relation to student performance and engagement, and teacher and administrator perceptions of technology.

Interpretation of Research Question 1

How do teachers use technology in their classrooms? The themes uncovered in answering Research Question 1 included the purpose of technology use in the classroom, technology program usage, and the grade level experiences of the participants. Focusing on the first theme, the purpose of technology use in the classroom, the data showed that the majority of the participants use technology as an integral part of daily reading instruction. The most common purpose of technology use was identified as a tool for differentiation purposes and assessment purposes, as well as for small group instruction.

These findings are consistent with current research. Evans, Hawkins, and McCrary (2014) discussed the ways in which early childhood teachers can effectively use technology at the early childhood level. These included individualizing instruction, data collection, student engagement, and home-school connections. This, in turn, also correlates with the conceptual framework developed for my study. Bloom's mastery learning theory proved that one-on-one tutoring yields higher academic achievement (Airasian, Bloom, & Carroll, 1971). ScootPad, ABC Mouse, and Journeys ThinkCentral provide teachers and students with instructional technology tools that incorporate

research-based strategies in order to promote the highest level of student achievement (ScootPad, 2015). These reading supplement programs are equipped with personalized learning paths, data-driven insights, and reinforcement, and immediate feedback. These programs lend themselves to Bloom's mastery learning theory in as much as they provide students with individualized, one-on-one instructional opportunities. Such individualization serves to explain why these tools have been identified by the participants as the most used to promote student learning.

The second theme I identified when addressing Research Question 1 was related to the technology programs commonly used by teachers during reading instruction. ScootPad and Reading A to Z proved to be the most used in both the kindergarten and first grade settings. However, all first-grade teachers use Journeys ThinkCentral and the accelerated reader programs. This usage occurred due to the focus of developmentally appropriate tools according to the grade level the tools are utilized in.

The results described above are evident in current research, as well. As mentioned above, programs such as ABC mouse, Raz-Kids, and ScootPad, allow the learner to enthusiastically engage in technology-based activities that promote understanding of content. The most current technology programs now offer engaging activities that focus on specific content or subject areas. Bransford's anchored instructional theory suggests that instructional activities should encourage exploration by the learner and encourage hands-on interactive learning opportunities (Onyang & Stanley, 2014). The infused ability to differentiate instruction in these technology-

enhanced tools make it easier for teachers to identify which programs would be most beneficial for the grade level that they teach.

On another note, the CCSS, have taken effect in most U.S. states. According to the International Reading Association, these standards require that all students be held to the same standards for literacy achievement, no matter the range of abilities and needs of the students. The challenge for teachers is to implement instructional supports for these ranges of abilities and needs within the classroom to support struggling readers required to achieve the standards set by the CCSS (International Reading Association, 2014). The teachers in my study are accomplishing this goal with the implementation of the tools currently used in their classrooms.

The third theme I identified in relation to Research Question 1 was related to the impact that grade-level experiences of teachers can have on technology implementation at the early childhood level. All of the participants in my study have had experience in various grade levels. Their grade level experiences impacted how they used technology depending on the grade levels they were presently teaching. The kindergarten participants expressed their concerns with how much time it takes to teach the students to use the technology-enhanced instructional tools correctly and effectively. The first-grade teachers stated that they are able to use more complex tools given the age level and experience the children had gained from their previous experiences.

According to current researchers, many teachers have implemented computers in the classroom setting, yet younger children require an abundance of guidance and structure to use these tools in an effective manner (Evans, Hawkins, & McCrary, 2014).

These researchers discussed the ways in which early childhood teachers can effectively use technology at the early childhood level. These include individualizing instruction, data collection, student engagement, and home-school connections. According to Boschman, McKenney, and Voogt (2014), many teachers are acting as designers of technology for their classrooms. Technology innovation and progression leads to increased technology integration, professional development opportunities, and the production of material that is in line with classroom practice. In relation to my study, the teacher participants discussed how they were able to assign tasks and passages to their students and develop the learning platforms in relation to the reading content being taught.

Interpretation of Research Question 2

What changes in student performance and engagement do teachers and administrators witness when technology tools are implemented? The common theme that emerged during the research process in relation to Research Question 2 (RQ2) refers to technology tools in relation to student performance and engagement. Although all of the participants stated that all of the tools that have been used in the classroom promote student engagement, only a select few were identified as promoting both engagement and reading performance. The tools that the majority of participants found to be the most effective in promoting both performance and engagement include: Accelerated Reader, Journey's Think Central, and ScootPad.

