THE INFLUENCE OF ELECTRONIC BOOKS

ON THIRD GRADE READING COMPREHENSION

by

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May 12th, 2012

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CERTIFICATION OF PROJECT WORK

We, the undersigned, certify that this project entitled, THE INFLUENCE OF ELECTRONIC BOOKS ON THIRD GRADE READING COMPREHENSION by Sarah A. Rich, Candidate for the Degree of Master of Science in Education, Literacy Education Birth through Grade Six, is acceptable in form and content and demonstrates a satisfactory knowledge of the field covered by this project.

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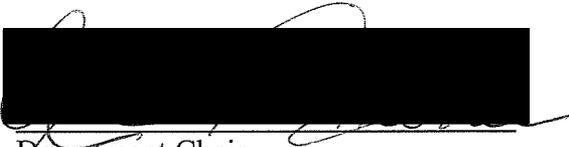
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Abstract

This study investigated the silent reading comprehension of three third grade participants who struggle to decode grade level material. The participants were given seven passages, four from a paper book and three from an e-book. After reading, the participants completed graphic organizers and met with the researcher to retell the story. The amount of what the participant recalled was estimated using a retelling guide. The amount of points the participant obtained from the retelling guide when reading from a paper book and reading from an e-book was compared. Data indicated that all participants retold more literal information when they read from an e-book. All participants also completed a survey to express his or her feelings about reading each type of text. Two participants preferred using an iPad to read and one preferred reading from a paper book. The participant who preferred reading from a paper book also had the smallest increase in comprehension score. Another participant stated that she would have liked the e-book more if it had a pronunciation feature that read individual words for her. In conclusion, it was found that there is no harm in giving participants the choice of reading a paper book or e-book in an elementary classroom. Also, e-books are most supportive for struggling readers when a pronunciation tool is provided.

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Chapter One

I bought my Nook e-reader from Barnes and Noble at the end of the 2010 school year

because the new technology appealed to me. By the end of the summer, I realized I had finished

reading multiple books at a much faster pace. Why did my reading motivation and speed

increase? The e-reader's dictionary and pronunciation feature, which I used often, let me keep

reading instead of getting stuck on a word and losing interest. Using my Nook, I browsed the

children's literature section on the online store and discovered many children's books available

for my students to read. Then, I found out that the school that I teach at purchased a cart of

twenty iPads for students to use. Since I experienced greater reading motivation using the Nook,

I wondered how an e-reader would affect my students who are typically unmotivated readers.

This Master's Thesis describes a research project that compared third graders' reading

comprehension when reading an e-book verses a printed book. The third graders' attitude

towards e-books and e-readers is also described.

Technology in Literacy Instruction

Literacy instruction is changing in the digital age. Communication and information is

received mainly through technology. New technology allows students to read books digitally.

Some schools are investing in this technology by purchasing electronic readers, (e-readers), to

allow students access to electronic books, (e-books). Amazon's Kindle, the Barnes and Noble

Nook, and Apple's iPad are three types of e-readers that are growing increasingly popular. Duke,

Schmar-Dobler, and Zhang (2006) state, "Electronic environments have the potential to be one

of the best things to happen to the field of reading comprehension in this field's history" (as cited

in Seyit, 2011). An e-book is similar to a traditional storybook because it displays print and has

book parts, but e-books are different because they use multimedia to support or enhance text on

the screen (Roskos, Brueck, & Widman, 2009). An e-book's text can also look different. E-books range from simple text-only PDF copies of book pages, to more complex e-books containing animation, audio, and interactive games and quizzes. However, e-books do not include computer assisted software or web pages (Zuker, Moody, & McKenna, 2009). Barron (2011) defines e-readers as "electronic devices displaying digital texts such as books, portable document files (PDFs), word processing documents, and a variety of other formats" (p.133). Daniel and Reinking (1987) define traditional book based text as printed on paper and not easily modified by a consumer (as cited in Park & Helsel, 2008).

Why Incorporate Technology?

In an effort to prepare students for college, the Common Core Learning Standards (CCLS) require teachers to incorporate technology into their instruction. The CCLS state students should "use technology and digital media strategically and capably" (Council of Chief State School Officers & National Governers Association, 2010, p. 9). E-readers are a form of technology teachers could incorporate into the curriculum so their students can efficiently use available technology in the future. The International Society for Technology in Education (ISTE) provides guidelines for technology performances through the National Educational Technology Standards (NETS) for both teachers and students (Larson, 2008). The second standard of the ISTE NETS for teachers states teachers are to use technology to suit the individual student's needs (International Society for Technology in Education, 2006). The e-reader's many adjustable features, like font size and color, and narration, can personalize the reading experience and provide support for struggling readers. The International Reading Association (IRA) set standards for literacy teachers to use a *variety* of texts for instruction in reading and writing

including traditional print, digital, and online resources (International Reading Association, 2010). Standard number two states literacy teachers should use, "traditional print, digital, and online reading and writing experiences that incorporate multiple genres, multiple perspectives, and media and communication technologies are necessary to prepare learners for literacy tasks of the 21st century." (International Reading Association, 2010).

Theoretical Stance

"Rosenblatt's (1938/1995) transactional theory of reader response explains each reader breathes life into the text through personal meaning making and individual experiences." (Larson, 2009, p. 257). Personal meaning making experiences are equal to what a reader comprehends. Rosenblatt's theory relates the use of e-books in the classroom because e-books can support the readers' ability to decode text which will allow the reader to pay more attention to the meaning of the text. Attending to the meaning of the text will allow the reader to add his or her life experiences to the text, which in turn would make reading more meaningful to the reader. The "Matthew Effect" states that those who read often will get better at reading and acquire more knowledge in contrast to those who do not like reading, and do not read often. E-books have the potential to lessen the negative side of the Matthew Effect on struggling readers. The reader needs to either improve his or her ability to decode text or lesson the burden of decoding text to feel confident and enjoy the process of reading. When the student does not have to focus on decoding, he or she may enjoy reading, and hopefully will read more and gain more knowledge. Leu et al. (2004) agree, "The more successful experiences a reader has, the better the reader becomes." (p. 497). Vygotsky's socio-cultural theory proposes culture shapes the mind. (Segal-Drori, Korat, Shamir, & Klein, 2010). Since we are living in a digital age, the use of digital tools for reading is now part of the student's culture and the knowledge one gains when they are

young shapes his or her future life/culture. If a student is able to gain more knowledge through

the use of e-books, it may improve his or her education and thereafter, become a valuable citizen.

Also, Vygotsky's idea of the "Zone of Proximal Development" states that a student's potential

development is aided by adults that support him or her. In this study, the e-book's supportive

features may be able to serve as a source to help the student develop literacy skills. When an

adult sees that a student is struggling to decode a word, they help them, just as an e-book's

pronunciation feature can. These two theories support my hypothesis that changing the way text

is presented may affect a student's comprehension of text. The qualitative data gained from the

small case study described aims to help educators decide if e-readers are beneficial tools to

scaffold the independent reading skills of struggling readers in the elementary classroom.

