EFFECT OF EBOOKS ON READING LEVEL, READING BEHAVIORS AND ATTITUDE OF SECOND GRADE STUDENTS

by
Annette Marie VanAken
Liberty University

A Dissertation Presented in Partial Fulfillment
Of the Requirements for the Degree
Doctor of Education

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ABSTRACT

This study investigated the effect of ebooks as a tool for providing small group reading interventions and independent reading practice to second grade readers in the classroom. A quasi-experimental, pretest–posttest, non-equivalent control group design was used to compare whether instructional reading environments (ebooks only, traditional books only or both ebooks and traditional books) effect reading level, and attitudes towards reading, while a posttest only non-equivalent control group design was used to measure reading behaviors of second grade students. A convenience sample of 88 English speaking students, at a rural, public elementary school in Southern Michigan participated. Reading level was measured by the Developmental Reading Assessment 2® (DRA2®) measuring independent reading level. Data was also collected utilizing the Elementary Reading Attitudes Survey (ERAS) a 20 minute group assessment containing 20 questions to determine participants' reading attitudes. Self-report reading logs were used to determine reading behaviors. The experimental groups consisted of second grade students from three of the four second grade classrooms, while the control group participants were students in the remaining classroom. Reading level and ERAS data were analyzed using ANCOVAs to compare the four groups with pretest scores providing statistical control, while one between–groups ANOVA assessed reading behavior. The results of the study revealed instructional reading environment effected reading levels and reading attitudes, but did not influence reading behaviors.

Keywords: *Cognitive load theory, working memory, Social cognitive theory, zone of proximal development.*

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List of Abbreviations

Analysis of Covariate (ANCOVA)

Analysis for Variance (ANOVA)

Developmental Reading Assessment® (DRA2®)

Ebooks only (EB)

Ebook Instruction and Choice Practice (EBC)

Elementary and Secondary Education Act (ESEA)

Elementary Reading Attitudes Survey (ERAS)

Institutional Review Broad (IRB)

International Reading Association's (IRA)

Michigan Educational Assessment Progress (MEAP)

National Assessment of Educational Progress (NAEP)

No Child Left Behind Act (NCLB)

Oral Reading Fluency (ORF)

Traditional Books Only (TB)

Traditional Books and Choice Practice (TBC)

Zone of Proximal Development (ZPD)

CHAPTER ONE: INTRODUCTION

Ebooks offer educators and students an additional format for reading. Ebooks have the potential to support or enhance learning; however, empirical studies of ebooks as an instructional tool with transitional readers in different instructional reading environments are lacking. This study investigated ebooks as an alternative reading format to traditional print books in four instructional reading environments: (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice.

Teaching reading is a primary focus for elementary educators and administrators. A foundational skill for school-based learning, reading is critical to future academic and vocational opportunities (Lesnick, Gorerge, Smithgall, & Gwynne, 2010). Yet, according to the National Assessment of Educational Progress (NEAP) report, sixty-six percent of fourth graders in the United States are reading below a proficient level (National Center for Education Statistics, 2013). Educational efforts have been made to address this issue as research has indicated that students reading below grade level in third grade continue to struggle throughout their academic activities (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996) and are more likely to be unemployed or earn incomes below the poverty level than students reading at or above grade level (Kutner, Greensberg, Boyle, Hsu, & Dunleavy 2007). Recognizing the need to increase reading levels and to reduce the achievement gap by end of third grade, the United States Department of Education adopted the No Child Left Behind Act of 2001 (NCLB) to guide educators. An

additional critical component of NCLB for educators is the Enhancing Education Through Technology Act of 2001 (EETT), designed to assist every student in becoming technology literate by the end of eighth grade (Enhancing Education Through Technology Act of 2001, 2002).

Long-term effects of reading ability outcomes and policies requiring technology integration have increased the purchase of technology tools such as mobile devices in the K–12 school systems (Gray, Thomas, & Lewis, 2010). However, evidence indicating the effectiveness of reading on mobile devices in different instructional reading environments is needed. In the *2012 Horizon report*, Johnson, Adams, and Cummins (2012) suggested tablets as an alternative learning format to print materials for K–12 institutions and described them as ideal devices for learning because of their portability, display, and touch screens. In particular, Johnson, Smith, Willis, Levine, and Heywood (2011) projected widespread ebook adoption within one year or less due to the increased access to mobile devices, suggesting the potential of ebooks to transform the reading experience. As adoption of ebooks read on personal hand held devices increases in K–12 classrooms, examining how this reading format affects the learners' reading levels, reading attitudes, and reading behaviors in different instructional reading environments is imperative. As reading acquisition is not an innate ability but a complex learned process (Dehaene & Cohen, 2007), researchers and educators search to discover the most effective reading practices and tools to teach reading. Chapter one will provide background information for understanding the importance of learning to read and the influence of ebooks on reading within the school setting. In particular it will focus on ebook potential, emphasizing the need to investigate ebook influences on reading achievement, reading

attitudes, and reading behaviors in the classroom. The remainder of chapter one is a theoretical framework guiding the research and a brief overview of the research plan, identification the problem, research assumptions, and limitations.

Background

Importance of Learning to Read

Learning to read is not an innate ability (Dehaene & Cohen, 2007). Although most children are born with the biological brain structures that will mature and develop allowing them to learn how to read, they do not intrinsically know how to read (Frey & Fisher, 2010). Therefore, learning to read is a complicated process requiring active involvement on the part of the learner (An, 2013).

Central to reading progress is the development of reading proficiency. Prior to the end of their third grade year, most children are transitioning from learning to read to reading to learn (Armbruster, Lehr, Osborn, & Adler, 2001). Following this transition, readers are expected by education systems to continue developing higher levels of reading proficiency to master the increasingly difficult subject content (Lesnick et al., 2010). For decades, researchers have suggested that literacy proficiency is a critical factor of academic, social, and economic success (Foster & Miller, 2007; Kaniuka, 2010; Kutner et al., 2007; Snow, Burns, & Griffin, 1998). Directly related to literacy proficiency is the reader's ability to read text fluently. The National Reading Panel (2000) stated that fluency is a basic component in reading comprehension, as both fluency and comprehension are necessary indicators of individual reading level.

Reading attitude is another factor that influences academic performance (Allen, Cipielewski, & Stanovich, 1992; Askov & Fischbach, 1973; Kaniuka, 2010; Martinez,

Aricak, & Jewell, 2008) and is related to reading behaviors (Allen et al., 1992; McKenna, Conradi, Lawrence, Jang, & Meyer, 2012; McKenna, Kear, & Ellsworth, 1995). Researchers have shown that attitudes toward reading develop over time, tending to be more positive in younger children, decrease with age, and are related to the level of reading competency (McKenna et al., 1995). Understanding how ebooks on personal devices can be utilized in different instructional reading environments and can affect reading behaviors and attitudes is essential for helping educators in their quest to enhance instruction through technology integration.

The Influence of Ebooks on Reading

Technology's rapid growth over the past few decades and educators' increased interest in ebooks as an alternative to traditional books has raised questions regarding the potential influences ebooks may have on reading. Electronic books can be traced back to Project Gutenberg in 1971, when Michael Hart created the first ebook (Lebert, 2005). These early e-texts provided a new reading format, creating a different instructional reading environment from which individuals could access reading materials. In the 1990s, ebooks on CD-ROMs delivered on desktop computers became the ebook format used in the classroom (Broderbund, 2012; Chesser, 2011). These early ebooks offered animated features capturing an individual's interest by providing options to read the story, listen to a narrated version, activate hotspots to make these books come alive, and turn on games options (Matthew, 1996). Educators readily exposed students to these electronic versions of popular children's literature with very little information regarding how ebooks affect literacy development (Hallstrom & Gyberg, 2011; Norris, Sullivan, Poirot, & Soloway, 2003; Reinking, 1997).

Books read in electronic format are different than traditional print books. The electronic reading format or ebook format changes the nature of reading, altering acquisition of fundamental skills such as word recognition and comprehension (Ertem, 2010; Felvégi & Matthew, 2012). In an effort to provide critical information to educators and policy makers regarding effective ebook integration in the classroom, researchers have been exploring various features, qualities, and instructional approaches. Mixed results indicated that ebooks have the potential to positively (Doty, Popplewell, & Byers, 2001; Korat & Shamir, 2012; Matthew, 1996; Pearman, 2008) and negatively (de Jong & Bus, 2002; Labbo & Kuhn, 2000; Shamir & Korat, 2006) influence literacy development.

Benefits revealed by researchers suggested that CD-ROM ebooks provided immediate help to the reader (Doty et al., 2001; Pearman, 2008) and increased reading comprehension (Doty et al., 2001; Korat & Shamir, 2012; Matthew, 1996; Pearman, 2008). These multisensory formats supported the process of constructing meaning and enhanced literacy development when assistive features, such as narrations, sound effects (Oakley & Jay, 2008; Pearman, 2008), highlighted text, repeat capabilities, and game modes (Shamir & Korat, 2009) were congruent with the text (Ertem, 2010; Matthew, 1996; Pearman 2008). In addition, when using ebooks, the reader's ability to control assistive features to support meaning construction has been documented as a benefit over traditional books (Lefever-Davis & Pearman, 2005). An example is the narrative assistive feature, which can assist a reader with unknown words, providing minimum interruption to comprehension processing, reducing cognitive energy required by decoding (Lefever-Davis & Pearman, 2005).

The use of congruent assistive features has been noted to support literacy development. Researchers have revealed that independent use of CD-ROM ebooks with congruent features provided similar reading comprehension results as traditional books read out loud by an adult (de Jong & Bus, 2004; Korat, 2010; Korat & Shamir, 2007) with superior results for ebooks used along with adult guidance (Korat, Segal-Drori, & Klein, 2009). However, the proficiency level of the reader impacted which skills were enhanced through the ebook environment (de Jong & Bus, 2002; Korat et al., 2009; Korat & Shamir, 2008). Supported by Sweller's (1988, 2010a) cognitive load theory based on the idea that cognitive capacity in working memory is limited, assistive narrative features help students reduce working memory load, thus allowing more working memory to process meaning for better comprehension (Pearman, 2008). Results regarding assistive features of ebooks were further supported with Vygotsky's (1978) theory of zone of proximal development (ZPD). Ebook features may provide scaffolding, allowing students opportunities to acquire new knowledge that was not possible when they read traditional texts independently.

Researchers have also found that ebooks may have detrimental effects on reading development. Features such as illustrations, games, and animations that are incongruent to the reading task can reduce comprehension (de Jong & Bus, 2002; Labbo & Kuhn, 2000; Shamir & Korat, 2006). Such features were reported to distract readers, possibly delaying literacy development (de Jong & Bus, 2002; de Jong & Bus, 2003; Labbo & Kuhn, 2000; Matthew, 1996; Roskos, Burstein, You, Brueck, & O'Brien, 2011; Shamir & Korat, 2006). Simultaneous activation of multimedia features may also negatively influence comprehension (de Jong & Bus, 2003). In addition, ergonomics play a critical

role in reader satisfaction when reading ebooks, possibly affecting literacy (Dockrell, Earle, & Galvin, 2010; Dundar & Akcayir, 2012; Woody, Daniel & Baker, 2010).

The type of electronic reading format may impact its effect on literacy development. The electronic reading format in previous studies generally utilized CD-ROMs on desktop computers providing limited access to electronic text and to appropriately leveled materials (Doty et al., 2001; Matthew, 1996; Pearman, 2008). This instructional reading environment created using CD-ROM ebooks is different than the instructional reading environment ebooks read on hand held devices such as iPad can create (Bayliss, Connell, & Farmer 2012). Yet, ebooks provided on hand held devices maintain access to the qualities identified by researchers as positively influencing literacy development, while potentially reducing factors that made CD-ROM ebook reading ergonomically difficult (Dundar & Akcayir, 2012). In a qualitative case study, Larson (2010) observed second grade reader literacy practices on hand held devices. Participants were found to engage with ebooks using features such as text to speech and text size adjustment allowing them greater control over their reading needs compared to traditional books. In addition, educators reported that when students read ebooks on hand held devices, they observed positive changes to students' reading behaviors, comprehension skills, and reading attitudes.

Educators require further research on ebooks read on hand held devices. The research available offers foundational information that ebooks have the potential to provide equivalent and/or enhanced literacy opportunities for young readers (de Jong & Bus, 2004; Korat; 2010; Korat et al., 2009; Korat & Shamir, 2007). Hand held reading devices have the potential to overcome some of the disadvantages, such as instructional

efficiency and lack of accessibility, previously reported with ebooks read on desktop computers (Dundar & Akcayir, 2012).

The effect of ebooks on literacy development may also be connected to the level of the reading materials. While the importance of reading individually-leveled literature to improve reading level has been suggested for decades (Allington 2005; Clay, 1991; Cunningham et al., 2005; Fountas, & Pinnell, 1999; Pinnell & Fountas, 2009), previous studies exploring the effects of ebooks on reading skills have primarily focused on titles that were age appropriate (de Jong & Bus, 2002; Doty et al., 2001; Korat, 2010; Korat et al., 2009; Korat & Shamir, 2007, 2008; Labbo & Kuhn, 2000; Pearman, 2008). With sixty-six percent of fourth graders reading below a proficient level (National Center for Education Statistics, 2013), students reading below level must have opportunities to read comfortable text or they may become frustrated, while above grade level readers need text that will stimulate growth and engagement (Fountas & Pinnell, 1999). More specifically, to assist accuracy and comprehension, reading materials should be provided to students at their instructional reading levels with adult guidance or their independent reading levels without adult guidance (Pinnell, & Fountas, 2009). Investigating the effect instructionally-leveled ebooks have on reading level may provide information to educators to help students read at grade level by the end of third grade.

Currently, many ebook options are available. Often for young readers, ebooks are digital versions of children's literature published in electronic format. Although the page presentation looks similar to traditional books, these ebooks offer integrated multimedia features such as animations, music, narrations, illustrations, and sound effects (de Jong & Bus, 2003; Labbo & Kuhn, 2000). Ebooks offered on ©Raz-Kids (http://www.raz-

kids.com/) provide access to hundreds of leveled books. As researchers have indicated, matching the reading levels of the text with students' reading levels is necessary for planning effective instruction (Allington, 2005; Stange, 2013). Students have the option of listening while reading or reading on their own with the ability to record and listen to their reading. As comprehension depends on fluency, assistive congruent features of ebooks may provide scaffolding and a reduction of working memory load (Ertem, 2010). The highlight feature highlights phrases with a secondary color illuminating individual words as they are read. Text can be enlarged to meet the student's needs and pages can be turned by swiping a finger across the page in a right to left motion. At the end of the story, students have the option of returning to the beginning to listen or to read the story again or returning to the login page to select another title. To check for understanding, students can choose to activate a series of story comprehension questions to answer. In this study ebooks are defined as electronic text software with animation, mp3 narration, sound effects congruent with the text, highlighted text features (Roskos, Brueck, & Widman, 2009), and an option to check for understanding.

In part, the enhanced interest in ebook use for reading instruction can be connected to governmental mandates. As part of NCLB, the Enhancing Education Through Technology Act of 2001 (2002) increased educator and researcher interest in developing a better understanding of the methods for utilizing technology to improve student academic growth and higher achievement. The Enhancing Education Through Technology Act of 2001 (2002) required educators to utilize technology to improve student academic growth and achievement. According the International Reading Association's (IRA) (2009) position statement, literacy educators are responsible for

integrating twenty-first century technologies into the curriculum to prepare students for the future.

Advancements in ebook development and hand held devices are changing the instructional environment. As evidenced by research (de Jong & Bus, 2004; Korat; 2010; Korat et al., 2009; Korat & Shamir, 2007), CD-ROM ebooks' effects on young readers have been actively pursued while fewer researchers have focused on ebook reading on personal devices such as iPads. Ebooks on hand held devices have the potential to unveil new teaching and learning possibilities (Larson, 2010). As learning new information must be processed in working memory, working memory is affected by load not necessary to learning (extraneous cognitive load) (van Merriënboer& Sweller, 2005). The presentation of new information utilizing ebooks may reduce the extraneous cognitive load that weakens problem solving (Srivastava & Gray, 2012; van Merriënboer & Sweller, 2005).

The movement toward reading on personal devices has been on the rise since Amazon Kindle was introduced in 2007, followed by devices marketed by Barnes and Noble, Apple, and Sony (Jones & Brown, 2011). Access to ebooks in K–12 classrooms is now more efficient than in the past, possibly affecting how students choose to read. Johnson et al. (2011) predicted and emphasized the significance of the mobility of hand held devices and ebooks' influence on teaching and learning. Furthermore, Hasselbring, Goin, Taylor, Bottge, and Daley (1997) reported that embarrassment when reading aloud or selecting appropriately leveled books was a critical component influencing reading engagement. Thus, reading ebooks on hand held devices may provide a more personal environment, affecting the readers' attitudes and behaviors (Larson, 2010), as attitudinal

and behavioral changes are more effectively accomplished through conditional changes that foster the desired behavior (Bandura, 1986).

Theoretical Basis

The theoretical bases for this research examining reading levels, reading attitudes, and reading behavior are the perspectives of cognitive load theory and social cognitive theory. These two theoretical perspectives provide support for technology to support literacy development, particularly through the use of ebooks on hand held devices. More specifically, ebooks on hand held devices may support (a) reading level, (b) reading attitudes, and (c) reading behaviors.

Cognitive load theorists have posited that human cognitive architecture consists of a limited working memory that interacts with a comparatively unlimited long-term memory (Leahy & Sweller, 2011; Paas, Tuovinen, Tabbers, & Van Gerven, 2003; Sweller, 1988, 2011). On its own, working memory has serious capacity and duration limits that allow for the processing of minor cognitive activities; however, these limitations are eliminated when working memory interacts with cognitive schemes (Paas & Sweller, 2012). Depending on the schemas of the readers, material that is complex for one individual may be simple for another (Sweller, 2010b). When extraneous cognitive load exceeds working memory capacity, meaning breaks down for the reader (Sweller, 2010b). The opportunity to build fluency through highlighting phrases and individual words, in alignment with Vygotsky's (1978) ZPD, may provide the reader with the means to co-construct meaning through interaction with the materials, thus supporting the development of the reader's schemas. Likewise, it is possible that the features of ebooks presented in the learner's ZPD may serve to scaffold learning to support the readers'

actual development level and their potential developmental levels (Abdullah, Hussin, Asra & Zakaria, 2013). These assistive features do not exist in traditional books, leaving the reader to access assistance from another individual or to move on without support.

Social cognitive theory and Bandura's (1986, 1999) emphasis on triadic reciprocal determinism are the theoretical bases for examining reading attitude and behavior in this study. Bandura (1986, 1999) posited that the environment influences thoughts and behaviors as well as that thoughts and behaviors impact the environment. Attitudinal and behavioral changes are best accomplished through conditional changes that foster the desired behaviors (Bandura, 1986). Utilizing mobile devices affords a personal and authentic learning and a behavioral experience for the learner different from that of the traditional learning environment (Shapley, Sheehan, Maloney, & Caranikas-Walker, 2010). Thus, the readers' attitudes may be influenced by the readers' behavioral changes from the ebook instructional reading environment. Ebooks on personal devices have the potential to provide a private, individualized reading experience influencing the reader's willingness to spend time reading. This change in reading behavior can lead to increased comprehension, potentially influencing the readers' attitudes toward reading.

Ebooks have the potential to influence learning outcomes. However, prior to the use of ebooks for reading instruction continues in K-12 classrooms, more evidence regarding their effect on reading level, behaviors and attitude is necessary.

Problem Statement

The problem addressed in this study was lack of information about the effectiveness of ebooks to support independent reading level, reading attitudes, and behaviors of second grade students. Ebooks read on a hand held device provide a

different experience than text read on stationary computers, laptops, or traditional books read independently or with others (Bayliss et al., 2012). In an effort to have all children reading at grade level by third grade (No Child Left Behind, 2002) and to utilize technology to support academic achievement (Enhancing Education Through Technology Act of 2001, 2002), researchers and educators have worked to discover the most effective instructional practices, classroom environments, interventions, and materials to achieve maximum reading growth (Begeny, Krouse, Ross, & Mitchell, 2009; Fletcher & Vaughn, 2009).

The lack of information about the effect of ebooks on reading level is a problem. Reading level is especially important as a key indicator of future academic success (Francis et al., 1996) and life-long achievement (Kutner et al., 2007). Savage and Carless (2008) suggested reading outcomes improve with early targeted interventions and provide sustained results. However, even with targeted interventions during the first two years of formal education, students remain behind in second grade (Begeny et al., 2009) with 66% of fourth graders achieving below a proficient level (National Center for Education Statistics, 2013).

Additional problems addressed in this study were participants' attitudes towards reading and their reading behaviors in a digital environment. Although research has been completed on the relationship between reading attitude and achievement (Allen et al., 1992; Askov & Fischbach, 1973; Kaniuka, 2010; Kush, Watkins, & Brookhart, 2005; Martinez et al., 2008; McKenna et al., 1995) as well as on the relationship between reading behavior and reading achievement (Leppänen, Aunola, & Nurmi, 2005; Wasson,

Beare, & Wasson, 1990), few studies exist that have focused on the influence of ebooks on reading attitude and behavior for second grade readers within the classroom.

Purpose Statement

The purpose of this quasi-experimental, pretest–posttest, non-equivalent control group study was to determine if a statistically significant difference existed in independent reading levels when using ebooks versus traditional books. The secondary purpose of this study was to determine if a statistically significant difference in reading attitude existed when comparing ebooks to traditional books. A posttest only non-equivalent control group study was used to determine if a statistically significant difference existed in reading behaviors when utilizing ebooks versus traditional books (Creswell, 2009). A convenience sample of 88 second grade students in southern Michigan served as the sample for this study. The independent variable was the type of book used to create an instructional reading environment. Students were assigned to one of the following reading environments: (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during reading instruction, with a choice of ebooks and traditional books during practice, or (d) traditional books only in both instruction and practice. The dependent variables were defined as student independent reading level, reading attitude, and reading behavior. Since early successes in reading acquisition are predictors of future academic success (Cunningham & Stanovich, 1997), developing a better understanding of how ebooks influence reading level is important. Reading level was measured by the Developmental Reading Assessment® (DRA2®) composed of accuracy, fluency and comprehension scores (Beaver & Carter, 2009). In addition,

reading attitudes play an important role in reading engagement and are related to reading achievement (Petscher, 2010), making reading attitudes a key factor to this study. The Elementary Reading Attitudes Survey (ERAS) measured reading attitudes, consisting of academic and recreational reading scores that yield a total reading attitude score (McKenna & Kear, 1990) Finally, time spent reading has been correlated to reading achievement (Allington, 2007), making time spent reading a critical variable in this study. Self-report reading logs were utilized to assess the dependent variable, reading behavior.

Significance of the Study

The current research represents a study essential for future adoption of ebooks for reading instruction in the elementary classroom. Mandates from NCLB and Enhancing Education Through Technology Act of 2001 (2002) have elementary educators and researchers interested in the integration of technology to enhance instruction. To meet the mandate to integrate technology, educators have included ebooks to support reading although research indicating ebooks' effectiveness at different levels of literacy development is lacking. Particularly important to this study was the presentation of ebooks on hand held devices offering a new instructional reading environment for students. As literacy experiences prior to third grade are critical to the learners' future academic success, the widespread use of ebooks as an instructional tool is dangerous without guidance gleaned from research results.

This research adds to the current knowledge base as the instructional reading environment of ebooks on hand held devices is largely absent from past research. Studies on the effect of ebooks on early literacy skills have focused on stationary computer ebook

encounters (Doty et al., 2001; Korat & Shamir, 2012). As school systems and educators move towards the use of more technology in their pedagogy, this study contributes to knowledge regarding ebook implementation. To date most research utilizing ebooks has focused on beginning, emergent literacy reading skills and comprehension (de Jong & Bus, 2002; Korat et al., 2009; Korat & Shamir, 2008). Segal-Drori, Korat, Shamir, and Klein (2010) have recommended expanding studies to second graders at different levels of literacy acquisition with adult support. This research provides information addressing a gap in the literature by using second grade readers, with transitional reading skills as the target population.

Determining the effect of ebooks on reading attitudes contributes information to the gap in the literature. Several authors have suggested that attitudes towards reading effect the readers' academic performances through their influence on reading behaviors (Allen et al., 1992; Askov & Fischbach, 1973; Kaniuka, 2010; Martinez et al., 2008). This study addressed the need to explore the inconsistent findings about the correlation of reading attitude to reading behaviors (Guthrie, Wigfield, Metsala, & Cox, 1999; Kush et al., 2005: Wigfield & Guthrie, 1997), while expanding knowledge about reading attitudes to the digital environment. Furthermore, connections to pedagogical practices regarding learner choice might be increased if research can shed some light on the influence ebook access in the classroom has on reading attitude and behavior.

Research Questions

R_1: Does a statistically significant difference exist in reading level scores among the instructional reading environments, i.e., (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books

during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice) while controlling for pretest scores?

R_2: Does a statistically significant difference exist in reading attitude scores among the instructional reading environments, i.e., (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice) while controlling for pretest scores?

R_3: Does a statistically significant difference exist in reading behavior among conditions based on the medium in which second grade readers receive reading instruction, and read independently and for practice as related to the four reading environments of (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice?

Null Hypotheses

$H0_1$: A statistically significant difference will not exist in reading level scores as measured by the DRA2® assessment among the student instructional reading environments: (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice,

and (d) traditional books only in both instruction and practice while controlling for pretest scores.

$H0_2$: A statistically significant difference will not exist in reading attitude scores as measured by the ERAS assessment among the student instructional reading environments: (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice, while controlling for pretest scores.

