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Effects Of The Mindplay Computer Program On Student Reading Achievement: An Action Research Study

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EFFECTS OF THE MINDPLAY COMPUTER PROGRAM ON STUDENT READING ACHIEVEMENT: AN ACTION RESEARCH STUDY

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DEDICATION

This action research is dedicated to my supportive husband, who stood by me every step of the way. In addition, I would like to dedicate this to my mother, aunt, and grandmother, all of whom helped instill a love of learning in me and supported my desire to become an educator.

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ABSTRACT

This quantitative Action Research study examined how a computer-assisted reading program, called MindPlay, affected reading achievement in four second-grade classrooms within a Title I School. The identified problem of practice at Amazing Elementary School (AES) involved numerous years of underachieving reading results for underprivileged, racially diverse children. The majority of primary school students at AES are considered "at-risk" given their reading performance. The study explored whether a different intervention technique would increase student reading achievement, specifically in fluency, phonics, and comprehension, within a Title I context. Therefore, the research question that guided this study was as follows: "What is the impact of the MindPlay computer program on second-grade students' academic achievement in reading?" Data was collected from three different assessment measures before and after implementation, which was conducted over a nine-week time period. The results indicated that MindPlay had a positive impact on student reading achievement results in fluency, phonemic awareness, and comprehension. An Action Plan was designed based on these findings, as well as feedback from the teacher participants and district personnel, to implement MindPlay in all Title I Schools within the school district where AES resides.

Key Words: *MindPlay, computer-assisted technology, Title I, at-risk students, reading achievement*

PREFACE

This dissertation is original, unpublished, independent work by the author, K. Mann.

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LIST OF ABBREVIATIONS

AES ..... Amazing Elementary School

CBM ..... Curriculum-Based Measurement

MAP ..... Measures of Academic Progress

NCEP ..... National Assessment of Educational Progress

NCES ..... National Center for Education Statistics

NCLB ..... No Child Left Behind Act

PSF ..... Phoneme Segmentation Fluency

OG Approach ..... Orton-Gillingham Approach

CHAPTER 1

INTRODUCTION

The purpose of this study was to examine how a computer-assisted reading program called MindPlay affected reading achievement in four second-grade classrooms within a Title I School. The first chapter introduces the study's background, its significance and rationale, and provides a brief methodology overview. The second chapter is a literature review focusing on the study's central research, theories, and historical contexts. The third chapter delves into the methodology behind the study. Findings are presented in chapter four. Finally, chapter five describes the action plan that resulted from the results and summarizes the study.

Introduction of Study

The United States Report Card written by the National Assessment of Educational Progress highlights a sobering fact: our students are struggling with reading. The NAEP (2013) reports that since 2011 reading scores have remained stagnant, with 62% of students scoring less than proficient. The National Center for Education Statistics (2013) similarly reports that 65% of fourth-grade students did not meet reading standards. In fact, 32% of those students did not meet the basic standards (NCES, 2013). According to the NCES, students with proficient reading skills can "integrate and interpret texts and apply their understanding of the text to draw conclusions and make evaluations" (2013, p. 6).

Background of the Problem

Federal and state laws attempting to assist impoverished and dual-language households have proliferated over the last several years. The most noteworthy example is the No Child Left Behind Act of 2001, which was written in response to the Reagan-era report *A Nation at Risk: The Imperative for Education Reform* (1983) (Schramm-Pate, 2014). NCLB focuses on academic performance measures, standardized tests, data disaggregation, and teacher/school accountability (2001). The main purpose of NCLB was to support schools in closing student achievement gaps between disadvantaged students and their wealthier counterparts. The federal law incentivizes participation by allocating funds to schools that employ standardized testing.

Federal politicians are not the only lawmakers concerned with education standards; state legislators are implementing new regulations as well. South Carolina legislators voted in favor for the Read to Succeed Act of 2014 to increase reading accountability. This South Carolina law requires four-year-old kindergarten programs to be accessible to all at-risk children, free of charge. Additionally, students in kindergarten through fifth grade are invited to free summer reading camps if they do not meet performance standards (Adcox, 2014). Diane Stephens (2014) stated that third-grade students who read at the equivalent of about two years below grade level on the state test are required to attend a summer reading camp. Following summer camp, students who are still two years behind grade level are retained and assigned to a special literacy classroom (Stephens, 2014). These increases in educational regulation makes it

imperative for educators to develop students' reading skills effectively (Frey & Fisher, 2013).

Problem Statement

Recent reading test results indicate that NCLB Title I funding has failed to close the achievement gap between low and middle socioeconomic class students. Specifically, Title I of NCLB assigns federal funding to procure higher-quality educators and improve academic accountability (Maxwell, 2014). Reading is a fundamental skill that facilitates academic success, personal independence, and reliable employment (Calhoon, 2005). However, since 2011 reading scores have remained stagnant, with 62% of students scoring less than proficient.

Purpose Statement

The purpose of this study was to examine how a computer-assisted reading program, MindPlay, affected reading achievement within four second grade classrooms at a Title I School. MindPlay is a nationally recognized computer-assisted instructional program that claims to be able to teach students to read fluently and comprehend grade-level text (Chambers, Mather, & Stoll, 2013).

Significance of the Study

The significance of this study is to produce new research on the effects of MindPlay, a computer-assisted instructional program, on students' academic outcomes. Throughout the years some research has been conducted regarding MindPlay; however, previous attempts have stopped short of investigating the impact of MindPlay among racial diverse and lower socioeconomic students. This study goes beyond previous research by including a longer temporal scope with a larger, racially diverse treatment

group of low socioeconomic status students with a prominent bilingual emergent learners' subgroup.

The previous research conducted on MindPlay were rooted in Arizona where MindPlay was founded. One study (Chambers, Mathew, & Stoll, 2013) studied the effect of MindPlay on reading achievement in a 16-day summer school program. The second study (Schneider, Chambers, Mather, Bauschatz, Bauer, & Doan, DATE) studied the effects of MindPlay on student reading achievement in a second-grade classroom. Both studies consisted of student populations that had small samples of impoverished and bilingual emergent learners.

The significance of this action research study is to examine the effects of MindPlay with a second-grade population where 100% of the students are considered impoverished and over half of the student population are bilingual emergent learners. This is noteworthy since impoverished students and bilingual emergent learners' populations are on the rise in classrooms.

Conceptual and Theoretical Framework

The conceptual framework of this study is computer-assisted instruction and student achievement. Effective academic leaders are essential to increasing student achievement. Much previous research has focused on the qualities of effective school leaders. Contemporary educational literature has revamped the roles and responsibilities of effective leaders. For instance, principals are expected to be in classrooms observing, rather than sitting in their offices working on administrative tasks. Effective leaders are instructional leaders, change agents, moral compasses, and servants. Motivating key players is an important aspect of leadership, as it establishes a school culture that allows

for risk-taking, sharing, and transparency (Jackson & McDermott, 2009). Specifically, principals must cultivate a culture that uses scientifically-based reading research to increase student achievement within their schools.

Research indicates that proficient readers are skilled in phonics, phonemic awareness, fluency, vocabulary, and comprehension. The Reading First Model is categorized as a balanced literacy approach to reading instruction (Pruisner, 2009). Pruisner (2009) stated that the balanced literacy approach mollified the skills-based and comprehension based instruction wars of the 1980s. According to her, The Reading First Model, NCLB's literacy initiative, narrows the focus of reading on these five essential components (2009). Reading instruction that balances rapid letter recognition, phonological awareness, orthographic knowledge, and semantic, morphological, and syntactic knowledge creates the building blocks of fluency (Bashir and Hook, 2009). Computer-assisted programs, like MindPlay, boast the ability to provide a balanced, differentiated approach to instructing students in all five essential skills.

Other research suggests that students underperform in reading because they do not receive the amount and type of instruction they need (Connor, Morrison, Fishman, Schatschineider, & Underwood, 2007). Differentiated instruction increases student achievement by targeting lessons based on student background, cultures, language proficiency, skills, and interests (Parsons, Dodman, & Burrowbridge, 2013). Effective differentiated instruction includes prior planning and improvisation during instruction (Parsons et al., 2013). The efficacy of any instructional strategy also depends on the skill level of the student (Connor et al., 2007). The concept of differentiation in instruction can be traced back to progressivists, particularly the work of John Dewey (1897). Dewey is

commonly considered the father of the progressive movement among educators, and believed that curriculum should be student-centered and at the students' present capacity level. Differentiated instruction is essential in creating proficient readers. Computer-assisted instruction programs may help differentiate instruction by developing students' weaker skills at a more appropriate level.

Students that continue to show underperformance in reading should participate in the Response to Intervention Model prior to being tested for a learning disability. The Individuals with Disabilities Education Improvement Act (IDEIA, 2004) allows children to be diagnosed with specific learning disabilities by using the Response to Intervention (RTI) model (Speece, Schatschneider, Silverman, Case, Cooper, and Jacobs, 2011). An RTI model operates with three or four stages. Speece et al. (2011) defined the four stages as universal screening, scientifically-based reading research general education instruction, intensive research-based intervention, and progress monitoring. A computer-assisted instructional program can be used as general education instruction or an intensive intervention for struggling readers.

Methodology

This study was guided by an action research methodology. Action research is a systematic process conducted by invested participants to perform inquiry within one's own practice (Mertler, 2014). In other words, action research is performed when professionals conduct research within their local settings to investigate topics of interest. The theoretical framework of action research is grounded in progressivism, mainly through the ideas of John Dewey (Herr & Anderson, 2005). Dewey helped define progressivism by advocating that knowledge should be focused on individual growth and

development (Schramm-Pate, 2014). “From Dewey, it was a short step to the notion of taking the professional experience of teachers and other practitioners and using it as a source of knowledge about teaching” (Herr & Anderson, 2005, p. 18).

Action research is described as a cyclical process that contains four stages: planning, acting, developing, and reflecting (Mertler, 2014). The planning stage consists of identifying and limiting a topic, gathering information, reviewing previous literature regarding that topic, and developing a research plan. The second stage of action research is the acting stage. This is completed by implementing the developed plan, through collecting and analyzing data. Next, in the developing stage the researcher makes revisions, changes, or improvements. Finally, in the fourth stage the researcher reflects on his or her progress by summarizing the results, creating a strategy to share the results, and considering the action research process.

Action research has recently become popular with practitioners in many fields. However, according to Dana & Yendol-Hoppy (2014), educators have been practicing action research since the late nineteenth century. It is common for educators to conduct action research among their student and stakeholder populations in the education industry. In this example, the educator designs a study, collects data, analyzes that data, and draws conclusions to further his or her understanding of a particular phenomenon (Dana & Yendol-Hoppey, 2014).

Nature of the Study

The purpose of this study was to examine how a computer-assisted reading program affected reading achievement within four second grade classrooms at a Title I School. The two variables for this study are student time spent on the computer-assisted

reading program and increases in student reading achievement. Participants include 45 second-grade students.