Rationale

I would like to add to the current research that exists on the use of e-books in the

classroom. The problem is struggling readers, or students who do not enjoy reading, fall behind

in knowledge acquisition and literacy development. Studies show e-readers can increase reading

motivation (Hsui-Shiang, et al., 2010). Therefore, if e-books can engage those who are

struggling, and unmotivated to read, then students may read more and improve their reading

ability. Stanovich (1986) coined the term the "Matthew Effect" to describe the fact that, without

intervention, some students rapidly develop and build upon strong literacy foundations, and other

students lag behind their more fortunate peers. A survey by Scholastic (2010) stated 33% of

students, ages nine through 17 would read more books if they had access to e-books on an

electronic device. If educators put e-books into the hands of students, will motivation alone

increase reading ability? Research is needed to examine the differences in reading

comprehension when students use e-readers rather than traditional paper books.

As a special education teacher who teaches reading, I would like to see if e-readers will support students struggling with reading comprehension versus a paper book during independent reading. Another aim of this study is to find out how the e-reader's tools scaffold the students when they are reading and how the tools help the students construct meaning. I also would like to discover the advantages and disadvantages of using e-readers in the classroom.

Research Questions

Because there are unmotivated readers in my classroom, I decided to determine if e-books would engage my students and have an impact on their reading comprehension. There are three main questions guiding the study. The questions are aimed to help teachers decide if e-books are a beneficial tool in an elementary classroom setting. The questions are as follows:

1. What is the difference in third grader's reading comprehension when independently reading e-books versus print-based books?

2. What supportive features or tools do students use when reading e-books?

3. What are the advantages and disadvantages of using e-books in the classroom?

Research relating to reading digital text helped form a hypothesis about the results of this study. Chapter Two of this Master's Thesis describes the current research related to the research questions above.

Chapter Two

Review of Literature

Research conducted on the educational value of technology in reading instruction has thus far been informative. Current research on the use of e-books in the classroom includes the effects e-books have on struggling readers, comparisons of using e-books versus print based books, how e-books can affect certain literacy skills, and resources for teachers. From the literature reviewed, there is not much research on the use of portable e-readers (i.e. Kindles, Nooks, iPads) in the classroom. The research reviewed is organized according to the topics stated above.

Effects of E-books on Literacy Skills

Some studies have affirmed e-books' potential to support young or struggling readers. E-books were found to support students with dyslexia (Ash, 2010), hearing impairments (Horney & Anderson-Inman, 1999), and English as a foreign language (EFL) learners (Lin, 2010). Ash (2010) states those with dyslexia benefit from changing text font size. Horney and Anserson-Inman (1999) used "ElectroText Documents" to support a 12 year old boy with hearing impairments in social studies class. The ElectroText Documents were electronic documents, on a laptop, that consisted of four chapters from a social studies textbook and included additional supplemental material such as pictures and definitions. The researchers found the supplementary material was the most beneficial to the student, specifically the pictures. Further research is needed to determine if the student comprehended the electronic text more than the textbook. Lin (2010) found an increase in reading motivation when introducing ninth grade English as a Foreign Language (EFL) students, also known as English as a Second Language (ESL) students,

to e-books in an after school program in Taiwan. The researcher encouraged the students to choose four e-books to read every week and discuss the books with their classmates. The results from a reading attitude scale, as well as additional qualitative data, displayed a positive increase in a motivation to read English text. The students enjoyed many e-book features including interactive games, songs, animations, and narration. The ESL students felt the animations would give them additional context clues to aid in comprehension. In another study, 48 kindergarten students in the Netherlands were divided up into four groups to read a story, either on computers or regular books. The researchers measured the book's effect on various literacy skills (de Jong & Bus, 2002). The students were put into four groups: regular book, computer book (restricted), computer book (unrestricted), and control. The unrestricted computer group was allowed to play the games embedded in the e-book. The researchers found Kindergartners with letter and word knowledge benefited from reading e-books but those who lacked literacy skills focused more on the pictures and games.

Other studies have stated the impact e-books have on specific literacy skills. Zuker, Moody, and McKenna (2009) completed a research synthesis including studies that involved students in pre-K through grade five. One conclusion was e-books have a moderate to small effect on reading comprehension. They also found little research on the effects e-books have on students with special needs. However, research that exists states e-books can be motivating for struggling readers. Zucker et al. also found many researchers state the effects "hot spots" have on reading comprehension. Hot spots are sounds, animations, and games that are embedded into a story. Researchers are worried hot spots can distract the reader from the meaning of the story. Trushell and Maitland (2005) agree that students who had access to cued animations and sound effects performed less well on inferential comprehension questions than students who did not

have access to the animations. Shamir (2009) found an improvement in Israeli low

socioeconomic status (SES) kindergartners' word meaning skills when they used the dictionary

feature of the e-book. Shamir observed and studied 96 students' phonological awareness, word

meaning, and story comprehension skills when reading an e-book on the computer. The

researcher found significant positive correlations between dictionary activations and post-

intervention word meaning scores. Korat (2010) also studied 90 Israeli kindergartners' and first

graders' word reading, vocabulary, and comprehension skills after reading an e-book and a

regular book. Korat (2010) found kindergarten and first grade students could benefit from using

e-books with a dictionary feature. The experimental group, who repeatedly read the e-book five

times, had better results than the group who read the regular book, in the areas of word

recognition, word meaning, and story comprehension. Both grade levels increased reading

comprehension after five sessions with e-books. However, kindergarten students progressed

more in word reading skills and first graders made progress with word meaning skills.

E-books Versus Print-Based Books

In addition, researchers have studied the impact of print based books in comparison to e-

books. Doty, Popplewell, and Byers, (2001) found comprehension test scores were higher after

students read CD-ROM books in comparison to printed books. Doty, Popplewell and Byers

(2001) studied 39 students in second grade. In the study, half of the students read a CD-ROM

storybook, without narration, and half read from a regular book. The results were students who

read the CD-ROM storybook had a better score on a comprehension test given but no significant

difference was found in the student's oral retelling.   Pearman (2008) also studied second grade

students' comprehension of a CD-ROM book, with the narration option deactivated, compared to

their comprehension of a regular book. Pearman (2008) found oral retelling scores were higher when students read the CD-ROM storybook. Pearman (2008) and Doty, Popplewell, and Byers (2001) believe the animations, pronunciations, and sound effects that were embedded in the CD-ROM book worked together to engage the readers better than the regular book engaged them. Grimshaw, Dungworth, McKinight, and Morris, (2007) found different results when they studied 132 students from nine to eleven years old. The students either read a CD-ROM book with a dictionary and pronunciation feature or a printed book. The researchers found there was no significant difference in the students' comprehension test scores but it took students longer to read electronic text than printed text. The authors believe it was because the students were not able to follow the text manually with his or her finger. Grimshaw et al. (2007) found the narration feature seemed to have the biggest effect on the students' comprehension and enjoyment of the story. The students who used the narration feature on the electronic text received higher scores on a comprehension test and enjoyed the story more (Grimshaw, Dungworth, McKinight, & Morris, 2007). Hsui-Shuang, et al. (2010) studied two classes of fifth graders in China who read either an e-book or a textbook. The study found comprehension results to be lower when a group of students read an e-book as opposed to a print-based book but the students who read the e-book enjoyed reading the e-book more. Therefore, the research reviewed shows the effect of e-books on reading comprehension and fluency varies but e-books have been found to increase reading motivation with young or struggling readers.

Some studies have also stated the advantages and disadvantages of using e-readers in the classroom. Some advantages of using e-readers include the ability to search text, reduced paper consumption, the use of a built-in dictionary, increased storage capacity, portability, wireless connection to the Internet, ability to download materials, fewer distractions compared to a laptop,

cost of e-books, and the number and variety of books available to instantly download (Barron, 2011; Rabb, 2010).