A similar study conducted by Muis, Ranellucci, Trevors, and Duffy (2015) found that student achievement in their study did increase; however, the researchers found that

some tasks were too difficult for students in using the technology and at the kindergarten level, the children had not yet learned to regulate their learning based on the feedback from the digital tools. The only tool that both the kindergarten and first grade teachers in my study both used consistently was ScootPad. Therefore, this study correlates with the findings within my own research analysis.

Bransford's anchored instructional theory suggests that instructional activities should encourage exploration by the learner and encourage hands-on interactive learning opportunities (Onyang & Stanley, 2014). The three main principles of anchored instruction include centering lessons on a specific concept, allowing the learner to explore the concept, and encouraging the use of multimedia programs to support the exploration. The teacher participants in my study have been identified as using these technology supplements in this manner. In relation to Research Question 3 (RQ3), these tools are proving to encourage the use due to the motivational factors that are developed in the classroom.

Piaget's constructivist theory holds that learning is an active process where knowledge is constructed by meaningful experiences (Piaget, 1985). Technology lends itself to the constructivist theory in how it can actively engage the student in learning activities. With the motivation that is being developed using the technology, teachers and administrators are reporting an increase in performance due to the supplemental implementation of instructional technology programs.

Interpretation of Research Question 3

How do teachers and administrators describe the implementation of technology-based strategies within the classroom environment? Research Question 3 (RQ3) uncovered one common theme during the research process, referring to teacher and administrator perceptions of technology. The data analysis process showed that a majority of the participants displayed both positive and negative perceptions toward technology use in the early childhood classroom. All the participants expressed the importance and significance that technology has on reading instruction. On the other hand, the participants did identify some negative components, the most common related to the reliability of the tools. These findings are consistent with current research.

According to the International Reading Association, technology is redefining the nature of reading, writing, and communication (Fenty & Anderson, 2014). The results of my research indicated that teachers believe in the importance of integrating instructional technologies in daily lessons; however, findings also indicated that teachers have the feeling of inadequacy in their preparations to incorporate these technologies in a successful manner. With these mixed emotions being evident in the research, one can identify the correlation to the findings that merged during my research study.

Another research study that correlates to the findings identified within my research study is that of Li, Worch, Zhou, and Aguiton (2015). Li, et al. stated that the barriers of technology use correlate with past findings showing that teachers computer skills, access to technology, and technical support effected their technology usage (Li, Worch, Zhou, and Aguiton, 2015). Hsn (2016) conducted a similar study that displayed

similar results in relation to the potential barriers, these are identified as lack of technology skills, the lack of time to use the technology, and the lack of technical support.

There were positive perceptions that were uncovered in my study, similarly to other current research studies. One study that correlates to my findings is that of Khatib (2013). Khatib (2013) concluded that the use of the internet has educators rethinking the way instruction is administered to students. According to this research study, students are now able to interact with internet-based learning combined with teacher-led instruction. The participants in my study followed this same model of instruction. Khatib (2013) also concluded that technology-enhanced instructional tools can act as an intervention tool that can overcome the barriers that some students face in a traditional classroom setting. Khatib (2013) stated that the teacher's role in effectively implementing technology supplements include careful planning, design, implementation, and evaluation.

The positive perceptions identified in my study, as well as current research, focus on the benefits of individualized instruction, the lessening of distractions during small group instruction, and learner-centered opportunities. According to Steffens, Bannan, Dalgarno, Bartolome, Esteve-Gonzalez, and Cela-Ranilla (2014), child-computer interaction is a learner centered approach where children can take the initiative to explore and learn a multitude of information in many subject areas. Similarly, Keyes, Cartlidge, Gibson, and Robinson-Ervin (2016) stated, for struggling readers, schools often try to provide students with intervention opportunities, commonly known as Response to

Intervention (RTI), however, if the staffing is not available to provide this support, teachers must find other ways to provide instruction. The programs that the teachers in my study utilized were described as tools that provided students with a learning platform built to suit their individual learning needs. Therefore, learner-centered learning and differentiation opportunities are identified not only in my study, but other current research as well, proving the importance it holds within today's classroom environment.