Amazing Elementary School, a pseudonym, is one of the smallest schools in Great Schools County School District (also a pseudonym). The school serves approximately 450 students in grades 4K through fifth. Approximately 56% of the students are Hispanic, 23% are African American, 20% are White, and 1% are of another ethnicity. Around 45% of the students use English as a Second Language. Amazing Elementary is a true community school that is located in the center of its neighborhood. Unfortunately, that community is considered dangerous and poor. These factors produce a transient population with students that constantly enroll and withdraw due to financial and social instability. The research question that guided this study was, "What is the impact of the MindPlay program on second grade student's academic achievement in reading?"

Limitations

This study did not contain a control group for comparison. Further research is recommended that compares student achievement with a control group and one group receiving MindPlay intervention. Further limitations include that practice effect could influence results. Observations of classroom instruction and MindPlay usage were not recorded due to time constraints. Finally, participant usage was a limitation. Some students were able to use MindPlay more than other participants. Further research with time spent on MindPlay and reading achievement growth is recommended. A final limitation of the study was the use of only one grade level. Further research is needed to look at other grade levels other than second.

Definition of Terms

Key terms that are used throughout the study should be defined in order to provide clarity (Lunenburg & Irby, 2008). The following terms are references throughout the study:

AIMSWeb. A universal screening, progress monitoring, and data management system that supports Response to Intervention (RTI) and tiered instruction. AIMSWeb uses brief, valid, and reliable measures of reading and math performance for grades K-12, which can be generalized to any curriculum (Pearson, 2014).

Comprehension. The ability to understand what is being read (Cooper, 2000).

Curriculum-based measurement (CBM). Standardized assessment utilized to assess reading fluency (Daly, Chafouleas, & Skinner, 2005; Deno, 1985).

Fluency. The ability to read text quickly, smoothly, effortlessly, with prosody, and automatically with little attention to sub skill tasks such as decoding (Hudson, Mercer & Lane, 2000; Meyer & Felton, 1999; Rasinski, 2003).

Phonemic awareness. The ability to understand how the smallest parts of speech can be separated, blended, and manipulated (Snider, 1997).

Chapter Summary

This chapter introduced the study by discussing background information. Educators have long examined how to cultivate successful readers. South Carolina recently passed the Read to Succeed Act of 2014 in hopes of increasing reading achievement. Recently, Amazing Elementary School, the setting for this study, has inquired about increasing student reading achievement. Research has shown that MindPlay, which is a virtual reading program that teaches students to read fluently and

on grade level, can meet this goal (Chambers, Mather, & Stoll, 2013). The purpose of this action research study is to determine if a relationship exists between the amount of time students spend using MindPlay and their academic outcomes.

CHAPTER 2

RELEATED RESEARCH AND LITERATURE REVIEW

The purpose of this study was to examine how a computer-assisted reading program affected reading achievement in four second grade classrooms within a Title I School. Specifically, the study explored whether using the MindPlay intervention technique as a supplement to regular language instruction would increase student reading achievement in fluency, phonics, and comprehension, within a Title I context. MindPlay is a virtual reading coach program that claims student success by teaching students to read fluently and comprehend grade-level text (Chambers, Mather, & Stoll, 2013). The significance of this study is to produce new research on the effects of MindPlay on students' academic outcomes in a racially diverse Title I setting.

This chapter presents a review of scholarly literature regarding the historical and theoretical contexts for the problem, purpose, and content of the research study. The six sections of this literature review chapter address the history of socioeconomic status and bilingual emergent students, essential components of reading instruction, responses to intervention, computer-assisted instruction, and MindPlay— the online reading instruction program used for this study. The section on essential components of reading instruction explores mechanisms that are essential for student reading achievement. The response to intervention section examines the dilemma schools experience when trying to assist struggling or "at-risk" readers. The computer-assisted instruction section illustrates

the importance of incorporating technology into the classroom and the potential for the success of computer-based technology. Finally, the MindPlay section explains how the computer-assisted program provides practice for the essential components of reading instruction.

Socioeconomic Status and Reading Achievement Gaps

The Annie E. Casey Foundation stated that 80% of students in impoverished households are not reading proficiently (2014). According to *The Washington Post*, the percentage of impoverished children is rising: approximately 51% of school-aged children are currently impoverished, and more are becoming so daily (Layton, 2015). Additionally, among dual-language learners 93% of students scored below reading proficiency, and their scores have not improved in over ten years (Annie E. Casey Foundation, 2014). According to Linda Espinoza with the Migration Policy Institute (2013), between 2007-2009 approximately 43% of American children lived with parents who did not speak English, and the number of dual-language households is on the rise (Espinoza, 2013). Federal and state laws attempting to assist impoverished and dual-language households, most notably No Child Left Behind (NCLB), have proliferated over the last several years.

NCLB attempts to close the achievement gap between low and middle socioeconomic class students. Recent reading test results indicate that NCLB Title I funding has failed to help disadvantaged students catch up to their wealthier counterparts. Research shows that lower socioeconomic status (SES) students are less likely to experience academic success (Ready, 2010). Lower-SES children enter kindergarten far below their more advantaged peers (Lee & Burkam, 2002). In particular, children living

in poverty suffer from frequent absences resulting from poor health and unstable living conditions, amplifying their decline in academic achievement. (Ready, 2010). Reading is a fundamental skill that facilitates academic success, personal independence and reliable employment (Calhoon, 2005). However, since 2011 reading scores have remained stagnant with 62% of students scoring less than proficient.

According to the Annie E. Casey Foundation (2014), third-grade students who read proficiently are more likely to be successful after graduating from high school. Studies have shown that students who fail to graduate from high school cost society an estimated $260,000 in lost earnings, taxes, and productivity (Fiester, 2010). Furthermore, by 2020 the United States may face a labor shortage due to potential workers lacking educational credentials (Annie E. Casey Foundation, 2014). This knowledge has propelled illiteracy into a national concern rather than just an individual issue.

Despite the large amounts of literature and research stating what works, many teacher preparation programs fail to provide teachers with the knowledge and skills needed to assist struggling readers and bilingual emergent learners in a Title I context (Schneider, Chambers, Mather, Bauschatz, Bauer, & Doan, 2016).

Bilingual Emergent Learners

The United States has long been celebrated as being a culturally diverse nation. However, the concomitant linguistic diversity has caused some hardships. For example, the United States does not currently have an official federal language, and incoming immigrants are simultaneously more and less educated than native-born Americans. However, many states have enacted legislation and propositions that mandate that all state business, including classroom instruction, be addressed in English only (Tse, 2001). In the

2040, white students will be the minority in classrooms (Garcia, 2005). Still, many contemporary educators are white, middle-class females who have not interacted with diverse multilingual students prior to entering the classroom (Garcia, 2005).

During the 1960s immigration laws changed, altering the nations from which America received immigrants. An immigrant is defined as someone who is born outside of the United States but moves to the United States, including refugees. A large portion of immigrants are coming from Asia and Latin America. In addition, many of the immigrants are women of childbearing age (Garcia, 2005). This has drastically changed our school system demographics, and legislation has been written in attempt to address these changes. *Plyler v. Doe (1982)* states that schools cannot exclude immigrant students from attending schools. In fact, most states have enforced a rule that does not allow schools to inquire about a student's immigration status, or request social security or birth certificate information. The case falls short in that it only addresses undocumented students' educational rights up until high school. The DREAM Act bill hopes to allow undocumented students the opportunity to attend colleges at in-state tuition rates, and to become legal citizens (Crawford & Krashen, 2007).

While the federal government has not mandated a specific type of education, such as bilingual education (Crawford & Krashen, 2007), South Carolina follows an English only statute, like approximately 30 other states. This means that classroom instruction can only be taught in English (Tse, 2001). In 2002, NCLB removed all bilingual texts, but does not mandate how best to teach Bilingual emergent learners. However, the accountability system provides incentives to schools that teach in English only (Crawford & Krashen, 2007). Title VI of the Civil Rights Act of 1964 states that schools cannot

discriminate. This law created an ideology that education must be equal. Many schools interpreted this law to mean that by providing equal instruction and curriculum to all students, they were doing their jobs. (Crawford & Krashen, 2007).

In 1974 schools were called into question regarding equal education policies towards ELL students. The *Lau v. Nichols (1974)* court case established that schools must take actions to provide equal access to curriculum for ELLs, and not just focus on language acquisition (Lucas & Katz, 1994). It interesting to note that many of the NCLB accountability requirements go directly against the precedents that were established under *Lau v. Nichols (1974).* For example, the state mandated testing requires ELL students to take state tests that are English-based (Crawford & Krashen, 2007). Federal mandates aimed at meeting these students' needs would not come for almost another ten years.

In 1981 the *Castaneda v. Pickard* ruling established a three-prong test for bilingual emergent access to education. This test was the court's way of enforcing the requirements for *Lau v. Nichols*. The three-prong test requires schools to provide a research based program for ELL students, states that the resources must be funded in order to be carried out effectively, and states that the programs must be evaluated and restructured if needed to ensure "language barriers are being overcome (Crawford & Krashen, 2007, p. 55). The *Castaneda v. Pickard* ruling came into question in 2009. *Horne v. Flores (2009)* was a class action suit brought against a school district that was charged with violating the *Equal Educational Opportunity Act (EEOA)* of 1974. The bilingual emergent students and parents argued that their school district did not do everything possible to address language barriers. The families claimed that neither

instructional policies nor adequate funding met the students' needs (Civil Rights Project, 2010).

Many classrooms, including those at AES, are experiencing an overwhelming majority of students labeled as bilingual emergent learners. Valdes (2001) completed an in-depth two-year study in which she followed students who were brand new to the country. Mastery of English became the dominant focal point for these students within school. Valdes claimed that students are placed in English-language courses and grade-level content falls to the wayside (Valdes, 2001). These actions have devastating effects for bilingual emergent students. Recent research indicates that 93% of dual-language learners scored below proficiency, and their scores have not improved in over ten years (Annie E. Casey Foundation, 2014). In addition, research indicates that bilingual emergent students are overrepresented in special education and that at least 40-50% of bilingual emergent learners students drop out of high school (Cummins, 1986). Valdes' in-depth research supported this finding: half of the students in her study dropped out of high school (2001). Computer-assisted technology is a tool that many educators are turning to in order to aid bilingual emergent learners students in their reading achievement. Research indicates that computer-assisted instruction in conjunction with conventional literacy instruction produced higher reading achievement than traditional reading instruction alone (Beechler & Williams, 2012).

Essential Components of Reading Instruction

The National Reading Panel Report (National Institute of Child Health and Human Development [NICHD], 2000) summarized several decades of scientific research that clearly shows characteristics of effective reading instruction. Past research defines

five critical areas of focus for reading instruction: phonemic awareness, phonics, fluency, vocabulary, and comprehension. These five areas were incorporated into the No Child Left Behind Act and the Reading First initiative, as essential components of effective reading instruction (Pruisner, 2009).