According to research, some disadvantages of using e-readers include breakability, difficulty browsing text, difficulty using highlighting and annotating features, difficulty navigating between multiple texts, possibility of losing text, highlights, or annotations, batteries, and distractions from comprehension due to an overload of animations and hot spots (Barron, 2011; Rabb, 2010; Zuker, Moody, & McKenna, 2009).

Methods to Integrate E-books in the Classroom

Various research states specific strategies or uses for technology in literacy instruction. Larson (2008) created an Electronic Reading Workshop (ERW) during which pre-service teachers read digital text on computers and responded to the text using online blogs, email, message boards, or online chats. When reading the e-book, the pre-service teachers discovered the e-book's highlighting and note-taking tools helped when later facilitating discussion in class. One pre-service teacher noted sitting at the computer to read made him focus, however, it was a struggle not to get distracted by the computer's other features. Another pre-service teacher found she was uncomfortable reading at her computer desk and would rather read on her bed. At the end of the study, all of the pre-service teachers favored paper books to e-books but they found the e-reading experience to be a positive one. The pre-services students found the benefits of responding to the e-book using electronic forms of communication to be: time to reflect and respond, they stayed on topic, and they felt it was a safe environment to share their thoughts. The pre-service teachers did not like the absence of body language or vocal tone in the electronic responses, and some experienced technical difficulties.

Another strategy reported was used in a literacy program that aimed to help unmotivated readers. The literacy program encouraged the children to choose a book, read it independently and then complete an online Accelerated Reader quiz to measure comprehension (Anderson & Balajthy, 2009). Anderson and Balajthy (2009) stated the literacy program asked a literacy coach to offer suggestions to help further motivate the children to read. The literacy coach noted the program did not interact and discuss the books with the children. Anderson and Balajthy (2009) noted, "a key component in blending technology with books is the maintenance of community building" (p. 542). The researchers found the Accelerated Reader program helped the children select books at their reading level that were of interest to them but additional discussions were needed to encourage the students to "interact" with the text.

Larson (2010) wrote a small case study about e-readers and students ability to comprehend e-books. The research participants included 17 second graders who read a story on a Kindle. Larson reported two students' individual interactions with the e-books. The students used the e-reader's digital note tool to respond to the literature and the teacher read the student's annotations to measure comprehension through their connections to the story. Larson found the students used the font adjustments, built-in dictionary, and the text-to-speech tool while reading. The findings were, "using digital reading devices with second grade students promotes new literacies practices and extends connections between readers and text" (Larson, 2010, p.17)

Rhodes and Milby (2007) describe how electronic books can be used to capture student responses after reading. The researchers first explain how retellings aid in reading comprehension because students recall the main idea and sequence of the story. Rhodes and Milby (2007) had students create an e-book using Microsoft PowerPoint slides and narration

capabilities to retell the story using technology. When students created e-books to retell a story, the researchers found benefits because the students were practicing comprehension strategies while making the e-book. Teachers could implement the retelling strategy in the classroom so students can watch and enjoy their e-books repeatedly while the teacher assesses students' reading comprehension (Rhodes & Milby, 2007).

Resources for Teachers

Research provides information about many available resources that allow teachers to combine technology and literacy instruction. Leu, Jr., Castek, Henrey, Corio, and McMullan (2004) describe a strategy called Internet Workshop in which students read a story, find Internet sources that go along with the topic or theme of the story, and discuss the sources with the class. Leu et al. (2004) claim Internet projects can increase student's responses to literature. Leu et al. (2004) give web links for teachers to view examples of Internet projects so they can learn how to create projects for their students. For example, some teachers create Internet projects to poll students around the world and then post the results on the Internet. The researchers state these projects have the potential to create excitement and engage the students in an authentic reading experience (Leu, Jr., Castek, Henry, Coiro, & McMullan, 2004). Guernsey (2011) cites an Internet resource called TumbleBooks that may help improve students' fluency rate. TumbleBooks is an online collection of various e-books. To access TumbleBooks, the school must purchase a subscription to the e-book database. The New York Public Library offers TumbleBooks to those who obtain a library card. TumbleReadables is a branch of TubmbleBooks that has difficult text and graphic novels. Other available resources to access e-

books include the International Children's Digital Library, Starfall, Light Up Your Brain, and

Sound Stories (Mangelson & Castek, 2007).

The research discussed may be helpful for teachers who want to incorporate technology

into literacy instruction, however, there are not many studies comparing reading an e-book on an

e-reader to reading paper-based books. Therefore, research is warranted on the use of portable e-

readers in the classroom since some schools are investing money in them.

Chapter Three

Methods

The following describes a research study that involved third grade students at a rural school district in Western New York. The district serves approximately 700 students in pre-school through grade twelve. I (the researcher) am a special education teacher who teaches a Student Support Service (SSS) class with six students in third grade who struggle with phonics and reading fluency and thus struggle with reading comprehension. The third graders in the SSS class range from eight to ten years of age. In the class, four students are male and two are female. The SSS class meets every Monday and Wednesday morning for 30 minutes. The purpose of the research project was to determine if e-books had an effect on third grade students' reading comprehension. The study was a small mixed method case study. The quantitative data included the comprehension scores obtained from the retelling guides. The qualitative data included graphic organizers, oral explanations the students gave after completing the graphic organizers, retelling guides, surveys, and field notes taken by the researcher.

Participants

The participants chosen for the research project met two criteria: they were unfamiliar with the *Frog and Toad* series by Arnold Lobel, and they completed all components of consent for the research study. The participants who qualified for the study included two boys, Tom and Cole, and one girl, Marissa (all names are pseudonyms). Only Marissa received special education services. Before I began to collect data, I showed the participants how to turn the Nook and iPad on, access the reading passages, turn the pages, and use page thumbnails to quickly find certain

pages of the e-book. I chose to use reading passages from the *Frog and Toad* series because it was close to the participants' independent reading level.

Data Collection

Data collection for each participant consisted of observational field notes, seven graphic organizers, audio taped explanations of the participant's graphic organizers, transcripts of participant explanations, a survey and seven retelling guides.

       Procedure.

         After the consent forms were completed, Tom, Cole, and Marissa participated in the process of reading passages, or stories, from an e-book and a paperback book. I will use the terms passage and story interchangeably throughout the remainder of this study's description. Before each reading session, I told the participants they could choose where they sat while reading and could ask questions if needed. After reading each passage, the participants completed a graphic organizer to retell the story. A graphic organizer is a visual way to organize information. The graphic organizer used for this study was a story map. The story map the participants completed described the title, author, characters, setting, and the events from the beginning, middle, and end of the story. I provided directions, modeled how to fill out the graphic organizer, and let the participants practice filling out the graphic organizer prior to data collection. The participants read a total of seven passages, three e-book passages, and four paper-based passages. The first passage, from a paper book, was a trial collection in order for the participants to experience the routine of reading, filling out the graphic organizer, and retelling the story to me. The participants alternated e-book passages with paper based passages and only read one passage, and completed graphic organizer, one time in each 30 minute session. I also

made an audio recording of the participants explanation of his or her graphic organizer and took

notes while the participants were reading to record their reading behaviors. At the culmination of

the study, each participant individually completed a survey to describe his or her feelings about

e-books and regular books. I took notes while the participants' explained his or her survey to

collect additional qualitative data.