$H0_3$: A statistically significant difference will not exist in the reading behavior scores as measured by the total minutes spent (a) pleasure reading in school, and (b) reading assignments in school, between the student instructional reading environments of (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice.

Identification of Variables

The independent variable, instructional reading environment, is operationally defined as use of ebook or traditional print book format. For the purpose of this study, ebooks were defined as online, multimedia storybooks with audio narration, animation, and highlighted text features (Roskos et al., 2009) and a check for understanding questions. Four instructional reading environments were used: (a) ebooks only-used during small group instruction and independent practice, (b) ebooks and traditional

books- ebooks used during small group instruction, ebooks and traditional books during independent classroom practice, (c) ebooks and traditional books- traditional books used during small group instruction, ebooks and traditional books during independent classroom practice, and (d) traditional books only-used during small group reading instruction and independent reading practice. The leveled ebooks used for this study were books accessed through the ©Raz-Kids website (http://www.raz-kids.com/). This online website allowed students access to book titles at their independent reading level. For the purpose of this study, traditional books were defined as leveled paper format books.

The dependent variable for research question one was reading level as measured by the DRA2® (Beaver & Carter, 2010). The DRA2® is designed to analyze a student's reading accuracy, comprehension level, and oral reading fluency yielding an independent reading level in grades K–8 (Beaver & Carter, 2010). The DRA2® assessment books are traditional print format books. Each book is leveled based on the following criteria: (a) inclusion of repetitive language, (b) story structure, (c) literary features, (d) story appeal, concepts, vocabulary, and common experiences of primary students, (e) picture support level, and (f) text size, layout, line and words per page (Beaver & Carter, 2009). The basic format of the assessment includes four steps: (a) the teacher introduces the text, (b) the student reads the first two to four paragraphs aloud while the teacher records word miscues and records reading time, (c) the student reads the remaining text silently, and (d) the student retells the story or shares story information with the teacher (Beaver & Carter, 2010). Reading level was operationally defined as the combined score of reading accuracy, comprehension, and ORF components of the DRA2®. These DRA2® scores

were combined to formulate the individual reader's independent reading level. DRA2® is used to "(a) assess reading engagement, oral reading fluency, and comprehension, (b) identify reading strengths and weaknesses, (c) determine students' reading levels, (d) inform reading instruction, (e) monitor progress in reading, and (f) aid in planning reading interventions" (Beaver & Carter, 2010, p. 182). For this study, independent reading level was assessed by combining accuracy, comprehension, and oral reading fluency scores. The DRA2® served as the pretest and posttest. The DRA2® pretest served as the covariate and was statistically controlled in the analysis for the research question one.

The dependent variable for research question two was reading attitude as measured by the ERAS (McKenna & Kear, 1990). The assessment was standardize based on a sample of first through sixth grade students, therefore a valid assessment tool for second grade students (Worrell, Roth, & Gabelko, 2007). The ERAS is a teacher administered survey developed to assess student's recreational and academic reading attitudes (McKenna & Kear, 1990). Attitudes toward reading were chosen as a key factor in this study. Researchers have showed that attitudes develop over time, tending to be more positive in younger children, become less positive with age, and are related to the level of reading competency (McKenna et al., 1995). The ERAS consists of 20 statements assessing two components of reading attitude, (a) recreational reading and (b) academic reading (McKenna & Kear, 1990). The recreational reading construct focused on reading outside the school setting. The academic reading construct focused on reading in the school setting (McKenna & Kear, 1990). The ERAS served as the pre and posttest.

The ERAS pretest served as the covariate and was statically controlled for in the analysis for the research question two.

The dependent variable for research question three was student reading behaviors. Reading behaviors were measured by minutes engaged in reading documented on personal reading logs used in the classroom. Similar to research reported by Anderson, Wilson, and Fielding (1988), student independent reading was recorded utilizing self-report reading logs recording the number of minutes read each day as well as the book title and author's name. To better assess time spent reading for pleasure, reading logs distinguished between assigned reading books and books read by choice (Taylor, Frye & Maruyama, 1990). Daily log entries were tabulated and calculated by two means: mean number of minutes read for practice in school and mean number of minutes for assigned reading in school. Using these data, the researcher was able to look at relationships between assigned and practice reading. Teachers reviewed daily classroom reading logs. By signing the reading logs each day, teachers verified that participants engaged in reading for the time recorded. Total number of minutes read for each participant was analyzed to assess the relationship to reading attitudes and instructional reading environments.

Definitions

Advanced reading level- reader's independent reading level is above expected level for grade and time of school year, reading at grade level text with 99%- 100% accuracy, fluency and comprehension (Beaver & Carter, 2009).

Comprehension- complex cognitive process where meaning is constructed through understanding and interpreting information (Shanahan, 2006).

Independent reading level- word recognition, comprehension and independent reading level is at 95%-98% (Beaver & Carter, 2009).

Instructional reading level- word recognition is level is 94% or higher while comprehension level is set at a minimum of 75% on the first reading of grade level text (Beaver & Carter, 2009; Ekwall, 1976).

Intervention reading level- word recognition level is 93% to 90% on the first reading of grade level text (Beaver& Carter, 2009; Ekwall, 1976).

Oral reading fluency- the ability to read text aloud with accuracy, speed, and text appropriate expression (Shanahan, 2006).

Reading attitude- readers' feelings towards reading influencing a reader's choice to approach or avoid reading tasks (McKenna et al., 1995).

Research Summary

This proposed quantitative study employed a quasi-experimental, pretest–posttest, non-equivalent control group design for questions one and two, while a posttest only non-equivalent control group design was utilized for question three. The use of quantitative, pretest–posttest, non-equivalent control group design to determine if there is a statistically significant difference between reading levels and instructional reading environments and reading attitudes and instructional reading environments was appropriate as intact groups were utilized for the study. Pretest–posttest, non-equivalent control group designs are aligned with determining the difference between the dependent and independent variables. The pretest–posttest design allows for the research to adjust for pre-existing differences in the treatment and control groups (Gall, Gall & Borg,

2007). The posttest only non-equivalent control group design was used to determine if there is a statistically significant difference between reading behaviors and instructional reading environments. Since intact groups were used, random assignment was not possible as the participants were pre-placed in second grade classrooms. Furthermore random selection did not occur when selecting the sample population as the researcher intentionally selected all second graders (Gall et al., 2007; Haertel, 2011) in the school system. Internal validity was threatened by the lack of random assignment and preexisting group difference; however, the covariate of pretest scores, provided a control for initial differences between the control and three experimental groups in regards to questions one and two. Homogenous groups also helped control for the selection threat to internal validity.

Using the analysis of covariance (ANCOVA), the researcher compared the mean DRA2® posttest scores of the four instructional reading environment groups (ebook only, traditional book only, ebook for instruction with ebooks and traditional books for practice, traditional books for instruction with ebooks and traditional books for practice) to determine if a statistically significant difference existed among the participants in the treatment groups and the control group. Pretest DRA2® scores served as covariates. An ANCOVA was also performed to compare the ERAS posttest scores for the four groups to determine if a causal relationship existed between reading attitudes and the instructional reading environment, while controlling for pretest differences. Pretest scores used as a covariate can help to reduce the error variance and to eliminate systematic bias if pretest scores are reliable (Van Breukelen, 2011). This data analysis allowed the researcher to adjust the posttest means for differences among groups on the

pretest (Dimitrov & Rumrill, 2003). An analysis of variance (ANOVA) was used to assess the significances of the instructional reading environment on reading behaviors. Pre intervention data were not collected on reading behavior, the use of homogenous groups helped control for the selection threat to internal validity.

The following chapters provide critical information pertaining to this study. Rational for the study can be found in chapter two while study design information is located in chapter three. Finally, the study results are found in chapter four followed by the discussion and recommendations for the future in chapter 5.

CHAPTER TWO: REVIEW OF THE LITERATURE

The purpose of this quasi-experimental, pretest–posttest, non-equivalent control group study was to determine if a statistically significant difference exists in independent reading levels when using ebooks versus traditional books utilizing the perspective of cognitive load theory. Additionally a quasi-experimental, pretest–posttest, non-equivalent control group study was to determine if a statistically significant difference in reading attitude when using ebooks versus traditional books using the perspective of social cognitive theory. The purpose of the posttest only non-equivalent control group study was to determine if a statistically significant difference exists in reading behaviors when utilizing ebooks versus traditional books from the perspective of social cognitive theory.

Chapter Two presents the theoretical framework and a review of the literature upon which this study of reading levels, reading attitudes, and reading behaviors was based. In addition, research on necessary reading skill development and the use of technology in the classroom was examined. Studies that identified these areas were examined with detailed information regarding study outcomes. In addition, this examination emphasized gaps in the literature that the current research was designed to address. A summary of the reviewed literature concludes the chapter.

Theoretical Framework

The theoretical framework guiding this research focuses on cognitive load theory, zone of proximal development, and social cognitive theory. Cognitive load theory and zone of proximal development are discussed in relation to reading level, while social

cognitive theory provides the framework for discussing reading attitudes and reading behaviors.

Reading

Cognitive load theory. Cognitive load theory is concerned with individual information processing and learning, based on human cognitive architecture that assumes a limited working memory and unlimited long-term memory that can be used to store schemas of varying degrees of automaticity (Paas et al., 2003; Sweller, 1988, 2010b, 2011; van Merriënboer & Sweller, 2005). Schemas refer to the familiar material stored in long-term memory, chunked as single elements (Paas et al., 2004; Paas et al., 2003). Automaticity occurs after the learner engages in sufficient practice. Following sufficient practice, an individual can perform a task with minimal conscious effort (Sweller, van Merriënboer, & Paas, 1998). Miller (1956) and Sweller (1988, 2010a, 2010b, 2011) posited that an individual's working memory is limited in capacity and duration and may be overwhelmed by the number of interactive information elements that need to be processed simultaneously before learning can occur (Paas et al., 2003; Sweller, 1988, 2010b, 2011; Sweller et al.,1998). However, schemas and automation can bypass working memory, reducing cognitive load (Paas et al., 2004; Paas et al., 2003).

The term *cognitive load,* was not new at the time the theory explaining it was developed. Its origin can be traced back to Miller (1956) who quantified the capacity of working memory to seven novel information elements. Moray's (1979) work on mental load, defined as the difference between task demands and the person's ability to master the demands, has also been connected to the development of cognitive load theory (Moreno & Park, 2010). Traditional cognitive load theory focused on the association between cognitive processes caused by problem-solving methods and schema acquisition

(Sweller, 1988). Sweller's (1988) research on conventional problem solving in the form of means-ends analysis, pointed to the importance of schema development referred to as schema acquisition. Sweller (1988) concluded that conventional problem solving in the form of means-ends analysis may not assist schema acquisition, thus impeding learning. Sweller and Sweller (2006) then presented cognitive load theory as a means to assist the presentation of information, based on Geary's (2002, 2008) explanation of biologically primary knowledge and biologically secondary knowledge. Biologically primary knowledge consists of knowledge that has evolved over generations; such has listening and speaking skills, while biologically secondary knowledge consists of knowledge requiring explicit instruction, such as learning to read (Geary, 2002, 2008). Geary (2002) identified knowledge required in school as secondary knowledge since individuals have not evolved to perform these tasks and the manner in which they are learned differs from the manner of acquiring biologically primary knowledge.

A basic concern of cognitive load theory is the ease with which information is processed in working memory to develop schemas (Sweller et al., 1998). Three types of cognitive load which affect working memory are distinguished through cognitive load theory: intrinsic, extraneous, and germane (Paas et al., 2004). Paas et al. (2004) stated that load is intrinsically imposed by the number of information elements and their interactivity. These researchers further suggested that extraneous and germane load are imposed on the learner by the manner the learning activity requires and with which information is presented. While germane load is related to information and activities that promote schema construction/acquisition and to automation processes fostering learning, extraneous load is imposed by information and activities that do not support these

processes (Paas et al., 2004). Furthermore, intrinsic cognitive load cannot be modified by instructional design, while both extraneous and germane cognitive load can (Paas et al., 2004; Sweller et al., 1998). However, extraneous cognitive load refers to the effort required to process information from poor instructional design, while germane cognitive load refers to the effort that helps the learner construct schemas (Sweller et al., 1998).

Cognitive load theory emphasizes instructional design to reduce unnecessary extraneous cognitive load. Researchers suggested that instructional design placing emphasis on intrinsic information increases the amount of information transferred to long-term memory (Leahy & Sweller, 2011; Paas et al., 2003; Sweller, 1988, 2010b, 2011; Sweller et al., 1998) if the majority of the freed working memory resources are germane (Sweller, 2010a). Germane cognitive load's positive relationship to learning is a result of cognitive resources devoted to schema acquisition and automation (Moreno & Park, 2010; Sweller, 2010a). Schemas stored in long-term memory circumvent or reduce the load on working memory during mental processing thus avoiding working memory limitations through automaticity (Paas et al., 2003; Paas & Sweller, 2012). Without schema acquisition and automaticity, the capacity limits of working memory only allow relatively minor cognitive activity of novel information (Paas & Sweller, 2012).

Researchers have adopted cognitive load theory as a theoretical framework for studies indicating that instructional design can impose heavy working memory load (Cooper & Sweller, 1987; Menon & Hiebert, 2005; Srivastava & Gray, 2012; Sweller, 1988; Sweller et al., 1998; van Merriënboer & Sweller, 2005). In particular, research by Menon and Hiebert (2005) suggested that the instructional design of reading materials

could reduce extraneous cognitive load impacting reading level. Additional researchers suggested that the reduction of heavy cognitive load on working memory could be achieved by increase its effective size through the modality effect (Leahy & Sweller, 2011; Mousavi, Low, & Sweller, 1995).

The modality effect occurs when information using both auditory and visual instruction is superior to visual only instruction. Researchers have suggested the auditory and visual channels are independent; therefore, utilizing both modes increases the effective size of working memory compared to using only one mode (Leahy & Sweller, 2011; Mousavi et al., 1995; Paas & Sweller, 2012). Researchers have also suggested that the presentation of information pictorially may reduce the level of cognitive load induced by a high level of interactivity if the picture conveys meaning, thus reducing the working memory load (Cooper, 1998; Rummer, Schweppe, Furstenberg, Seufert, & Brunken, 2010; Schwamborn, Thillmann, Opfermann, & Leutner, 2011). For example, an individual reading and at the same time creating mental images based on the text has a higher cognitive load than an individual reading but viewing pictures that show the meaning of the text (Rummer et al., 2010).

Some researchers have turned their attention to technology's influence on learning and to technologies effective on working memory capacity. Bus, de Jong, and Verhallen (2006) suggested that ebooks can help struggling readers construct or activate more complete schemas. Results from their study indicated that interactive features may serve as electronic scaffolds when presented in the learner's Zone of Proximal Development (ZPD). Further evidence supporting schema development and automation can be found in a study conducted by Ertem (2010). Readers in this study utilized ebooks with

congruent animation features compared with readers using ebooks without animation features. Results indicated that ebooks with congruent animation support comprehension.

Zone of proximal development. Along with the use of cognitive load theory, reading development can be further explained by Vygotsky's (1978) zone of proximal development (ZPD). According to Vygotsky's theory of ZPD, learners construct meaning through active engagement among the learner, other persons, and social context (Miller, 2002; Vygotsky, 1978). Social constructive theorists identified that learning should correspond in some way with the developmental level of the child, but not be limited to these developmental levels (Vygotsky, 1978).

Vygotsky (1978) identified two developmental levels. The first level is the actual developmental level that includes the learner's mental functions resulting from a completed developmental cycle. The second is the ZPD, recognized as the distance between the actual developmental level and the learner's potential level of development with the guidance of an adult or more capable peer (Vygotsky, 1978). The ZPD framework centers on the interactions between the learner and the adult or more capable peer. When an individual's ZPD is combined with a scaffold instructional approach, the more knowledgeable individual can give necessary learning support. Researchers Reis, Eckert, McCoach, Jacobs, and Coyne (2008) indicated that enriched reading environments that challenge readers in their ZPD with the guidance of a more knowledgeable other resulted in more positive reading outcomes than reading experiences that did not present materials in the individual's ZPD. The idea of guidance of an adult or more capable peer to scaffold learning has recently begun to include the idea that digital technology could scaffold learning (Abdullah et al., 2013; Cook, 2010).

Digital technology might support learners, enabling them to problem solve or reach a level of achievement otherwise beyond their independent levels (Cumming-Potvin, 2007; Wood, Bruner, & Ross, 1976; Zaretskii, 2009). The degree of support is adjusted by the more knowledgeable other as the learner actively constructs new knowledge (Miller, 2002), thus establishing a supportive environment that supplies essential opportunities for learners (Clay, 1991; Pinnell & Fountas, 2009). Thus, utilizing knowledge of the reader's ZPD, the more knowledgeable other can provide challenging text with assistance allowing the reader to construct new knowledge internalizing the more difficult material. Reading is a complex cognitive skill that can be supported through cognitive load theory and ZPD. Schnotz and Kürschner (2007) suggested that learners have high and low limits of ZPD. Instructional designs aimed at promoting learning above the learner's ZPD will exceed the individual's working memory capacity, while instructional designs below the learner's ZPD will result in unused cognitive capacity (Schnotz & Kürschner, 2007). Therefore, utilizing knowledge of the individual's ZPD will allow the more knowledgeable other to provide learning material and instruction that will not exceed the individual's working memory capacity.

Reading Attitude and Behaviors: Social Cognitive Theory

Bandura's (1986, 1999) social cognitive theory expressed triadic reciprocal determinism in which behavior patterns, environmental events, and personal factors in the form of cognitive, affective, and biological events influence each other. Bandura (1986, 1999) stated that the environment influences thoughts and behaviors and that thoughts and behaviors impact the environment. However, interactions between the three factors don't always demonstrate equal amounts of influence. In fact, different activities,

individuals, and circumstances determine the power of the influence of each factor (Bandura, 1986, 1999).

A tenet of social cognitive theory is that three types of environmental constructs exist: the imposed environment, the selected environment, and the constructed environment (Bandura, 1997). The imposed environment is the physical and socio-structural environment, which the individual has little control over, and is, for the most part, inoperative until it is actualized by individuals through their behavior. Similarly, personal factors, such as cognitive, affective, and biological events, do not come into being until they are activated (Bandura, 1986). The ability to transform and construct desired environments is partially dependent on individuals' self-efficacies and judgments of how well they will be able to perform (Bandura, 1986; Byrd-Bredbenner, Abbot & Cussler, 2011; McAlister, Perry, & Parcel, 2008). Self-efficacy, defined as individuals' beliefs in their ability to successfully execute the behavior required to produce the desired outcome (Bandura, 1997), is a more important predictor of behavior than outcome judgments of the individual (Bandura, 1986). Schunk (1989) suggested that individual attitudes are one function causing differences in self-efficacy beliefs among individuals.

Central to Bandura's (1986) work is how individuals exercise control over personal motivation, behavior, and environment through human agency regulated by self-evaluation and internal standards; i.e., how they feel or their attitudes (Sheehy, 2004). Attitude acquisition is developed by external controls, such as modeling, and becomes internalized through identification of the experience by the individual and classical conditioning (Bandura & Walter, 1963). Identification and classic conditioning are

possible through a variety of channels such as parental attitudes, socio-cultural background, mass media, education, and peers (Kaur, 2010). The formation and transformation of attitudes are impacted by a reciprocity among affect, behavior, and beliefs (Albarracin, Johnson, & Zanna, 2005). Bandura's (1986) reciprocal determinism hypothesis has led researchers to consider the way a behavior feeds back to individuals to alter a personal factor such as an individual's attitude, since attitude is an internal state impacting the behavior of the individual (Kihlstrom & Harackiewicz, 1990).

Bandura (1986) further suggested that personal factors and cognition are influenced by the environment and are determined by natural and extrinsic actions. These actions can be vicarious or direct experiences with others and the environment (Mearns, 2009). More specifically, experiences including modeling and imitation have been identified as advantageous in promoting learning (Bandura, 1977, 1986, 1997, 1999; Byrd-Bredbenner et al., 2011; Martin, 2004). Exposure to multiple instances of social modeling produces stronger beliefs in an individual's ability to learn with a wide variety of modeling superior to a single modeling (Bandura, 1997).

Bandura's (1986) emphasis on triadic reciprocal determinism provides a framework for studying reading behaviors and reading attitudes. This triadic model outlines the interactions among behavior, personal factors identified as cognitive and other internal variables that affect actions and perceptions, and the individual's environment (Bandura, 1986). One can use this framework to investigate the relationships between reading behaviors, reading attitudes, and the reading environment.

Reading Development and Theory

Researchers have provided evidence that early literacy interventions are an important component to reducing the achievement gap between at-risk learners and their typical peers and that these gaps become more difficult to decrease with time (Cooke, Kretlow, & Helf, 2010; Harn, Linan-Thompson, & Roberts, 2008; Perez-Johnson, & Maynard, 2007; Simmons et al., 2008). At birth the human brain has few synapses or junctions from which information passes from neuron to neuron (Bransford, Brown, & Cocking, 2000); however, studies have shown that brain circuits stabilize as the brain matures and these circuits are difficult to alter with age (Cameron, 2010). Therefore the early learning experiences of an individual influence cognitive and social development by impacting the construction of lower level functions, such as language acquisition, necessary for the higher level functions, such as reading, to build upon (Bransford et al., 2000; Knudsen, Heckman, Cameron, & Shonkoff, 2006). As the architecture of the brain is influenced by early learning experiences, the architecture is either strengthened or weakened through the development of brain circuits and is the basis for future learning (Knudsen et al., 2006).

Early learning experiences assisting the construction of new knowledge building on foundational information, or schema acquisition, require quality interventions (Barnett, 2008; Bruder, 2010; Sweller, 1988). Critical to quality intervention construction is an understanding that schema acquisition and automacity are influenced by the individual needs of the learner (Donalson, 2009). Research results support the premise that reading interventions can affect student development and learning (Barnett, 2008; Bruder, 2010).

Without reading interventions readers will encounter varied levels of success. More specifically, without successful reading interventions struggling learners will continue to be reluctant readers (Benner, Nelson, Ralston, & Mooney, 2010). These students face more academic challenges than their typical peers throughout school, creating an achievement gap between these groups that limits their abilities to reach their full potentials in life (Benner et al., 2010; Slavin, Lake, Chambers, Cheung, & Davis, 2009; Slavin, Lake, Davis, & Madden, 2011). Essential to reducing the achievement gap is the implementation of targeted interventions addressing the individual needs of the learner. Equally important as the at-risk readers' achievement are the above grade level readers whose needs are frequently not met. These students may not reach their full reading potential without differentiated reading instructional opportunities teaching them how to react to challenging text (Reis et al., 2004). In a synthesis of the research regarding effective programs for readers, Slavin et al. (2011) examined 97 studies comparing alternative strategies to help elementary readers become successful readers. Their findings suggested that classroom small group interventions can be an effective instructional approach to enhancing literacy acquisition skills. Applying what is known about knowledge acquisition, educators can provide appropriate interventions for all readers. Building on the readers' schemas and automation, educators can reduce the amount of cognitive load imposed on working memory and can scaffold lessons that challenge the learners above their instructional levels (Donalson, 2009). Continued growth in reading is critical to all levels of readers.

Several variables, such as reading level, reading attitudes, and reading behaviors, have been identified to play a role in reading achievement with a direct connection

between text and reader. In particular, text level and its connection to the reader have been linked to reading acquisition (Kucer, 2005, 2011; Soleimani & Mohammadi, 2012) and reading behaviors (Treptow, Burns, & McComas, 2007), while text topic interests have been connected to reading attitudes (Allen et al., 1992; McKenna et al., 1995) and reading environment (Flowerday, Schraw, & Stevens, 2004). An investigation of the reciprocal relationship between personal, behavioral, and environmental variables as well as the constructs of reading attitude within the personal factor can lead to a better understanding of the influence these variables have on reading achievement. According to Bandura (1986), motivational and instructional factors are necessary to foster adoption of new behaviors, especially if the new behavior is replacing an unfavorable behavior. Changes to behavior are best accomplished by designing conditions that foster both attitudinal and behavioral changes (Bandura, 1986, 1997). Within this research study, the reading environment was changed to investigate the effect on the reader's behavior and attitude, addressing a gap in current literature. If the instructional reading environment implemented in this study has a positive effect or no effect on reading behaviors and/or attitudes, then educators will be able to employ this instructional reading environment with some reassurance that reading achievement will not be hindered by its implementation. With the increased ebook availability, ebooks may be a cost efficient alternative to traditional books.

Included in the social interactions of the learner is the impact of the growing social culture, which involves the use of technology. Technology integrated into the daily lives of individuals must be recognized and the possible benefits for educational achievement explored. According to Bransford et al. (2000), technology has the potential

to function as an instructional tool to scaffold learning and to support learners' successful completion of advanced activities, thinking, and problem solving. Cook's (2010) reconceptualization of Vygotsky's (1978) ZPD, specifically the concept of guidance from a more knowledgeable other, suggested the more knowledgeable other may be in the form of technology. Cook (2010) presented this augmented context for development to include the use of mobile devices. In a case study utilizing mobile devices to assist language-learning of undergraduate students, Abdullah et al. (2013) suggested that student achievement was enhanced when a scaffold model was utilized along with the individual's ZPD in a mobile learning environment. Thus, the multimodality of ebook presentation may provide a reading environment that decreases working memory load, supports the learner's ZPD, and encourages student interest and involvement, thereby assisting reading achievement (de Jong & Bus, 2002).