Phonemic Awareness

Phonemic awareness is "part of a hierarchy of metalinguistic skills that begins with the conscious awareness that sentences are made up of words and culminates in an awareness that words are made up of phonemes, those small units of sound that roughly correspond to individual letters" (Snider, 1997, p. 203). It was not considered an important skill for developing readers until the 1990s (Manning & Kato, 2006). Phonemes are the smallest sounds in spoken language, and make up spoken words. They are represented in writing through graphemes, which can be single letters or clusters of letters that represent single sounds (Shanahan, T, 2005).

Throughout the past two decades, research has identified phonemic awareness as an essential skill for emerging readers. In fact, some research claims that phonemic awareness is a better predictor than IQ or mental age for future success in reading and spelling (Snider, 1997). Furthermore, "explicit training of phonemic tasks improves reading achievement" (Snider, 1997, p. 203). An effective literacy program must incorporate explicit phonemic instruction, especially for emerging readers, in order to develop successful readers.

Phonics

Students who understand the alphabetic code are able to link knowledge of spoken language to knowledge of written language (Ehri, Nunes, Stahl, & Willows,

2001). Ehri et al. (2001) define the alphabetic code as "the system of grapheme-phoneme correspondences that links the spellings of words to their pronunciations" (p. 394). Phonics instruction focuses on reading and pronouncing words by "learning the phonetic value of letters and groups of letters" (Hammill & Swanson, 2006, p. 17). However, the relative importance of phonics instruction has been a subject of controversy for the past few decades.

Educators have debated the importance of phonics instruction for many years. In fact, during the 1980s these disagreements came to a head in the Reading Wars (Pruisner, 2009). One faction of educators believed that phonics was essential in developing readers. These phonics-based instructors argued that teaching should begin with explicit symbol-sound correspondence instruction (Ehri, et al, 2001). Opponents believed that literacy instruction should take on a more whole-word or whole-language approach, with instruction being meaning-centered (Ehri, et al, 2001). The National Reading Panel calls for literacy instruction that is balanced between these two approaches (Pruisner, 2009).

The goal of phonics instruction is teaching the phonetic value of letters and groups of letters (Hammill & Swanson, 2006). Phonics instruction teaches students the alphabetic code and how to use this knowledge to read words (Ehri, et. al, 2001). Research has indicated that effective phonics programs are sequential and systematic, focusing on consonants, vowels, and consonant/vowel digraphs (Ehri, Nunes, Stahl, & Willows, 2001).

Fluency

Reading fluency has gained attention as a key component to successful reading (Rasinski, 2006). However, many researchers have diverging definitions of fluency. The

Merriam-Webster Dictionary defines fluency as "the ability to speak easily and smoothly" (Merriam-Webster, 2015). Helen Abadiano and Jesse Turner caution against defining fluency without including comprehension in their article, "Reading Fluency: The Road to Developing Efficient and Effective Readers" (2005). They believe that fluency must include the comprehension to ensure that students are understand what they are reading. Timothy Rasinski, like Abadiano and Turner, stated that the goal of increasing fluency is to improve text comprehension (2006).

William Therrien's research for his article "Fluency and Comprehension Gains as a Result of Repeated Reading" pinpointed two historic theories on why fluency is significant and why students struggle with it. One theory stems from the concept of decoding (2004). Research has shown that attentional capacity is limited, so spending time decoding words stifles cognitive processing (Hudson, Lane, & Pullen, 2005). Another theory focuses on prosodic cues. Readers may misunderstand a text because they are unable to infer cues while reading, and cannot break the text into meaningful phrases (Therrien, 2004). Both theories feature frameworks around the three major components of reading fluency.

Accuracy, automaticity, and prosody are the three components of fluency that lead to text comprehension. Accuracy in fluency requires readers to "sound out text with minimal errors" (Rasinski, 2004, p. 1). Accuracy is imperative to fluent readers, because they need to decipher authors' intended meanings. If a student reads a text inaccurately, he or she will not understand the author's message (Hudson, Lane, & Pullen, 2005). Automaticity refers to the ability to decode words with minimal mental effort (Rasinski, 2004). Fluent readers that are able to read automatically spend their mental efforts on

comprehending and inferring rather than on decoding text. Hudson, Lane, and Pullen (2005) state that beginner readers spend much time attempting to convert between identifying words and comprehending text, which inhibits them from succeeding in either task. Exposure to and practice with sight words and repeated reading will both assist students during this stage. Finally, prosody "is a linguistic term to describe the rhythmic and tonal aspects of speech: the 'music' of oral language" (Hudson, Lane, & Pullen, 2005, p. 704). Most educators refer to prosodic readers as those that read with expression. Prosodic features are broken down into pitch, stress patterns, and duration of reading. All three mechanisms of fluency create readers who are successfully able to comprehend text.

Vocabulary

Vocabulary is essential to accessing background knowledge, expressing ideas, and producing effective communication (Sedita, 2005). Readers use their vocabulary for word recognition, by using pronunciations and meanings of words they know in print (Learning Point Associates, 2004). The Learning Point Associates (2004) recognized listening, speaking, reading, and writing as the four types of vocabulary. Students with strong vocabulary knowledge have higher academic success because they understand new ideas and concepts faster (Sedita, 2005). Research indicates that average students should add 2,000 to 3,000 new words to their vocabulary per year (Sedita, 2005).

Research has likewise shown that vocabulary plays an important role in comprehending text. Long-term vocabulary instruction and teaching vocabulary words prior to reading assignments both help improve comprehension (Learning Point Associates, 2004). Experts believe that reading comprehension depends on a person

already knowing 90% to 95% of the words in a text (Sedita, 2005). This allows the reader to extract the main idea from the reading and guess any unknown words (Sedita, 2005). Building vocabulary among students is essential for training proficient readers.

Comprehension

The final goal of reading instruction is for students to comprehend the text (Learning Point Associates, 2004). Comprehension is defined as the "process in which the reader constructs meaning using as the building materials the information on the printed page and the knowledge stored in the reader's head" (Duke & Pearson, 2001, p. 423). Research indicates that good readers that can comprehend text, are aware of their own thinking, put effort into their reading, and use a range of strategies to deepen and enrich their understanding (Learning Point Associates, 2004). Furthermore, good readers are self-regulated in their use of comprehension strategies (Learning Point Associates, 2004).

Comprehension strategies are ways of thinking about what has been read, and allow readers to go beyond a surface understanding of the text (Learning Point Associates, 2004). Popular strategies include graphic and semantic organizers, using prior knowledge to connect with a text, and summarizing what was just read (Learning Point Associates, 2004). Experts believe that for a comprehension strategy to be effective, it must be explicitly modeled (Learning Point Associates, 2004).

Response to Intervention

The Individuals with Disabilities Education Improvement Act (IDEIA, 2004) allows children to be diagnosed with specific learning disabilities using the Response to Intervention (RTI) model (Speece, Schatschneider, Silverman, Case, Cooper, & Jacobs,

2011). An RTI model operates with three to four stages. Speece et al. (2011) defined those stages as universal screening, scientific research-based instruction in general education, intensive research-based instruction in subsequent tiers, and progress monitoring.

Screening

The first step in the Response to Intervention Model is universal screening. A universal screener is defined as "the mechanism for targeting students who struggle to learn when provided a scientific, evidence-based general education" (Hughes & Dexter, 201, p. 1) Two vital characteristics of screening are efficiency and validly (Speece et al., 2011). Research indicates that universal screening typically occurs three times a school year, during the fall, winter, and spring (Hughes & Dexter, 2011).

Research-Based General Education Instruction

Experts agree that RTI is not an instructional model but a framework that provides comprehensive support for struggling students. The goal of RTI is to respond quickly and efficiently to documented concerns, in an effort to minimize negative longer-term outcomes (Duran & Diamond, 2010). Since primary education involves "high quality core instruction that meets the needs of most students," teachers must scaffold and differentiate instruction to assist all students in their learning (Duran & Diamond, 2010, p. 4).

Research suggests that students underperform in reading because they do not receive the amount and type of instruction they need (Connor, Morrison, Fishman, Schatschineider, & Underwood, 2007). Differentiated instruction increases student achievement by targeting instruction based on students' backgrounds, cultures, language

proficiency, skills, and interests. Effective differentiated instruction includes planning prior to instruction and being adaptive during instruction (Parsons, Dodman, & Burrowbridge, 2013). The efficacy of any instructional strategy depends on the skill level of the student (Connor et al., 2007). This theory can be traced back to progressivists. John Dewey (1897), the father of the progressive movement, believed that curriculum should be student-centered and at the student's present capacity level.

Scaffolding suggests that "given appropriate assistance, a learner can attain a goal or engage in a practice otherwise out of reach" (Davis & Miyake, 2004, p. 206). Davis and Miyake identified four features of effective scaffolding. Initially, the teacher must accept responsibility for encouraging the student to perform an activity beyond the child's current level. The teacher then carefully diagnoses the learner's current level of understanding and calibrates appropriate support. Next, the teacher provides a range of types of support. Finally, the teacher gradually reduces support so students master the skills individually (Davis & Miyake, 2004). This theory is based on social constructivism. Lev Vygotsky, the founder of social constructivism, developed the zone of proximal development. Many researchers define the zone of proximal development as an earlier version of scaffolding. According to Vygotsky (1978), this zone requires students to operate within a range of ability, so educators should present students with work that challenges them without overwhelming them.

Intensive Evidence Based Instruction

At-risk students, once identified via screening, are given additional evidence-based intervention. These interventions are of moderate intensity, and are given in addition to core instruction. Evidence-based instruction is defined as "an intervention for

which data from scientific rigorous research designs have demonstrated (or empirically validated) the efficacy of the intervention" (Duran & Diamond, 2010, p. 6). Students who respond to the intervention return to the primary prevention. Students who do not show minimal response to intervention are moved to a more intensive and individualized support, designed for struggling students (Duran & Diamond, 2010).

Progress Monitoring

Progress monitoring is used to measure students' rates of responsiveness to instruction or intervention, and to assess student performance over time (Duran & Diamond, 2010). Progress monitoring tools typically measure and compare a student's expected rate of learning with his or her actual rate of learning. According to experts, "progress monitoring tools must accurately represent students' academic development and be useful for instruction planning and assessing student learning" (Duran & Diamond, 2010, p. 6)

Computer-Assisted Instruction

The failure of teacher preparation programs to prepare teachers for assisting struggling readers and English as a second language readers has led to efforts that "identify and promote means to ensure that all students nevertheless have access to high quality reading instruction" (Schneider et al., 2016, p. 800). Computer-assisted instruction has been hailed as a way to promote reading achievement through systematic reading instruction requiring little or no direct instruction for the teacher (Schneider et al., 2016). The National Reading Panel (NRP) stated computer-assisted reading instruction was a promising development (2000).