Text and medium.

Each participant read seven passages, three e-book passages and four paper-based

passages. Data were collected the first time to familiarize the participants with the routine of

reading the passage, filling out the graphic organizer, and orally retelling the story. The passages

were from the *Frog and Toad* series written by Arnold Lobel. The two books chosen were *Frog*

and Toad Are Friends (paperback) and *Frog and Toad Together* (e-book). I chose passages from

the *Frog and Toad* series because they were at the participant's independent reading level. Also,

the book has short chapters which do not take much time to read, and the stories are literal,

which requires the participants to have a basic level of reading comprehension. The titles of the

paper book chapters were: "Spring, A Story, A Lost Button, and A Swim". The titles of the e-

book chapters were, "A List, The Garden, and Cookies". I will refer to the passages, or stories,

by its chapter name in Chapter Four. Participants read the paper-based passages from a

paperback book. The e-book passages were read on a Barnes and Noble Color Nook, or an iPad

with the Barnes and Noble Nook application installed. The e-book gave the participant the

options "Read to Me" or "Read by Myself" and included other features such as brightness

adjustments or page "thumbnails" at the bottom of the screen. The "Read To Me" option had

narration and background music. The narration was a recording of a real person, not a robotic

voice. The "Read by Myself" option let the participant read and turn the pages independently.

The layout, words, and pictures of the e-book were the same as those in the paperback version of *Frog and Toad Together.*

Observational field notes.

To record participants' reading behaviors, I wrote observational field notes and used a model provided by Bogdan and Biklen (2003). I recorded the time it took for the participant to read the e-book and paper book. Also, I noted the location in the classroom where the participant was reading. In addition, I wrote down what features the participant used when he or she was reading the e-book. During each session, I made a note if the participant needed assistance or asked a question while reading.

Graphic organizers.

When the participant finished reading each passage, he or she completed one graphic organizer to retell the story. The graphic organizer used was a basic story map from Teacherfiles.com (see Appendix). The participants were asked to write the title and author of the book, the characters, the setting, and a summary of events from the beginning, middle and end of the story. The participants recorded the title, author, characters and setting in small boxes on the graphic organizer. Three larger boxes were given for the participants to draw a picture and write a summary for the events that happened in the beginning, middle, and end of the story.

Audio taped explanations.

After completing each graphic organizer, I asked the participant to explain what he or she remembered about the story. I prompted the participant to begin retelling the story by saying, "tell me what you have here" (referring to the graphic organizer) or, "tell me what you read

about today". The participants had their completed graphic organizer to refer to when retelling

the story. I audio taped the participant's explanation of the graphic organizer to collect additional

quantitative information.

Retelling guides.

I created a retelling guide for each short story by looking at the story and writing down

each event in the story. Goodman, Watson, and Burke's (2005) example of a retelling guide was

used as a model to create the retelling guides for this study. The retelling guides had three

sections: characters, setting, and events in the story. I allotted points for each character, setting,

and event in the story and then counted the total points for each story. Not all stories had the

same number of points. The total number of points for each story range from 28 to 53 points,

depending on how many characters and events were in the story. The amount of points of each

story starting with the story with the smallest points and ending with the story with the most

points is as follows: "Cookies" (28 points), "The Story" (37 points), "A Swim" (38 points),

"Spring" (42 points), "A List" (47 points), "The Garden" (51 points), "A Lost Button" (53

points).

Survey and explanation.

After the participant read a total of seven passages and completed seven graphic

organizers, the participant completed a survey. I created the survey based on the Elementary

Reading Attitude Survey made by the Liberty County School System in Georgia (see Appendix).

The survey included a total of nine questions. The participant was asked to circle and write his or

her to response to the question asked. I read the directions and each question aloud to the

participants. The purpose of the survey was to see how the participants felt about reading e-

books and reading paper books. When the survey was completed, the participant also orally

explained his or her survey responses. I took notes on his or her explanation of the survey

responses to collect additional qualitative information.

After data collection was completed, I analyzed all sources of information to determine if

e-books effected the participant's reading comprehension and if the participants found any

benefits to using e-books in the elementary classroom.

Data Analysis

Observational field notes.

Data analysis included reading field notes and counting tallies to determine what

supportive tools were used, and how often supportive tools were used during e-book reading.

Technical "miscues" such as accidentally turning the page, closing the e-book, or asking for help

was counted to determine how often participants made technical mistakes. Data from field notes

also included how long the participants took to read each passage and where the students were in

the classroom when they were reading.

Graphic organizers.

I counted the words and ideas written on each graphic organizer. The amount of words

and ideas on e-book graphic organizers was compared to the print based graphic organizers to

determine if participants wrote more information about the e-books or print based books. I took

notes about what the participants wrote on the graphic organizers to determine what story

elements the participants included (i.e. problem, solution, resolution, details). I also took notes

about the pictures the participants drew on the graphic organizers to see if they added more detail

to them after reading paper books or e-books.

Audio taped explanations.

After the participants read all seven passages and retold the information they read, I typed

the oral explanations of the graphic organizers. I counted the number of words the participant

used to retell the story using a word processor on a computer. I also collected the duration of the

audio taped explanation using the audio recorder. Finally, I compared the typed version of the

audio taped explanations to the retelling guide to see how much of the story the participants

recalled.

Retelling guides.

Each participant's typed audio taped explanation was compared to the retelling guide. I

highlighted what the participant recalled on the retelling guide. Then, the points the participant

received were compared to the total amount of points for the story to obtain a percentage. This

process was repeated for each participant and each story he or she read. The percentage from the

retelling guide depicts an estimation of the participants' literal comprehension of each text. The

percentage does not depict the accuracy of the participant's comprehension, but how much of the

story each participant recalled.

Survey.

On the last day of data collection, each participant completed a survey to describe his or

her experience reading an e-book with an e-reader. I coded the survey results to determine the

participants' attitude toward reading e-books versus print-based books. The participants also

orally explained his or her survey responses while I took notes. The additional information provided additional qualitative data about the participant's feelings about reading each type of book format.

The data collected from this research project were aimed to answer the following questions: First, did the participants reading comprehension improve when reading an e-book? Second, how did the participants use the supportive features of the e-book to scaffold reading comprehension? Last, how did the participants feel about reading an e-book in comparison to reading a paperback book? The answers to these questions will be used to inform future classroom instruction.

Chapter Four

Results and Interpretation

Over the period of one month I collected data in my classroom to determine three things: if there was a difference in the participants reading comprehension when they read e-books versus paper books, what supportive tools the participants used when reading e-books, and what format of text participant's preferred reading. Since each individual participant yielded different data, the findings will be presented according to how each participant's data answered the research questions. First, I will present his or her data and describe each participant's reading behaviors and then I will compare the data among the three participants. All quantitative data are rounded to the nearest whole number. The term, graphic organizer, is abbreviated (GO) in the following tables. Again, the comprehension scores were obtained from the retelling guides and depict the amount of literal information recalled during the oral retellings.