Through educational experiences, foundational skills, and knowledge that increase, cognitive growth can be built. According to Bransford et al. (2000), cognitive development does not result from simple accumulation of information, but from processes involved in conceptual reorganization. Imperative to this process is stimulating and guiding learners in schema construction and automation (Sweller, 1988). As poor reading comprehension performance and overload on working memory have been shown to be directly related (Oakhill, Hartt, & Samols, 2005), supportive text features of ebooks help remove overload, allowing learners to focus on meaning instead of having their working memory focused on decoding (Miller, Blackstock, & Miller, 1994). Taking what is known about best practices in teaching and learning for knowledge acquisition, school districts and educators have new opportunities allotted by interactive technology

tools, supportive software, and various kinds of hardware to improve current curriculum designs. Although support during printed text reading could be received from teachers or supportive materials, studies indicated that learners often do not use these resources (Greenlee-Moore & Smith, 1996). Through the use of technology integration and more specifically ebooks, educators can offer opportunities to acquire knowledge that are different than previous learning experiences, with the possible benefits of reduced wait time for assistance and privacy of help (Hasselbring et al., 1997). However, educators must remember that the use of technology tools does not equate to more effective learning. In a literature review, Felvégi and Matthew (2012) suggested that attempts to use technology to facilitate learning require researchers and educators to work together to identify practices that effectively infuse technology in the process of teaching to enhance learning. They further suggested that including interactive technology, such as ebooks, into classroom instruction can offer new creative ways for students to acquire knowledge, reduce the achievement gap between struggling and at grade level readers, and support reading growth for average and above grade level readers.

Bandura (1986) suggested that creating conditions to foster the desired behavior is advantageous when trying to alter attitudes. New practices will be adopted by an individual if the new practice is viewed as beneficial, followed by qualified acceptance and reinterpretation of beliefs. Intrinsic and extrinsic motivators along with competent modeling provide positive incentives for behavioral and attitudinal changes (Bandura, 1986). Modeling a behavior, such as good reading, alone will produce improvements, but modeling with guided enactment and practice strengthens the results of changed behaviors, thus fostering new skill development (Bandura, 1986). In addition, reading

behaviors in and out of school are influenced by young students' attitudes towards reading and are related to reading ability (Askov & Fischbach, 1973; Kirby, Ball, Geier, Parrila, & Wade-Woolley, 2011; McKenna et al., 1995). Ebooks have the potential to influence reading behaviors, attitudes, and achievement. With the assistive features such as mp3 narrations, ebooks can provide additional modeling support both in and out of school.

The investigation of attitude was an essential component of this study to assess whether participants perceived ebooks to have greater value than traditional books to reading. If ebooks positively impact reading achievement, then they have the potential to positively influence the reader's attitudes towards reading. If reading achievement and attitudes are positively affected, then a possibility exists that reading engagement both in and out of the classroom will increase. Positive interactions among attitude, reading achievement, reading behaviors, and the use of ebooks on portable handheld devices should influence the decision to incorporate ebook use into daily instruction. The goal of education is to foster an environment that influences the learner's behavior and cognitive factors. To accomplish this monumental task, educators must develop a better understanding of the multidirectional transactions among the environment, behavior, and personal factors and the role ebooks play.

Importance of Learning to Read

Historical Summary

Developing an understanding of the history of literacy in the United States is a crucial component to planning for the future. Reading scholars who comprehend past debates and reforms have a rich knowledge of methodologies and pedagogies that have

been influenced by cultural and societal events. Lacina, Block, and Weed (2009) suggested that examining the evolution of reading allows educators and researchers to gain perspective of the rapid growth in reading education and issues that have sustained attention. Although the context of this paper does not allow all of these avenues to be addressed, past works offering valuable insight are included. In addition, educational changes and debates that influenced the methods, practices, and tools educators have utilized to improve reading for all students are discussed.

The continual theoretical, methodological, and pedagogical evolution of education is evident through history. In the early to mid-1800s American educators began to look to reformers such as Rousseau and Pestalozzi who stressed the importance of meaning for the learner and Mann's notion that the lack of meaningful materials was problematic for American education (Barry, 2008). The response to the need for meaningful materials was a series of graded reading materials, referred to as basal readers, of which the McGuffey Readers were the most popular, providing activities, teacher instructions, and a comprehension component. Throughout the 1800s basal readers continued to grow in popularity, changing and incorporating new ideas, such as silent reading components, Initial Teaching Alphabet, and various types of stories. During this time when the use of basal readers was growing, basal readers were joined by a whole word method for reading instruction in the 1830s (Barry, 2008). Then in the late 1880s Colonel Francis Parker and George Farnham promoted the sentence-method and story-method, which included teacher-guided questioning to foster learner discovery (Barry, 2008).

Educational changes and debates continued in the 1900s. During the beginning of the twentieth century, literacy skills, such as simple reading, writing, and calculating,

were the focus for education, with little emphasis on critical thinking, complex problem solving, or reading critically for clarity and persuasive expression (Bransford et al., 2000). In the early 1900s through the 1930s, more realistic stories appeared in readers than during the 1800s (Barry, 2008). However, comprehension elements in reading were mainly composed of lower level recall understanding (Bransford et al., 2000).

The debate of whole-language and phonics captured the American public when Flesch's (1955) text, *Why Johnny Can't Read and What You Can Do About It*, was published. This book prompted researchers, scholars, and educators to rethink the teaching of reading with a renewed interest in cognitive processes and looked to philosophers, theorists, psychologists, and educators like Pestalozzi (1801), Dewey (1915), Vygotsky (1978), and Clay (1991) who proposed theories of appropriate educational practices for guidance (Barry, 2008; Venezky, 1977). The intentional identification of emergent literacy skills introduced in the mid1960s by Clay (1991) suggested that children acquire some language, reading, and writing knowledge before formal schooling through early experiences (Morrow & Dougherty, 2011). However, many educators neglected the value of children's early experiences, thus they continued to facilitate reading instruction utilizing either whole-language or a phonics approach instead of a combined approach to meet the different instruction needs of their learners (Chall, 1989). Many believe this neglect to provide a combined approach caused a decline of reading scores during the late 1980s (Chall, 1989). In *Reading Instruction That Works: The Case for Balanced Teaching*, Pressley (1998) suggested that neither skill-based nor whole-language approaches were going to provide for the literacy needs of learners, but a balanced approach engaging both components would provide effective

reading instruction (Pressley, Roehrig, Bogner, Raphael, & Dolezal, 2002). Indrisano and Chall (1995) suggested that when children's beginning literacy skills lag, they also fall behind in acquiring substantive knowledge that peers at and above grade level are gaining from reading experiences. Though the debate of whole-language or phonic-based reading curricula was still being questioned, by the late 1990s many educators and researchers concurred that literacy development required both whole-language and phonics methods (Indrisano & Chall, 1995). This acceptance of both whole-language and phonics methods suggested that each had a place in a balanced literacy approach and provided critical components to learners at various stages (Indrisano & Chall, 1995).

Differentiated learning instruction is an additional component of interest as history reveals that educators' methodologies have been influenced by their pedagogies. Differentiated instruction occurs when the educator understands the strengths and weakness of each student, can teach responsively, and has in-depth knowledge of the content to be taught (Ankrum & Bean, 2007). Through this level of knowledge and skill the educator can provide varied instruction meeting the needs of all students (Ankrum & Bean, 2007). In the 1950s early attempts at differentiation took the form of ability groups consisting mainly of leveled basal reading groups; however, the shift back to whole group instruction reentered the classroom in the 1980s (Ankrum & Bean, 2007; Barr, 1989; Moody & Vaughn, 1997). Educators were encouraged to avoid differential treatment to provide equal access to curriculum (Ankrum & Bean, 2007). However, over the past two decades research results have suggested that differentiating instruction is a critical component for successful academic growth (Ankrum & Bean, 2007; Moody & Vaughn, 1997; Pressley et al., 2002). In a study examining time on task and reading

comprehension of struggling third grade readers, higher levels of comprehension and time on task were reported for students provided reading material at their independent reading level than students reading books at a frustration or instructional level (Treptow et al., 2007). Whitley (1979) investigated differentiated instruction on middle school students' attitudes towards teachers, learning processes, reading, and mathematics. The study results indicated that exposure to differentiated instruction had a positive impact on all four variables: attitudes toward teachers, learning processes, reading and mathematics.

The attention to quality instruction and increased research by psychologists, theorists, linguists, and educators (Venezky, 1977) highlighted additional concerns for American education, prompting the federal government to establish the Elementary and Secondary Education Act of 1965 (ESEA), which evolved into the NCLB Act in 2001. The NCLB Act increased focus on accountability and emphasized the integration of all students, requiring students to reach grade level performance in reading and math by the 2013- 2014 school year (Borkowski & Sneed, 2006; Servilio, 2009). These expectations of accountability and integration have enhanced the interest of researchers to deepen understanding of best practices through technology integration. Evidence of this interest can be seen in the number of researched and presented topics at the annual International Reading Association (IRA) convention over the past thirty-five years. Topic numbers have doubled with eighteen of the same topics continuing to receive significant amounts of time and with sixteen topics increasing in presentation time (Lacina et al., 2009). Among the sixteen topics, increased interest, integration of language arts, computer-assisted instruction, nonfiction content, comprehension, metacognition, and struggling readers were at the top of the list (Lacina et al., 2009). The continuation of these topics

each year suggests that they have not reached a level of resolution, while the increased number of topics indicates that more diverse fields of study are occurring in reading research (Lacina et al., 2009). Lacina et al. (2009) suggested that the repetition of topics is evidence that literacy is a complex issue requiring continual investigation.

As evident through history, the discovery of how best to provide for the needs of learners is not new to the field of education. A common thread throughout reading instruction's historical progress has been the search for methods, practices, and tools to improve reading for all students. Past researchers have identified key components of reading instruction necessary for developing young learners into proficient readers (Fletcher & Vaughn, 2009; Harn et al., 2008; National Reading Panel, 2000; Vaughn et al., 2009). However, as technology changes the experiences of young learners (Shapley et al., 2010), researchers are now interested in how learning experiences and technology tools might influence reading instruction assisting readers' continued growth and levels of proficiency.

Reading at Grade Level

Legislation impacting reading education. The federal government is taking a more active role in reading education than it used to as reading has been identified as a foundational skill and as critical to an individual's academic and vocational opportunities (Lesnick et al., 2010). In 2001 NCLB established testing mandates aimed at making states and schools accountable for student progress. Since this time NCLB has undergone changes with the most current change allowing states to request flexibility from specific NCLB mandates impeding progress. Flexibility is granted if school districts are aligned with the college and career standards, have differentiated

accountability systems, and are initiating classroom instructional and school leadership reform (Differences between the NCLB Act and the ESEA Renewal, 2010).

Educators', administrators', and school districts' responsibilities for all children to be at or above grade level in reading have encouraged researchers to investigate the issues surrounding children at risk of reading difficulties. Conditions that place children at risk for reading difficulties have been identified by researchers and include socioeconomics, cultural, and linguistic differences (Allington, 2007; McKool, 2007), neurological problems, inadequate instruction, limited developmental experiences, and family history (Knudsen et al., 2006). A study of fifth grade students indicated that the home culture was a key factor between avid and reluctant readers, with avid readers raised in homes where daily reading occurred (McKool, 2007). Information regarding conditions placing children at risk of reading difficulties has contributed to improved reading achievement awareness regarding the impact of these conditions on learning. This information is critical as reading deficiencies were suggested to impact an individual's future success in school and life (Benner et al., 2010; Knudsen et al., 2006; Slavin et al., 2009; Slavin et al., 2011; Wehby, Lane, & Falk, 2005). Research has motivated researchers and educators to identify methods, practices, and tools to prevent or decrease deficiencies. From this research, small group and independent reading practice (Allington, 2007; Benner et al., 2010; Denton, Fletcher, Anthony, & Francis, 2006; Menzies, Mahdavi, & Lewis, 2008; Pinnell & Fountas, 2009; Simmons et al., 2008) and the use of leveled reading materials (Pinnell & Fountas, 2009; Taylor, Pearson, Clark, & Sharon, 2000; Treptow et al., 2007) have been identified as useful methods, practices, and tools to support reading level.

Small group and independent practice. Intensive reading interventions providing differentiated instruction can assist struggling readers' learning experiences, and help them to achieve reading proficiency (Benner et al., 2010; Simmons et al., 2008). Educators' provisions of rigorous reading interventions is necessary to support students who fall behind in reading (Gijsel, Bosman, & Verhoeven, 2006) and should be implemented as soon as deficiencies are determined. Reading acquisition is not an innate ability, but a complex learned process (Dehaene & Cohen, 2007). Research supports the employment of early interventions as more effective than later interventions or remediation in upper grades (Denton et al., 2006). Remediation within the upper grades can be problematic since the reading gaps have broadened and deficiencies have compounded, which make them more difficult to address over time (Cunha, Heckman, Lochner, & Masterov, 2005). In a longitudinal study conducted by Simmons et al. (2008), students from kindergarten through third grade, who were involved in reading interventions that scaffold reading foundation skills to provide the necessary instruction to address weak areas, responded positively, reducing the achievement gap.

According to Denton et al. (2006), students with persistent severe reading deficiencies can benefit from targeted reading interventions that include oral reading fluency and comprehension instruction along with active student involvement. There is no room for a one-size fits all intervention curriculum plan (Allington, 2007). Interventions achieving successful reading outcomes provide support during the reading of difficult text, guiding learners to increase comprehension (Donalson, 2009; Scharer, Pinnell, Lyons, & Fountas, 2005). Children with reading difficulties need individual or small group instruction well designed to meet their needs (Menzies et al., 2008; Pinnell &

Fountas, 2009). Similarly, talented above average readers require interventions to assist them to reach their full potentials. Above grade level readers often read below their ability levels and receive little support to obtain their ability level (Reis et al., 2004).

Reading interventions are critical to all readers. Benner et al. (2010) wrote that educators must begin the intervention process in the beginning years of formal education. Early interventions through small group instruction are also recognized as a possible method for enabling above average readers to respond more positively to challenging text (Reis & Boeve, 2009). Most advanced readers possess the ability to process language to obtain meaning at an advanced level and respond best to more independent learning and critical thinking instruction (Catron & Wingenbach, 1986). Just as differences exist between skill levels and reading outcomes of above readers or advanced readers and below grade level readers, differences exist between average and advanced readers (Chall, 1983; Reis & Boeve, 2009). Developmentally each of these categories of readers is at a different stage of reading requiring differentiated instructional practices (Chall, 1983). No Child Left Behind (2002) reauthorized an emphasis on early intervention as a means to help all students become proficient readers. Research on varied interventions showed an increased interest in small group instruction (Denton et al., 2006; Menzies et al., 2008; Pinnell & Fountas, 2009; Reis & Boeve, 2009).

Leveled reading materials. Small group instruction has many advantages when the instruction is intentional and matches the needs of the learners. Harn et al. (2008) suggested that most reading difficulties can be prevented through well planned, effective instruction practices. One such opportunity is small group reading instruction designed to meet explicit needs of readers. Providing small group reading instruction cannot only

help readers make faster progress, but this progress can enable them to profit from other whole group classroom learning opportunities as the reading achievement gaps are reduced (Pinnell & Fountas, 2009). The structure of these groups is essential to the progress of each reader. In addition to group structure, lesson structure with predictable sequencing helps learners develop a sense of security, essential for struggling readers (Pinnell & Fountas, 2009). This supported learning environment is crucial to the reading process, which prompts learners to engage in various strategies and to build on prior knowledge (Donalson, 2009; Taylor et al., 2000). Reading instruction that individualizes and differentiates has had compelling results not only for struggling readers, but for proficient readers as well (Taylor et al., 2000). Individualizing and differentiating reading instruction requires educators to provide leveled text reading materials (Kontovourki, 2012; Treptow et al., 2007). Individual reading levels are determined by the individual's accuracy, oral reading fluency (ORF), and comprehension scores (Beaver & Carter, 2009). Text labeled at a frustration level suggests the text is too difficult for the reader to read with or without assistance. Independent labeled text suggests that text may be read and comprehended by the individual without assistance, while text labeled as instructional suggests that with support the reader will be able to read and comprehend the text (Beaver & Carter, 2009). According to a study of third graders with low levels of on-task behaviors and comprehension, students reading independently leveled text demonstrated improved comprehension, while instructionally leveled text improved time on-task behaviors (Treptow et al., 2007).

Time to read. Readers need time to read materials at the individual level. The volume of reading engagement by students is a critical component to reading

achievement that should not be overlooked. In a study to identify effective teaching practices, researchers Taylor et al. (2000) suggested that educators who provided leveled reading materials and time to read had higher reading achievement results than teachers who did not. In addition, children who were in classrooms and schools that provided opportunities for them to read independently as well as to select materials were more likely to engage in voluntary reading in and out of school (McKool, 2007). In high-achieving classrooms, independent reading practice time was a distinguishing feature (Pressley et al., 2002). Time spent reading leveled books is particularly important for struggling readers who not only need books in their hands that they can read accurately, fluently, and with good comprehension, but who also need sufficient time to read (Allington, 2007).

Foundational Skills for Readers

Oral reading fluency. The ability of a reader to read smoothly and effortlessly with attention to punctuation and inflection while reading orally (Hapstak & Tracey, 2007) is a concern for educators who transition readers from learning to read to reading to learn (Chall, 1983). According to Chall (1983), typically second grade level texts contain familiar, high-frequency words and short sentences that move second grade students from learning to read to reading to learn by the end of their third grade. During this stage of development, readers acquire fluency and comprehension skills necessary to proceed to the subsequent reading stages (Chall, 1983). The diminishing role of decoding skills during the reading process is necessary to reduce the cognitive load of the individual so that reading for meaning is possible (Reutzel, Fawson, & Smith, 2008). The National Reading Panel (2000) report suggested that without oral reading fluency

(ORF), text becomes laborious and inefficient, making story content difficult for readers to remember and to relate the ideas from the text to their prior knowledge, thus directly impacting reading comprehension (Ari, 2011). Fluency instruction helps readers automatically recognize words and comprehend text at the same time making readers passage comprehenders rather than struggling decoders (Nichols, Rupley, & Rasinski, 2009).

According to the National Reading Panel (2000) report, many effective methods, such as repeated reading, paired reading, listening-while-reading, recorded reading and so on, exist for assisting ORF development; however, the common thread for each of these approaches is that they include oral reading and repetition and each provides guidance or feedback (Denton et al., 2006). Denton et al. (2006) and Ari (2011) found that repeated reading improved ORF when text was presented at the instructional level, while research by Hapstak and Tracey (2007) suggested that to promote growth in ORF through repeat readings, an independent level text is most appropriate. Hapstak and Tracey (2007) concluded that independent leveled text allowed readers to focus their energy on practicing expression, prosody, and reading rate rather than to spend energy on decoding words. These studies supported positive repeated reading effects on fluency of learners (Ari, 2011; Denton et al., 2006; Hapstak & Tracey, 2007).

Several key reading components, such as vocabulary, automatic word recognition, and reading comprehension, have been linked to ORF. In a study conducted by Berninger, Abbott, Vermeulen, and Fulton (2006), reading comprehension for at-risk second grade readers was significantly improved through increased accuracy and rates of word-level and text-level oral reading. Phonics instruction has been linked to increased

ORF and comprehension with younger readers, kindergarten through second grade; however, with older learners phonics instruction was not shown to significantly impact comprehension (Shanahan, 2006). Although oral reading fluency alone does not equate to reading success, it is an important component (Taguchi, Takayasu-Maass, & Gorsuch, 2004).

Critical to improving ORF and reading comprehension is the practice of repeated reading (LeVasseur, Macaruso, & Shankweiler, 2008; Wise et al., 2010) often utilized by educators in assisted or unassisted formats in small group and one-to-one arrangements (Begeny et al., 2009). Typically, repeated reading involves the reader reading a text two or more times (Begeny et al., 2009; National Reading Panel, 2000). Within the assisted format, reading is modeled through adult, peer, or audio facilitation while the unassisted configuration provides no modeling (Hapstak & Tracey, 2007). Researchers suggested that the effects of repeated reading have a positive impact on both repeated passages and new passages previously not practiced (Lo, Cooke, & Starling, 2011) and on word reading fluency. Comprehension was best when readers used appropriately leveled texts (Hapstak & Tracey, 2007). Repeated reading during small group interventions for below and at grade level readers was shown to be effective (Begeny et al., 2009). The National Reading Panel Report (2000) concluded that, for all levels of readers across grade levels, guided repeated oral reading practice had a significant positive impact on word recognition, fluency, and comprehension.

Commonplace in education is the practice of reading aloud to young learners, which has been promoted as a means to increase children's literacy development (Swanson et al., 2011). Many times this format has a more skilled reader or recorded

audio reading of the story read aloud while the less skilled individuals listen, read, or follow along. Various studies favor listening-while-reading for improving ORF and comprehension (Begeny et al., 2009; Chomsky, 1976; National Reading Panel, 2000; Rasinski, 1990; Taguchi et al., 2004; Winn, Skinner, Oliver, Hale, & Ziegler, 2006); however, mixed reports exist regarding its impact on reading comprehension (Rasinski, 1990; Schmitt, Hale, McCallum, & Mauck, 2010).

Reading comprehension. Comprehension is a continuous, ongoing thinking and learning process as a reader encounters various texts and engages in reading for different purposes and in different ways (Scharer et al., 2005). By building relationships between the text and prior knowledge, the reader is actively involved in constructing new understandings through mentally representing different text structures, inferencing, and monitoring (Meyer & Ray, 2011; National Reading Panel, 2000). Imperative to readers' successes is the ability to engage in these mental processes before, during, and after reading. These activities set the stage for learning and help the reader understand that reading includes more than reading words. Learners need to be able to monitor their reading to identify when meaning is breaking down (Indrisano & Chall, 1995). When learners are able to understand the learning processes that determine what they know, what they want to know, and what they need to know, these understandings create the basis for metacognition and increase comprehension (Indrisano & Chall, 1995).

Teaching specific comprehension strategies is critical to effective reading comprehension. The development and application of reading comprehension strategies is intimately linked to academic achievement (National Reading Panel, 2000). According to TaŞDemİR (2010), readers who employed reading comprehension strategies increased

reading their comprehension success. This complex cognitive process is vitally important to the overall long-term educational success of the learner, setting the stage for life-long learning (National Reading Panel, 2000).

A balanced approach to reading instruction must include a comprehension component. Too much attention to decoding and other reading skills while neglecting reading comprehension can often have an adverse effect on struggling readers (Hapstak & Tracey, 2007). The goal of teaching phonics, phonemic awareness, and vocabulary is to help early readers automatically utilize these skills without distracting their attention from understanding the text (Shanahan, 2006). Comprehension should not be misunderstood as the ability to read well orally. Readers who are good word callers may give the appearance that they are able to read well, but they may not comprehend what they have read (Boyer & Hamil, 2011). The purpose of reading is accomplished through comprehension (Meyer & Ray, 2011).

Beyond Reading Skill Instruction

Attitude and behavior. The McKenna model, developed to discuss the long-term reading specific implication of attitude development, detailed three factors: (a) normative beliefs and the individual's motivation to conform, (b) beliefs about outcomes based on the desirability of the outcomes, and (c) reading experiences outcomes (McKenna et al., 1995). Much research has been conducted on the learner's attitude towards reading and its relationship to the amount of reading engagement, which impacts reading skills (Alexander & Filler, 1976; Kush et al., 2005; Martinez et al., 2008; McKenna et al., 1995; Stanovich, 2008) and overall reading level (McKenna et al., 1995).

The relationship between reading behaviors and reading achievement is a key component to reading ability. According to research conducted by Leppänen et al. (2005) with first grade participants, a bidirectional relationship exists between reading behaviors and reading achievement. Each factor was reported to be predictive of the other. This conclusion built on Wasson et al.'s (1990) research on108 first through sixth graders. Results indicated that students with the lowest reading achievement exhibited the lowest reading engagement behaviors; the opposite was reported for the highest achieving readers. In a more recent study focusing on the relationship between reading attitude and reading achievement, 76 fourth graders were administered Curriculum-Based Measurement tasks and the ERAS, followed by the Indiana Statewide Testing for Educational Progress-Plus reading assessment four months later (Martinez et al., 2008). Results supported a temporal interactive effect of prior reading attitude and ability as predictors of reading achievement. The longest and largest of the studies conducted by McKenna et al. (1995), with a total of 18,185 first through sixth graders, suggested that reading attitudes decline with age, poor readers' attitudes and self-perceptions declined through the grades, the achievement gap between girls with positive attitudes and boys with negative attitudes grew as students progressed through the grades, and girls demonstrated more positive attitudes than boys across all grades. A positive correlation between young children's reading achievements and motivations seems to exist with a possible bidirectional relationship between them (Morgan & Fuchs, 2007).

Both academic and recreational practices have the potential to influence attitudinal changes. Reading attitude and achievement appear to be closely linked over time, developing into valuable causal determinants of future reading achievement (Kush

et al., 2005). Allen et al.'s (1992) examination of fifth grade students' reading attitudes suggested recreational reading was likely to have a more significant impact on academic performance than academic reading. These results might be plausible as young readers who enjoy reading engage in it more often than readers who do not find it enjoyable (Flowerday et al., 2004; Morgan & Fuchs, 2007).

In addition, positive attitudes have been linked to reading material choices (Flowerday et al., 2004; Jones & Brown 2011). Readers are more likely to engage in reading if they are able to choose books that interest them (Anderson, Higgins, & Wurster 1985). In a study using printed text during independent reading, reading growth among third to fifth grade readers was significantly related to the availability of printed materials (Allen et al., 1992). Ease of access to reading materials and the vast array of book choices have made ebooks a topic of interest. Educators need to provide a wide variety of reading material choices as a strong correlation exists between choice and enjoyment of electronic text, which may impact the reader's engagement (Ciampa, 2012a, 2012b).