Computer-assisted instruction (CAI) has its roots in programmed instruction: "This instructional technique is based upon B. F. Skinner's behaviorism theory and teaching machines concept established in 1954" (Sugar & Brown, 2008, p. 59). Until the 1980s, computers were not seen as instructional tools (Reiser, 2001). However, IBM developed the first CAI in the 1950s (Reiser, 2001). The initial CAI programs followed a drill-and-practice format (Reiser, 2001). Many educators did not feel the simulation tasks, instructional games, and tutorials that consisted of early CAIs as educationally beneficial to student achievement (Tillman, 2009). The goal of CAIs has been to develop individualized technological instructional solutions in many subjects (Reiser, 2008). Research has shown that students improve reading skills when using computer-assisted instruction (Tillman, 2009).

MindPlay

MindPlay is a computer-assisted program that helps students stay focused and accelerate their reading progress. After an initial assessment, MindPlay "builds a unique prescription plan for every student and begins teaching to the student's specific gaps" (Chambers, Mather, & Stoll, 2013, p. 5). It provides individual instruction with virtual reading coaches and speech pathologists that provide immediate feedback. This technology-based reading solution is systematic, repetitive, and rule-based (Chambers, Mather, & Stoll, 2013).

MindPlay was created by Judith Bliss 30 years ago. She overcame her dyslexic reading struggles and wanted to help her son do the same (Chambers, Mather, & Stoll, 2013). She developed MindPlay in 1981 to help struggling readers, based on the Orton-

Gillingham Approach (OGA). The OGA follows a bottom-up approach because the basic skills are taught in a hierarchical order (Rose & Zirkel, 2007).

Originally developed for dyslexic students, the OGGA has been proven to help struggling readers, spellers, and writers (Academy of Orton-Gillingham Practitioners and Educators, 2012). The OGA is an instructional approach that is "language-based, explicit, multisensory, structured, sequential, and cumulative" (MindPlay, 2015). It includes visual, auditory, and kinesthetic/tactile learning techniques, often referred to the *Language Triangle* (Ritchey & Goeke, 2006). Researchers state that the OGA is successful due to the "integration of multiple learning pathways, and auditory and visual feedback for sounds as well as the kinesthetic/tactile input of letter formation" (Lim & Oei, 2015, p. 376). One major discrepancy between MindPlay and the claim of being based on the OGA is the lack of kinesthetic/tactile ability. Students are not able to write using the computer program, as they type their answers.

Chapter Summary

MindPlay is a research-based and evidence-based computer-assisted program that can be used in the general education setting or as an intensive intervention. MindPlay automatically differentiates instruction by meeting students at their current level. Furthermore, MindPlay focuses on all five essential components of a balanced literacy program, according to The National Reading Panel, targeting phonemic awareness, phonics, vocabulary, fluency, and comprehension. Little research has been conducted to determine MindPlay's effectiveness with bilingual emergent students and students within in a Title I context. In researching MindPlay only four studies were located. Two studies appeared on the MindPlay website. One of the studies was published in an educational

journal. Three studies comprised of students in Arizona and had some overlapping researchers, measurements, and data. One study (Chambers el al., 2013) was conducted in a middle school setting over a 16-day summer school program. Another study (Schneider, 2015) was conducted with second grade students in two elementary schools. The participants were largely Hispanic, at 81.6%. However, only 9% of the participants were considered bilingual emergent. Only one study (Jensen, 2015) was found as an independent entity that occurred in Missouri and did not contain the same researchers, measurements, and data associated with MindPlay. The purpose of this action research study was to examine how MindPlay affected reading achievement in four second-grade classrooms, within a Title I School comprised of a large population of bilingual emergent learners.

CHAPTER 3

METHODOLOGY FOR QUANTITATIVE STUDIES

The purpose of this study was to examine how a computer-assisted reading program affected reading achievement in four second grade classrooms, within a Title I School. This study explored whether using a different intervention technique, MindPlay, in conjunction with regular language arts instruction would increase students' reading achievement, in terms of fluency, phonics, and comprehension. MindPlay is a computer-assisted program that promises student success by teaching students to read fluently and comprehend grade-level text (Chambers, Mather, & Stoll, 2013). In this action research study, 45 second-grade students were provided intensive literacy intervention for a period of nine weeks. Pretest and posttest results from these 45 second-grade students were evaluated per repeated measures t test to determine in MindPlay had an effect on mean student reading achievement scores. The significance of this action research study is to produce new research on the effects of MindPlay on students' academic outcomes in a Title I context.

The following methodology is organized into six sections. The research design implementation is discussed in the first section. The second and third sections describe the study participants and setting, respectively. Data instrument information will be provided in the fourth section, followed by procedural information in the fifth. Section six designates the germane data analysis types.

Research Design

Quantitative inquiry requires the collection and analysis of numerical data in an attempt to explain phenomena (Mertler, 2014). In this action research study the phenomena being studied is academic achievement. The numerical data collected are district benchmarks that measures student fluency, phonemic awareness, and reading comprehension. An analysis of variance (or ANOVA) would also not be appropriate for this action research because students will be measured twice, not once (Mertler, 2014). Mertler (2014) noted that the repeated measures t-test is an appropriate action research design when students are given a pretest, exposed to an intervention, and given a posttest. The independent-measures t-test would not work for this action research study because there will not be a control group, since all the students will be exposed to the treatment. The numerical data collected are district benchmarks that measures student fluency, phonemic awareness, and reading comprehension.

The students were tested on fluency, phonemic awareness, and comprehension. The fluency and phonemic awareness benchmark that was used for this study was through a program called AIMSWeb. AIMSWeb is considered a universal screener that schools use to identify at risk students. The fluency assessment is called a CBM, which stands for curriculum based measurement and measures how many grade level words students can read in a minute. The phonemic awareness portion of AIMSWeb is referred to as PSF, which stands for phonemic sounds fluency. The comprehension assessment will be measured through MAP, which stands for Measures of Academic Progress. The classroom teachers faithfully implemented MindPlay for nine weeks. After the nine weeks, the students were given a posttest, using the December benchmarks of AIMSWeb

CBM, AIMSWeb PSF, and MAP. The same students (one group) will be tested or measured twice. The data will be analyzed by comparing the pretest mean with the posttest mean for each literacy category. Given Mertler's (2014) descriptions of various quantitative analyses, the repeated-measures t-test is the most viable data analysis technique for this quantitative action research study.

Mertler (2014) stated that in a repeated-measures t-test, pretests must be given to the one group prior to intervention exposure. In this action research study, district benchmarks given in the first two weeks of school acted as the pretests. Students were given an AIMSWeb CBM assessment, which measures fluency. They were also given an AIMSWeb PSF assessment, which measures phonemic awareness. Lastly, the second-grade students participated in the district MAP benchmark, which measures comprehension. After students are given a pretest, they must engage in the intervention when conducting a repeated-measures t-test (Mertler, 2014). Amazing Elementary second-grade students completed the MindPlay intervention in conjunction with regular literacy instruction for nine weeks. Finally, the repeated-measures t-test must evaluate a posttest given to subjects after the intervention (Mertler, 2014). Students were given the AIMSWeb CBM, AIMSWeb PSF, and MAP benchmarks in December after the intervention period. The mean pretest scores and mean posttest scores will be compared and discussed in detail in Chapter 4.

The research question that guided this study was, "What is the impact of the MindPlay computer program on second-grade students' academic achievement in reading?" The researcher for this action research study was the assistant principal of the school where the MindPlay program was being implemented, and collected the data from

the data sources directly. The researcher then analyzed the results, after obtaining the participants' pretest and posttest scores. The action researcher shared these results and her insights with the second-grade teachers and administration team at various points throughout the study.

Participants

This study includes a defined population of four regular education second-grade classrooms, all at Amazing Elementary. These four self-contained, heterogeneous classes are comprised of approximately 67 students and 4 teachers. The gender make-up of the participants consists of 49% male and 51% female. The study had 45 second-grade participants. Approximately 13% of the students are African American, 13% are White, 67% Hispanic, and 6% are of another ethnicity. The participants consist of approximately 60% of the students coded as bilingual emergent. However, there may be more that should be coded but are not due to parent refusal. 15 of the students receive resource support and 30 of them receive English as a Second Language support.

Setting

Amazing Elementary School (AES) was the only site location for this action research study. Amazing Elementary is one of the smallest schools in the Great Schools District. Amazing Elementary is considered a true community school since it is nestled within the neighborhood it serves. Amazing Elementary serves approximately 450 students in grades 4K through fifth. Approximately 56% of the students describe themselves as Hispanic, 23% as African American, 20% as White, and 1% as other ethnicities. About 45% of the students at Amazing Elementary participate in the English language learners program.

Amazing Elementary has a typical classroom flow in comparison to other schools. The teacher to student ratio is 21:1 for much of the classrooms. 65% of the teachers hold advanced degrees, and approximately 84% of teachers were retained from the previous employment year. English Language Arts instruction occurs for 90 minutes each day, with 30 additional minutes of writing lessons. The school adopted Journeys, a second-grade reading curriculum published by Houghton Mifflin Harcourt, for use in conjunction with Balanced Literacy. AES is also piloting MindPlay, a computer-instructed intervention program, in conjunction with district-mandated literacy instruction. This action research explored how MindPlay improved student reading achievement.

Instrumentation

The researcher employed a repeated-measures t-test study to determine if a computer-assisted reading program affected reading achievement in four second-grade classrooms at AES. The independent variable was the instructional intervention of MindPlay, in conjunction with classroom literacy instruction. Reading achievement-test scores for AIMSWeb and MAP were the two dependent variables.

AIMSWeb

AIMSWeb was designed by Pearson to serve as a universal screening to assess struggling readers. For the fluency test (CBM) the students read three probes aloud while the rater followed along. Students were given one minute to read as much as they could. The rater marked each word that the student said incorrectly. The rater gave students three seconds if the student fell silent before encouraging the student to continue. After the student read all three probes, the rater took the median amount of words and errors as the student's score. Students read the exact same probes for the fall and winter

assessments (AIMSWeb, 2012). The AIMSWeb phonemic segmentation test evaluates the phonemic awareness of students. Each student was given a word and had to say the sounds for each word. The student had one minute to sound out as many words (phonemes) as possible (AIMSWeb, 2012).

Measures of Academic Progress (MAP)

MAP (Appendix D) is a research-based universal screener, or quick assessment, that is given three times a year. At Amazing Elementary, MAP is only given for second- through fifth-grade students. MAP is an untimed, computer-administered test designed to monitor growth (Northwest Evaluation Association, 2012). Data can be viewed historically or from season to season for students (Northwest Evaluation Association, 2012).

Procedures

The researcher followed a specific timeline, as defined in Appendix A. The researcher obtained permission from Great Schools District's Director of Accountability and Quality Assurance to conduct research at Amazing Elementary. Ethical considerations were imperative in completing this action research study. Student permission and parent permission were obtained prior to assessment data being collected. Assessment data will be stored on a district laptop with district encryption. In addition, student data will be coded with random numbers as Craig Mertler (2014) suggests to ensure anonymity and confidentiality.