Such importance leads to the relationship of the perceptions to the conceptual framework of my study. Several studies have shown that when students are taught in a way that is appropriate to their needs and when they receive help in overcoming individual learning difficulties, virtually all of them learn well (Airasian, Bloom, & Carroll, 1971). The concept of mastery learning addresses the importance of varying teaching strategies because children have varying learning styles. The continuous advancement of technology-enhanced instructional tools is making it possible to provide children with personalized learning opportunities. Many of these programs, including ScootPad, ABC mouse, and Journey's Think Central, provide teachers and students with a technology learning platform that incorporates research-based strategies to promote the highest level of student achievement (ScootPad, 2015). These tools were identified and used by the teacher participants in my research study. It is evident that my research findings run parallel to the findings of current research.

Limitations of the Study

Limitations within my research study have been identified as potential weaknesses or problems identified when conducting my research (Creswell, 2012). The limitations regarding my research study have been identified as:

- A limited number of participants from the kindergarten and first grade levels.
- A limited number of administrators who are employed at the elementary school level.
- Gender demographics. The participants of this study include 11 women and just 1 man.
- The school system's exclusive use of the McGraw Hill Journeys reading program for its core read curriculum.
- The technology study participants used was limited to that purchased by the school system.

Within this qualitative case study, challenges were identified in terms of the results, such as the credibility and accuracy within the data collection and analysis process. Due to the limitations described above, it can prove to be difficult in transferring this data to other school settings.

Recommendations

The purpose of this qualitative case study was to determine the perspectives of early childhood teachers and administrators on the use of instructional technologies in enhancing reading instruction. The intended outcome of this study was to establish data for the local stakeholders and early childhood affiliates with knowledge and potentially

strategies in incorporating developmentally appropriate technology-enhanced instructional tools that boost student reading motivation and development. The basis for the recommendations for action was gained from the data collected and revealed in this study.

Further research is needed to investigate how teachers are implementing developmentally appropriate technology-enhanced instructional tools. With technology continuing to develop and advance, research must continue to keep up with these changes. Additional information is also needed in relation to the perspectives of teachers and administrators and the use of technology supplements in reading, as well as other subject areas.

Implications

The findings from this study highlight teacher and administrative perspectives on the use of technology enhanced reading curriculum. This study increased the knowledge base on technology usage as an instructional supplement to core reading programs, contributing to the increased understanding of developmentally appropriate practices. The implications for social change may be realized when technology is infused into planning and instruction reflecting research-based best practices. Positive social change is the process of encouraging teacher collaboration in sharing the positive benefits of technology integration and the skills and tools necessary for successful implementation. The findings of my research may also enhance educator's overall perceptions about technology integration in reading instruction. Additionally, this study could provide strategies and insights that help teachers who are struggling with instructional technology

integration. Educators can learn from the insights provided by the participants in this study who have shown consistent success in implementing technology in reading instruction.

Implications for Social Change: Administrators and Educators

Overall, the implications for social change lay in the teachers and administrators ability to be self-aware of what, how, and why they are using technology reading supplements in their classrooms. Administrators and teachers need to work in a collaborative manner to create positive social change. The results of this study focused on the perceptions of teachers and administrators concentrating on effective technology-enhanced instructional tools that boost student reading development. Providing a more positive focus on social change toward the implementation of effective instructional technologies will increase the fidelity of instruction and may, in turn, increase student reading performance.

Implications for Social Change: Student Learning

According to Soujah (2014), the teacher's role in a constructivist classroom is to scaffold student learning by introducing the element of inquiry using technology. Piaget's constructivist theory illuminates the learner as the most significant piece within the learning process. In other words, the learner must be actively involved in the learning process. Data revealed through this study found that teachers are using the technology provided to them for small group instruction, individualized instruction, and assessment purposes. These practices can have a significant impact on student academic achievement and engagement. My research findings may also enhance the teacher

perceptions about technology integration in providing children with lessons infused with technology-enhanced instructional supplements that increase student motivation and engagement.