Developing readers require guidance in making appropriate book choices (Anderson et al., 1985). Anderson et al. (1985) found that poor readers may not select suitable books for independent reading because the books are unavailable, they may not know how to select appropriately leveled books, or they may select books for "show" to get real or imagined praise from peers and adults. Children are especially sensitive to their relative standing with their peers and this perception serves as a major agency for the growth and validation of self-efficacy (Bandura, 1986). Hasselbring et al. (1997) reported embarrassment as a factor influencing reading engagement and motivation to read. Embarrassment was minimized when students used desktop computers for reading.

Ebooks have the potential to influence the impact of book selection based on perceived peer judgment as ebooks provide a more private instructional environment than print books do.

Technology in the Classroom

Historical Background of Classroom Technology

The importance of technology integration in the classroom should not be ignored as evidenced by the increased attention it has been receiving in research studies. Yet, classroom technology is not a new topic in education. The utilization of resource tools to supplement instructional practices has been influencing pedagogy since lantern slides and stereographs were introduced in 1908. Technology progressed to film projectors, radio, television, and other audio/visual technologies (Petrina, 2002). These new technologies were thought by educators and administrators to be the answer to reforming educational practices by piquing student interest and promoting instruction that could lead to more active engagement (Hallstrom & Gyberg, 2011).

Educators, scholars, and other professionals have continued to look at various technology tools, hoping they might act as catalysts to education reform; however, the goals of education in the early 1900s were different than the goals of education today, as schools used to be modeled after factories (Hallstrom & Gyberg, 2011). During the 1990s, technology integration gained renewed interest in the field of education as computer technology was looked to as an educational tool to enhance classroom instruction (An, Wilder, & Lim, 2011). Support came from the Department of Education to build a national technology infrastructure to assist technology utilization in schools (Sternberg, Kaplan, & Borck, 2007). The noteworthy investment increases by state and

federal agencies made technology infrastructure available, increasing educational opportunities (Sternberg et al., 2007); yet, technology integration in the classroom is still lagging.

Knowing the history of technology in education is critical to understanding past successes and failures of technology's inclusion in educational practices. The mere existence of technology tools does not guarantee that they will be effectively integrated to enhance learning; technology integration must be part of a sound education approach (Bransford et al., 2000). The United States Department of Education has recognized technology as a vital part of education, which needs to provide engaging learning experiences, content, resources, and assessment measures (U.S. Department of Education, Office of Educational Technology, 2010). Technology's role in education has captured the attention of many; however, continued research is necessary to understand how technology can be included in educational experiences that improve student achievement.

Role of Technology in Education

Integration for reading instruction. The integration of technology within the instructional practices of the classroom is an important component of NCLB Act. Specific goals to guide educators and state and local officials addressing the integration of technology into the curriculum emphasize technology use to improve academic achievement, making sure all learners are technologically literate (Learning Point Associates, 2007). Technology is recognized to be an essential component of education as it is connected to the prosperity of society (U.S. Department of Education, Office of Educational Technology, 2010). Technology should offer engaging learning

opportunities, content, and resources (U.S. Department of Education, Office of Educational Technology, 2010). Although the federal government has increased funding for technology infrastructure to increase technology access in schools, obstacles remain that limit its use, such as providing teachers with an understanding of how technology can support learning (Shapley et al., 2010). Information is needed to better understand how to interweave technology throughout the curriculum (Shapley et al., 2010). NCLB, along with the increase of federal funds, has heightened the need for research to better understand best practices for technology integration for improving the educational experiences of all learners.

Educators have much to learn about effective integration of technology for instructional purposes. Ciampa (2012a, 2012b) suggested educators should consider technology integration. Ciampa (2012a) found that first grade students engaged more in online reading than in reading of traditional books. A strong correlation between online reading enjoyment and the participants' preferences to have more choices of reading materials was also reported. Other research over the past decades has focused on the potential ways digital technology might support reading comprehension, vocabulary development, phonemic awareness, and sight word development (Doty et al., 2001; Matthew, 1996; Pearman, 2008; Welch, 2010). To date, minimal information addressing the issue of how ebooks can change the instructional reading environment to assist second grade readers in the classroom is available.

Electronic books. An ebook is like a traditional book in several ways: it displays printed text and has cover and title pages; its pages contain the body or story and are organized by a theme or topic for the purpose of communication (Roskos et al., 2009);

and an ebook is not web content (Rockinson-Szapkiw & Holder, 2011). Most ebooks for young readers offer a variety of options aimed at broadening the reader's experience (de Jong & Bus, 2002; Roskos, et al., 2011). Over the past two decades, the importance of quality electronic books has become evident as researchers began to identify some ebook features as distracting or mediocre at best (de Jong & Bus, 2002; Roskos, et al., 2011), while other features promoted meaning construction (de Jong & Bus, 2002, 2003; Ertem, 2010; Korat & Shamir, 2008). Researchers continue to focus attention on design features, such as graphics, hyperlinks, dictionaries, audio, and animations, trying to better understand the impact they have on readers.

The potential for ebooks to enhance reading achievement has been shown to be connected to the ebook design and the learner's needs (Berkeley & Lindstrom, 2011; Roskos et al., 2011; Shamir & Korat, 2009). Researchers de Jong and Bus (2002) proposed that ebook features that provide overlapping and complementary experiences demonstrate the potential to support the learner's ability to internalize the vocabulary and word configuration. Further evidence suggested that supportive features offered through narrations, feedback, and sounds of electronic talking books can help reading development (Oakley & Jay, 2008). Kindergarten age students have been reported to benefit more from ebooks that offer dictionary and interactive features than from ebooks that only offer a listen or read feature (Korat & Shamir, 2008). de Jong and Bus (2003) suggested that features available within electronic texts such as games and hidden hotspots are distracting to readers. Shamir and Korat (2009) examined features to reduce distractibility. They recommended providing design features such as (a) text highlighting as text is read, (b) repeat reading capabilities for dictionary option, (c) separation of game

and text modes, and (d) hotspots that can be activated by the reader that correspond to text. Evidence (de Jong & Bus 2003; Korat & Shamir, 2007; Shamir & Korat, 2009) supports the potential of ebooks' supportive features to positively impact readers' abilities to access more challenging texts than they would be able to read without the supportive features.

Compared to traditional printed text materials, electronic texts offer powerful differences that can help the reader construct new meaning and can support the reader's reading challenges (Reinking, 1998). The interactive, adaptable, nonlinear features of ebooks are different from the features of printed books (Ertem, 2010; Larson, 2010). For readers the electronic reading format offers an active engagement environment helping readers build or activate more complete schemas of the text allowing readers to reach a more complex level of comprehension (Ertem, 2010; Verhallen, Bus, & de Jong, 2006). In an investigation of struggling fourth grade readers, three different reading environments were examined to assess reading comprehension (Ertem, 2010). Results indicated that the use of ebooks with aligned interactive animations resulted in improved comprehension and inferencing when compared with printed text experiences (Ertem, 2010). In addition, reading comprehension increases have been connected to the use of audio narrative text features of electronic books in a study by Grimshaw, Dungworth, McKnight, and Morris (2007) in which subjects ranged in age from 9 to 11 years. Participants benefited from this audio narrative feature when retrieving information and making inferences (Grimshaw et al., 2007). Contributing to the findings that animations and audio narrations can assist reading comprehension, researchers Korat and Shamir (2007) examined low and middle socio-economic status groups' reading comprehension

in an electronic book environment. In this study kindergarten students showed similar improvements in comprehension when they read electronic books read or listened to them independently, as compared with an adult read printed version of the same text. According to Larson (2010), digital reading devices put the reader in greater control of the text, promoting new literacy practices that strengthen comprehension and enhance the reader's connectedness to the text. In this study, Larson (2010) identified audio narrative text as helpful for readers that were experiencing decoding difficulties. Results from Larson's (2010) study support the use of audio narrative text features to reduce decoding and fluency problems.

Researchers have also provided evidence that adult supportive environments during reading acquisition influence reading achievement outcomes (de Jong & Bus, 2002; Korat et al., 2009; Korat & Shamir, 2007). de Jong and Bus (2002) studied kindergarten age subjects and concluded with the suggestion that adult-read printed book formats provided more support for learning story content and phrasing than electronic text without adult support listened to independently. Furthering de Jong and Bus's (2002) findings were Korat et al.'s (2009) claims that interventions using researcher-developed ebooks with adult support demonstrated superior reading outcomes than printed text with adult support or ebooks read independently. Additional research regarding interventions using electronic books without adult support and printed text with adult support showed growth for both groups in vocabulary, word recognition, and phonological awareness skills (Korat & Shamir, 2007). Korat and Shamir's (2007) results indicated that independent utilization of ebooks can provide a supportive instructional reading environment for early readers. Information regarding the influence of adult-

supported ebook experiences on reading behaviors and overall reading level when adult support may not be available has the potential to add insight to previous research.

That electronic talking books have the potential to help readers construct meaning and support reading fluency is well documented (Doty et al., 2001; Grimshaw et al., 2007; Pearman, 2008). Audio narrative features are important to understanding how ebooks can support daily instructional practices. Ebooks with narrative mp3 features allow students access to more difficult text with their assistive features (Doty et al., 2001; McKenna, 2002). Through narration, illustration, and some animations, these electronic talking books can support reading comprehension measured by comprehension questions (Doty et al., 2001). The intonation and pronunciation of the text reduces the burden of decoding, thereby allowing the reader to devote more attention to processing and constructing meaning from the text (Doty et al., 2001; Grimshaw et al., 2007; Pearman, 2008). The distinction of the voice presenting the material is important to future studies. Most audio features fall under two categories: (a) synthetic voice narration (i.e., text-to-speech) or (b) natural voice (i.e., mp3 format). The basic tenet of multimedia learning is the voice principle (Mayer, 2011, p. 102), suggesting that cognition improves during multimedia presentations if a natural voice rather than a machine or foreign accented voice is used (Mayer, 2011). When natural voice is utilized in combination with ebooks, words and sentences are pronounced and read aloud fluently, providing quality modeling to allow the reader to concentrate on meaning rather than to focus on decoding (McKenna, 2002). In the past few decades, audio books have been noted to provide an effective instructional reading environment for elementary students with disabilities (Gilbert & Williams, 1996; Gilbert, Williams, & McLaughlin, 1996) and struggling

readers (Koskinen et al., 2000), promoting fluency. Grimshaw et al. (2007) investigated nine to eleven year old participants' comprehension of electronic text with mp3 narrations compared to traditional text books. Evidence suggested that the mp3 narrations supported the readers' abilities to both retrieve information and to make inferences, thus improving comprehension. Larson (2010) tested the use of synthetic voice features in a study of second grade readers and reported that students did not prefer to use the feature. However, in a study focusing on undergraduate college students, no significant difference in learning gains was evident when comparing synthetic or natural voice types (Santally & Goorah, 2012).

The use of ebook features to support reading skill development and comprehension has also raised concerns for educators and researchers. de Jong and Bus (2002) suggested that many attractive features of ebooks, like automatic animations during a read aloud of the text, can distract the reader's attention. Dundar and Akcayir (2012) compared ebooks delivered on tablet PC with printed text, and found that fifth grade students' reading performances, reading speeds, and reading comprehension were not significantly different. However, the electronic text in Dundar and Akcayir's study did remove physical and ergonomic difficulties.

Regardless of the inconsistent findings (Doty et al., 2001; Dundar & Akcayir, 2012; Grimshaw et al., 2007; Larson, 2008; McKenna, 2002; Pearman, 2008), commonalities within the studies should be noted. Ebooks support various reading skills when reading with and without reading instructional support. The presence of text highlights, animations aligned with text, dictionary option with repeat action, narrations, and a game mode separate from the text mode are advantageous (de Jong & Bus, 2002,

2003; Grimshaw et al., 2007; Korat & Shamir, 2004, 2008; Larson, 2008; Shamir & Korat, 2009).

Although past study results (Doty et al., 2001; de Jong & Bus, 2002, 2003; Dundar & Akcayir, 2012; Grimshaw et al., 2007; Korat & Shamir, 2004, 2008; Larson, 2008; McKenna, 2002; Pearman, 2008; Shamir & Korat, 2009) have produced some inconsistent results, foundational information regarding the importance of ebooks as educational tools to promote literacy development is evident. Possible explanations for the conflicting results might be the features, type of ebook, suitability of the text level, book choice, or the device from which the ebook was read. Integration of ebooks into the classroom should be guided by developmental appropriateness (Lamb & Johnson, 2011; Moody, 2010) as educators using ebooks have the potential to create new teaching and learning possibilities (Larson, 2010).

Conclusion

The history of reading education and technology integration are not new topics in education with its attention on beginning reading achievement and technology inclusion. However, over the past decade the NCLB Act has perhaps increased the focus of researchers and educators to identify how technology can support or enhance reading achievement outcomes. Educators have continued to seek possible technology integration and instructional enhancements opportunities, including emerging technologies, to provide optimal student reading outcomes. Researchers have been investigating potential technology integration into reading instruction practices to bring improved reading outcomes (Wang & Reeves, 2003). According to Harris (2011), print-based strategies assisted reading comprehension when learners utilized multimodal texts.

In addition Benner et al. (2010) suggested that, as struggling readers become older, they require well-targeted instruction to support better comprehension. These readers also require time to practice reading books at their instructional and independent reading levels (Allington, 2007). Strong support exists for interventions that provide differentiated instruction (Ankrum & Bean, 2007; Reis et al., 2004; Whitley, 1979). Researchers have suggested that classrooms providing only grade appropriate reading materials for reading instruction can be detrimental to student achievement (Ankrum & Bean, 2007). Successful instruction requires educators to be knowledgeable regarding technology integration, differentiated instruction, intervention planning, and best practices. For educators to teach effectively, a deep understanding of the reading process, student strengths, needs and abilities are also necessary for differentiated teaching (Ankrum & Bean, 2007).

CHAPTER THREE: METHODOLOGY

According to the No Child Left Behind Act 2001 (2002), all students should have reached a proficient level in reading by 2014. In the state of Michigan, the Michigan Educational Assessment Progress (MEAP) for reading and math begins the formalized assessment process (Michigan Department of Education, 2013). Currently this process provides schools with information to assess how well their school's programs and curriculum are aiding students to attain proficiency on the Common Core Standards and reading proficiency. Prior to third grade, the state of Michigan allows each school to use an assessment of its choice to evaluate their students' reading progress and to determine if their students are making progress towards the Common Core Standards.

In July 2012, Michigan received an ESEA flexibility waiver for the United States Department of Education allowing Michigan School Accountability Scorecards to replace the Michigan School Report Cards used to report the schools' Annual Yearly Progress (Michigan Department of Education, 2013). Scorecards combine student assessment data with graduation or attendance rates and compliance with state and federal law information to replace Annual Yearly Progress report cards. As school districts worked to meet proficiency targets, educators recognized that the foundational reading skills necessary to meet reading goals by third grade needed to be developed in the primary grades. In a longitudinal study, Cunningham and Stanovich's (1997) research results indicated that early reading ability was a strong predictor of future academic achievement outcomes and that changes in students' reading risk statuses were sustainable over time. This result was supported by Simmons et al. (2008) longitudinal study of reading risks for participants in kindergarten through third grade. This information regarding early

reading status as it relates to future achievement, along with the formal testing process, make the acquisition of reading proficiency before students reach the critical third grade marker imperative.

The purpose of this quantitative, quasi-experimental pretest–posttest research was to explore the significance of using ebooks during reading instruction and practice for second graders in the classroom. This non-equivalent posttest only control group design utilized data collected from reading logs to determine the possibility that the instructional reading environment influenced reading behavior. Chapter 3 presents an overview of the methodology used for this study. The appropriateness of the study's design, hypotheses, sample population, setting, instrumentation, procedures, and methods of data analysis will be discussed.

Design

To determine the causality of instructional reading environment influencing reading level and reading attitude, a quasi-experimental, pretest–posttest, non-equivalent control group research design was utilized, while a posttest only non-equivalent control group design was used to examine reading behaviors in different instructional reading environments. All students received small group reading instruction and independent reading practice time in different instructional reading environments: (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice.

Intact classes at a south central Michigan rural elementary school were used for this study. Prior to the start of the school year, teachers and administrators worked together to place students in classrooms that balanced academic achievement levels, discipline issues, and other special needs. The goal of the placement process was to establish homogeneous classrooms with equal numbers of high, middle, and low achieving students in each classroom. Because these classrooms were organized in such a deliberate manor, randomization of students was not possible as is common in educational research conducted in classroom settings (Kraska, 2010). Thus, the quasi-experimental design was convenient and not very disruptive to the educational setting. Although random assignment was not possible in the educational setting, the design employed in this study was acceptable (Gall et al., 2007). Further, quasi-experimental designs have been used to investigate ebook influences on elementary age students' reading skills, thus further supporting the use of this design for this study (Chambers et al., 2011; Doty et al., 2001; Dundar & Akcayir, 2012; Korat et al., 2009). For example, Korat (2010) utilized a pretest-posttest, quasi-experimental design to investigate the extent to which an ebook supported kindergarteners' and first graders' language and comprehension. The pre-experimental, posttest only non-equivalent control group design to assess the dependent variable reading behaviors was used as an exploratory approach to discern whether reading behaviors are worthy of further investigation based on instructional reading environment.

Threats to internal validity are inherent in studies in which participants cannot be randomly assigned to groups. Specifically, the selection threat due to non-equivalent groups was inherent. However, the use of a pretest as a covariate in the statistical

analysis in this study provided some control for the selection threat to validity due to non-equivalent groups (Kraska, 2010). The use of analysis of covariances (ANCOVAs) with the pretest scores utilized as covariates to test hypotheses 1 and 2 provided critical information regarding the possibility that pre-existing group placement, rather than the treatment condition, was responsible for differences between groups (Gall et al., 2007). However, with the posttest only non-equivalent control group design used to examine reading behaviors in different instructional reading environments, no covariate was possible. To control for the selection threat to validity, homogenous groups were used. Comparison proportion of gender groups for each of the four independent variable levels via chi-square test of independence was performed to establish that the four reading environments were homogenous in regards to gender. Homogeneity of gender distributions across the four instructional reading environments was important to the study, because the homogeneity helped to assure that the influence of gender did not confound the measurements between the levels of the independent variable and the measurement of the dependent variables.

Questions and Hypotheses

Research Questions

R_1: Does a statistically significant difference exist in reading level scores among the instructional reading environments, i.e., (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice, while controlling for pretest scores?

R_2: Does a statistically significant difference exist in reading attitude scores among the instructional reading environments, i.e., (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice, while controlling for pretest scores?

R_3: Does a statistically significant difference exist in reading behavior among conditions based on the medium in which second grade readers receive reading instruction, and read independently and for practice related to the four reading instructional environments, i.e., (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice?

Null Hypotheses

$H0_1$: A statistically significant difference will not exist in reading level scores as measured by the DRA2® assessment among the student instructional reading environments: (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice, while controlling for pretest scores.

$H0_2$: A statistically significant difference will not exist in reading attitude scores as measured by the ERAS assessment among the student instructional reading

environments: (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice, while controlling for pretest scores.

$H0_3$: A statistically significant difference will not exist in the reading behavior scores as measured by the total minutes spent (a) pleasure reading in school, and (b) reading assignments in school, between the student instructional reading environments of (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice.

Participants

Demographics and Sampling

The participants for the study were recruited from second grade classrooms from a rural, Title 1 elementary school located in a town of approximately 8,300 people (City-Data, 2012). According to the National Center for Education Statistics (2011), the school's enrollment in pre-school through second grade was approximately 389 students. Of this Title 1 school's population, approximately 67% of the students were eligible for free or reduced lunches, which was 19% higher than reported by the state of Michigan (VanOrman, 2013). The school population's ethnic diversity consisted of 94% Caucasian students with a Caucasian population of 96 % in the second grade; Hispanic students accounted for 3% of the student population, with 2% of the second grade students being

Hispanic, African American students accounted for 3% of the student population, with 2% of second graders being African American. Within this pre-school through second grade population of students, 18% received language services with 8% of second grade students receiving language services. About 17% of the pre-school through second grade student population were eligible for special education services, with 7% of the second grade population eligible for special education services. The student population at this rural elementary school ranged from 4 years 10 months to 9 years of age and consisted of 56.9% male students and 43.1% female students (VanOrman, 2013).

Recruitment

The participants were second grade students (*N*=88) selected from four second grade classrooms and were a convenience sample. Eighty-eight participants (88%) of the 100 possible participants volunteered to be part of the study. All students participated in the treatment and control activities as part of their reading curriculum; however, data for analysis were only collected and analyzed for the 88 volunteers.

Second grade students were identified as a group of interest since past researchers suggested that even with targeted interventions during the first two years of formal education, many students struggle to become proficient readers (Begeny et al., 2009). Yet, in third grade students are expected to read at grade level (No Child Left Behind, 2002), indicating the literacy experiences prior to third grade are critical to the learner. The researcher recruited participants in the target population by first meeting with the local principal and second grade teaching team to share the proposed study. The researcher also presented the study to each second grade classroom. Parental consent forms were provided to the teacher for distribution to their students; the teachers were

asked to instruct their students to take the materials home to their parents for consent and subsequently return the materials to the teachers. Assent forms were provided to the classroom teachers and distributed to the students requesting their assent to participate. Consent and assent is explained in more detail in the procedure section.

Once consent and assent were received from the parents and students, the researcher randomly assigned one classroom of second grade students (*n*=24) to form a treatment group using ebooks only, one classroom of second grade students (*n*=22) to form a treatment group receiving ebooks during instruction with a choice of ebooks and traditional books during practice, one classroom (*n*=23) to form the treatment group receiving traditional books during instruction with the choice of traditional books or ebooks during practice, and finally one classroom (*n*=19) to form the control group using traditional books both in instruction groups and during practice.

Demographics of Participant Sample

Table 1 displays the demographics of the 88 participants disaggregated by instructional reading environment. Although within this study's population, approximately 67% of the students were eligible of free or reduced lunches (VanOrman, 2013), this information specific to the second grade participants was unavailable.

Table 1

Frequencies and Percentages of Demographic Variables of Study Disaggregated By Instructional Reading Environment (N = 88)

	Ebook Only (*n* = 24)		Ebook Instruction/ Choice Practice (*n* = 22)		Traditional Book Instruction/ Choice Practice (*n* = 23)		Traditional Book Only (*n* = 19)		Total (*N* = 88)	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Gender										
Male	13	54.2	9	40.9	11	47.8	8	42.1	41	46.6
Female	11	45.8	13	59.1	12	52.2	11	57.9	47	53.4
Race										
Caucasian	23	95.8	21	95.5	23	100.0	17	89.4	84	95.4
Hispanic	1	4.2	0	0.0	0	0.0	1	5.3	2	2.3
African American	0	0.0	1	4.5	0	0.0	1	5.3	2	2.3
Language Services										
Yes	2	8.3	2	9.1	2	8.7	1	5.3	7	8.0
No	22	91.7	20	90.9	21	91.3	18	94.7	81	92.0
Special Education Services										
Yes	1	4.2	2	9.1	1	4.3	2	10.5	6	6.8
No	23	95.8	20	90.9	22	95.7	17	89.5	82	93.2

Power Analyses and Needed Sample Size

An a priori power analysis was performed to determine the required sample size for this study. GPOWER 3.0.10 software (Faul, Erdfelder, Lang, & Buchner, 2007) was used in this determination. Power is defined as (1-β), where β is the chance of Type II

error (i.e., one accepts the null hypothesis when it is, in fact, false). At a power of .80, one has an 80% chance of seeing significance that is truly in the data.

Two analysis of covariance tests (ANCOVA; one each for Hypotheses 1 and 2) and one analysis of variance test (for Hypothesis 3) were utilized for this study. The power analysis was performed for an ANCOVA analysis with four independent student groups of (a) ebooks only for instruction and practice, (b) ebooks for instruction with ebooks and traditional books for practice, (c) traditional books for instruction with ebooks and traditional books for practice and, (d) traditional books-only for instruction and practice. Previous research examining the influence of ebooks on learning indicated a large effect size for reading comprehension and reading vocabulary (e.g., Macaruso & Rodman, 2009). However, much of the literature regarding ebooks' influence on reading outcomes indicated a small to moderate effect size (e.g., Korat, 2010; Korat & Shamir, 2012; Sharmir & Korat, 2009). Research examining reading attitudes indicated a moderate to large effect size for instructional reading environment treatments (e.g., Fawson, Reutzel, Smith, & Moore, 2009). Yet, other research indicated a small to moderate effect size for reading attitudes utilizing CD-ROM instructional reading environments (e.g., Matthew, 1996; Moody, 2007). Thus, an a priori power analysis that included an alpha level of .05, power of .80, and a medium effect size of $f = .25$ was performed. The results indicated that a sample of 201 students would be required to achieve power at 80%. For a large effect size of $f = .40$, a sample of 81 records would be required. A sample size of N=88 was obtained for this study, which was appropriate and sufficient for this study.

Setting

The setting was a public elementary school located in a rural area of south central Michigan. The school had a total K-12 enrollment of approximately 1,730 students, with 389 students Pk-2. This school was located in a small town of approximately 8,211 within a county of approximately 47,000 in southern Michigan (U.S. Census Bureau, 2014). Demographic information indicated the city's population was 96% White, 1% Black, 2% Hispanic, less than 1% Asian, and less than 1% American Indian (U.S. Census Bureau, 2014).