Marissa

Table 4.1 Marissa's Data

Date & Story	Text Format	Time spent reading	Words on GO	Ideas on GO	Accuracy of GO	Duration of Audio min:sec	Words in Audio	Comprehension Score
2/1/12 Spring	paper	9 min	0 did not finish	0	All ideas accurate	1:30	50	21/42 50%
2/6/12 Story	paper	8 min	59	8	All ideas accurate	1:36	45	15/37 41%
2/13/12 Lost Button	paper	8 min	30	5	All ideas accurate	0:32	20	7/53 13%
2/27/12 Swim	paper	9 min	34	3	all ideas accurate	1:18	44	11/38 29%
Average		9	41	4		1:14	40	33%

Date & Story	Text Format	Time spent reading	Words on GO	Ideas on GO	Accuracy of GO	Duration of Audio min:sec	Words in Audio	Comprehension Score
2/8/12 A List	E-book Nook	9 min	28	3	All ideas accurate	1:08	44	20/47 43%
2/15/12 Garden	E-book iPad	10 min	19 did not finish	3	all ideas accurate	1:36	52	23.5/51 46%
3/5/12 Cookies	E-book iPad	9 min	32	5	all ideas accurate	2:13	51	12/28 43%
Average		9	26	4		1:39	49	44%

Field notes indicate that Marissa, six out of seven times, sat at a desk while reading. She only sat crossed legged on the floor once when she read on the Nook. She read one story for an average of nine minutes. On the graphic organizers, Marissa wrote an average of 29 words and four ideas. Marissa did not finish the graphic organizer in the allotted class time two times out of seven trials. On her graphic organizers, Marissa wrote minimal literal information. Her pictures depicted the events in the story but did not add any inferences about the text. However, Marissa drew details in the pictures without writing about them on the graphic organizer. The audio recordings show she explained each story she read with an average of 44 words for an average of one minute and 24 seconds. All of the information recalled on the graphic organizers and in oral retellings were accurate. She recalled literal information and did not show that she made any inferences or connections with the stories. The retelling guides estimated she orally recalled an average of 38% of the literal information in all stories. Therefore, out of a possible 100 points for all the retelling guides combined, Marissa earned 38 points. This does not mean that Marissa did not comprehend over 60% of the story, but that she did not recall information from 60% of the story during the retelling process.

When comparing the paper book data and electronic book data from Table 4.1, Marissa spent nine minutes reading both formats. Marissa wrote an average of 41 words on the graphic organizer after reading the paper book and an average of 26 words on the graphic organizer after reading the e-book. Marissa wrote an average of 15 more words on the graphic organizers after reading the paper book format. On two occasions, Marissa did not complete the graphic organizers. The first incidence occurred after reading a paper book and the second one occurred after reading an e-book. Marissa recalled accurate events on all graphic organizers. She wrote literal information on graphic organizers completed after both types of texts. She drew more pictures on the graphic organizers completed after reading the paper books, possibly because she had more time to draw. She also wrote more words on the graphic organizers after reading paper books but her average time reading both formats are the same. She orally retold the story with an average of 40 words after reading the paper book and used 49 words after reading the e-book, which is a difference of nine words. Marissa's comprehension scores show she orally recalled an estimate of 33% of the total amount of literal information in the text after reading a paper book and recalled 44% of the total amount of literal information in the text after reading an e-book, which is an 11% difference in how much literal information she recalled from the text out of the total amount of literal information in the story.

Marissa stated on her survey that she "likes e-books because you can't lose your spot". She also explained, "You can get to the pages faster because you can press the little arrow and find the page". Marissa likes to read both kinds of books in school because if she gets stuck on a word, the teacher might help her. She further added, the e-book reads the entire story. She wishes that the e-book would read her just one word because it is not necessary for her to hear the whole text read aloud. After retelling the story, Marissa also said she likes the e-book better than the

paper book. She commented, "Paper books, you have to turn by yourself and the Nook, you just

touch the screen and drag". She also said she prefers the iPad to the Nook because the iPad's

screen is larger. During one observation, I noticed Marissa used her finger to track the text while

reading on the Nook. She only touched the e-reader to turn the page or access the thumbnails to

find what page to start reading on. Overall, the feature she liked best on the e-book was that you

can't lose your spot and the thing she does not like about the e-book is the only support feature is

having the whole story read aloud.

Cole

Table 4.2 Cole's Data

Date	Text Format	Time spent reading	Words on GO	Ideas on GO	Accuracy of GO	Duration of Audio min:sec	Words in Audio	Comprehension Score
2/1/12 Spring	paper	5 min	23	3	all ideas accurate	1:49	171	19/42 45%
2/6/12 Story	paper	8 min	21	3	all ideas accurate	1:00	92	16/37 43%
2/13/12 Lost Button	paper	7 min	24	4	all ideas accurate	1:00	102	16/53 30%
2/27/12 Swim	paper	7 min	24	3	all ideas accurate	1:22	101	18/38 47%
Average		7	23	3		1:17	117	41%

Date	Text Format	Time spent reading	Words on GO	Ideas on GO	Accuracy of GO	Duration of Audio min:sec	Words in Audio	Comprehension Score
2/8/12 A List	E-book iPad	6 min	20	3	all ideas accurate	1:21	115	24/40 51%
2/15/12 Garden	E-book Nook	9 min	17	3	all ideas accurate	1:29	119	22.5/51 44%
3/5/12 Cookies	E-book iPad	5 min	26	3	switched characters	1:25	135	19/28 68%
Average		7	21	3		1:25	123	54%

When observing Cole read, he sat at his seat five out of seven times. During the other two sessions, he sat on the floor and whispered the words to himself while he read. Cole asked me for help when he had a problem with the e-reader. When Cole used the Nook, he said "I barely can see it, letters are so small!" and, "What the heck!" when the pages were not working right. I also noted Cole was flipping through the pages of the paper book and then asked, "When does this chapter end?" I noted this may have been a sign of boredom because he interrupted his reading to ask this question, whereas a reader who was interested in the story would have just kept reading.

According to Table 4.2, Cole read one story in an average of seven minutes. He wrote an average of 22 words and three ideas on his graphic organizers. His ideas were mostly accurate and only switched the characters names around on one occasion. Cole mostly wrote about the main ideas in the stories and did not write about details. Cole orally explained his graphic organizer with an average of 119 words. The average duration of his explanations was one minute and 20 seconds. Overall, he orally recalled about 47% of the literal information in the story each time.

When comparing Cole's data on reading paper books to reading e-books, the time it took him to read the story did not vary. Also, the amount of words he wrote on his graphic organizers did not vary much according to the type of text read. He wrote an average of 23 words on his graphic organizers after reading a paper book and wrote an average of 21 words on his graphic organizers after reading the e-book. His graphic organizers were all accurate when he read the paper books but switched the character's names around once after reading the e-book. He also drew more pictures on the graphic organizers completed after reading a paper book. He only

drew pictures on one out of three graphic organizers completed after reading an e-book but, on average, he did not have more time to draw after reading the paper books. It is possible that the pictures were more vivid in Cole's mind after reading from the paper book. Cole took an average of one minute and 17 seconds to retell the story after reading a paper book and one minute and 25 seconds to retell the story after reading an e-book, which is a difference of eight more seconds after reading the e-book. When Cole orally explained the story he used about 117 words to explain the story after reading a paper book and 123 words to explain the e-book. Therefore, he used an average of six more words to explain the e-book after reading it. Six more words is not a big difference so his length of explanation is not much different in the retelling of the two text formats. The points from the retelling guide estimate Cole orally recalled 41% of the literal information from the story after reading a paper book and 54% of the literal information from the story after reading e-books. These results show Cole recalled 13% more literal information from the story after he read an e-book. When I asked Cole how he liked reading the e-book, he often stated he preferred the swiping motion to turn the pages of the e-books to physically turning the pages of a paper book.