Collected data will be used for research purposes only and will not be used as an evaluative tool for teacher performance nor student progression. Teachers, parents, and students will be given statements of their rights and the purpose of conducting the

research. Parents and students can withdrawal at any point during the research without any ramifications. All students will have access to the instructional tool, MindPlay, regardless of whether they participate in the research or not. Therefore, teachers, students, and parents will not know which students participated in the action research.

The following section outlines the study's procedures.

1. Obtaining Consent

   The research met with the participating school's principal regarding the study, and met with district personnel to discuss the study. Since the study involves minors, informed parental consent was obtained (see Appendix B). Invitation letters were sent in English and Spanish.

2. Training on MindPlay

   MindPlay personnel came to the school and trained teachers for implementation purposes. Educators completed two hours of training on the treatment specifications.

3. Testing

   Baseline data was collected during the first two weeks of the school year. The school's literacy coach and two interventionists administered and scored the AIMSWeb tests. Two interventionists administered the MAP assessments.

4. Treatment Period

After the researcher collected the pretest data, the experimental group received the treatment instruction for nine weeks. To meet MindPlay fidelity, students were expected to complete two hours a week or thirty minutes a day of MindPlay intervention, in conjunction with traditional literacy instruction. An internal timer contained in the

MindPlay program recorded active time spent in the learning sequences for individual students, to monitor fidelity.

Data Analysis

The purpose of this quantitative study was to determine if MindPlay, a computer-assisted reading program, would affect students' reading achievement. This study specifically analyzed fluency, phonemic awareness, and comprehension. The nonrandom sample for this study consisted of 45 second-grade students from a Title I elementary school. A repeated-measures t-test was used to analyze results. Students took three district examinations during this period, including: an AIMSWeb benchmark that tested fluency, an AIMSWeb phonemic segmentation (PSF) assessment that evaluated phonemic awareness, and a Measure of Academic Progress (MAP) assessment that tested comprehension. The AIMSWeb benchmark fluency test, AIMSWeb phonemic segmentation benchmark, and MAP benchmark were given as the pretest and posttest for this action research. Each individual assessment was analyzed using a repeated-measures t-test to see if the MindPlay computer program affected student scores.

Three highly-trained teachers benchmarked all of second grade for the AIMSWeb fluency (CBM) and phonological awareness (PSF) assessments. The school has the same teachers give benchmarks instead of utilizing the classroom teachers, to ensure that each assessment is calculated similarly. This was done so that the results were valid and reliable.

Second-grade students took MAP assessments in the computer lab for fall and spring. There are two teachers at Amazing Elementary that have been designated to give

the MAP benchmark to all students, to maintain validity and reliability. These two teachers have been MAP testing coordinators for four years and are highly trained.

Teachers were also trained by MindPlay personnel on how to use the intervention program. The expectation was set that second grade would use the program consistently. To meet fidelity standards, students had to be on the program for two hours per week or thirty minutes per day. Teachers officially began using the MindPlay program in the last week of August, after all the initial benchmarking was completed. Throughout the action research study, administrators went into the classrooms to informally observe how MindPlay was being utilized. In addition, the administration team and second-grade teachers discussed how the teachers felt about using MindPlay.

Data was initially collected in late August and early September when school started. Three highly-trained teachers tested the entire second grade class for AIMSWeb fluency and phonemic awareness benchmarks. Two highly-trained teachers also benchmarked the entire second grade student body via MAP, which tests comprehension. Second-grade teachers, interventionists, resource teachers, and administration shared and discussed data during the initial data day in mid-September. Data day is a half-day meeting where all the data that has been collected is analyzed. Data day allows the various teams to discuss which students are at-risk and need interventions and support.

The administration team continued to monitor MindPlay through monthly meetings with experts from the MindPlay company. Likewise, they held monthly meetings with second-grade teachers and staff to discuss student progress with MindPlay and reading achievement. Students that were considered at-risk went to reading

interventionists that would monitor students' progress every fourteen days. This allowed educators to track fluency progress for their most at-risk students.

The administration team, second-grade team, interventionist, and resource teacher met for the final data day, within this action research study timeframe, on December 12th, 2016. The results for midyear benchmarking were discussed and analyzed. In addition, the educators looked at MindPlay data and discussed an action plan for moving forward with MindPlay as a primary instructional tool. The administration team also met separately afterward, to discuss strengths and concerns noted during the data meeting. In this meeting, additional professional development pieces were added to the plan for teachers.

Chapter Summary

This chapter describes the methods and procedures used to determine if the repeated reading instructional method affected student performance per MAP and AIMSWeb scores. A quantitative inquiry method was used to complete this study. Quantitative inquiry requires the collection and analysis of numerical data to explain phenomena (Mertler, 2014). To complete this study, independent and dependent variables were identified and relationships were tested, using formal instruments. Finally, germane numerical data was compiled and analyzed to answer the defined research question.

CHAPTER 4

FINDINGS AND IMPLICATIONS

The purpose of this study was to examine how a computer-assisted reading program affected reading achievement in four second-grade classrooms within a Title I School. The identified problem of practice at Amazing Elementary School (AES) involved numerous years of underachieving reading performance for underprivileged, racially diverse children. The study explored whether a different intervention technique would increase student reading achievement— specifically, their fluency, phonics, and comprehension— within a Title I context. Therefore, the research question that guided this study was as follows: "What is the impact of the MindPlay computer program on second-grade students' academic achievement in reading?" Data was collected from three different assessment measures before and after implementation, which was conducted during a nine-week period. This chapter analyzes the study's findings and discusses the researcher's interpretations of those results.

Data Collection

The purpose of this quantitative study was to determine if MindPlay, a computer-assisted reading program, would affect students' reading achievement. This study specifically analyzed fluency, phonemic awareness, and comprehension. The nonrandom sample for this study consisted of 45 second-grade students from a Title I elementary school. The repeated-measures t-test was used to analyze results.

Students took three district examinations during this period, including: an AIMSWeb benchmark that tested fluency, an AIMSWeb phonemic segmentation (PSF) assessment that evaluated phonemic awareness, and a Measure of Academic Progress (MAP) assessment that tested comprehension. The AIMSWeb benchmark fluency test, AIMSWeb phonemic segmentation benchmark, and Measures of Academic Progress (MAP) benchmark were given as the pretest and posttest for this action research. Each individual assessment was analyzed using a repeated-measures t-test to see if the MindPlay computer program affected student scores.

Data was initially collected in late August early when school started. Three highly trained teachers tested the entire second grade class for AIMSWeb fluency and phonemic awareness benchmarks. Two highly trained teachers benchmarked the entire second grade class for MAP, which tests comprehension. Second grade teachers, interventionists, resource teachers, and administration shared and discussed data during the initial data day in mid-September. Final data for the study was collected and analyzed in mid-December 2016.

Findings of Study

The AIMSWeb CBM, which measures fluency, fall assessment indicated that 21% of second-graders were performing well below grade level, 26% were performing below grade level, 5% were performing at grade level, and 35% were performing above grade level. Per the AIMSWeb CBM winter assessment, only 16% of second-grade students were well below grade level, an eight-point improvement from the fall. Students at and above grade level also increased: at grade level students increased from 1% to 2%, while those above grade level grew from 33% in August to 40% in December. The

percentage of students receiving below grade-level scores did not fluctuate from August to December.

Table 4.1

AIMSWeb CBM Grade Level Performance & Repeated Measures Statistics

Test Dates	Well Below Grade Level	Below Grade Level	On Grade Level	Above Grade Level
CBM- Aug	24%	42%	1%	33%
CBM- Dec	16%	42%	2%	40%

Table 4.2

AIMSWeb CBM Repeated Measures Statistics

		N	Mean	Std. Deviation
Pair 1	CBM-Aug	45	47.49	34.05
	CBM-Dec	45	70.49	42.14

Table 4.3

AIMSWeb CBM Paired Samples T-test

		Paired Differences Mean	Std. Deviation	t-value	Df	p-value
Pair 1	CBM-Aug CBM-Dec	23.0	2.400	9.5845	44	0.0001

The AIMSWeb PSF, which measures phonemic awareness, fall assessment indicated that 23% of second-graders were performing well below grade level, 55% were performing below grade level, 5% were performing at grade level, and 18% were performing above grade level. On the winter AIMSWeb PSF, 0% of second grade students were well below grade level, a decrease from the 10% of students that were well below grade level in the fall. On grade level students increased from 7% to 14%. Meanwhile, the percentage of above grade level students grew from 21% in August to 34% in December. The percentage of students reading below grade level decreased as well, from 62% to 52%.

Table 4.4

AIMSWeb PSF Grade Level Performance & Repeated Measures Statistics

	Well Below Grade Level	Below Grade Level	On Grade Level	Above Grade Level
CBM- Aug	10%	62%	7%	21%
CBM-Dec	0%	52%	14%	34%

Table 4.5

AIMSWeb PSF Repeated Measures Statistics

		N	Mean	Std. Deviation
Pair 1	PSF-Aug	29	30.90	13.09
	PSF-Dec	29	54.07	14.00

Table 4.6

AIMSWeb PSF Paired Samples T-test

		Paired Differences Mean	Std. Deviation	t-value	Df	p-value
Pair 1	PSF-Aug PSF-Dec	23.17	2.614	8.8649	28	0.0001

The MAP fall assessment, which measures comprehension, indicated that 32% of second-graders were performing well below grade level, 38% were performing below

grade level, 6% were performing at grade level, and 24% were performing above grade level. The winter MAP scores showed a decrease in students performing well below grade level (from 40% to 22%) and those performing above grade level (from 22% to 20%). Students performing below grade level increased from 36% to 56%, while students performing on grade level maintained a 2% proportion.

Table 4.7

MAP Grade Level Performance & Repeated Measures Statistics

	Well Below Grade Level	Below Grade Level	On Grade Level	Above Grade Level
CBM- Aug	40%	36%	2%	22%
CBM-Dec	22%	56%	2%	20%

MAP Repeated Measures Statistic

		N	Mean	Std. Deviation
Pair 1	MAP-Aug	45	165.02	13.10
	MAP-Dec	45	172.16	14.72

Table 4.8

MAP Paired Samples T-test

		Paired Differences Mean	Std. Deviation	t-value	Df	p-value
Pair 1	MAP-Aug MAP-Dec	6.95	1.113	6.2483	44	0.0001

Struggling or at-risk readers improved from a mean AIMSWeb CMB score of 26.79 in fall to a mean score of 46.76 in winter. The obtained p-value from the t-test was equal to 0.0001. At-risk readers' mean AIMSWeb PSF fall score of 30.89 rose to 51.89 in winter. The obtained p-value from the t-test was equal to 0.0001, again indicating improvement. The at-risk mean MAP score of 164.74 in fall improved to a mean score of 172.16 in winter. The obtained p-value from the t-test was equal to 0.0001. These results indicate an improvement in the second-graders' fluency.