The classroom teachers included one male and three female teachers with a range of public school teaching experience from 13-20 years. Each teacher had earned a bachelors and a masters' degree in elementary education. Three of the four teachers had taught in the lower elementary school setting for their entire careers, however, one teacher was completing her second year as a second grade teacher. The ebook only during instruction and practice treatment was randomly assigned to the classroom of the male teacher who had 16 years of second grade teaching experience. The ebooks during instruction, with a choice of ebooks and traditional books treatment was randomly assigned to the female teacher with only two years of second grade teaching experience and 13 years overall teaching experience. The traditional books during instruction, with the choice of ebooks and traditional books during practice treatment was randomly assigned to the female teacher with 20 years of elementary teaching experience. The traditional books only during instruction and practice control group was randomly assigned to the female teacher with 15 years of elementary teaching experience.

Within each second grade classroom used in the study, the small group reading curriculum consisted of five instructionally leveled groups per classroom. Instruction consisted of a before, during, and after reading instruction format. Lessons began with a review of a teacher-identified skill or strategy or a new book introduction followed by a first reading or a reread of a familiar book. Lessons were constructed by the teacher to support effective processing and problem solving through questioning at planned stopping points during reading. A school-approved small group lesson design format was followed by each classroom teacher. As part of the school improvement plan, each second grade teacher had received ongoing training, professional development, and observation and evaluation on their effectiveness to create and implement small group reading lessons prior to and during this study. The school principal continued to review reading lesson plans as part of the building's improvement plan throughout the study. This approach helped ensure treatment fidelity. Finally, reading lessons ended with a story discussion, revisiting text and vocabulary, or with an oral or written comprehension extension. Comprehension extensions provided the students with opportunities to think about the story, which deepens understanding. Interventions and assessments were conducted by the students' reading teachers and occurred within the self-contained classrooms during class time. Interventions were completed in small group settings within the classroom, five days per week for four consecutive weeks. The small group reading instruction was completed in the morning hours during the reading block for all students. Participants were provided reading practice time within the classroom 5 days per week for the length of the four week intervention. This time was optional reading practice time for students.

All four classrooms were the similar except for the independent variable, instructional reading environments. A detailed description of the four intervention groups is provided in the procedure section.

Instrumentation

For the reading level assessment, each student was assessed within the classroom setting. All students were administered the Developmental Reading Assessment 2® (DRA2®) (Beaver & Carter, 2009) beginning one week prior to and one week following the intervention, as these assessments are individualized assessments impossible to complete as a group. The time required to complete each assessment was dependent upon the reader's reading level and would not allow for all students to be assessed on the same day. However, each participant completed their individual reading level assessment within one day, with all assessments completed within a five day period. Reading level score was a continuous variable construct derived as the DRA2® independent reading level from the DRA2® instrumentation sub-scores of oral reading fluency (ORF), accuracy, and comprehension.

One day prior to the beginning of the treatment, all participants were administered the Elementary Reading Attitudes Survey (ERAS) (McKenna & Kear, 1990) to assess reading attitudes. This survey was given after the students returned from their lunch breaks. Classroom teachers read the directions and questions aloud, then waited for students to circle their answer before reading the next question. On the final day of the four week small group reading intervention all participants again completed the ERAS survey after they returned from their lunch breaks. All participants completed this assessment using a paper copy. Reading attitude score was a continuous variable

construct derived from the ERAS (McKenna & Kear, 1990), which consists of 20 statements assessing two components of reading attitude: (a) recreational reading and (b) academic reading.

All participants were instructed on the use of the Daily Reading Logs prior to the beginning of the small group reading interventions. Participants had easy access to the reading logs to allow them to record reading time. Procedures for teachers' signing the reading logs were established prior to the intervention. Teachers or trained assistants checked reading logs throughout the day to validate the students' records. Logs were collected at the end of each school week. The total number of minutes students read for pleasure and assignments were used to measure the dependent variable reading behaviors.

Developmental Reading Assessment® (DRA2®)

The DRA2® is a standardized reading test used to determine the instructional reading level of an individual (Beaver & Carter, 2009). For this study, it served as the pretest and posttest assessment tool for identifying independent reading level. Its design is structured to allow classroom teachers or other trained individuals to administer the assessment repeatedly within and across multiple school years. Of particular interest to this study was its ability to (a) determine the student's independent reading level, (b) identify reading strengths and weaknesses, (c) inform reading instruction, and (d) monitor progress in reading (Beaver & Carter, 2010). Using the pretest DRA2® scores, interpreted according to reading level, independent reading levels were used to assign students into small reading groups within each classroom. The DRA2® reading levels were computed according to accuracy percentages and students were grouped according to their individual performance levels as (a) 93% or lower Intervention/Frustration level,

(b) 94% Instruction level, (c) 95%-98% Independent level, and (d) 99%-100% Advanced level. The DRA2® pretest for reading level also provided critical information to the classroom teachers regarding the readers' strengths and weaknesses for their small group reading instruction planning. So, in addition to serving as a pretest, DRA2® scores were used to provide appropriate scaffolding for each student.

The DRA2® assessment establishes a student's reading comprehension, accuracy, and oral reading fluency. These scores are analyzed to formulate the individual's independent reading level. An assessment criterion has been outlined by Beaver and Carter (2009) for each of the DRA2® assessments. Text books are "leveled" identifying student level as "below," "average," or "above" levels for each grade level allowing educators to determine if students are making adequate progress throughout the school year.

DRA2® - Oral Reading Fluency (ORF) and Accuracy. The Oral Reading Fluency evaluates the individual's reading rate and percent of accuracy. Utilizing a running record oral reading format, ORF scores are assessed on indicators of expression, phrasing, rate, and accuracy. The four indicators are then summed to derive a score which ranges from 4 to 16. ORF scores ranging from 4 to 6 indicate that the student is at an Intervention (below) level. Performance scores from 7 to 10 indicate an Instructional (at) level and scores from 11 to 14 indicate an Independent (above) level. Expression and phrasing scores are established by rubric criteria. Performance level for rate and accuracy are determined according to the words per minute or the accuracy continuum provided in the DRA2® teacher assessment kit where rate is calculated by the number of words in the passage multiplied by 60, then divided by reading time in seconds. An

accuracy percentage is calculated by subtracting the reader's total number of word errors from the number of words in the passage, then divided by words in the passage and multiplied by 100. Accuracy percentages indicate the performance levels as (a) 93% or lower Intervention/Frustration level, (b) 94% Instruction level, (c) 95%-98% Independent level, and (d) 99%-100% Advanced level. Combining the expression, phrasing, rate, and accuracy scores creates the ORF score for a range of 4-16 (Beaver & Carter, 2009).

For lower leveled (levels 4-12) readers' phrasing, self-monitoring/self-corrections, problem solving unknown words, and accuracy behaviors are assessed, while readers at levels 14-80 are assessed on accuracy, expression, phrasing, and reading rate. The DRA2® provides leveled text A, 1, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 28, 30, 34, 38, 40, 44, 50, 60, 65, 70, and 80. At each reading level, the administrator selects from two to three leveled text possibilities. Depending on the reader's age and instructional level, scoring procedures vary. For the younger readers, reading the lower leveled text, the administrator models reading prior to the student reading the text. Students predict outcomes for the mid-leveled text based on illustrations and then read the entire text. Upper level readers are only required to read a preselected portion of the text (Beaver & Carter, 2010). During the reading, the administrator notes the student's reading behaviors in a running record and records the length of time required to complete the text in minutes:seconds format.

DRA2® - Comprehension. A student's comprehension is measured by story retelling and story understanding. Key criteria included are main idea, important facts, characters, sequenced events, or topic information (Beaver & Carter, 2009). Rubrics are provided to assess level of comprehension performance for each assessment. At each

level of performance, Intervention/Frustration, Instructional, Independent, and Advanced, expectations of retelling information increases. The administrator uses the suggested percentages on the supplied rubrics, introducing the students to each level of text until they fall below the percentage for their level of reading, for example, fall below 91% on level 2.

DRA2® - Independent Reading Level. By analyzing the information from the accuracy, ORF, and comprehension scores determines overall independent reading level. Independent reading level is described as the reader's ability to engage with text independently without adult assistance. Students achieving an independent reading level of 38 and above are identified as above the expected grade level for the end of their second grade school year. Independent reading text level scores of 28 to 34 are considered at grade level or level 24 and below scores are identified as below grade level. At each text level, performance level is identified as Intervention/Frustration, Instructional, Independent, or Advanced level for the individual student. Instructional performance level indicates the reader's ORF or comprehension score is within the Instructional range. Independent level requires both ORF and comprehension to be within the Independent range and advanced performance requires Advanced level scores in both ORF and comprehension. If the reader's overall reading levels indicate that the reader is at an advanced level, then the assessor will move to the next level of text to determine the reader's independent reading levels. Likewise if the reader's score indicates that the assessment text is at a frustration level, the assessor will continue the evaluation process with a text that is below the current assessment text level. This process continues until the reader's independent and instructional levels are determined. Possible scores of

the DRA2® independent reading level are A-80, with scores of 28-34 indicative of reading at the second grade level. Higher DRA2® scores are indicative of higher reading levels of students.

Reliability of DRA2® instrumentation. According to Beaver and Carter (2010), reliability testing for the various DRA2® components was conducted for internal consistency, parallel equivalency reliability, test-retest reliability, and inter-rater reliability. Analyses indicated reliability between Oral Reading Fluency and Comprehension at all levels to be moderate to high, ranging from .50 to .80. Equivalency across text was established as well as test-retest reliability and inter-rater reliability. Inter-rater reliability had raters agreeing 66% to 72% of the time on Oral Reading Fluency and Comprehension respectively (Beaver & Carter, 2010). Internal consistency reliability of the DRA2® instrumentation with the sample used in this study (N = 88) could not be computed. This is because only aggregate scores, not scores for each individual item of the DRA2®, were included in the study dataset.

Validity of DRA2® instrumentation. Validity was established through assessing face validity, criterion-related validity, including concurrent and predictive validity, and construct validity (Beaver, & Carter, 2010). Face validity was rated as high. Criterion-related validity was reported on two categories, concurrent and predictive. Concurrent validity compares the assessment results of the current assessment with other assessments performance concurrently (Beaver & Carter, 2010). No significance on comparison tests was found for concurrent validity yielding correlation scores of .60 to .70. Predictive validity involves comparing the current performance assessment with other performance assessments obtained at a later time (Beaver & Carter, 2010). For the DRA2® predictive

validity yielded coefficient scores of .63 and .60 for ORF and Comprehension. Construct validity testing indicated a high correlation between Oral Reading Fluency and overall score as well as the Comprehension section and score (Beaver & Carter, 2010).

Elementary Reading Attitude Survey (ERAS)

To determine the students' attitudes towards reading, the ERAS (McKenna & Kear, 1990), which consists of 20 statements assessing two components of reading attitude, (a) recreational reading and (b) academic reading, was administered utilizing the pretest as a covariate and a posttest. A pictorial rating scale utilizing the Garfield cartoon character depicting various emotions on a four point scale followed each statement. The expressions ranged from "very happy" to "very upset." Students circled the picture that best represented their attitudes for each statement. The most negative score to the most positive score are quantified by assigning 1 to 4 points respectively. Scores on each of the two subscales represent a range from 10 to 40 total points with a total scale sum maximum equaling 80 points. Statements 1 to 10 relate to attitude towards recreational reading while statements 11 to 20 relate towards academic reading aspects. For this study of the students' overall reading attitudes, the composite scores were utilized. Higher ERAS scores were indicative of a more positive reading attitude.

Reliability and validity of ERAS instrumentation. The norms for the ERAS were developed based on a standardization sample of 18,138 students in grades 1-6 from 38 states. Within this study the internal consistency coefficients for the two subscales and the composite score ranged from .74 to .89 (McKenna & Kear, 1990). A series of tests by which the students were grouped according to various criterion variables provided construct validity evidence. Both recreation and academic subscales were

found to be moderately correlated (r = .64) (McKenna & Kear, 1990). In a study conducted by Worrell et al. (2007), the reliability and structural validity of the scores on the ERAS were found to have satisfactory correlations between the two subscales (r = .62) across elementary grades and reading levels. Evidence suggests that ERAS is a reliable instrument for measuring recreational and academic reading attitudes of first through sixth graders (Allen et al., 1992; McKenna et al., 1995). Internal consistency reliability of the ERAS instrumentation with the sample used in this study (N= 88) could not be computed. This is because only aggregate scores, not scores for each individual item of the ERAS, were included in the study dataset.

Self-report Reading Logs

Reading behaviors for assigned and practice independent reading were recorded utilizing self-report reading logs recording the number of minutes read each day as well as the book title and author's name, similar to data reported in the study by Anderson et al. (1988). The possible range of minutes could be 0 to 1 and above with greater numbers of minutes indicative of a student's spending longer amounts of time reading. To better assess time spent reading for pleasure, reading logs distinguished between assigned reading books and books read by choice (cf. Taylor et al., 1990). Daily log entries were tabulated and calculated in two ways: total number of minutes spent for reading practice in school and for assigned reading in school. Using these data, the researcher looked at relationships between assigned and practice reading. Classroom teachers reviewed daily classroom reading logs. By signing the reading logs each day, teachers verified that students engaged in reading for the time recorded. The total number of minutes students read was used as the dependent variable in Hypothesis 3.

Procedures

After the researcher's proposal was approved by the dissertation committee, IRB approval for the study was sought. Following IRB approval (Appendix A) the researcher received school approval (Appendix B), then worked with the study location principal to present the study to teachers, paraprofessionals, parents, and students.

To begin the study, the researcher met with the local principal and second grade teaching team to share the proposed study and to respond to questions. Following her presentation to teachers, the researcher provided each teacher with parent letters and consent forms to be sent home for parental consideration (Appendices C and D). The consent forms described the study accompanied by a parent letter inviting parents to attend an informational meeting where the researcher could discuss the study and answer questions. The informational meeting was provided at two different times to accommodate parents' schedules. Parents were asked to return consent forms to the classroom teacher. All consent forms were placed in a sealable envelope provided to them by the researcher. Sealed envelopes containing the consent forms were taken to the school office for the researcher to collect. Upon receiving parental approval, the researcher, in the presence of the classroom teacher, explained the study to the students and requested their assent to participate in the study. Following the explanation of the study, the researcher left the classroom. The assent forms were distributed by the classroom teacher and read aloud (Appendix E). Students indicated on the assent form their willingness to participate by placing an X next to the word yes or no and signing their names. All assent forms were collected, placed in the sealable envelope and taken to the school office for the researcher to collect.

After parental consent and assent from the students were obtained, the researcher provided a training session for all second grade teachers. Training sessions were offered to control for instrumentation threat to validity and treatment fidelity. The training session was conducted in a two-part format. The first part of the training lasted 30 minutes. It reviewed the small group reading format, practice reading time expectations, and reading logs procedures that all four groups followed. An additional one-hour training session followed providing a review of iPads and ©Raz-Kids (http://www.raz-kids.com/) ebooks to be used in this study. The second part of the training time focused on the use of iPads for accessing ©Raz-Kids ebooks. It should be noted that all teachers participated even though the control group's teacher would not use ebooks in her instructional reading environment. This was completed so that the control group teacher would be able to include ©Raz-Kids ebook instruction into the classroom instructional reading environment following the study if desired and to reduce treatment diffusion. ©Raz-Kids is an interactive ebook website accessible through a paid subscription with access to over 100 titles grouped according to reading level.

All titles had three viewing options: (a) listen and read, (b) read with links to glossary and selected words pronunciation, or (c) record your reading. Each viewing option had highlighted text features and comprehension quizzes.

Training sessions began by presenting teachers with their classroom sets of iPads, preloaded with the ©Raz-Kids app. The researcher guided teachers through accessing steps, followed by a viewing of the site's teacher tutorial. Teachers then reviewed their classroom rosters and reading level limits for each student. These reading level limits were previously set up by the researcher according to the reading level information

provided by each classroom teacher. Following the DRA2® pretest assessments, reading limits were adjusted to reflect these students' reading levels if different than the teacher indicated. The reading limits correlated with the students' individual reading levels, allowing students to access book titles that were at or below their individual instructional level. After rosters were reviewed, teachers viewed the student tutorial they used to introduce ©Raz-Kids to their students. The researcher provided guidance during this time until all teachers expressed a level of confidence and comfort with the hardware and software. Each treatment classroom was provided a classroom set of iPads to allow each student a personal hand held reading device. The charging and storage of the devices was determined by the classroom teacher with the stipulation that during the school day, students had access to these devices for reading practice as they would traditional books. During small group instruction, teachers of the treatment groups followed the same instructional guide and lesson planning format as the control group. Students brought their iPads to the reading table similarly to the control group bringing their traditional books to their small group. All groups followed the same before, during, and after reading format. For treatment groups, the teachers asked students if they had any questions regarding accessing features of the ebooks. The day prior to the beginning of the study, students were assigned iPads, labeled with their identification. As a whole class, the teacher guided the students through the steps for handling the devices, storage, accessing ©Raz-Kids ebooks as well as explained how to use the ebooks. Students viewed a supportive tutorial for using the site's ebooks followed by a guided practice for accessing ebooks and the features available for use. Each student in the (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks or

traditional books during practice, and (c) traditional books during instruction, with a choice of ebooks or traditional books during practice groups was given a login identification and password. The interactive features of the ebooks, such as electronic page turning, highlighted text, read-aloud, read on your own, recording option, comprehension checks, text enlargement, and pause option were introduced to the students by their classroom teachers. Time was provided for questions as students explored the site through their personal profiles. Note that this condition differed from the ebook condition from some previous studies (de Jong & Bus, 2002; Jones & Brown, 2011; Korat & Blau, 2010) in that instructional reading level texts specific to each individual's reading level were provided.

Reading instructional groups were established prior to the beginning of the intervention. One week prior to the intervention's beginning, the researcher administered the DRA2® to all second grade participants with a trained DRA2® assessment teacher reviewing the process. Based on the covariate of pretest DRA2® scores of all groups, treatment and control group teachers assembled small reading instructional groups within their classrooms according to similar instructional reading level. Small groups consisted of three to six students per group depending of the needs of the students. Students participated in a five day per week, 15 minutes per day small group reading instruction and five days per week independent practice time for a period of four weeks. Small reading instructional groups were utilized by all classroom teachers. Placement was based on reading levels. Through ongoing assessments these groups changed to reflect the growth of the reader throughout the school year. However, the covariate of DRA2®

pretest scores revealed accurate intact small group placement for most students. Prior to the study only 2 students changed small groups.

During small group instruction, teachers focused on before, during, and after reading strategies to increase comprehension as well as on metacognitive skills through the use of questioning. Metacognition is defined as the reader's awareness and/or an ability to analyze the reading for the purpose of effective comprehension (Othman, Darussalam & Darussalam, 2010). Therefore, self-monitoring and checking for understanding during reading supports meaning construction, increases comprehension, and develops text evaluation skills (Wichadee, 2011). All groups followed the same small group instructional format (Appendix F) and lesson guidelines (Appendix G). Instructional materials for small group instruction and practice times were individually leveled to meet the students' needs. The only difference among groups was the text format. When new text was introduced, the students took a picture walk, discussed the illustrations, addressed potential difficult words drawing on phonemic awareness skills, and made predictions. The teachers set the stage for reading by identifying the purpose for reading. During the reading, the teacher asked prediction questions, checked for understanding and promoted reading strategies to assist students when difficulties arose. After the reading, students discussed main ideas, characters and important details, or revisited predictions, drew conclusions, and made inferences.

Making text-self-connections both before and after reading assists comprehension and schema development. During reading questioning promotes self-monitoring, while questioning after reading provides an informal assessment of student strengths and weakness to guide future lesson development. For example, in checking for

understanding before reading a book about hermit crabs, the teacher helps build and assess prior knowledge by questioning students, asking them what they think they know about hermit crabs and what experience provided them with this information. During the reading, the teacher may stop to check for understanding and model a metacognition strategy by saying, "I wonder…" After the reading, the teacher may stimulate deeper understanding by asking what they think will happen next.

Following the small group work, students returned to their seats with their personal hand held reading devices (iPads) or traditional books. The same books were available in both formats. Access to leveled familiar and new books for independent practice was available throughout the day as an assigned reading and choice activity. Although students had assigned in class independent reading three days per week for 25 minutes, practice reading time was a choice activity allowed anytime students finished work prior to the next lesson, free time during indoor recess, or center time. During the independent reading portion of the day, students were required to practice reading their small group books by repeat reading before they could select additional books for reading. While using ebooks, participants were able to use the audio, to use the listen-while-reading and comprehension check features, and to click on difficult words while reading to hear words pronounced for them to support comprehension and fluency. In addition, assistance from an adult or peer was available for technical support. Students in the control group were provided similar support from an adult by raising their hand for assistance as needed while reading traditional books. For example, adults assisted students with decoding, word meaning, and clarification of text meaning if needed. Note that because these students have been exposed to iPads for the past two years, the novelty

of this tool should not be a factor. However, iPads have not been used for intentional reading instruction. Consequently, all classroom teachers continued to utilize iPads throughout the day as they were doing prior to commencement of the study.

One day prior to the beginning of the intervention, all students completed the ERAS (McKenna & Kear, 1990) following their lunch periods. Teachers followed the test administration guide accompanying this survey. Participants were also provided with their individual reading logs (Appendix H) with an explanation of use and storage by the classroom teacher.

On day one of the study, small group reading instruction began with the instructional reading environment for which the classroom had been randomly assigned. Treatment groups and the control group continued with the same reading format and daily schedule that had been followed by teachers throughout the year. For the control group, access to individually leveled books was available similar to ebook access. The control group read appropriately leveled text during small group, assigned, and practice reading times. Storage and access of the traditional books was similar to access and storage of the iPads.

Ongoing assessments included bi-weekly running records to monitor participants' instructional reading levels so that instructional materials were provided continuously at the appropriate reading levels. Text selections for reading instruction included instructional level texts for each group following a guided reading, repeated reading format. Small group instruction followed the same 15 minute format for both the experimental and control groups and lasted a total of 4 consecutive weeks. On the final day of the intervention, students completed the ERAS (McKenna & Kear, 1990)

following their lunch periods. At the conclusion of this day teachers collected the students' reading log sheets for the week. DRA2® testing began the following school day with different equivalent forms of the DRA2® than used for the pretests. Testing was completed within one week by the researcher and reviewed by a trained DRA2® assessment teacher following the four week intervention.

Data Analysis

An ANCOVA was performed to test the null hypothesis that no statistically significant difference existed in reading level scores, as measured by the DRA2® (Beaver, & Carter, 2010) of second grade students based on instructional reading environment while controlling for preexisting differences in reading level. ANCOVA is useful when the researcher wants to control for initial differences between groups before a comparison of the within-group variance and between-group variance is made (Gall et al., 2007). "In quasi experiments, it adjusts for a group difference with respect to that covariate, thereby adjusting the between-group difference on *Y* for confounding variables" (Van Breudelen, 2011, p. 21). In addition, ANCOVAs have been used in many quasi-experimental studies to investigate the effectiveness of a treatment to increase reading levels (e.g., Chambers et al., 2011; Doty et al., 2001). These past studies support the use of ANCOVA as the choice for analysis.

An ANCOVA was also performed to test the null hypothesis that no statistically significant difference existed in reading attitudes scores, as measured by the Elementary Reading Attitude Survey (ERAS; McKenna & Kear, 1990) of second grade students based on instructional reading environment while controlling for preexisting differences in reading attitudes. ANCOVA is useful to the researcher for reasons indicated above. In

addition, ANCOVAs have been used in many quasi-experimental studies to investigate the effectiveness of a treatment for reading attitudes (e.g., Fawson et al., 2009; Matthew, 1996). These past studies support the use of ANCOVA as the choice for analysis.

An ANOVA was performed to test the null hypothesis that no statistically significant difference existed in reading behaviors, as measured by the total number of minutes students read for pleasure and/or assignments indicated on reading logs, of second grade students based on instructional reading environment. ANOVA is useful when the researcher wants to compare the amount of between-groups difference in individuals' scores with the amount of within group difference (Gall et al., 2007). In addition, ANOVAs have been used in posttest only non-equivalent control group design studies that investigate the effectiveness of a treatment to examine reading behaviors (e.g., Anderson et al., 1985). These past studies support the use of ANOVA as the choice for analysis with one dependent variable and one independent variable, instructional reading environment, with multiple groups.

Statistical procedures of the study included analysis of covariance tests (ANCOVA) to test null hypotheses 1 and 2 and an analysis of variance (ANOVA) to test null hypothesis 3. Prior to conducting the ANCOVA tests, the assumptions of absence of outliers, normality of the covariates and dependent variables, homogeneity of variances, linearity, and homogeneity of regression slopes were tested. Internal consistency reliability for the DRA2® and the ERAS were not assessed as data collected was total scores, item by item data was not collected. However, as previously noted in the instrumentation section, the DRA2® and the ERAS are both reliable instruments. Prior to

conducting the ANOVA test the assumptions of absence of outliers, normality of the dependent variables, and homogeneity of variances were tested.

None of the 88 records were missing data. Outliers in a dataset have the potential to distort results of an inferential analysis. A check of boxplots for all three dependent variables constructs of (a) post DRA2® reading level scores, (b) post ERAS scores, and (c) total time spent reading in minutes, as well as the covariates of (a) pre DRA2® reading level scores and (b) pre ERAS scores were performed to visually inspect for outliers. The boxplots indicated that none of the variables contained more than 5% outliers. The variables were standardized to check for the presence of extreme outliers (z-score of +/- 3.3), and none were noted. A check of the mean values and 5% trimmed mean values for all dependent variable constructs of (a) post DRA2® reading level scores, (b) post ERAS reading attitudes scores, and (c) total time spent reading in minutes, and two covariates of (a) pre- DRA2® reading level scores and (b) pre ERAS reading attitudes scores did not indicate large differences in values. Additionally, the mean and median were close in value for each of the scores, another indication that outliers were not adversely impacting the data distribution. It was therefore determined that all cases would be retained for analysis and that the absence of outlier assumption was met for all three dependent variables.