On his survey, Cole stated he "loved" reading e-books, and only "liked" reading paper books. If someone asked Cole's opinion of what type of book to read, he would recommend e-books, not paper books. He stated, "I would tell my grandma to read an e-book." Cole also told me he owned a Kindle Fire, which is an e-reading device. He enthusiastically brought the Kindle to school to share with me after he received it as a gift. Cole had a personal interest in using technology and his family supported his interest and bought him a Kindle.

Tom

Table 4.3 Tom's Data

Date	Text Format	Time spent reading	Words on GO	Ideas on GO	Accuracy of GO	Duration of Audio min:sec	Words in Audio	Comprehension Score
2/1/12 Spring	paper	4 min	49	6	wrong month	1:57	106	23/42 55%
2/6/12 Story	paper	4 min	52	6	all ideas accurate	1:03	57	17/37 46%
2/13/12 Lost Button	paper	5 min	39	5	All ideas accurate	0:36	49	Dec-53 23%
2/27/12 Swim	paper	4 min	62	10	All ideas accurate	1:00	81	15/38 39%
Average		4	51	7		1:09	73	41%

Date	Text Format	Time spent reading	Words on GO	Ideas on GO	Accuracy of GO	Duration of Audio min:sec	Words in Audio	Comprehension Score
2/8/12 A List	E-book iPad	6 min	18	3	All ideas accurate	1:01	51	19/47 40%
2/15/12 Garden	E-book Nook	5 min	36	5	All ideas accurate	1:09	63	23/51 45%
3/5/12 Cookies	E-book iPad	5 min	30	7	All ideas accurate	2:17	135	13/28 46%
Average		5	28	5		1:29	83	44%

When it was time to read, Tom was usually found reading on the floor on his belly with his feet kicking back and forth. According to field notes, he used the e-book's features more frequently than the other participants. He enlarged each paragraph of text and used the page thumbnails to find specific pages. He also accidentally closed the book once but he knew how to quickly reopen it. Tom's body is rarely still and his use of the e-book mirrored his active personality. Instead of focusing just on reading the e-book, he "jumped" around the text using

the page thumbnails and accidentally closed the e-book application because he was trying to use

the e-book's additional features and pressed the wrong button.

According to Table 4.3, Tom read one story in an average of five minutes. When he

completed the graphic organizers he used about 41 words and six ideas on each. All of his ideas

were accurate on the graphic organizers except he said the wrong month in the story, "Spring",

which was read from the paper book. Compared to the two other participants in the study, Tom

wrote more details on his graphic organizers. When Tom explained what he read, he did so in an

average of one minute and 17 seconds and used about 77 words. According to his retelling guide

scores, Tom recalled an average of 42% of the literal information in all of the stories he read

during the research project.

When reading the paper books, Tom read for an average of four minutes. When Tom read

the e-books he read for about five minutes, which is one minute more than when he read the

paper book. Tom spent time looking at the page thumbnails on the e-reader and he may have also

had trouble turning the pages of the e-book. His difficulty turning the e-book's pages may have

influenced Tom to write on the survey that he liked paper books better. After reading a paper

book, he wrote about 51 words and seven ideas on his graphic organizers. After reading an e-

book he only wrote an average of 28 words and five ideas. Tom wrote an average of 23 more

words and 2 more ideas after reading the paper book. This could mean that Tom was paying

better attention to the story when reading a paper book. The features of the e-book and the fact

that he was not used to reading on an e-reader could have distracted Tom during the reading

process. Tom also took about a minute more when reading the e-book chapters, so he may have

felt slightly rushed when completing his graphic organizers. All of his ideas were accurate on the

graphic organizer after reading an e-book but he was confused about the setting of the story after

reading the paper book. Similar to the other two participants, Tom drew more pictures on his

graphic organizers after he read the paper book. Tom took about one minute and nine seconds

and used about 73 words to explain the story after reading it from a paper book. After reading the

e-book, he retold the story for about one minute and 29 seconds and used 83 words, which is 20

more seconds and 10 more words than after he read the paper book. The length of Tom's

retellings were slightly longer after reading the e-book which indicates that he may have

remembered more events to retell. After totaling the retelling guide points, Tom retold an

average of 41% of the literal information in the stories printed on paper and 44% of the literal

information in the story when reading an e-book. Overall, Tom retold an average of 4% more

literal information in the story when he read an e-book than when he read a paper book. Again,

this does not mean that he did not know over 60% of the story, but he just retold about 40% of

the literal information, or events, in the story.

Tom often told me he preferred reading e-books to reading paper books during the

retelling sessions. He said he liked e-books better because, "you have to flip pages in a book and

you only have to slide on the iPad". He also stated he preferred the iPad over the Nook because

the screen was larger and easier to see, similar to what Marissa said and what Cole's comments

implied. However, on Tom's survey, at the conclusion of the study, he wrote he feels "okay"

when reading an e-book and he "loves" reading paper books. Tom eventually said he preferred

flipping the pages of a book. He commented, "Sometimes it (the e-book pages) won't slide" and

"you can read more slowly and flip the pages more easily." When asked if he understood the

story when reading e-books, he stated, "Yes, because it reads to you and you can understand." I

did not allow the participants to choose the "Read to Me" option while reading but Tom assumed

if this option was allowed, he would have understood the story better. Tom also said he

understands paper books "because you can read slow and take your time". Tom's responses on

the survey conflicted with what he said after reading the e-books. He also contradicted himself,

in his last statement on the survey, when he said he would recommend a paper book to someone

else because you can read fast and it is easier to flip the pages. Earlier in the survey, Tom said

the opposite that you could take your time while reading a paper book.

Comparisons

Table 4.4 Comparison of paper and e-book comprehension scores

Participant	Paper comprehension scores	Electronic comprehension scores	Difference in scores
Marissa	33%	44%	+11%
Cole	41%	54%	+13%
Tom	41%	44%	+3%

Table 4.4 shows each participant's average comprehension score of paper passages and e-

book passages. The percentage illustrates, out of a possible 100 points, the participant obtained a

certain amount of points on the retelling guides. The average was found by adding the

comprehension percentage scores from the retelling guides and dividing it by the number of

stories read. The difference between the comprehension scores of the two formats is shown in the

third column. The retelling score estimated the amount of literal information retold, not the

accuracy of the retelling. The retelling scores of all of the participants were higher after reading

an e-book. They all retold literal information from the story but they retold more information

after reading the e-book. Cole retold 13% more of the story's elements, Marissa retold 11% more

of the story's elements and Tom retold 3% more of the story's elements after reading e-books.

The participant's difference between the two formats can also be compared to how much they enjoyed using e-books. The survey data show Cole enjoyed using the e-books very much. He also told me he owned an e-reader. The difference between Cole's comprehension score of the e-book and the paper book was the highest at 13%. Marissa also said she enjoyed reading the e-books and she had a difference in comprehension score of 11%. Tom ultimately said he preferred reading paper books, and his difference in comprehension score was the smallest of the group of participants with only a 3% difference.