Bilingual emergent readers improved from a mean AIMSWeb CMB score of 48.78 in fall to a mean score of 74.56 in winter, p=0.0001. bilingual emergent readers' mean AIMSWeb PSF score of 32.08 in fall improved to a mean score of 53.83 in winter, p=0.0001. Finally, the bilingual emergent learners mean MAP score of 163.22 in fall improved to a mean score of 170.72 in winter, p=0.0001. This p-value indicates an improvement in the second-graders' fluency.

The Hispanic subgroup of readers improved from a mean AIMSWeb CMB score of 47.42 in fall to a mean score of 71.03 in winter, p=0.0001. Hispanic readers' mean AIMSWeb PSF score of 30.89 in fall increased to a mean score of 51.89 in winter, p=0.0001. Their mean MAP score of 164.74 in fall increased to a mean score of 172.16 in winter, p=0.0001. This p-value indicates an improvement in these students' fluency.

The African American subgroup of readers improved from a mean AIMSWeb CMB score of 30.17 in fall to a mean score of 54.67 in winter. The obtained p-value from the t-test was equal to 0.0046, lower than 0.05. This p-value indicates an improvement in the second graders with fluency. African American readers' mean AIMSWeb PSF score of 30.00 in fall more than doubled to a mean score of 63.50 in winter. The obtained p-value from the t-test was equal to 0.0464. This p-value indicated an improvement in the students' fluency. Their mean MAP score of 162.00 in fall also improved to a mean score of 169.50 in winter. The obtained p-value from the t-test was equal to 0.0029. This p-value indicates an improvement in the second graders with fluency.

Lastly, the white subgroup of readers improved from a mean AIMSWeb CMB score of 51.73 in fall to a mean score of 71.33 in winter. The obtained p-value from the t-test was equal to 0.0828. This p-value does not quite indicate an improvement in the second-graders' fluency. White readers' mean AIMSWeb PSF score of 37.80 in fall increased to a mean score of 60.00 in winter. The obtained p-value from the t-test was equal to 0.0398. This p-value indicates an improvement in their fluency. Finally, these students' mean MAP score of 166.67 in fall improved to a mean score of 174.17 in winter. The obtained p-value from the t-test was equal to 0.1972. This p-value does not indicate an improvement in the students' fluency.

Interpretation of Study Results

This study adds to the limited body of research surrounding the use of computer-assisted technology for increasing student reading achievement. Most studies that have been conducted revolving around MindPlay have centered on schools in Arizona and with spelling achievement. In fact, three of the four studies found revolving around MindPlay took place in Arizona. Much of the research is linked to MindPlay with few studies being "conducted by independent entities" (Jensen, 2015, p. 68).

The MindPlay Computer Program is based on the Orton-Gillingham Approach, which is an instructional approach that is "language-based, explicit, multisensory, structured, sequential, and cumulative" (MindPlay Computer Program, 2015). In addition to the skills tested in this study, MindPlay claims it will also help struggling readers improve phonics and vocabulary (MindPlay Computer Program, 2015). The results indicated that using MindPlay had a positive impact on students' reading achievement results in fluency, phonemic awareness, and comprehension. The AIMSWeb CBM descriptive table indicates that the December mean (70.49) was higher than the September mean (47.49), indicating higher levels of fluency. In addition, the AIMSWeb PSF descriptive table indicates that the December mean (54.07) was higher than the September mean (30.90), indicating higher phonemic awareness. Finally, the MAP descriptive table showed the December mean (172.16) was higher than the September mean (165.02), indicating higher levels of comprehension. Therefore, we can conclude that the second-grade students participating in the action research study improved their fluency, phonemic awareness, and comprehension.

Overall, the students who used MindPlay showed improvement in their reading achievement, in the majority of the tested ethnic subgroups. It is interesting to note that of all the examined subgroups, the white subgroup was the only set of students that did not show statistical improvement. There were only 6 test subjects within that subgroup, however. In addition, there was a major outlier within that subgroup: one of the students missed a large majority of the study due to an illness, which could affect the group's degree of improvement. Even with the improvement in overall reading achievement, the results were not as substantial as the administration team and second-grade teachers had expected when looking in terms of below, on, and above grade level.

Reflection

Reflection was a continuous process throughout this action research study. Mertler (2014) defined reflection as thinking critically about what you are doing, why, and what effects take place. Administrators met continuously throughout this action research study to discuss student progress and teacher implementation. In addition, administrators met continuously with the second-grade team to discuss results, feelings, and observations. The final meeting stage between the administrators proved to be most useful in planning for next steps after analyzing the data and noting concerns.

Chapter Summary

The purpose of this chapter is to analyze the findings of the study and to discuss interpretations of those results. The purpose of this study was to examine how a computer-assisted reading program affected four second-grade classrooms' reading achievement within a Title I School. The identified problem of practice at Amazing Elementary School (AES) involved numerous years of underachieving reading

achievement for underprivileged, racially diverse children. The study explored whether a different intervention technique would increase student reading achievement, specifically fluency, phonics, and comprehension, within a Title I context. Data analysis indicated that MindPlay did assist in increasing student reading achievement, specifically fluency, phonemic awareness, and comprehension. MindPlay guarantees to their customers that struggling readers will improve their reading performance through using their program.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND ACTION PLAN

The purpose of this study was to examine how a computer-assisted reading program affected reading achievement in four second grade classrooms within a Title I School. The identified problem of practice at Amazing Elementary School (AES) involved numerous years of underachieving reading achievement for underprivileged, racially diverse children. Many primary students at AES are considered "at-risk" given their reading results. The study explored whether using the MindPlay intervention technique as a supplement to regular language instruction would increase student reading achievement, specifically in fluency, phonics, and comprehension, within a Title I context. Therefore, the research question that guided this study was, "What is the impact of the MindPlay computer program on second grade student's academic achievement in reading?"

The main goal of this action research study was to evaluate the effect of the MindPlay computer program on second-grade student participants' reading scores, based on the MAP, AIMSWeb, and Fountas and Pinnell tests. The secondary purpose of the study was to describe the MindPlay computer program as a reading intervention tool for elementary students at AES. The tertiary purpose was to develop an action plan in conjunction with teacher-participants, to implement MindPlay more widely. This chapter

discusses the action plan that was developed based on the findings that were analyzed in Chapter 4.

The results of this action study indicated that there was growth for the second-grade students in reading. The AIMSWeb CBM descriptive table indicates that the December mean (70.49) was higher than the September mean (47.49), indicating higher levels of fluency. In addition, the AIMSWeb PSF descriptive table indicates that the December mean (54.07) was higher than the September mean (30.90), indicating higher phonemic awareness. Finally, the MAP descriptive table showed the December mean (172.16) was higher than the September mean (165.02), indicating higher levels of comprehension. The t test results proved that MindPlay improved reading literacy in fluency, phonemic awareness, and comprehension.

The participants included 45 second-grade students at a small Title I school: 6 African American students, 30 Hispanic students, 6 white students, and 3 students that identify as other or mixed ethnicities. Furthermore, 27 of the participants were considered Bilingual emergent students, and 7 were receiving resource services. Students were given a pretest prior to the implementation of MindPlay and a posttest after the nine-week period. Students took a district AIMSWeb benchmark that tested fluency, a district AIMSWeb phonemic segmentation (PSF) assessment that evaluated phonemic awareness, and a district Measure of Academic Progress (MAP) assessment that tested comprehension. A repeated measures t-test analysis was used to determine the students' performance growth. The results indicated there was an increase in student reading achievement in fluency, phonemic awareness, and comprehension following the nine weeks of treatment.

Overview of the Study

Reading is a fundamental skill that facilitates academic success, personal independence, and reliable employment (Calhoon, 2005). However, since 2011 reading scores have remained stagnant, with 62% of students scoring less than proficient. Per the Annie E. Casey Foundation (2014), third-grade students who read proficiently are more likely to be successful after graduating from high school. Studies have shown that students who fail to graduate from high school cost society an estimated $260,000 in lost earnings, taxes, and productivity (Fiester, 2010). Furthermore, by 2020 the United States may face a labor shortage due to potential workers lacking educational credentials (Annie E. Casey Foundation, 2014). This knowledge has propelled illiteracy into a national concern rather than an individual issue. MindPlay is a computer-assisted literacy program that prides itself on transforming struggling readers into readers that are on grade-level.

MindPlay provides individualized practice in phonics, fluency, vocabulary, and comprehension. It also helps students stay focused and accelerate their reading progress (MindPlay, 2015). After an initial assessment, MindPlay "builds a unique prescription plan for every student and begins teaching to the student's specific gaps" (Chambers, Mather, & Stoll, 2013, p. 5). It provides individual instruction with virtual reading coaches and speech pathologists that provide immediate feedback. The technology-based reading solution is systematic, repetitive, and rule-based (Chambers, Mather, & Stoll, 2013). Originally developed for dyslexic students, the Orton-Gillingham Approach has been proven to help struggling readers, spellers, and writers (Academy of Orton-Gillingham Practitioners and Educators, 2012).

The Action Researcher

This study was guided by an action research methodology. Action research is a systematic process conducted by invested participants to gather inquiry within one's own practice (Mertler, 2014). In other words, action research is performed when professionals conduct research within their local settings to investigate topics of interest. Therefore, the action researcher acted as a curriculum leader in data collection and data analysis. The action researcher in the assistant principal in the Title I school where the research was conducted, which made gathering and analyzing data easy.

Action research is described as a cyclical process that contains four stages. Mertler (2014) defined the four-stage procedure as planning, acting, developing, and reflecting. Throughout the four phases of action research, the action researcher often occupied an insider/outsider status. She acted as an insider through data collection and through reflection with teachers and the administration team, regarding student progress and MindPlay questions or concerns. In addition, the researcher acted as an insider by meeting with MindPlay representatives throughout the implementation phase. However, the researcher also acted as an outsider during the action research in that she did not implement the intervention strategy personally or evaluate teachers on their implementation practices.

The action researcher, acting as the assistant principal, did observe teachers utilizing MindPlay throughout the implementation. Some teachers were very reluctant to have students use MindPlay because they did not want to use technology. A lot of teachers initially complained that "two hours takes up too much instructional time" or "students cannot use computers individually without assistance." One of the major

questions that emerged from these observations and comments was how to create teacher buy-in. However, with the help of an interventionist that truly believed in the program, teachers began to see the progress their students were making. This created a sense of excitement and eagerness to use the program. The primary concern the action researcher discovered through these informal observations was that teachers were not utilizing the program as initially presented. In all the observations, the action researcher conducted, both the morning tutorial and classroom use, teachers had students on MindPlay. However, the teacher was not working with students within the program. The teachers would be talking during the morning tutorial or working in the classroom during instructional time. The action researcher and administrative team decided that one component of the action plan would have to be more direct instruction between teachers and the online computer program. One of the components of the action plan will be professional development for teachers emphasizing blended literacy instruction with the computer program.