Normality for the scores of the three dependent variables and the two covariate variable constructs were investigated. The Shapiro-Wilks test (S-W test) was used to assess normality for each variable since it is appropriate for small sample sizes ($n < 50$). The S-W test indicated that the covariates and two of the three dependent variables, post DRA2® reading level scores and post ERAS reading attitudes scores were not normally

distributed (p<.01). The dependent variable of post reading behavior total reading time was normally distributed according to the S-W test (p=.08). However, normality tests, including the S-W test, are conservative (Tabachnick & Fidell, 2007). Thus, further investigation of normality was done via a visual check of frequency histograms, and Normal Q-Q plots for the distributions of the DRA2® and ERAS dependent variables. The plots indicated that the post DRA2® reading level scores and the pre DRA2® reading level scores used as the covariates were mildly/moderately negatively skewed. A comparison of the mean, 5% trimmed mean, and median relating to each of the variable constructs indicated numbers close in value on the mean, 5% trimmed mean, and median across the measures. ANCOVA and ANOVA are robust to mild to moderate violations of normality when the assumption of equal variances is met (Kozak, 2009). Therefore, this assumption violation was not of concern and the researcher continued with the planned parametric analyses and made no data transformations.

Homogeneity of variances among the reading groups was investigated for each of the three dependent variables using Levene's test. The assumption of the homogeneity of variance is tenable based on the results of the Levene's test of equality of error for the post DRA2® reading level scores, post ERAS reading attitudes scores and reading behaviors total reading time.

A visual inspection of scatterplots was preformed to investigate the assumptions of linearity between the dependent variables of (a) post DRA2® reading level scores and (b) post ERAS reading attitudes scores, and the two covariate variables of (a) pre-DRA2® reading level scores and (b) pre ERAS reading attitudes scores. The assumption

of linearity was met as evident by the scatterplots, which showed a linear relationship between the variables.

The assumption of homogeneity of regression slopes was investigated between the dependent variables of (a) DRA2® reading level scores and (b) ERAS reading attitude scores, and the two covariates of (a) pre DRA2® reading level scores and (b) ERAS reading attitude scores. The assumption of homogeneity of regression slopes was tenable for the DRA2® as the interaction between the pre DRA2® reading level scores and the post DRA2® reading level scores was not statistically significant; however, the assumption of homogeneity of regression slopes as the interaction between the pre ERAS reading attitudes scores and the post ERAS reading attitudes score was statistically significant. Thus, it was determined that the ANCOVA analysis would be utilized as planned.

SPSS v.20 was used for all descriptive and inferential analyses. All inferential tests for the hypotheses addressing the research questions of the study were set at a 95% level of significance (reject the null hypothesis if $p < .05$). Post hoc analyses was tested with a Bonferroni adjusted alpha level of .0125 (.05/4) to investigate which pairs of instructional reading environments statistically significantly differed on the post reading level and reading attitude scores. The Bonferroni adjustment allowed for control of possible Type I error due to the repeated testing of the dataset during post hoc analyses. Effect sizes were assessed to determine the magnitude of the relationship between the independent variables as relates to the mean differences on the dependent variables using partial eta squared.

CHAPTER FOUR: FINDINGS

The purpose of this quantitative, quasi-experimental, pretest-posttest non-equivalent control group design research was to explore the effect of using ebooks during reading instruction and practice for second graders on reading level and reading attitudes. A posttest only non-equivalent control group design explored the effect of using ebooks during reading instruction and practice for second graders on reading behaviors. The research questions of this study were as follows:

R_1: Does a statistically significant difference exist in reading level scores among the instructional reading environments, i.e., (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice) while controlling for pretest scores?

R_2: Does a statistically significant difference exist in reading attitude scores among the instructional reading environments, i.e., (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice) while controlling for pretest scores?

R_3: Does a statistically significant difference exist in reading behavior among conditions based on the medium in which second grade readers receive reading instruction, and read independently and for practice as related to the four reading groups of (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a

choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice?

The corresponding null hypotheses using the analysis of covariance (ANCOVA) and the analysis of variance (ANOVA) procedures included:

$H0_1$: A statistically significant difference will not exist in reading level scores as measured by the DRA2® assessment among the student instructional reading environments: (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice while controlling for pretest scores.

$H0_2$: A statistically significant difference will not exist in reading attitude scores as measured by the ERAS assessment among the student instructional reading environments: (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice, while controlling for pretest scores.

$H0_3$: A statistically significant difference will not exist in the reading behavior scores as measured by the total minutes spent (a) pleasure reading in school, and (b) reading assignments in school, between the student instructional reading environments of (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a

choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice.

In Chapter 4, the results are presented. This chapter is divided into five sections (a) sample population and demographic findings, (b) instrumentation and descriptives (c) assumptions (d) inferential analyses, and (e) summary. The chapter concludes with a summary of the results. SPSS v22.0 was used for all descriptive and inferential analyses.

Sample Population and Demographic Findings

The study included students from four second grade classrooms in a public elementary school located in a rural area of south central Michigan. Data from 88 students were included in this study. Forty-seven (53%) females and 41 (47%) males participated. The ebooks only group had 11 (46%) female participants and 13 (54%) male participants. The traditional books only group had 11 (58%) female participants and 8 (42%) male participants. The ebooks with a choice group had 13 (59%) female participants and 9 (41%) male participants. The students in the traditional books with a choice group had 12 (52%) female participants and11 (48%) male participants. Table 2 presents the frequency and percentages of the student demographics for each of the instructional reading groups.

Table 2

Frequencies and Percentages of the Gender Groups According to Instructional Reading Environment (N = 88)

Instructional Reading Environment	Females		Males		Total	
	Frequency	%	Frequency	%	Frequency	%
Ebook only	11	12.5	13	14.8	24	27.3
Ebook instruction/choice practice	13	14.8	9	10.2	22	25.0
Traditional book instruction/choice practice	12	13.6	11	12.5	23	26.1
Traditional book only	11	12.5	8	9.1	19	21.6
Total	47	53.4	41	46.6	88	100.0

Since gender differences have been identified for student reading level and attitude (National Center for Education Statistics, 2013; Worrell et al., 2007), investigation was necessary. A chi-square test for independence was performed to examine the proportion of gender across the instructional reading groups. Results indicated no statistically significant association between gender and the instructional reading groups [$\chi^2(3) = 1.01$, $p = .800$]. Non-significant results for the chi-square test of independence indicated that gender proportions did not differ across reading groups. A series of independent sample t-tests were also performed to investigate mean differences on the scores of the pretest covariates DRA2® and ERAS based on gender. The results

were not statistically significant for any of the comparisons ($p > .05$). Males and females did not significantly differ on reading level or reading attitudes, indicating there was no need to include gender as a control variable in the ANCOVA and ANOVA procedures. Table 3 presents the means and variability by gender for dependent variables pre DRA2® and ERAS.

Table 3

Means and Variability by Gender for the Variable Constructs of the Study

	Female (n = 47)		Male (n = 41)	
Dependent variable	*M*	*SD*	*M*	*SD*
DRA2® independent reading level Pre	22.00	7.39	21.78	6.79
ERAS reading attitude score Pre	62.68	11.50	59.93	13.06

Instrumentation and Descriptives

Two reading assessment instruments were used in the study (a) Developmental Reading Assessment (DRA2®), and (b) Elementary Reading Attitude Survey (ERAS). A researcher designed measure, the student self-report reading log, was used in the study to assess reading behaviors.

Developmental Reading Assessment (DRA2®). The DRA2® is a standardized reading test used to determine the instructional reading level of an individual (Beaver & Carter, 2009). For this study, DRA2® served as the pretest-posttest assessment tool for identifying independent reading levels. The DRA2® was composed of three subscales oral reading fluency, accuracy, and comprehension. The composite DRA2® was used in

this study. Possible scores of the DRA2® independent reading level were 1 - 44, with scores of 18-28 indicative of reading at the second grade level. Higher DRA2® scores were indicative of higher reading levels of students. The DRA2® posttest scores were used as the dependent variable in Hypothesis 1. The DRA2® pretest scores were used as the covariate in Hypothesis 1. Table 4 presents the frequency and percentages of the pre DRA2® levels and post DRA2® levels, disaggregated by the four groups. Students achieving an overall DRA2® score of 24 or below were identified as "below" grade level. Students achieving an overall DRA2® score of 28 to 30 were classified as "at" grade level. Students achieving an overall DRA2® score of 34 or above were identified as "above" grade level.

Table 5 presents the measures of central tendencies and the variability for each instructional reading environment group for pre DRA2® raw scores and the adjusted and unadjusted marginal means and the associated standard errors for the estimated marginal means of the post DRA2®. The traditional books only group had the highest average post DRA2® scores (M = 25.42, SD = 8.49), and the ebooks with a choice group had the lowest average post DRA2® scores (M = 22.91, SD = 8.79). Figure 1 presents a graphical representation of the mean pre DRA2® and post DRA2® scores by each instructional reading environment.

Table 4

Frequencies and Percentages of the Demographic Variables of the Study (N = 88)

	Pre DRA2®		Post DRA2®	
Instructional reading environments/ levels	Freq	%	Freq	%
Ebooks only (*n*= 24)				
Below grade level (24 or below)	14	15.9	9	10.2
At grade level (28 to 30)	10	11.4	12	13.6
Above grade level (34 or above)	---	---	3	3.4
Ebook instruction/choice practice (*n*= 22)				
Below grade level (24 or below)	18	20.5	13	14.8
At grade level (28 to 30)	4	4.5	5	5.7
Above grade level (34 or above)	---	---	4	4.5
Traditional book instruction/choice practice (*n*= 23)				
Below grade level (24 or below)	17	19.3	11	12.5
At grade level (28 to 30)	6	6.8	9	10.2
Above grade level (34 or above)	---	---	3	3.4
Traditional book only (*n*= 19)				
Below grade level (24 or below)	10	11.4	7	8.0
At grade level (28 to 30)	7	8.0	9	10.2
Above grade level (34 or above)	2	2.3	3	3.4

Note: The pre and post DRA2® scores were continuous variables. However, in order to look at the levels, the scores were aggregated into three levels: "below," "at," and "above." Therefore, since the pre and post DRA2® scores were aggregated, they are now nominal (or categorical) instead of continuous.

Table 5

Measures of Central Tendency and Variability for DRA2® Independent Reading Level Score, with Adjusted and Unadjusted Marginal Means and Standard Error (N = 88)

	Pre-test				Post-test Unadjusted				Post-test Adjusted	
Variable	*M*	*SD*	*Mdn*	Range	*M*	*SD*	*Mdn*	Range	M_{ADJ}	SE_{ADJ}
Ebook only (*n*=24)	21.67	7.77	24	4-30	24.50	8.87	28	4-38	24.75	0.52
Ebook instruction/ choice practice (*n*=22)	19.45	6.96	21	8-28	22.91	8.79	22	8-38	25.59	0.55
Traditional book instruction/ choice practice (*n*=23)	22.61	4.41	20	14-30	25.39	5.83	28	14-34	24.61	0.53
Traditional book only (*n*=19)	24.16	8.43	24	3-40	25.42	8.49	28	3-40	22.94	0.59

Note. *M* = Mean; *SD* = Standard Deviation; *Mdn* = Median; M_{ADJ} = Adjusted Mean; SE_{ADJ} = Adjusted Standard Error.

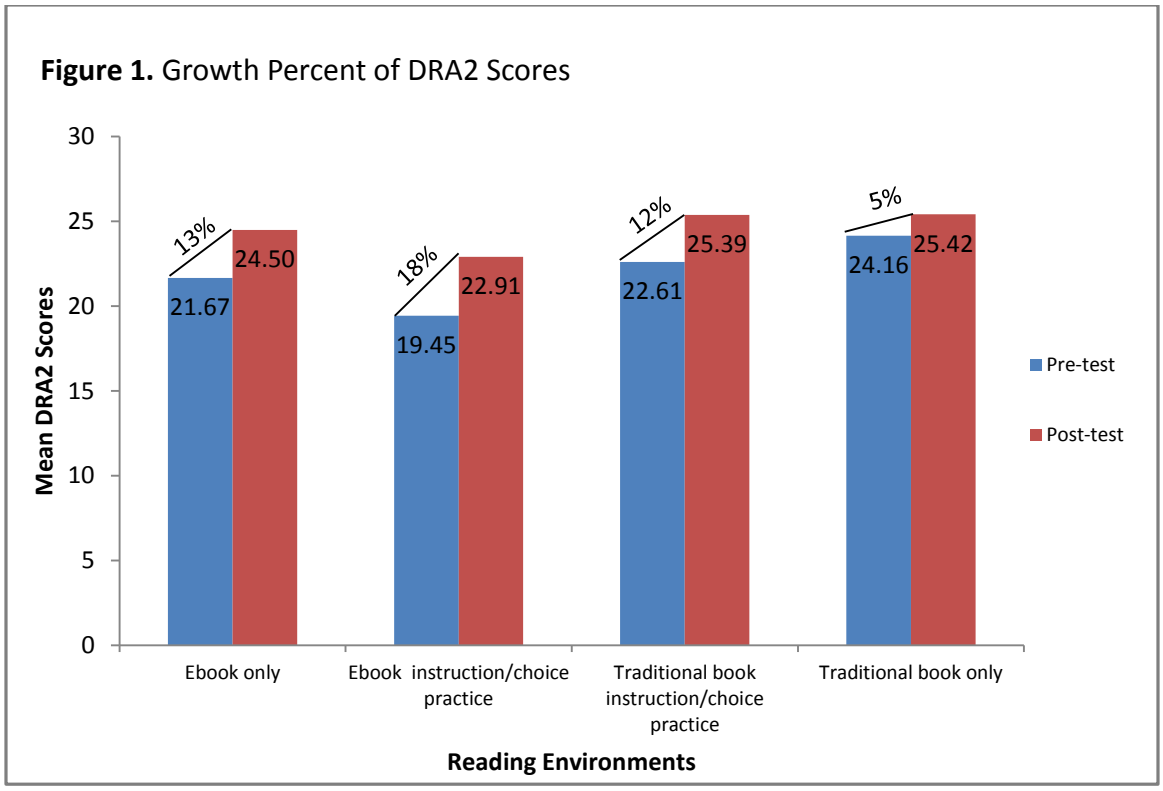

Figure 1. Bars represent the mean reading levels for the pre-intervention DRA2® reading levels and post-intervention DRA2 reading levels by reading environment and the lines represent the growth percent between pre and post scores.

Elementary Reading Attitude Survey (ERAS). The ERAS was used to determine the students' attitudes towards reading. The ERAS (McKenna & Kear, 1990), which consisted of 20 statements assessing two components of reading attitude, (a) recreational and (b) academic reading, was administered as a pretest and posttest. Scores on each of the two subscales represented a range from 10 to 40 total points with a total scale sum maximum equaling 80 points. Students' overall reading attitude posttest scores were used as the dependent variable in Hypothesis 2. The ERAS pretest scores were used as the covariate in Hypothesis 2. Higher ERAS scores were indicative of a more positive reading attitude.

The traditional books only group had the highest average post ERAS scores (M = 76.05, SD = 6.20) and the ebooks with a choice group had the lowest average post ERAS scores (M = 57.95, SD = 15.48). Table 6 presents the measures of central tendencies and the variability for each instructional reading environment groups for pre ERAS raw scores and the adjusted and unadjusted marginal means and the associated standard errors for the estimated marginal means of the post ERAS. Figure 2 presents a graphical representation of the mean pre ERAS and post ERAS scores by each instructional reading environment and the growth percent between pre and post scores.

Table 6

Measures of Central Tendency and Variability for the Variable of ERAS Independent Reading Level Score, with Adjusted and Unadjusted Marginal Means and Standard Error (N = 88)

	Pre-test				Post-test Unadjusted				Post-test Adjusted	
Variable	*M*	*SD*	*Mdn*	Range	*M*	*SD*	*Mdn*	Range	M_{ADJ}	SE_{ADJ}
Ebook only (*n*=24)	56.58	11.65	58.5	29-80	61.67	10.29	63.0	38-74	64.12	1.95
Ebook instruction/ choice practice (*n*=22)	60.18	12.19	61.0	29-80	57.95	15.48	60.5	21-80	58.57	1.99
Traditional book instruction/ choice practice (*n*=23)	59.83	11.77	58.0	36-80	66.91	9.08	67.0	44-80	67.71	1.95
Traditional book only (*n*=19)	70.79	9.00	69.0	51-80	76.05	6.20	80.0	63-80	71.27	2.29

Note. M = Mean; SD = Standard Deviation; Mdn = Median; M_{ADJ} = Adjusted Mean; SE_{ADJ} = Adjusted Standard Error.

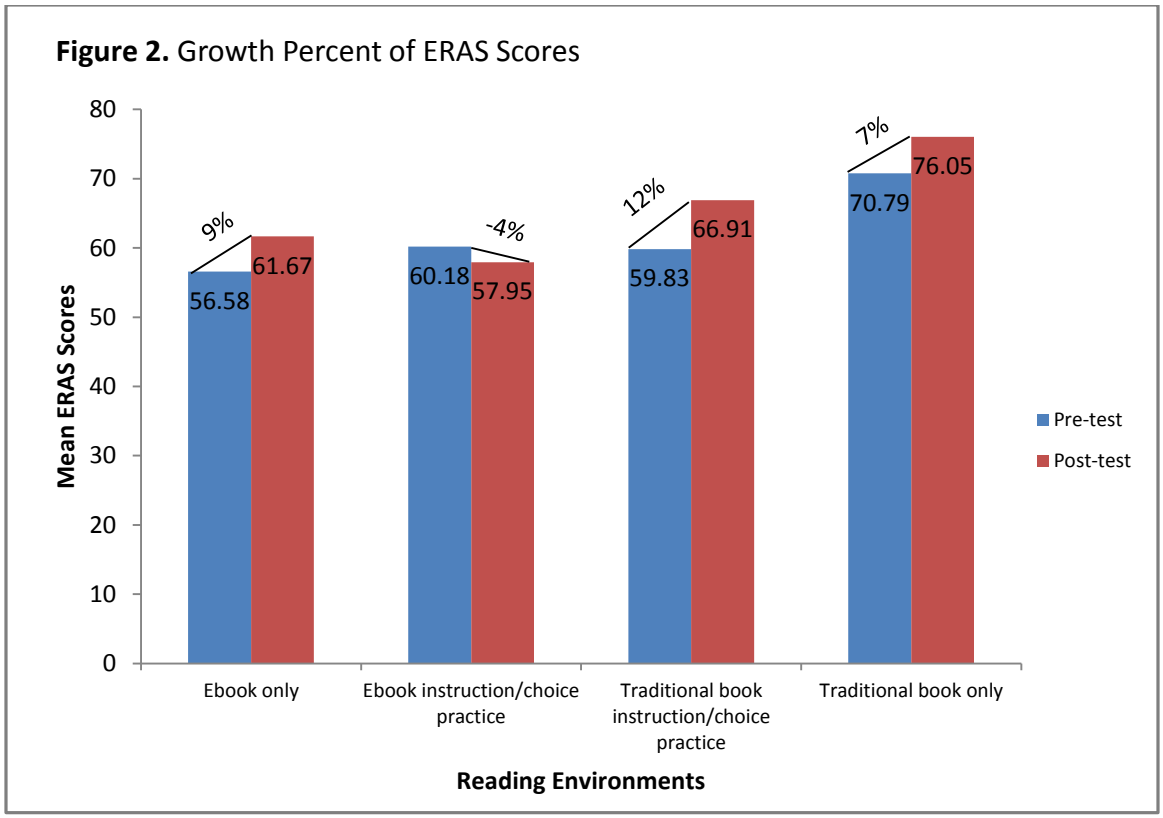

Figure 2. Bars represent the mean reading attitudes for the pre-intervention ERAS reading attitude scores and post-intervention ERAS reading attitude scores by reading environment and the lines represent the growth percent between pre and post scores.

Reading Logs. A third measure used in the study was a researcher designed student self-report reading log (Appendix H), which was utilized to record the number of minutes a student read each day during the intervention. Daily log entries were tabulated and calculated by two measures: (a) the total number of minutes read for practice in school and (b) the total number of minutes of assigned reading in school. The two measures were then added together to derive the total number of minutes each student read. The total number of minutes read by each student was used as the dependent variable in Hypothesis 3. Table 7 presents the measures of central tendencies and variability of the time spent reading (in minutes) for each of the four instructional reading

environment groups. Of note, the reading logs were only kept by the students during the intervention period, and therefore there are no measurements for the reading logs at the pre-intervention time.

The reading behavior time of the sample ranged from 1148 to 1822 minutes (*M* = 1427.92 minutes, *SD* = 149.40 minutes). The traditional books with a choice group had the highest average reading behavior times (*M* = 1446.22, *SD* = 133.49), and the traditional books only group had the lowest average reading behavior times (*M* = 1411.63, *SD* = 135.60). Table 7 presents the measures of central tendencies and variability of the time spent reading (in minutes) for each of the four instructional reading environment groups.

Table 7

Measures of Central Tendency and Variability for Post Reading Behavior Total Reading Times (in minutes) as Relates to Reading Environments (N = 88)

Group	*n*	*M*	*SD*	*Mdn*	Range
Post reading behavior total reading times					
Ebook only (n=24)	24	1411.67	188.41	1355	1148-1822
Ebook instruction/choice practice (n=22)	22	1440.59	134.48	1436	1226-1678
Traditional instruction/choice practice (n=23)	23	1446.22	133.49	1441	1236-1681
Traditional books only (n=19)	19	1411.63	135.60	1434	1153-1639

Note. *n* = Sub-sample Size; *M* = Mean; *SD* = Standard Deviation; *Mdn* = Median.

Table 8 presents the unadjusted measures of central tendency for the DRA2®, ERAS, and reading behaviors dependent and covariate variables constructs.

Table 8

Unadjusted Measures of Central Tendency and Variability Dependent and Covariate Variable Constructs (N = 88)

	Pre-test				Post-test			
Variable	*M*	*SD*	*Mdn*	Range	*M*	*SD*	*Mdn*	Range
DRA2® independent reading level	21.90	7.08	24	3-40	24.53	8.00	28	3-40
ERAS reading attitude score	61.40	12.26	62	29-80	65.22	12.56	66	21-80
Reading behavior total reading time					1427.92	149.40	1432	1148-1822

Note. *M* = Mean; *SD* = Standard Deviation; *Mdn* = Median.

Assumptions

Statistical procedures of the study included analysis of covariance tests (ANCOVA) to test null hypotheses 1 and 2 and an analysis of variance (ANOVA) to test null hypothesis 3.

Prior to conducting the ANCOVA tests, the assumptions of absence of outliers, normality of the covariates and dependent variables, homogeneity of variances, linearity, and homogeneity of regression slopes were tested. Internal consistency reliability for the DRA2® and ERAS were not assessed as data collected were total scores: item by item data was not collected. However, both of the instruments were valid and reliable as reported in the literature (Beaver & Carter, 2010; McKenna & Kear, 1990). Prior to

conducting the ANOVA test, the assumptions of absence of outliers, normality of the dependent variables, and homogeneity of variances were tested.

None of the 88 records was missing data. Outliers in a dataset have the potential to distort results of an inferential analysis. A check of boxplots for the three dependent variable constructs of (a) post DRA2® reading level scores, (b) post ERAS reading attitudes scores, and (c) total time spent reading in minutes, as well as the covariates of (a) pre DRA2® reading level scores and (b) pre ERAS reading attitudes scores were performed to visually inspect for outliers. The boxplots indicated that none of the variables contained more than 5% outliers. The variables were standardized to check for the presence of extreme outliers (z-score of +/- 3.3), and none were noted. A check of the mean values for all three dependent variable constructs of (a) post DRA2® reading level scores, (b) post ERAS reading attitudes scores, and (c) total time spent reading in minutes and two covariates of (a) pre DRA2® reading level scores and (b) pre ERAS reading attitudes scores did not indicate large differences in values. Additionally, the mean and median were close in value for each of the scores, another indication that outliers were not adversely impacting the data distribution. It was therefore determined that all cases would be retained for analysis and that the absence of outlier assumption had been met for all three dependent variables.

Normality for the scores of the three dependent and the two pretest for DRA2® and ERAS as covariate variable constructs was investigated. The Shapiro-Wilk test (S-W test) was used to assess normality for each variable since it is appropriate for small sample sizes ($n < 50$). The S-W test indicated that the covariates and two of the three dependent variables, post DRA2® reading level scores and post ERAS reading attitude

scores were not normally distributed ($p<.01$). The dependent variable of post reading behavior total reading time was normally distributed according to the S-W test ($p= .08$). However, normality tests, including the S-W test, are conservative (Tabachnick & Fidell, 2007). Thus, further investigation of normality was done via a visual check of the histograms and Normal Q-Q plots for the distributions of the DRA2® and ERAS dependent variables. The plots indicated that the post DRA2® reading level scores and the pre DRA2®reading level scores used as the covariate were moderately negatively skewed. A comparison of the mean: $M = 21.90$, 5% trimmed mean = 22.18, and median $Mdn = 24.00$, relating to each of the variable constructs indicated numbers close in value across the measures. ANCOVA and ANOVA are robust to mild to moderate violations of normality when the assumption of equal variances is met. Therefore, this assumption violation was not of concern and the researcher continued with the planned parametric analyses and made no data transformations.