Table 4.5 Average comprehension scores comparison by story and format

Format	Story	Average Story Comprehension Score	Format Comprehension Score
e-book	A List	45%	
e-book	The Garden	45%	47%
e-book	Cookies	52%	
p-book	The Story	43%	
p-book	A Swim	38%	38%
p-book	A Lost Button	22%	
p-book	Spring	50%	

Table 4.5 displays the average comprehension score of each story. I found the average comprehension score of each story by taking each participant's comprehension score of the story, from the retelling guide, adding them together and dividing it by three, which is the number of participants in the study. "A Lost Button" has the lowest average comprehension score possibly because it was the longest passage out of the passages selected. The Format Comprehension Score column is an average score of all of the e-book comprehension scores and all of the paper book comprehension scores. Table 4.5 shows the participants retold an average of 47% of the story elements in the e-book passages and 38% of the story elements in the paper book passages, based on the retelling guides. The difference in average comprehension scores is 9%, which

means the participants recalled an average of 9% more of the story elements when they read an e-book.

The data presented is related to the research questions presented in Chapter One and Rosenblatt and Vygotsky's theories of reading. There were also some limitations of this study that lead me to formulate suggestions for further research. This and the significance of the data will be discussed in Chapter Five.

Chapter Five

Conclusion

Summary

This small qualitative study involved three third grade participants and their interactions with and comprehension of print based books compared to e-books in a classroom setting. After the participants read four paper passages and three e-book passages, I compared a typescript of each participant's audio taped retelling to a retelling guide to obtain a comprehension score for each story. I then compared each participant's average paper book comprehension score and e-book comprehension score to see which text format the participant comprehended more literal information. At the end of the study, participants individually completed a survey that described their attitude toward reading paper books and e-books. Audio taped interviews also provided additional qualitative data on how the participants felt about reading paper books and e-books.

Answers to the Research Questions

As discussed previously, there were three questions the data served to answer. The first question was: what is the difference in the participants' comprehension when independently reading e-books versus print-based books? Evidence from this study indicates literal reading comprehension appears to be better when participants read e-books versus paper books. Additionally, participants who enjoyed reading an e-book increased their reading comprehension score more than those who did not enjoy reading an e-book.

The second question was: what supportive features or tools did the participants use when reading an e-book? Observations show the participants enlarged the electronic text and used the page thumbnails to navigate through the e-book. One participant would have liked the e-book

more if it allowed her to click on one word to hear it pronounced. In this study, the participants were told to choose the "Read by Myself" option instead of the "Read to Me" option, although most of the participants probably would have chosen the latter if they were allowed because they all struggle with decoding.

The last question was: what are the advantages and disadvantages of using e-books in an elementary classroom? This question can be answered in either a teacher's perspective or the participants' perspective. The participants found the advantages of reading e-books to be:

- the narration feature

- it is hard to lose your place when reading

- swiping the screen to turn the page

The participants thought the disadvantages of the e-book were:

- swiping the screen to turn the page (one liked turning the pages of a paper book instead)

- poor visibility due to the small screen of the Nook

- the application's inability to read/pronounce one word at a time

I, from a teacher's perspective, also found the e-book had advantages and disadvantages. The disadvantages are few. A teacher must first have an e-reader in the classroom to be able to utilize it, and the devices are expensive. Also, if the school does have e-readers available for participants, there are times when they are unavailable because another teacher is using them. A second disadvantage of using e-books in the classroom is it was difficult for me to find a specific text with the supportive features I knew my participants needed. For this study, I could not find any application (app) that would allow the participants to click on one word to hear it pronounced when reading the *Frog and Toad* text. This feature is available on the Nook app for more difficult texts, but not for children's books. Scholastic's Storia app has a pronunciation

feature, but not for the *Frog and Toad* text I needed. The last disadvantage was when I found what app I wanted to use for the research project, my lesson plans to use the e-books were delayed because the technology team had to install the app on multiple devices and they could only do it when their schedules allowed them.

The first advantage of using e-books in the elementary classroom is they have supportive features (i.e. narration, text enlargement) to allow the participants who struggle with reading to become independent readers. Secondly, the participants in this study quickly learned how to use the e-reader so I did not have to spend many class periods teaching the participants how to access the e-books and use the supportive features. Another advantage is a teacher can differentiate participant's reading assignments using the same device. If students are all using the same device, differentiation can be discrete and students do not have to be embarrassed about reading a different text than their peers. Also, most students think using an iPad is "cool" so it motivates them to use it to read. Lastly, while the participants were reading, I could tell they were engaged with the text because it was eerily quiet in the room. The participants were not chatting, or off task. They liked to sit near each other and may giggle at the story, so the social aspect still existed, which I consider a positive aspect because the participants were able to build personal connections to the story could share the reading experience with others. A student's personal connection to a story relates to the theoretical stance previously discussed in Chapter One.

Theoretical Connections

The participants said they enjoyed reading the e-book more than the paper book during the study. Rosenblatt's reader response theory states that readers bring their own experiences to the process of reading. The data that shows Cole's efferent (literal) comprehension increased the most (13%) out of the three participants. During Cole's interviews, he told me how much he

enjoyed reading e-books and how he had a Kindle at home. His knowledge and positive experiences with e-readers allowed him to fully immerse himself in the story he was reading to ultimately recall more ideas when reading an e-book.

Rosenblatt's theory also relates to Tom's comprehension results. At the end of the study, Tom stated he preferred print based books to e-books for various reasons. Tom's comprehension score still increased when he read the e-book but his comprehension score increased the least out of the participants with only a 3% difference on his retelling guides. It may be possible something distracted Tom from comprehending the story while he was using the e-book. As previously mentioned in Chapter Two, possible distractions may include the availability of supportive features, accidentally cuing the iPad to turn the page, or even the brightness of the screen. Tom finally stated on the survey, he would rather manually turn the pages of a paper book than slide his finger on an e-reader's screen. If Tom did not encounter problems when reading the e-book, he could have potentially had a more positive attitude about reading the e-book, which may also positively impacted his comprehension score.

Furthermore, the *Frog and Toad* Book on the Nook application did not allow the participants to click on a word to hear it pronounced. Marissa commented on her survey that the e-reading experience would have been better if she could have clicked on one word to hear it pronounced when she did not know how to read it. The pronunciation feature was important to Marissa and her reading experience. Marissa's reading comprehension scores could have increased if this feature were available to her. Rosenblatt's reader response theory explains reading is a personal experience. The features of the e-book, or the novel experience surrounding reading e-books, may have satisfied each participant's needs enough for them to comprehend the story more than a paper book did.

Vygotsky's idea of the "Zone of Proximal Development" is related to the comment that Marissa made about the e-book's lack of supportive features. Her potential to understand the story may not have been fulfilled because she did not have someone (or something) there to help her decode the text. It was my intention to provide an e-book that had the pronunciation tool available for the participants to use, but the availability of an appropriate text with this feature could not be found. Marissa also may have said that she likes when the teacher is there to help her because she enjoys the social aspect of reading and discussing with someone. E-books do have a note taking feature which allows you to record any questions or thoughts about the text but some still appreciate interacting with a human being.