Recommendation for Practice

This study established that teachers recognize the benefits of integrating technology within reading instruction. These positive perceptions are valuable for students, educators, and administrators because these perceptions shape the school culture. I recommend that the teachers who have displayed consistent success in implementing instructional technology tools in their daily reading instruction aid in developing training models for fellow educators. Additionally, administrators should provide their educators with opportunities to observe one another, as well as provide their educators with effective professional development opportunities in the area of effective technology implementation.

It is imperative that teachers are provided with the time necessary to become familiar with accessible products and software. Teachers also need to be provided with time to collaborate with their peers and how to successfully implement these tools into their daily instruction. Through the research uncovered in my study, it has become evident that there is a need for research that further explores technology integration in all subject areas as well as the impact that professional development can have on teacher's integrational methods.

Conclusion

Overall, the findings of my research were consistent with that of current literature which revealed that technology driven instruction plays an integral role in increasing early childhood learning outcomes. Within the United States, reading achievement scores of our children strongly suggest the necessity of research on the impact that instructional technologies can have on reading development focusing on the instructional methods at the early childhood level. A mere 36% of fourth graders achieved at or above the proficient level on the 2015 National Assessment of Educational Progress (National Center for Educational Statistics, 2015).

Technology has revolutionized the early childhood classroom. Among these technologies are educational software programs that hold great promise in helping children develop early literacy skills. Understanding the perceptions and motivations of teachers who have been successful with the integration of technology can lead to learning opportunities for those teachers who find it difficult to take full advantage of technology in the reading curriculum. This, in turn, may also lead to an increase in student performance and motivation, raising student reading achievement scores. The results of my study suggest that teachers who embrace technology integration and use the tools on a daily basis help increase student engagement and learning. This, in turn, can lead to the development of student's life-long love of learning, the ultimate goal of all educators.

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Appendix A: Interview Questions in Relation to Technology Implementation

Interview questions for Teachers:

1. What are your experiences with using technology within the reading curriculum?
2. How often do you use technology as a reading instructional tool?
3. Can you describe in general the types of instructional reading activities you have used that involve technology?
4. Have you noticed any significant changes in student motivation when incorporating technology into your reading instruction? If so, what changes have you noticed?
5. Have you noticed any significant changes in student achievement when incorporating technology within your reading instruction? If so, what changes have you noticed?
6. How often do you use technology as a reading supplemental tool within your daily lessons?
7. Describe your beliefs on technology-based instruction as a learning tool to enhance reading instruction.
8. What do you believe is the most significant factor that promotes or hinders the use of technology within reading instruction?
9. Have your beliefs in using technology as a teaching tool changed as technology advances and if so how?

Appendix B: Interview Questions in Relation to Technology Implementation

Interview questions for Administrators:

1. What experiences have you had in using technology in the educational setting?
2. How would you describe the types of instructional activities that you have conducted involving technology?
3. Based on your experiences in observing teacher use of technology as an instructional supplement, have you noticed any significant changes in student motivation or achievement? If so, what changes have you noticed?
4. Describe your beliefs on technology-based reading instruction as a teaching tool.
5. How would you describe the impact that technology has had on reading instruction? Explain your reasoning.
6. What would you describe as the most significant factor in promoting or hindering technology use in the early childhood setting and why?
7. Have your beliefs changed over time on the use of technology as a teaching tool and if so how?

Appendix C: Stakeholder E-mail Invitation

[redacted],

My name is Kerri Willmann and I am employed by the [redacted] as a kindergarten teacher at [redacted] Elementary School. I am currently working on my doctoral degree through Walden University and have reached the research study phase of my dissertation. I am writing to you in order to gain your permission to conduct my research study within our school system, specifically at [redacted] and [redacted] Elementary Schools. I have attached some documents for your review including a letter of cooperation that I would need signed by you stating that you approve my efforts to involve our school system for my research. I have also included the consent forms that I will send to possible participants, a confidentiality agreement, and my NIH certificate stating that I have gone through the training to allow me to conduct research. I have also attached my proposal that has been approved by Walden University in order for you to better understand what my study will entail.

It is my hope that the results of my study will help benefit our school system as I focus my efforts on reading instruction with an emphasis on instructional technology. I am more than willing to meet with you regarding any questions or concerns you may have about my study. I greatly appreciate your consideration for my research and I look forward to hearing back from you soon.

Sincerely,
Kerri Willmann