Homogeneity of variances among the reading groups was investigated for each of the three variables using Levene's test. The assumption of the homogeneity of variance is tenable based on the results of Levene's test of equality of error for the post DRA2® reading level scores (F (3, 84) = 0.98, p = .404). The assumption of the homogeneity of variance is also tenable based on the results of Levene's test of equality of error for the post ERAS reading attitude score (F (3, 84) = 1.60, p = .195) and for the post reading behaviors total reading time (F (3, 84) = 1.81, p = .151).

A visual inspection of scatterplots was performed to investigate the assumptions of linearity between the dependent variables of (a) post DRA2® reading level scores and (b) post ERAS reading attitudes scores, and the two covariate variables of (a) pre DRA2®

reading level scores and (b) pre ERAS reading attitudes scores. The assumption of linearity was met as evident by the scatterplot, which showed a linear relationship between the variables.

The assumption of homogeneity of regression slopes was investigated between the dependent variables of (a) post DRA2® reading level scores and (b) post ERAS reading attitudes scores, and the two covariate variables of (a) pre DRA2® reading level scores and (b) pre ERAS reading attitudes scores. The assumption of homogeneity of regression slopes was tenable for the DRA2® as the interaction between the pre DRA2® reading level scores and the post DRA2® reading level scores was not statistically significant, (F (3, 80) = 1.65, p = .185). The assumption of homogeneity of regression slopes as the interaction between the pre ERAS reading attitudes scores and the post ERAS reading attitudes scores was not statistically significant, (F (3, 80) = 3.84, p = .013)

Inferential Analysis

Two one-way analyses of covariance tests (ANCOVA) and an analysis of variance (ANOVA) were used to test the null hypotheses corresponding to the three research questions in this study. The results of each analysis are presented.

Hypothesis Testing for Research Question 1

An ANCOVA was used to test if a statistically significant difference existed in posttest reading level scores as measured by the DRA2® assessment among the student instructional reading environments while controlling for pretest scores.

The dependent variable of post DRA2® reading level score was used in the analysis. The covariate was pre DRA2® reading level score. The independent variable

included in the analysis was instructional reading environment, which was divided into four groups (a) ebook only (EB), (b) ebook during instruction, with a choice of ebooks and traditional books during practice (EBC), (c) traditional books during instruction, with a choice of ebooks and traditional books during practice (TBC), and (d) traditional books only (TB).

The model for the covariate, pre DRA2® reading level score, was statistically significant, F (1, 83) = 774.85, $p < .0005$, observed power = 1.00, with a large effect size (partial eta squared = .90). Thus, the need to control for the covariate was necessary for this study's final model. After adjusting for the pre DRA2® reading level scores, the analysis demonstrated that there was a statistically significant main effect for instructional reading environment, F (3, 83) = 3.67, p = .015, observed power = 0.78, with a moderate to large effect size (partial eta squared = .12). Thus, post hoc analysis was performed with a Bonferroni adjustment (.05/4= .0125). The ebooks during instruction, with a choice of ebooks and traditional books during practice reading environment (EBC) (M_{ADJ}= 25.59, SE_{ADJ} = 0.55) had the highest post DRA2® reading level scores and scored statistically significantly higher than the traditional books only group (TB) (M_{ADJ} = 22.94, SE = 0.59) (p = .002). All other post hoc comparisons were non-significant (p >.0125). Table 9 presents summary of the findings for the post hoc analysis of the ANCOVA results for Hypothesis 1.

Table 9

Results of Post Hoc Comparisons of ANCOVA Findings for Post DRA2® Reading Level Score as Relates to Instructional Reading Environments via Tukey's Highly Significant Difference (HSD) Test

Dependent Variable / Cohort (I)	Cohort (J)	Mean Difference (I – J)	*SE*	*p*
Post DRA2® reading level score/				
EB	EBC	-0.84	0.75	.269
EB	TBC	0.14	0.74	.848
EB	TB	1.81	0.78	.023
EBC	TBC	0.98	0.76	.205
EBC	TB	2.65	0.81	.002*
TBC	TB	1.67	0.79	.037

Note. * $p < .0125$

EB = ebooks only; EBC = ebooks during instruction, with a choice of ebooks and traditional books during practice; TBC = traditional books during instruction, with a choice of ebooks and traditional books during practice; TB = traditional books only.

Conclusions as relates to Research Question 1. There was a statistically significant between subjects main effect involving the instructional reading environments of EBC and TB for the dependent variable outcome post DRA2® reading level scores after controlling for the covariate of pre DRA2® reading level. Therefore, evidence was provided to reject Null Hypothesis 1. There were statistically significant differences in reading level scores as measured by the DRA2® assessment between the following

reading environments: (a) traditional books only (TB) and ebooks during instruction with a choice of ebooks and traditional books during practice (EBC).

Hypothesis Testing for Research Question 2

An ANCOVA was used to test if a statistically significant difference existed in posttest reading attitude scores as measured by the ERAS assessment among the student instructional reading environments, while controlling for pretest scores.

The dependent variable of post ERAS reading attitude score was used in the analysis. The covariate was pre ERAS reading attitude score, and was used to control for group differences. The independent variable included in the analysis was instructional reading environment, which was divided into four groups (a) ebook only (EB), (b) ebook during instruction, with a choice of ebooks and traditional books during practice (EBC), (c) traditional books during instruction, with a choice of ebooks and traditional books during practice (TBC), and (d) traditional books only (TB).

The covariate of pre ERAS reading attitude scores was also statistically significant, F (1, 83) = 32.23, p < .0005, observed power = 1.00, with a large effect size (partial eta squared = .28). Thus, the need to control for the covariate was necessary for this study's final model. After adjusting for the pre ERAS reading attitude scores, there was a statistically significant main effect for instructional reading environment, F (3, 83) = 6.59, p <.0005, observed power = 0.97, with a large effect size (partial eta squared = .19). Bonferroni adjusted post hoc analyses were performed with an alpha level of .0125 (Bonferroni adjustment of .05/4) for the instructional reading environments indicated that students who read ebooks during instruction, with a choice of ebooks and traditional books during practice (EBC) (M_{ADJ} = 58.57, SE_{ADJ} = 1.99) had significantly lower mean

post ERAS reading attitude scores than students who read traditional books during instruction, with a choice of ebooks and traditional books during practice (TBC) (M_{ADJ} = 67.71, SE_{ADJ} = 1.95). Likewise, students who read ebooks during instruction, with a choice of ebooks and traditional books during practice (EBC) (M_{ADJ} = 58.57, SE_{ADJ} = 1.99) had significantly lower mean post ERAS reading attitude scores than students who read and students who read traditional books only (TB) (M_{ADJ} = 71.27, SE_{ADJ} = 2.29). Table 10 presents a summary of findings for the post hoc analyses of the ANCOVA results for Hypothesis 2.

Table 10

Results of Post Hoc Comparisons of ANCOVA Findings for Post ERAS Reading Attitude Score as Relates to Instructional Reading Environments via Tukey's Highly Significant Difference (HSD) Test

Dependent Variable / Cohort (I)	Cohort (J)	Mean Difference (I – J)	*SE*	*p*
Post ERAS reading attitude score				
EB	EBC	5.55	2.77	.048
EB	TBC	-3.60	2.73	.192
EB	TB	-7.15	3.13	.025
EBC	TBC	-9.14	2.77	.001*
EBC	TB	-12.70	3.07	<.0005*
TBC	TB	-3.56	3.05	.247

Note. Bonferroni adjustment (.05/4 = .0125) * p < .0125and *SE* = Standard Error of the Mean Difference.
EB = ebooks only; EBC = ebooks during instruction, with a choice of ebooks and traditional books during practice; TBC = traditional books during instruction, with a choice of ebooks and traditional books during practice; TB = traditional books only.

Conclusion as relates to Research Question 2. There were statistically significant differences in reading attitudes scores as measured by the ERAS assessment after controlling for the covariate of pre ERAS reading attitudes between the following instructional reading environments: (a) ebooks during instruction with a choice of ebooks and traditional books during practice (EBC) vs. traditional books during instruction with a choice of ebooks and traditional books during practice (TBC), and (b) ebooks during instruction with a choice of ebooks and traditional books during practice (EBC) vs. traditional books only (TB). Therefore, evidence was provided to reject Null Hypothesis 2.

Hypothesis Testing for Research Question 3

An ANOVA was used to examine if a statistically significant difference existed in the reading behavior scores among the students' instructional reading environments, as measured by the total minutes spent (a) pleasure reading in school, and (b) reading assignments in school. The dependent variable used in the analysis was the post reading behavior total reading time. The instructional reading environments were divided into four categories: (a) ebook only, (b) ebook during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only. There was no statistically significant mean difference in the post reading behavior total reading time among the four instructional reading environments, F (3, 84) = 0.33, p = .804, with an effect size of .01 and power of .05. The post-hoc power of .05 indicated that the

ANOVA model had a 5% chance of finding significance for an effect size of .01, given the sample size of $N = 88$ students.

Conclusion as relates to Research Question 3. Significant differences in mean scores between the four reading environment groups were not noted. Therefore, Null Hypothesis 3 was not rejected. There were no statistically significant differences in the reading behavior scores as measured by the total minutes spent (a) pleasure reading in school, and (b) reading assignments in school, among the four student instructional reading environments: (a) ebooks only, (b) ebooks during instruction with a choice of ebooks and traditional books during practice, (c) traditional books during instruction with a choice of ebooks and traditional books during practice, and (d) traditional books in both instruction and practice. The statistical hypothesis for Research Question 3 was not supported.

Summary

Chapter 4 began with a sample population and a description of the demographics of the participants in the study. Following the report of demographics of the sample population, instrumentation and descriptives were briefly defined. Information pertaining to required assumptions and the inferential analyses variable constructs were then presented and discussed.

Following the assumption sections, the performed hypothesis testing was discussed via analysis of covariance (ANCOVA) and one-way analysis of variance (ANOVA). A statistically significant main effect involving the instructional reading environments for the dependent variable outcome post DRA2® reading level scores were

found thus supporting the rejection of Null Hypothesis 1. A statistically significant main effect was found for the dependent variable outcome post ERA reading attitudes scores based on instructional reading level. Students who read ebooks during instruction, with a choice of ebooks and traditional books during practice (EBC) (M_{ADJ} = 58.57, SE_{ADJ} = 1.99) had significantly lower mean post ERAS reading attitude scores than students who read traditional books during instruction, with a choice of ebooks and traditional books during practice (TBC) (M_{ADJ} = 67.71, SE_{ADJ} = 1.95), and students who read traditional books only (TB) (M_{ADJ} = 71.27, SE_{ADJ} = 2.29), thus supporting the rejection of Null Hypothesis 2. Results of the testing for Null Hypothesis 3 indicated that there was not a statistically significant difference found between the post reading behavior total reading times and the instructional reading environments. Therefore, Null Hypothesis 3 was not rejected. Chapter 5 will present a discussion of the results as well as implications of the findings as relates to the literature review and further research. The tested null hypotheses are summarized in Table 11.

Table 11

Summary of Tested Null Hypotheses

Hypothesis	Statement	Test	*F*	p value	Results
H_{01}	A statistically significant difference will not exist in reading level scores as measured by the DRA2® assessment among the student instructional reading environments (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice while controlling for pretest scores.	ANCOVA (Omnibus Test)	*F*=3.67	.015	Reject
H_{02}	A statistically significant difference will not exist in reading attitude scores as measured by the ERAS assessment among the student instructional reading environments (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice, while controlling for pretest scores.	ANCOVA (Omnibus Test)	*F*=6.59	<.0005	Reject
H_{03}	A statistically significant difference will not exist in the reading behavior scores as measured by the total minutes spent (a) pleasure reading in school, and (b) reading assignments in school, between the student instructional reading environments of (a) ebooks only in both instruction and practice, (b) ebooks during instruction, with a choice of ebooks and traditional books during practice, (c) traditional books during instruction, with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice.	ANOVA (Omnibus Test)	*F*=0.33	.804	Fail to reject

CHAPTER FIVE: DISCUSSION

The purpose of this chapter is to review the findings from this combination quasi-experimental, pretest–posttest, non-equivalent control group and posttest only non-equivalent control group study. This chapter will review the methodology and provide a summary of the results of the analysis of covariance (ANCOVA) and the analysis of variance (ANOVA). The results are summarized, organized by Hypothesis. Next, this chapter will provide information regarding the connection the results have to prior research and theory as well as practical implications. An outline of the assumptions and limitations are discussed. The chapter concludes with the recommendations for future research.

Review of Methodology

A convenience sample of second grade students (*N*=88) in four separate classrooms from a rural, Title 1 elementary school in south central Michigan was used. Consent and assent forms were provided to all second graders, and 88 were returned. Each classroom was randomly assigned to one of the four groups: (a) ebooks only (*n*=24), (b) ebooks during instruction with a choice of ebooks and traditional books during practice (*n*=22), (c) traditional books during instruction with the choice of ebooks and traditional books during practice (*n*=23), and (d) traditional books only (*n*=19). Data were only collected for these participants.

The DRA2® was administered as a pretest and posttest to measure independent reading level. One week prior to the beginning for the intervention, all second grade participants were administered the DRA2® as the covariate pretest measure for independent reading level. Within one week of the completion of the intervention the

participants were again administered the DRA2® as a posttest measure. Data analysis for the DRA2® was analyzed using an ANCOVA, which determined if the four groups significantly differed in terms of independent reading level while controlling for prior group differences.

The ERAS was administered to all participants as a pretest and posttest measure for reading attitude. One day prior to the beginning of the intervention, all students were administered the ERAS as the covariate pretest measure for reading attitudes. The ERAS was administered again on the final day of the intervention as a posttest measure. Data was collected from the ERAS pre and posttest scores and was analyzed using an ANCOVA.

Two days prior to the study, students were given reading logs and provided instruction and training for using the reading logs. Reading logs were used to collect information about students' reading behaviors and were reviewed by classroom teachers daily and collected at the end of each week. A one-way ANOVA was used to explore the effect of instructional reading environments on the post reading behavior total reading time variable.

Summary of Results

An ANCOVA was used to test the null hypothesis for research question #1: Does a statistically significant difference exist in reading level scores among the instructional reading environments, i.e., (a) ebooks only in both instruction and practice, (b) ebooks during instruction with a choice of ebooks and traditional books during practice, (c) traditional books during instruction with a choice of ebooks and traditional books during practice, and (d) traditional books only in both instruction and practice while controlling

for pretest scores? The researcher hypothesized that statistically significant differences would exist in reading level scores among the participants within the instructional reading environments as measured by the DRA2® assessment. Results indicated that a statistically significant difference in reading level among the instructional reading environments did exist. More specifically, results indicated that a statistically significant difference existed between two of the intervention groups. Second grade participants in the ebooks during instruction with a choice of ebooks and traditional books during practice treatment group displayed significantly higher reading levels when compared to second grade participants in the traditional books only control group. Statistically significance differences were not indicated at a $p > .0125$ among the three treatment groups. While the Bonferroni test has been traditionally used to control for family wise error as it is straightforward, it is important to note that Bonferroni test is considered to be overly conservative by many researchers (Rice, 1989). Results provided statistical evidence to support the inclusion of ebooks for reading instruction to improve reading level in this study's research sample. Although the results did not provide statistical support for all instructional reading environments, results indicated that treatment groups' reading levels were not adversely affected when compared to the control group. This study did not investigate physical environment, teacher-student relationship, or ebook features that participants utilized during instruction and practice. As past researchers suggested, ebook features can scaffold reading, thus support comprehension (Doty et al., 2001; Korat & Shamir, 2012; Matthew, 1996; Pearman, 2008). The physical environment and teacher-student relationship may have contributed to the non-significant results. The physical environment of each classroom varied in size and organization, possibly

influencing the ease with which the reading devices were retrieved. In addition, differences in teacher-student interactions were observed that may have influenced the students' levels of engagement.

An ANCOVA was used to test the null hypothesis for research question #2: Does a statistically significant difference exist in reading attitude scores among the instructional reading environments while controlling for pretest scores? The researcher hypothesized that a statistically significant difference would exist in reading attitude scores measured by the ERAS among the students within the different instructional reading environments. Results indicated that a statistically significant difference existed in reading attitude scores based on instructional reading environment. Participants in the ebooks during instruction with a choice of ebooks and traditional books during practice instructional reading environment had significantly lower reading attitudes scores than participants in the traditional books during instruction with a choice of ebooks and the traditional only during instruction and practice instructional reading environments. The results did not indicate that all treatment groups showed statistical support for the use of ebooks in instructional reading environments to enhance reading attitudes compared to the control group, as lower indicated a negative effect. However, results suggested that instructional reading environment did not adversely affect reading attitudes for two of the treatment instructional reading environments when compared to the control group. This researcher questions whether the teacher instructional experience was an influencing factor for these results. Past research indicated that expert teachers' classroom environments differ from novice teachers' classroom environments (O'Connor, Fish, & Yasik, 2004; Webster, 2010). Although none of the teachers was a novice teacher

differences were present in the years of teaching experience within the four classrooms ranging from 13-20 years. This researcher became aware that the teacher for the ebook during instruction with a choice of ebooks and traditional books for practice treatment group was just completing her second year as a second grade teacher and feeling a level of stress regarding her students' reading achievement. Although experience and social and emotional factors were not directly tested in this study, an analysis might have provided insight into why reading attitudes scores for this treatment decreased from pre to post test.

Although the physical environments or the teacher-student relationship were not analyzed in this study, the researcher observed differences among the four groups. Although all students had equivalent access to ebooks, classrooms varied in size and organization, possibly influencing the ease with which the reading devices could be retrieved. Physical environment contributes to the learners' enjoyment and learning outcomes (Berris & Miller, 2011). Information regarding the relationship between the teacher and the students could possibly influence student attitudes, as researchers have indicated the importance of teacher–student relationship to academic achievement and engagement (Roorda, Koomen, Spilt, & Oort, 2011). Regardless of this information, results provided support for reading instructional environments to include the integration of ebooks.

An ANOVA was used to test the null hypothesis for research question #3: Does a statistically significant difference exist in reading behavior among conditions based on the medium in which second grade readers receive reading instruction, and read independently and for practice as related to the four reading environments? The

researcher hypothesized that a statistically significant difference would exist in the reading behavior scores as measured by the total minutes spent among the four reading instructional environments. Results indicated that no statistically significant differences in reading behaviors based on reading instructional environment were present. Second grade students in this study's treatment group population did not display significantly different reading behaviors than second graders in the control group. The effect size for reading behaviors was small at .01 and power of .05. This researcher determined that the instructional reading environment was trivial. Although reading behaviors were not improved by using ebooks in different instructional reading environments, the use of ebooks did not negatively affect reading behaviors. Therefore, the use of ebooks within the reading instructional environment should be considered.

Relationship to Prior Research

The results of this study regarding reading level were similar to those found in other studies, possibly due to the connection to ebook features (Ertem, 2010; Pearman, 2008; Verhallen et al., 2006). Previous research regarding ebooks' effects on reading comprehension, a component of reading level has noted the potential of ebooks' features to build or activate more complex schemas allowing more in-depth levels of reading comprehension (Ertem, 2010; Pearman, 2008; Verhallen et al., 2006). The possibility is strong that features of ebooks presented on hand held devices share similar supportive features. These features, such as animated illustrations instead of static illustrations, may provide scaffolding for the reader (Ertem, 2010). Furthermore, the synergy created within the multimedia ebook instructional reading environment including the highlighting of words while the narrator reads the text as well as adult support during and after reading

many contribute to the statistically significant results indicating that the instructional reading environment influences reading level (Korat et al., 2009).

The results of this study indicated a statistically significant difference existed in reading attitudes among instructional reading environments; this difference was only significant for the ebooks during instruction with a choice of ebooks and traditional books during practice instructional reading environment. This instructional reading environment had significantly lower reading attitudes scores than participants in the traditional books during instruction with a choice of ebooks and traditional books during practice and traditional books only instructional reading environments. Previous research conducted by Esteves and Whitten (2011) suggested that greater reading growth is not an indicator of positive changes in reading attitudes. It is also possible that the ebooks provided through the ©Raz-Kids website did not meet the participants' reading interests, therefore affecting the readers' attitudes toward reading (Esteves & Whitten, 2011). However, instructional reading environments including ebooks only during instruction and practice provided equivalent support to ebooks during instruction with a choice of ebooks and traditional books during practice, traditional books during instruction with a choice of ebooks and traditional books during practice, and traditional books only during instruction and practice. An additional possibility for the results of this study on reading attitudes could be the role ergonomics played in the students' reading attitudes. Past researchers suggested that ergonomics played a critical role in students' interactions with technology (Dockrell et al., 2010). Although the results did not indicate that reading attitudes improved with the use of ebooks, the results do suggest that ebooks affect reading attitudes. While attempts to control for all of the cognitive and academic

variables in the classroom, the social-emotional variables, including the dynamics between the teacher and the participants, were not accounted for. Past researchers Snyder et al. (2013) suggested social-emotional components influence students' attitudes and behaviors. Thus, reading attitudes within an ebook instructional reading environment require further investigation.

The current study's null hypothesis that no statistically significant difference in reading behaviors based on the instructional reading environment condition was exploratory. Previous research conducted on reading behaviors was concerned with the number of pages read by participants, indicating that average and below average readers selected books of similar length resulting in fewer pages completed by the below average participants (Anderson, et al., 1985). This information may account for the lack of statistical difference identified within this study as book reading levels for all participants were set according to the individual students' instructional reading level. In addition, the fact that data was only collected within the school environment may have contributed to the findings that reading behaviors showed no significant differences among the instructional reading environments. The possibility is strong that extra reading time was limited within the school setting, thus creating conditions where differences would be minimal. Examining reading behaviors within the home environment where free time for reading activities might be more readily available may provide additional insight into the effects of ebooks on reading behaviors. Prior research has indicated that the home reading environment plays a critical role in students' reading behaviors and attitudes toward reading (Katzir, Lesaux, & Kim, 2009), while the amount of reading has been shown to increase when ebooks are taken home (Oakley & Jay, 2008).

Theoretical Implications

Theoretically the results of this study provide support for the theory that cognitive load is influenced by instructional reading environment. Sweller et al. (1998) presented cognitive load theory as a means to example information processed in working memory to develop schemas. Cognitive load theorists emphasized instructional design to reduce unnecessary cognitive load on working memory resources. Past researchers (Paas et al. (2004) suggested that extraneous and germane load are imposed on the learner by the manner with which information is presented and the learning activity required, while Leahy and Sweller (2011), Paas et al. (2003), Sweller (1988, 2010b, 2011) and Sweller et al. (1998) suggested that the reduction of extraneous cognitive load frees working memory resources for intrinsic load. This study provides support for cognitive load theory in that instructional reading environment affected reading level. The students' DRA2® reading level scores were affected by the use of ebooks during instruction with a choice of ebooks and traditional books for practice, possibly reducing extraneous cognitive load, thus allowing more working memory to process meaning. Menon and Hiebert (2005) suggested that the instructional design of reading materials could reduce extraneous cognitive load impacting reading level. The current study provides support for this viewpoint in that the instructional design of the ebooks with supportive features utilized in this research differed from the traditional book format. More specifically, the instructional reading environment of ebooks during instruction with a choice of ebooks and traditional books during practice as an instructional design resulted in improved reading level when compared to traditional books only during instruction and practice. Although ebook features were not directly assessed in this study, the results suggest that

these features influenced cognitive load. The use of ebooks to assist the reader was further supported by Cook's (2010) augmentation of Vygotsky's (1978) Zone of Proximal Development as Cook (2010) suggested the more knowledgeable other may not be in human form. Bus et al. (2006) suggested that ebooks can help struggling readers construct or activate more complete schemas indicating that interactive features may serve as electronic scaffolds when presented in the learner's ZPD. This research provided support for this view that features offered in ebooks provides scaffolding when presented in the learners' ZPD. Access to individually leveled books within their ZPD was available for all students, however DRA2® reading level scores indicated that ebook during instruction with a choice of ebooks and traditional books during practice displayed significantly different levels of achievement from the traditional books only instructional reading environment. This information suggests that ebook features within this instructional reading environment helped readers construct or activate more complete schemas.

The theoretical framework for this study regarding students' reading attitudes and reading behaviors was supported by the basic tenet of social cognitive theory in which behavior patterns, environmental events, and personal factors in the form of cognitive, affective, and biological events influence each other (Bandura, 1986, 1999). Specifically, Bandura's (1986, 1999) ideas regarding the environment's influences on thoughts and behaviors, with the amount of influence of these interactions not necessarily being equal, are supported through this study's results. Bandura's view suggests different activities, individuals, and circumstances determine the power of the influence of each event. This study's results provided support for Bandura's view in that the instructional reading

environment had an effect on reading attitudes, however reading behaviors were not statistically significant. These research results suggest that the interactions among the instructional reading environment, reading attitudes and reading behaviors did not influence each other equally.