Students in the study spent 30 minutes per day using the MindPlay computer program to meet fidelity. A question that emerged from the teachers implementing the strategy now was how to ensure that struggling readers met the fidelity requirements. Students who were identified as "at-risk" spent extra time in MindPlay through various avenues. The school offers a morning tutorial every day, intervention throughout the day, and an afterschool tutoring session once a week. An internal timer contained in the MindPlay program recorded active time spent in the learning sequences for individual students to monitor fidelity. The action research revealed that fidelity was not being fully met in any of the second-grade classrooms. Approximately half of the students were

meeting fidelity. The students meeting fidelity were in the morning tutorial, intervention program, and classroom instruction.

Action Plan

The data included the amount of time students spent in MindPlay, as well as district benchmarks that tested fluency, phonemic awareness, and comprehension. Students were given a pretest prior to the implementation of MindPlay and a posttest after the nine-week period. Specifically, students took a district AIMSWeb benchmark that tested fluency, a district AIMSWeb phonemic segmentation (PSF) assessment that evaluated phonemic awareness, and a district Measure of Academic Progress (MAP) assessment that tested comprehension. A repeated measures t-test analysis was used to determine the growth in student performance. The results indicated there was an increase in reading student achievement in fluency, phonemic awareness, and comprehension following the nine weeks of treatment. Results from the analysis were used to formulate conclusion and recommendations for Chapter 5.

The results indicated using MindPlay had a positive impact on student reaching achievement results in fluency, phonemic awareness, and comprehension. The AIMSWeb CBM descriptive table indicated that the December mean (70.49) was higher than September (47.49) indicating higher levels of fluency. In addition, the AIMSWeb PSF descriptive table indicated that the December mean (54.07) was higher than the September mean (30.90), indicating higher phonemic awareness. The MAP descriptive table showed the December mean (172.16) was higher than the September mean (165.02), indicating higher levels of comprehension. Therefore, we can conclude that the second-grade students participating in the action research study improved their reading

fluency, phonemic awareness, and comprehension. Given that AES has an overwhelming number of bilingual emergent students, a question emerged about how the MindPlay program affected bilingual emergent students' reading achievement scores. bilingual emergent readers improved from a mean AIMSWeb CMB score of 48.78 in fall to a mean score of 74.56 in winter. bilingual emergent readers' mean AIMSWeb PSF score of 32.08 in fall increased to a mean score of 53.83 in winter, while their mean MAP score of 163.22 in fall jumped to a mean score of 170.72 in winter. This result confirms that the bilingual emergent students showed growth in fluency, phonemic awareness, and comprehension. Indeed, the results of the MindPlay computer program showed improvement in students' overall reading achievement and within most of the subgroups. However, these improvements were not as substantial as the administration team and second grade teachers had expected in terms of students scoring below, on, and above grade level.

Having completed this action research, it is evident that second-grade students are weak in fluency, phonemic awareness, and comprehension. The results of this action study have made substantial changes to the school and district. The district is considering purchasing MindPlay for the entire district in stages based on the results. The school administration team and superintendents decided to continue MindPlay for the remainder of the 2016-2017 school year. The hope is that MindPlay will continue increasing student fluency, phonemic awareness, and comprehension schoolwide, based on the growth that was shown from the August through December treatment. The administrators of the school also decided to reach out to the MindPlay coordinators to plan an in-depth professional development seminar that will focus on how to use the program for

instructional purposes. Furthermore, the school district decided to purchase licenses for kindergarten through fifth-grade students who are two or more years behind grade level on MAP, for all Title I schools in the district in the next year. District Title I funding will be used to pay for the student licenses. The district research team will analyze state and district data to determine which students meet the criteria to receive these licenses. Based on results from the Title I Schools progress, the district will purchase MindPlay licenses for the entire district the following year.

Table 5.1

AES Action Research Plan

Action	Responsibility
AES second-grade teachers will continue to implement MindPlay with fidelity for the remainder of the 2016-2017 school year	Second-grade teachers are responsible for implementing MindPlay
AES will provide professional development (lecture, modeling, co-teaching) on how to blend literacy instruction with MindPlay	The principal and instructional coach will develop and implement the professional development mode

Table 5.1

District Action Research Plan

Action	Responsibility
The school district will continue to pay for MindPlay licenses	School district personnel will use Title I funds for the remainder of the 2016-2017 school year to maintain MindPlay data
The school district will pay for MindPlay licenses for all Title I schools for the 2017-2018 school year	School district personnel will use Title I funds for the 2017-2018 school year to purchase MindPlay licenses for students reading two years or more below grade level
A district research team will analyze elementary Title I students' state and district scores	The district research team will analyze results to determine the number of needed licenses
The district will purchase MindPlay licenses for the 2017 Read to Succeed Summer Camps with Grant Money	The district project coordinator will write a grant and purchase licenses to be used during the 20-day summer camp. The lead administrator will analyze testing results.

Facilitating Educational Change

The school district where AES is located is heavily interested in developing personalized learning communities within all its schools. This movement puts technology in Title I schools, where students do not have such means at home. MindPlay is a high-potential instructional tool that will improve student achievement in reading. Most students who read two years or more below grade level attend Title I schools. Teachers that utilize MindPlay as a supplement to effective literacy instruction have the potential to provide high-poverty students the tools and knowledge to become literacy rich. This could provide Title I students the opportunity to become academically successful, creating personal independence and reliable employment.

Bilingual emergent learner cultural differences could have posed another limitation. While bilingual emergent performance was not the focus of the study, 60% of the test subjects were bilingual emergent. The school district focuses on teaching bilingual emergent students English so they can pass state tests. There is little regard for truly educating these students and embracing their heritage.

While the federal government has not mandated a specific type of education, such as bilingual education (Crawford & Krashen, 2007); South Carolina, like approximately 30 other states, follows an English only statute. This means that classroom instruction can only be taught in English (Tse, 2001). In 2002, the No Child Left Behind Act (NCLB) removed all bilingual text and does not mandate how best to teach bilingual emergent learners. However, the accountability system provides incentives to schools that teach in English only (Crawford & Krashen, 2007).

In 1974 schools were called into question for the equal education policies towards bilingual emergetn students. The *Lau v. Nichols (1974)* court case established schools must take actions to provide equal access to curriculum for bilingual emergent learners and not just focus on language acquisition (Lucas & Katz, 1994). It interesting to note that many of NCLB accountability requirements go directly against the precedents that were established under *Lau v. Nichols (1974)*. For example, the state mandated testing requires bilingual emergent students to take state tests that are English based (Crawford & Krashen, 2007). Many school districts still focus on language acquisition as the primary goal due to the state assessment mandates.

In a perfect world, our school system would implement a bilingual program to help all our students become truly competitive graduates. Bilingualism is a standard in many other countries (Baker, 2001). The school district most likely does not have the time and money to invest in such an educational overhaul. Therefore, it is recommended that bilingual emergent students are taught according to need. The district needs to consider not only helping students learn English but become academically successful while embracing and honoring their heritage. MindPlay is setup to assist bilingual emergent learners by using their native language in addition to English to teach them to read.

Suggestions for Future Research

The literature review revealed that students improve reading skills when using computer-assisted instruction (Tillman, 2009). Computer programs, like MindPlay, are often systematic, repetitive, and rule-based (Chambers, Mather, & Stoll, 2013). The analysis in this study revealed there was an increase in reading student achievement in

fluency, phonemic awareness, and comprehension following the nine weeks of treatment with MindPlay. These results were like those of Jensen (2015) in regards to second graders, which indicated there was an effect on students' fluency growth using MindPlay. The results of the study mirrored the results of Beechler and Williams (2012), indicating the computer-assisted technology aids in reaching achievement for bilingual emergent learners. Further scientific research studies conducted on similar software programs would provide more evidence to help leadership make important decisions that affect budgets and classroom instruction. Teachers need scientific research that explains how computer-research programs affect student progress in foundational reading skills.

Conclusion

The purpose of this study was to examine how a computer-assisted reading program affected reading achievement in four second grade classrooms within a Title I School. Based on quantitative analysis, the study's results indicated an increase in student reading achievement in fluency, phonemic awareness, and comprehension following the nine weeks of treatment. However, further research is needed to determine whether MindPlay will be a useful tool within the district, especially in a non-Title I school context. The site-based leadership team has also concluded that more professional development is needed to assist teachers in using MindPlay as a collaborative tool.

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APPENDIX A – TIMELINE OF STUDY

The study adhered to the following schedule:

July, 2015	Submit expedited/full review application form to the University of South Carolina Institutional Review Board.
August, 2015	Submit request to conduct research to school's district office. Permission has been obtained.
August, 2015	Meet with teachers to discuss research and provide professional development with MindPlay representatives.
August 18, 2016	Send home consent letters with students.
August 22- September 2, 2016	Collect baseline data: Compile results from MAP, AIMSWeb PSF, AIMSWeb CBM
September 6 -December 16, 2016	Implement MindPlay
December 1-16, 2016	Administer posttest: Compile results from MAP, AIMSWeb PSF, AIMSWeb CBM
January, 2017	Analyze data. Draw conclusion. Write research report.
February, 2017	Defend dissertation.

APPENDIX B – PARENTAL CONSENT

Informed Parental Consent

You are invited to have your child become a volunteer in a research study being conducted by Kara Mann, a doctoral student in the Education program at the University of South Carolina. The study will begin in August after AIMSWeb and Fountas and Pinnell benchmarking, and end in December after students have taken the winter AIMSWeb and Fountas and Pinnell benchmarking. Please read this form and indicate whether you give consent for your child to participate. Your child was selected as a possible participant because of their stage of reading development that is associated with students in third grade. We ask that you read this form carefully, and ask any questions you may have before agreeing for your child to be in the study.

Researcher: ***Kara Mann***, Ed.D., candidate, University of South Carolina.

Inquiries: The researcher will gladly answer any inquiries regarding the purpose and procedures of the present study. Please send all inquiries via email at klmann@email.sc.edu.

Background Information
The purpose of this research study is to better understand if a specific reading instructional strategy can improve students' overall reading achievement.

Procedures:
With informed parental consent, your son or daughter's data from the AIMSWeb and Fountas and Pinnell benchmarks will be accessed by the researcher and analyzed to determine the effectiveness of the instructional strategy utilized in this study. Identifying information will only be provided to the researcher. The researcher will take precautions to protect participant identity by not using the names of participants, classrooms, or the school in her results or writing. The researcher will use the assessment results for dissertation, publication, and presentation purposes.