Significance of Findings

The findings of this study are significant to teachers in an elementary classroom setting who have e-readers available for students. The findings are also applicable to school personnel who are considering making the investment to purchase e-readers. The participant's increase in comprehension scores, although small, illustrate that the participants were more engaged with the text when reading an e-book. This data proves e-readers may be a wise investment if the teacher is willing to incorporate them into his or her curriculum. Because some participants benefitted from reading the e-books more than others, teachers could give the students a choice to read an e-book or a paper book. Since all participants had an increase in comprehension scores, it is assumed e-books would not harm other students reading comprehension. One of the participants said he preferred to read a paper book, but I predict if more time and assistance was provided for that participant to customize the e-reader to fit his needs, he may have had a more positive reading experience.

For those who are looking to purchase e-readers for the classroom, the participants

preferred the iPad's display to the Barnes and Noble Color Nook's display. The participants did

not have a problem accessing the text I provided and it only cost me $4.99. A teacher who is

planning on using e-readers in the classroom should plan lessons at least one month in advance

to make sure the e-readers are available, if they are shared with other teachers, and have the

needed apps installed. The participants easily learned how to use the e-reader's functions but it

was necessary to plan one lesson to show the participants how the e-reader worked at the

beginning of the study. Although the data from this study provided insight on whether to use e-

books with this specific group of participants, there are also some limitations to the study.

Limitations of the Study

The first limitation of the study is it had a very small sample of participants. Out of a

class of six students, only three gave consent to participate in the study. The results from only

three participants cannot be generalized to students in other settings. Also, the participants were

all from the same grade level, so results may vary for students in earlier or later grades. In

addition, data collection occurred for one month. More data should be collected over a longer

span of time to receive a better average and comparison of comprehension scores. Also, 30

minutes was too short of a period to collect data. As reflected in Table 4.1, Marissa did not finish

her graphic organizer on two occasions. I would have liked to allow more time for her to finish,

but because she had another class after SSS, I could not extend the class period. A class period of

45 minutes would be ideal to allow all students to finish assignments.

Another limitation of this study is that the retelling guide was not a standardized measure

of comprehension. I created the retelling guide and there was no way to establish validity and

reliability. It would have been beneficial to have a co-researcher help to create data collection materials or discuss the data when analyzing it. Also, according to Rosenblatt, the participants were responding to the text from the "efferent" stance, which means the participants were recalling literal information from the story. I could have also asked the participants to tell me how they felt about the story to collect data on the "aesthetic" reading of the text. Further, the graphic organizer may have limited what the participants could have recalled after reading. The size of the text boxes and the directions that told the participants to recall the beginning, middle, and end of the story may have affected the amount information they could have told me. For future studies, I would suggest not using a graphic organizer and also asking the participants to comment on how they felt about the story. Also, I would find a better way to measure reading comprehension. The data collection materials used in this study did not allow me to determine whether the participants' comprehension was at an independent, instructional, or frustration level. I could have used passages from the Qualitative Reading Inventory 4 (QRI-4) and transferred them on to an e-reader and then asked the participants the comprehension questions related to each passage. Then, I could have determined the level of the participants' comprehension.

Lastly, I had difficulty finding an e-book that had the supportive features I wanted the participants to experience. Because the participants were struggling readers, I wanted to find a text that was appropriate for them to read independently. I searched through many different applications and websites to find a text that would allow the participants to utilize a pronunciation feature/tool that allowed the participant to click on one word to hear the word pronounced. The appropriate material that I found only offered the "Read to Me" option or "Ready by Myself" option. The "Read to Me" option allowed the participants to have a narrator

read the whole story. I did not want the participants to choose the "Read to Me" option because it would have measured participant's listening comprehension, not reading comprehension. If the participants had a pronunciation tool, their comprehension scores may have increased more because the participants had a history of difficulty with decoding words and reading fluently.

Suggestions for Future Research

For those who are interested in further exploring the difference in comprehension when reading e-books on an e-reader compared to reading paper books, suggestions are given as follows. First, it is strongly suggested a longer span of data collection, at least six months, be conducted to examine students' differences in reading comprehension. If data were collected over a longer span of time, the data would more accurately depict students' differences in reading comprehension.

A future study should also include a variety of grade levels. With a larger pool of participants, data may show participants at different ages prefer different text formats. Students below first grade may have difficulty using the e-reader independently because they have not developed necessary motor control of their fingers and may not be able to read certain messages and labels within applications.

It would also be interesting to compare the e-book's effect of comprehension with students that struggle with reading to those who read at grade level. Those who have more literacy skills may provide inferences in retellings and the researcher could determine what comprehension skills the students are using (i.e. literal, inferential, analytical, and evaluative). The participants' use of the e-books supportive features may differ between those who have

different sets of literacy skills. Including those who do not have reading difficulties may provide insight as to what tools support higher order comprehension skills.

Finally, it is suggested that e-books with the dictionary/pronunciation feature be used in a future study. A participant in this study stated a pronunciation tool would have been helpful when reading the e-book. I would have liked to extend this study to include data using an e-book with this feature available. Then, comprehension scores reading the e-book without the pronunciation feature could be compared to comprehension scores reading an e-book with the pronunciation feature. For others who would like to explore a student's comprehension of e-books when using the pronunciation feature, it is suggested to select participants who read above a second grade level because there are more e-books available with the pronunciation feature at higher reading levels (chapter books).

Final Thoughts

Now that I look back on the purchase of my Barnes and Noble Color Nook, I am glad that I made the investment. Not only did I discover a newfound interest in reading and interacting with literature, but it led me to realize that this technology would be useful for my students. As time has passed, I have "upgraded" from the Nook to an iPad and continue to purchase e-books to read for pleasure. Hopefully my attitude towards using technology to read will encourage my students, who typically do not read for pleasure, to find texts that they can enjoy. Fortunately, there has been news that the elementary library is going to start lending out Nooks for students. I can only hope that my students will take advantage this opportunity and continue to develop their literacy skills to be valued citizens in the future.

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Appendix

Graphic Organizer – Story Map

Basic Story Map

Instructions: Fill in the boxes to show how your story developed.

Name:_____

Title:

Author:

Characters:

Setting:

Beginning:

Middle:

End:

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Example of Participant Survey

Name:

Date:

Directions: Answer the questions by circling the picture or writing your answer.

1. How do you feel when you read an <u>e-book</u>?

Love it!	Like it.	It's ok…	I don't like it!

2. How do you feel when you read a <u>regular book</u>?

Love it!	Like it.	It's ok…	I don't like it!

3. Explain number 1 and 2. Why do you feel that way?

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Example Retelling Guide

<div align="center">

Retelling Guide
Spring – Paper
42 points
</div>

Characters:

Frog (5)

Toad (5)

Setting: Toad's House (5)

Events:

Frog went to Toad's house and knocked at the front door. (2)

Frog told Toad to wake up because it was spring (2)

Toad wouldn't wake up (1)

Frog told toad the sun was shining and the snow was melting (2)

Toad said he wasn't there. (1)

Frog walked into the dark house. (1)

Toad said to go away. He was in bed. (2)

Frog pushed toad out of the house onto the front porch. (2)

Toad couldn't see anything. (1)

Frog told him it was the light of April and they can start a new year together. (2)

Frog wanted to skip through the meadows, run through the woods, and sit on the porch and count the stars. (4)

Toad went back to bed because he was too tired. (1)

Frog told Toad he had been asleep since November and Toad said to come back in May. (2)

Frog tore off the pages of the calendar until it said May. (1)

Frog ran back to Toad and told him it was May. (1)

Toad woke up and he and Frog ran outside to see the spring. (2)