Practical Implications

The results of this study, specifically related to research questions 1 and 3 regarding reading level and reading behavior, provide support for the purchase and integration of ebooks into the elementary school instructional reading environment. These findings contribute to the growing evidence of ebooks' effectiveness to support reading instruction. Given these results regarding reading level, educators and administrators who have access to instructional funds or access to personal hand held reading devices should consider the purchase of ebooks and/or classroom sets of personal hand held reading devices such as iPads for the purpose of reading instruction. The fact that reading levels of the participants using ebooks on personal hand held devices were positively affected in some ebooks environments, educators and administrators should consider transitioning from traditional books only instructional reading environments to instructional reading environment that include ebooks. In addition, this study provides statistical evidence that ebook instructional reading environments support second grade readers' reading behaviors that are equivalent to those provided in a traditional book only instructional reading environment. Within this study's results no statistically significant difference was indicated in participants' reading behaviors among the instructional reading environments. Since the integration of ebooks into the instructional reading environment did not adversely influence reading behaviors educators with access to

ebooks should consider using them for reading instruction. Although results indicated a statistically significant difference for reading attitudes among instructional reading environments, the results did not favorably support the use of ebooks, thus further investigation is necessary. Given these mixed results, educators and administrators should carefully consider the costs associated with the transition to ebook instructional reading environments for second grade students. However, if funds are available to purchase instructional materials, ebooks and hand held devices should be considered.

Educational environments are changing. . In the *2011 Horizon report* Johnson et al., (2011) projected widespread ebook adoption within one year or less, followed by the *2012 Horizon report,* in which Johnson, Adams, and Summins (2012) suggested tablets as an alternative learning format to print materials. Most recently in the *2014 Horizon report,* Johnson, Adams, Estrada, and Freeman (2014) predicted the rapid acceleration of intuitive technology such as the touch screens available on personal devices like iPads to be integrated into the classroom while the role of the teacher as a mentor to promote student-centered learning will occur over the next year or two. This study's results provide statistical evidence that ebook instructional reading environments can support second graders' reading levels and reading behaviors and in some instructional reading environments such as the ebook only during instruction and practice and traditional books during instruction with a choice of ebooks and traditional books during practice, provide equivalent support for reading attitudes to traditional book only environments. Although integration of ebooks is recommended, given the results that reading attitudes were significantly lower for the ebooks during instruction with a choice of ebooks and traditional books during practice, then traditional books only during instruction and

practice, and traditional books during instruction with a choice of ebooks and traditional books during practice, it is also recommended that the less than favorable reading attitudes be investigated and addressed as not to negate the positive results.

Assumptions and Limitations

This quasi-experimental, pretest–posttest, non-equivalent control group and posttest only non-equivalent control group design research attempted to limit the threats to internal and external validity. Through experimental design for the pretest–posttest, non-equivalent control group this study attempted to account for the participants' selection bias, history, maturation, and differential mortality. However, the limitations need to be recognized.

The current study needs to be interpreted in light of the study's limitations. Since intact second grade classrooms were utilized, the lack of random assignment and the selection threat to validity due to non-equivalent groups were limiting factors and threats to internal validity (Dimitrov & Rumrill, 2003; Gall et al., 2007). However, all second grade students who returned consent forms and signed assent forms had the opportunity to participate as this study did not exclude any second grade student. In addition, the pretests as covariates for hypotheses 1 and 2 provided control for initial differences between the control and three treatment groups. The short-term nature of the study (four weeks), the inclusion of a control group selected from the same population as the treatment groups and classrooms homogeneous for gender, academic ability, and behaviors account for the threats to history and maturation. Regardless, the results are only generalized to the sample population for this study (Shadish, Cook & Campbell, 2002).

The Elementary Reading Attitudes Survey (ERAS) (McKenna & Kear, 1990) was a self-report measure, and it was assumed that the participants responded with true reflection of their overall satisfaction with reading. Past research results have indicated the ERAS is an effective tool for measuring reading attitudes for students in grades 1 through 6 (McKenna & Kear, 1990; McKenna et al., 1990). However, it is possible that participants may have been vulnerable to personal or environmental influences that may have swayed their responses (Borgers, de Leeuw, & Hox, 2000).

As an inherent threat to internal validity, the effects of repeated testing were minimized through the use of different equivalent forms of the DRA2® for dependent variable reading level. The ERAS survey of reading attitudes did not provide an alternative equivalent survey. However, in the posttest only non-equivalent control group design used to examine reading behaviors, no covariate was possible.

Homogenous groups were used to limit the selection threat to validity. A comparison proportion of gender groups for each of the four independent variable levels via chi-square test of independence, as well as comparisons of the mean scores on the pretest DRA2® and ERAS measurements used as covariates, were performed to establish that the four reading environments were homogenous as relates to gender, thus helping to ensure against a selection threat to validity.

External validity concerns limit the generalizability given the fact that this study only included second graders from a rural southern Michigan school. Of the 100 students, 88 second grade parents and students returned the consent and assent forms to participate. It was determined that for a large effect size of $f = .40$, a sample of 81 records would be required. All students who returned consent forms and signed assent

forms were eligible to participate in the study. This study did not account for the participants that declined participation as they may have differed from the sample population. In addition, a convenience sample was used with intact groups. Therefore, the results are only applicable to the current sample population (Shadish et al., 2002).

External validity was further threatened by the demographics of the community of the town in which the study took place. The school is located in a small town of approximately 8,300 people (City-Data, 2012). The school's enrollment in pre-school through second grade was approximately 389 students. Of this Title 1 school's population, approximately 67% of the students were eligible of free or reduced lunches (VanOrman, 2013). The school population's ethnic diversity consisted of 94% Caucasian Hispanic students accounted for 3% of the student population, African American students accounted for 3% of the student population. Within this pre-school through second grade population of students, 18% received language services with 8% of second grade students receiving language services. About 17% of the pre-school through second grade student population were eligible for special education services, with 7% of the second grade population eligible for special education services. The student population at this rural elementary school ranged from 4 years 10 months to 9 years of age and consisted of 56.9% male students and 43.1% female students (VanOrman, 2013). Results may differ had the population displayed more variances in ethnicity, as past researchers have indicated ethnicity as a critical component influencing student achievement as it is often associated with socioeconomic status (van Steensel, 2006). In addition, the socio-economic level of the participants and the dependent variables may have affected the study results. Although within this study's population, approximately 67% of the

students were eligible of free or reduced lunches (VanOrman, 2013) this information specific to the second grade participants was unavailable. Socio-economic status has been suggested by researchers Kayiran, and Karabay (2012) to play a critical role in reading comprehension, favoring of children from high socio-economic status families.

The self-reporting nature of the reading logs to measure reading behaviors posed a threat to the external validity for the study. It was assumed that participants' responses were true representations of their reading time. However, the self-report measure was a limitation in that the researcher could not guarantee the reports were free from external influences and that they were accurately and honestly completed (Campbell & Stanley, 1963).

Additional threats to external validity were the novelty and Hawthorne effect. The novelty of the iPads for direct instructional purposes posed a threat to external validity. Although participants had utilized iPads within the classroom, teacher instructional practice differences prior to the study may have influenced the participants' use of ebooks since they are different than the normal instructional reading format (Gall et al., 2007). Finally, the Hawthorne effect was a possible external validity threat, as blinding was not utilized. Parents, participants and teachers knew which treatment they were receiving and understood what the study was designed to measure which may have caused them to act uncharacteristically, increasing their efforts to improve literacy skills (Gall, et al., 2007).

This study attempted to determine the effect of ebook instructional reading environments on second graders' reading level, reading attitudes, and reading behaviors, despite the possible limiting influences on data and results. Although the results of this study regarding the independent variable instructional reading environment and

dependent variables reading levels, reading attitudes, and reading behaviors are limited to second grade students from in this rural Michigan elementary school, the findings could be used as support for future educational research and educational knowledge.

Recommendations for Future Research

Future investigations regarding the effectiveness of ebooks to support young readers is necessary to continue to provide important information regarding their use in instructional environments. As indicated in the theoretical implications section, ebooks features were not directly assessed in this study, but the results of this study suggest that these features may have influenced cognitive load. Future studies may be designed to directly measure the effect of ebook features on cognitive load. Future studies are also recommended to expand on this investigation and to focus on classroom atmosphere. As suggested by prior research (e.g., O'Connor et al., 2004; Webster, 2010), an educator's level of experience effects the classroom environment. The current study did not investigate the effects of the classroom teachers experience level. Expanding the current study to include the home environment is also suggested, as past researchers have indicated that the home environment influences the amount of reading students engage in for enjoyment and their reading attitudes (Katzir et al., 2009; Oakley & Jay, 2008). It is possible that home environments that allow more free choice time than the school environments may provide additional insight into the effect ebooks have on reading behaviors, reading attitudes and reading levels.

An additional recommendation involves the availability of ebooks that meet the students' interests. Researchers have indicated that a strong correlation exists between a wide variety of reading material choices and enjoyment (Ciampa, 2012a, 2012b). Future

studies could record whether participants had ebooks available that were interesting to them.

Future researchers should consider investigating the ebook instructional reading environments effect on comprehension, fluency and accuracy as separate dependent variables. The current study investigated the effect ebook instructional reading environments had on reading levels: a composite score of oral reading fluency, reading comprehension, and reading accuracy. Therefore, only aggregate score, not scores for each individual item of the DRA2®, were included in the study dataset. It is possible that the effect of these instructional reading environments had a different effect on the individual components as past researchers have suggested that ebooks increase reading comprehension (Doty et al., 2001; Korat & Shamir, 2012; Matthew, 1996; Pearman, 2008).

An additional recommendation for future research is to extend the current study to include participants' gender. This current study's small sample size did not allow for the investigation of gender. However, past researchers examining on reading attitudes reported gender differences in reading attitudes in traditional print book reading environments (Martinez et al. 2008).

Summary and Conclusion

The purpose of this study was to determine the effect of ebook instructional reading environments on the reading levels, reading attitudes, and reading behaviors of second grade students. Results indicated participants in ebooks during instruction with a choice of ebooks and traditional books during practice displayed significant reading level gains on the DRA2 when compared to the control group using traditional books only for

instruction and practice. Participants in the ebooks during instruction with a choice during practice displayed significant differences in reading attitudes as measured by the ERAS scores when compared to the traditional books only control group as well as with the traditional books during instruction, with a choice during practice group. No statically significant differences in reading reading behaviors were found for the four instructional reading environments.

These results suggest that educators, administrators and school district personal should consider ebooks on personal devices as an alternative to traditional books. Educators and administrators should consider a transition toward the integration of the ebooks in the instructional reading environment. Personal hand held devices increase access, portability, and personalization of ebook reading instruction environments, previously unavailable through stationary desktop computers and CD-ROM ebooks. While this study supports integration when considering reading level and reading behavior, more investigation is still needed to address the attitude concern.

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APPENDIX

Appendix A

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

April 11, 2014

Annette VanAken
IRB Approval 1842.041114: Effect of Ebooks on Reading Level, Reading Behaviors and Attitudes of Second Grade Students

Dear Annette,

We are pleased to inform you that your above study has been approved by the Liberty IRB. This approval is extended to you for one year. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. The forms for these cases were attached to your approval email.

Please retain this letter for your records. Also, if you are conducting research as part of the requirements for a master's thesis or doctoral dissertation, this approval letter should be included as an appendix to your completed thesis or dissertation.

Thank you for your cooperation with the IRB, and we wish you well with your research project.

Sincerely,

[redacted]

Fernando Garzon, Psy.D.
Professor, IRB Chair
Counseling

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Appendix B

School Approval Letter

March 24, 2014

To Whom It May Concern:

I, Laurie VanOrman, grant permission to allow Annette VanAken to conduct a quantitative study examining the effect of electronic books on the reading comprehension and motivation of second grade students at [redacted] I understand that the information gathered will be for research purposes only, and the identity and identifying information of all participants will be kept confidential.

Sincerely,

[redacted]

Laurie VanOrman

Principal

Appendix C

Parental Letter

Dear Families,

My name is Annette VanAken. I am a former [redacted] first grade teacher before moving to [redacted]. Since moving to Pennsylvania, I have been actively pursuing my doctoral degree in curriculum and instruction. One of the final components of my degree from Liberty University is a dissertation study. Attached you will find information regarding my study. This is a unique opportunity the second grade classes have to be a part of a study furthering what is known about teaching young people to read through the use of technology.

It would be greatly appreciated if you would read over the consent form and consider allowing your child to be part of this study. If you agree for your child to be part of the study, please sign and return the bottom portion of the attached consent form to your child's classroom teacher.

If you have any questions regarding the study or would like more information, two information sessions will be available to you. The date for these meetings is Thursday, April 24, 2014. There will be a 5:30 p.m. information session and a 7:00 p.m. information session located at [redacted] in room 130. Identical information will be available at each session. If you cannot attend either of these sessions, but require more information before agreeing to have your child participate, you can call me at [redacted]. I would be happy to answer any questions you may have.

Thank you for taking the time to read the consent form. I am looking forward to being back in the [redacted] working with great educators.

Sincerely,

Annette VanAken

Appendix D

Parental Consent Form

EFFECT OF EBOOKS ON READING LEVEL, READING BEHAVIORS AND ATTITUDE OF SECOND GRADE STUDENTS

Annette VanAken, Doctoral Candidate
Liberty University, School of Education

Introduction

Your child is invited to participate in the research study, "Effect of Ebooks on Reading Level, Reading Behaviors and Attitude of Second Grade Students". This study is being conducted by Annette VanAken, a doctoral student at Liberty University under the guidance of Dr. Amanda Rockinson-Szapkiw. I understand that participation is voluntary and I can withdraw my child at any time without penalty and have the results of the participation, to the degree that it identifies my child, given to me and removed from the study. This consent form provides you information you will need to read before you agree to participate in the study. After reading the information, if you have any questions about anything you do not understand you may ask questions for qualification before deciding whether or not to participate. Please send all inquiries via email to Annette at [redacted].

Purpose of the Study

The purpose of this study is to determine if student's reading attitudes, reading level and reading behaviors can be influenced through the utilization of ebooks as a reading instructional tool. While participating in the study your child will complete a survey regarding their feelings as they imply to reading and fill out a reading log to track reading behaviors. Implemented in their small group reading instruction, already incorporated by their classroom teacher, will be the use of ebooks if randomly assigned to the treatment group to provide this instruction. Your child's reading instruction and independent reading time will be recorded on reading logs to determine the influence of the ebooks on reading behaviors. The researcher will also assess your child's reading level from the Developmental Reading Assessment testing already taking place in the classroom.

Duration and Location

Your child's participation in the study will last for 4 weeks, beginning in mid to the end of April of the 2013-2014 school year. Surveys will be conducted prior to the implementation of the reading intervention and following the 4 week reading intervention at [redacted] at a mutually agreed upon time. Survey questions will include questions regarding how your child feels about reading in and out of school. Minimal to no academic time will be missed to complete the survey.

Procedure

If you allow your child to participate in this study, their participation will require two sessions taking 10-20 minutes each to complete an attitudes towards reading survey. The

first session will be given at the beginning of the study and the second session at the end of the study. Both sessions will be conducted following your child's lunch period. Classrooms will be randomly assigned to one of four groups. Group one will complete all small group reading instruction and independent practice using leveled traditional books as they currently do. Group two will complete all reading instruction and independent practice using leveled ebooks on an iPad. Group three will complete small group reading instruction using using leveled ebooks on an iPad and will have the choice of reading traditional books or ebooks during independent reading time. Group four will complete small group reading instruction using using leveled traditional books and will have the choice of reading traditional books or ebooks during independent reading time. Participants will complete daily reading logs to verify minutes engaged in reading. Before the study begins, the school approved DRA2® reading achievement assessments will be given to identify your child's reading level. Following the 4 week intervention, the DRA2® reading achievement assessments will be completed again to examine the effect. DRA2® varies depending on the level of the reader, however the anticipated assessment time is 15-25 minutes per assessment. This study will be part of the regular school curriculum.

Potential Risks and Benefits

The risks involved in participation in this study are no more than what any participant would experience during a normal school day. If your child participates, they will not experience any achievement testing or reading interventions that are not already occurring in the classroom. Participants may experience instructional benefits from using ebooks for instruction and independent reading practice. Thus, there will be no loss of instructional time.

The potential publication of the findings of this study may prove beneficial to researchers as they seek to proactively improve this reading process. It is possible that the ebooks read on the personal hand held devices will enhance the reader's experience and promote positive changes in the student's reading level, reading attitudes, and reading behaviors if in one of the treatment groups. Understanding the effectiveness of ebooks on reading achievement, reading attitudes, and reading behaviors at the second grade level will help researchers, educators, and administrators. Information from this study will provide critical information when making curriculum, fund spending, and instruction decisions benefiting students.

Compensation:

Your child will not receive any compensation of any type for participation in this study.

Confidentiality

When the results of the research are published or discussed, information regarding your child's identity will not be included. Your child's information will be kept confidential. Participants will be given number codes instead of names. The number code with the participant's name will be kept in a secure computer file by the researcher. Results will use only group designation, noting the comparison between the four groups. Following

the completion of the study, the research will share the information with classroom teachers, principals and the superintendent. You will also be informed of significant behavioral, attitudinal and achievement changes for each group. The researcher will take precautions to protect participant identity. All data collected will be kept in a locked, secure filing cabinet located off the study site by the researcher. Data entered on spreadsheets will be kept in a password-protected database and will not be shared with anyone. The information will be stored by the researcher's password-protected computer for the duration of three years then deleted from the database.

Participation and Withdrawal

Participation is voluntary and you may withdraw your child at any time without penalty by emailing [redacted] with a request to withdraw. Any choice to participate or decline to participate will not affect your child's current or future relations with Liberty University, [redacted] or the researcher. If you decide to allow your child to participate, he/she is free to not answer any question or withdraw at any time without affecting those relationships.

Questions Regarding Study

If at any time before, during or after the study you have any questions, you may contact the researcher.

Contacts and Questions

Provided below are the names of the committee members overseeing this research:

Dr. Amanda Szapkiw, Committee Chair [redacted]

Assistant Professor, Liberty University

Dr. Kathy Keafer, Committee Member [redacted]

Assistant Professor, Liberty University

Dr. Jennifer Griffin, Committee Member [redacted]

Assistant Professor, Thiel College

If you have any questions or concerns regarding this study, please contact the researcher at [redacted] or any of the committee members at the email addresses provided.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd, Suite 1837, Lynchburg, VA 24515 or email at irb@liberty.edu.

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

Parent Consent Form

Please sign and return this form to your child's classroom teacher.

Signature of Parent of Research Subject

I have read the information provided regarding this research study. I have been given an opportunity to have my questions answered and believe that they have been satisfactorily answered. At this time I have full knowledge of the nature and purpose of this study and give consent for my child to participate. I understand that I will receive a copy of this consent form after signing (Informed Consent, n.d.).

☐ I consent for my child to be in the study.

☐ I do **not** consent for my child to be in the study.

_____ _____

Signature of Parent Date

_____

Name of Child

Appendix E

Student Assent Form

EFFECT OF E-BOOKS ON READING LEVEL, READING BEHAVIORS AND ATTITUDE OF SECOND GRADE STUDENTS

Annette VanAken, Doctoral Candidate

Liberty University, School of Education

(To be read aloud by the research)

I am doing a study to learn if ebooks changes reading for second graders. I am asking you to help because I do not know very much about this strategy. I would like to know if reading ebooks is different than reading paper books. I am wondering if reading ebooks changes your reading level, how much you read and how you feel about reading.

If you agree to be in this study, you are going to take a survey asking you how you feel about reading. You will fill out a different reading log sheet than you do now and you will continue to have your reading assessed using the DRA2® that your teacher already uses. You will not earn a grade for your work, so you should be completely honest and complete all reading assignments as your teacher instructs you. The question sheets asking you how you feel about reading do not have right or wrong answers.

If you have questions during this study, you can ask them at any time. If you decide at any time you do not want to be part of this study, you can ask us to stop.

During your small group reading time with your teacher you may get to use ebooks on iPads. You may also get to choose if you want to use ebooks on iPads or paper books to practice reading in the classroom.

If you sign this paper, it means that you have read this and that you want to be in the study. If you don't want to be in the study, don't sign this paper. Being in the study is up to you, and no one will be upset if you don't sign this paper or if you change your mind later.

_____YES I want to be in this study.

_____NO I do not want to be in this study.

Your signature: _____ Date _____

Your printed name: _____ Date _____

Witness signature: _____ Date _____

Signature of the Researcher _____Date _____

Appendix F

Small Group Lesson Format

Before Reading

Identified strategy/skill:

Vocabulary/Sight Word Review

Reread familiar Title or Introduction of new Title:

Title of new book introduction:

Read title

Picture walk

Prediction Question: *What do you think the story is going to be about? What evidence supports your prediction?*

Teaching Point: *(Word-solving, fluency, comprehension)*

During Reading

Read Book

After Reading

Discussion:

Teaching Point:

Activity to support comprehension: *(Story web, Character web, Non-fiction features, Written or Oral Comprehension Activity, Vocabulary or Sight Word Work)*

Appendix G

Small Group Lesson Guidelines

Definition: In guided reading the teacher works with a small group of students who have similar reading behaviors and are able to read similar levels of text with support at their instructional level.

Characteristics of Small Group Reading:

- Teacher scaffolds: introduces the text, guides students on picture walks, draws students' attention to key vocabulary, etc.
- Text presents only a few challenges for students.
- Students read the entire text or a unified part of the text.
- Teacher works briefly with individuals students in the group as they read the text.
- Teacher may select one or two teaching points following the reading of the text; teacher may also ask students to participate in an extension activity after reading.
- Groups are flexible: children are grouped and regrouped based on ongoing assessment and observation.
- Text used in guided reading lessons will eventually be placed in students' browsing boxes.
- Teacher selects a "spotlight child," or specific student and takes a running record during or immediately following the guided reading lesson.

District Resources

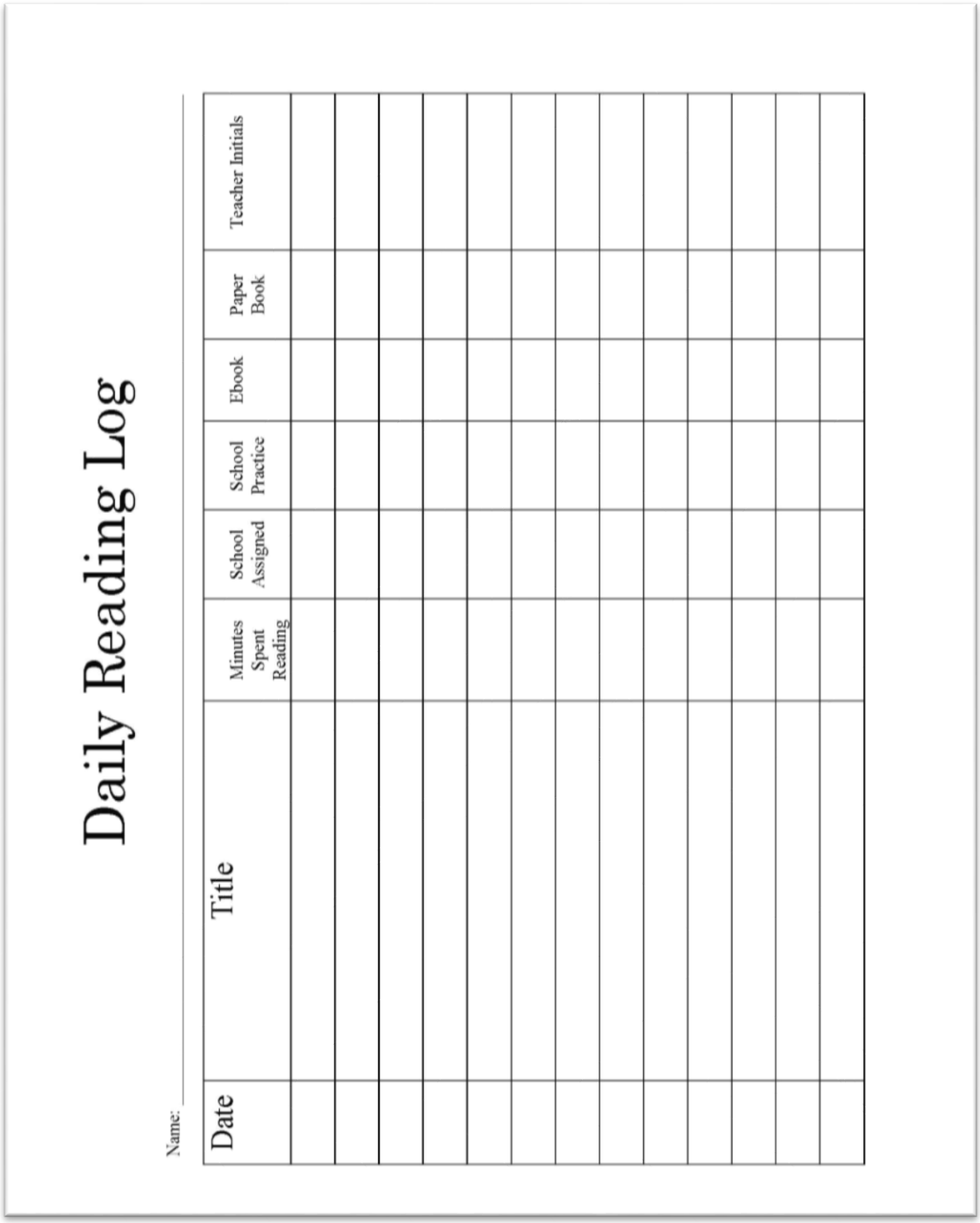
- Leveled library
- Reading A to Z

Professional Resources

- *Guided Reading: Good First Teaching for All Children*, Irene Fountas and Gay Su Pinnell
- *Matching Books to Readers: A Leveled Book List for Guided Reading, K-3*, Irene Fountas and Gay Su Pinnell
- *Classrooms that Work*, Richard Allington

Appendix H

Daily Reading Log



Daily Reading Log

Name: _____

Date	Title	Minutes Spent Reading	School Assigned	School Practice	Ebook	Paper Book	Teacher Initials