Participant Risks
No study is without risk. However, the risks are minimal and no more than the participant would encounter in everyday life. As a result of this study, awareness of uncomfortable and unpleasant thoughts associated with the experience may increase. The study may involve additional risks to the participants, which are currently unforeseeable. The type of research being conducted makes it unlikely that the researcher will become privy to information that triggers the mandatory reporting requirements for child abuse, child neglect, elder abuse, or intent to harm self or others. However, if the researcher does

become privy to information that triggers the mandatory reporting requirements for child abuse, child neglect, elder abuse, or intent to harm self or others, reporting procedures will be followed.

Participant Benefits
There are benefits for participating in this research project. Participants may increase their overall reading achievement and reading motivation. The findings from this study may also assist educators in planning effective reading instruction. Specifically, information from this study will provide educators with valuable insight into students' motivations, attitudes, and the skills needed to become a proficient reader. This knowledge can assist them in providing a more enjoyable environment and learning experience for students in future language arts classes.

Confidentiality:
The records of this study will be kept private. In any sort of report that the researcher might publish, she will not include any information that would make it possible to identify an individual subject. Research records will be stored securely and only the researcher will have access to the records. All answers to the survey questions and scores on the AIMSWeb and Fountas and Pinnell benchmarks will be kept confidential to the extent allowed by law, and identified only by a subject code number. Your son or daughter's name will not appear in any of the published results and reports for this study. No individual responses will be reported. Only coded group findings will be reported. The researcher will store all research documentation on a password-protected computer database on her personal computer, used for education and university purposes, for a duration of three years, and will then delete the documentation from the computer database. Any hard copies of the data will be stored in a locked filing cabinet and shredded at the end of three years.

Voluntary Participation:
Your son or daughter's participation is totally voluntary and he or she may stop participating at any time. Your consent may likewise be withdrawn at any time without prejudice, penalty or loss of benefits to which your child is otherwise entitled.

Contacts and Questions:
The principal researcher conducting this study is Kara Mann. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact the researcher at 864-355-1032 by email at klmann@email.sc.edu
This research project is being conducted under the direction of Dr. Kenneth Vogler, Ed.D. Associate Professor, University of South Carolina. He can be contacted at (803) 777-3094 or by email at kvogler@mailbox.sc.edu. If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **you are encouraged** to contact the Institutional Review Board, Dr. Christine DiStefano, Chair, 1600 Hampton Street, Suite 414, Columbia, SC 29208 or email distefan@mailbox.sc.edu.

Statement of Consent:

I have read and understood the above information. I have been given the opportunity to ask questions and have received answers. I give my informed consent for my child to participate in the study.

Signature of parent or guardian:_____ Date: _____
(If minors are involved)

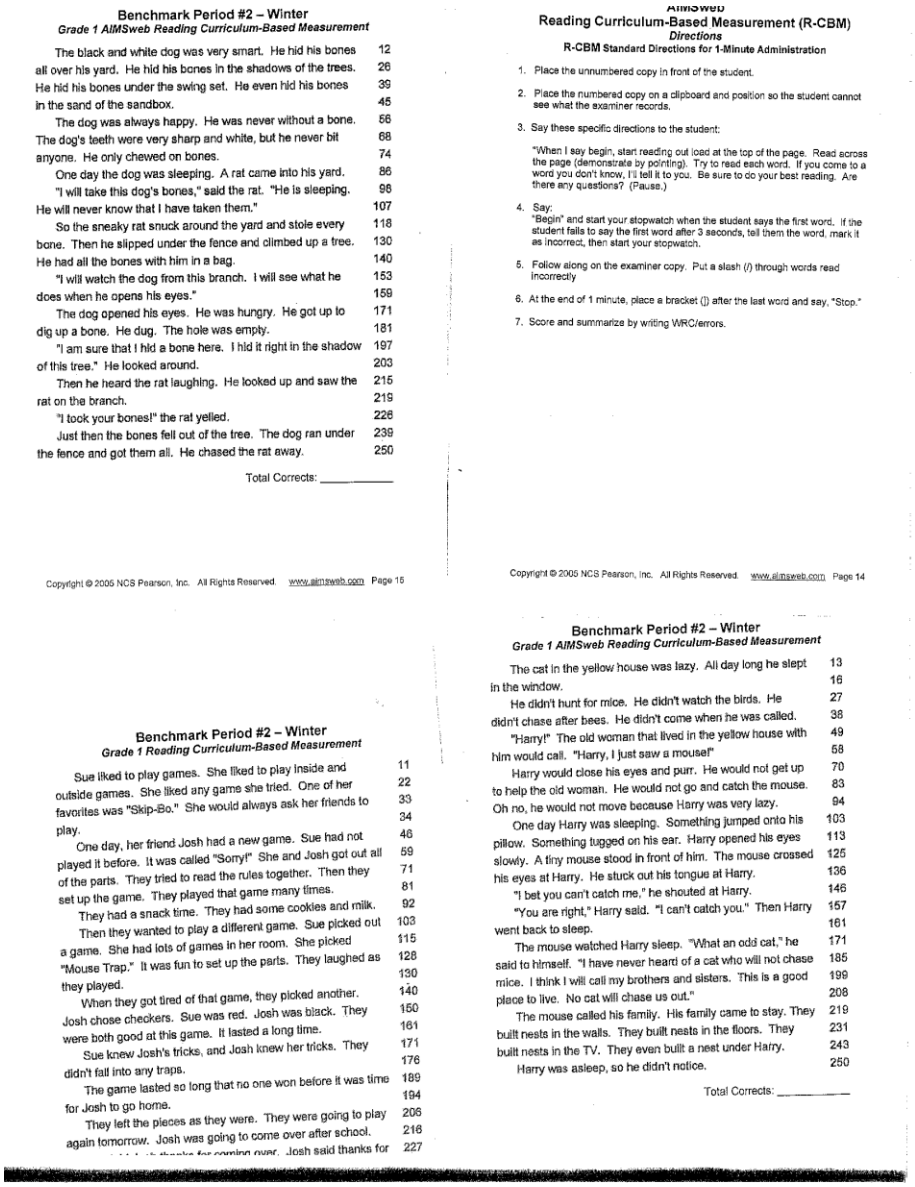
Printed name of parent or
guardian:_____

Child's name:
_____

Signature of Investigator:_____ Date:
_____

You will be given a copy of this information to keep for your records.

APPENDIX C- AIMSWEB BENCHMARK



Benchmark Period #2 – Winter
Grade 1 AIMSweb Reading Curriculum-Based Measurement

The black and white dog was very smart. He hid his bones 12
all over his yard. He hid his bones in the shadows of the trees. 26
He hid his bones under the swing set. He even hid his bones 39
in the sand of the sandbox. 45
The dog was always happy. He was never without a bone. 56
The dog's teeth were very sharp and white, but he never bit 68
anyone. He only chewed on bones. 74
One day the dog was sleeping. A rat came into his yard. 86
"I will take this dog's bones," said the rat. "He is sleeping. 96
He will never know that I have taken them." 107
So the sneaky rat snuck around the yard and stole every 118
bone. Then he slipped under the fence and climbed up a tree. 130
He had all the bones with him in a bag. 140
"I will watch the dog from this branch. I will see what he 153
does when he opens his eyes." 159
The dog opened his eyes. He was hungry. He got up to 171
dig up a bone. He dug. The hole was empty. 181
"I am sure that I hid a bone here. I hid it right in the shadow 197
of this tree." He looked around. 203
Then he heard the rat laughing. He looked up and saw the 215
rat on the branch. 219
"I took your bones!" the rat yelled. 226
Just then the bones fell out of the tree. The dog ran under 239
the fence and got them all. He chased the rat away. 250

Total Corrects: _____

AIMSweb
Reading Curriculum-Based Measurement (R-CBM)
Directions
R-CBM Standard Directions for 1-Minute Administration

1. Place the unnumbered copy in front of the student.
2. Place the numbered copy on a clipboard and position so the student cannot see what the examiner records.
3. Say these specific directions to the student:

   "When I say begin, start reading out loud at the top of the page. Read across the page (demonstrate by pointing). Try to read each word. If you come to a word you don't know, I'll tell it to you. Be sure to do your best reading. Are there any questions? (Pause.)
4. Say:
   "Begin" and start your stopwatch when the student says the first word. If the student fails to say the first word after 3 seconds, tell them the word, mark it as incorrect, then start your stopwatch.
5. Follow along on the examiner copy. Put a slash (/) through words read incorrectly
6. At the end of 1 minute, place a bracket (]) after the last word and say, "Stop."
7. Score and summarize by writing WRC/errors.

Benchmark Period #2 – Winter
Grade 1 Reading Curriculum-Based Measurement

Sue liked to play games. She liked to play inside and 11
outside games. She liked any game she tried. One of her 22
favorites was "Skip-Bo." She would always ask her friends to 33
play. 34
One day, her friend Josh had a new game. Sue had not 46
played it before. It was called "Sorry!" She and Josh got out all 59
of the parts. They tried to read the rules together. Then they 71
set up the game. They played that game many times. 81
They had a snack time. They had some cookies and milk. 92
Then they wanted to play a different game. Sue picked out 103
a game. She had lots of games in her room. She picked 115
"Mouse Trap." It was fun to set up the parts. They laughed as 128
they played. 130
When they got tired of that game, they picked another. 140
Josh chose checkers. Sue was red. Josh was black. They 150
were both good at this game. It lasted a long time. 161
Sue knew Josh's tricks, and Josh knew her tricks. They 171
didn't fall into any traps. 176
The game lasted so long that no one won before it was time 189
for Josh to go home. 194
They left the pieces as they were. They were going to play 206
again tomorrow. Josh was going to come over after school. 216
Josh thanks for coming over. Josh said thanks for 227

Benchmark Period #2 – Winter
Grade 1 AIMSweb Reading Curriculum-Based Measurement

The cat in the yellow house was lazy. All day long he slept 13
16
in the window.
He didn't hunt for mice. He didn't watch the birds. He 27
didn't chase after bees. He didn't come when he was called. 38
"Harry!" The old woman that lived in the yellow house with 49
him would call. "Harry, I just saw a mouse!" 58
Harry would close his eyes and purr. He would not get up 70
to help the old woman. He would not go and catch the mouse. 83
Oh no, he would not move because Harry was very lazy. 94
One day Harry was sleeping. Something jumped onto his 103
pillow. Something tugged on his ear. Harry opened his eyes 113
slowly. A tiny mouse stood in front of him. The mouse crossed 125
his eyes at Harry. He stuck out his tongue at Harry. 136
"I bet you can't catch me," he shouted at Harry. 146
"You are right," Harry said. "I can't catch you." Then Harry 157
went back to sleep. 161
The mouse watched Harry sleep. "What an odd cat," he 171
said to himself. "I have never heard of a cat who will not chase 185
mice. I think I will call my brothers and sisters. This is a good 199
place to live. No cat will chase us out." 208
The mouse called his family. His family came to stay. They 219
built nests in the walls. They built nests in the floors. They 231
built nests in the TV. They even built a nest under Harry. 243
Harry was asleep, so he didn't notice. 250

Total Corrects: _____

APPENDIX D- MAP SAMPLE