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Correlation Between Interactive eBooks and Printed Text in Reading Achievement and Student Interest

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Abstract

Interactive eBooks or traditional printed text? Teachers face difficult decisions when determining which are the most effective tools to use to increase student reading achievement. Studies (Chong, Lim, & Ling, 2009; Ciampa, 2012; Coyle, 2008; Huang, Liang, Su, & Chen, 2012; Jones, & Brown, 2011; Larson, 2010; Martinez-Estrada, & Conaway, 2012; Maynard, 2010), have found that students prefer the additional features of interactive eBooks over traditional printed text; however, studies have failed to prove that these additional text features increase student reading achievement over traditional printed text. There has not been enough evidence to show that student reading achievement increases in the general education classroom when students read from an interactive eBook rather than a traditional printed text. This study was conducted to determine if the additional text features of interactive eBooks in the general education classroom increased student reading achievement and student motivation over traditional printed text. The results of this study did not provide significant evidence that the additional text features of interactive eBooks increase reading achievement over traditional printed text. The results of the study did indicate that while students prefer the additional text features of interactive eBooks, use of interactive eBooks did not increase student motivation.

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Abstract

Interactive eBooks or traditional printed text? Teachers face difficult decisions when determining which are the most effective tools to use to increase student reading achievement. Studies (Chong, Lim, & Ling, 2009; Ciampa, 2012; Coyle, 2008; Huang, Liang, Su, & Chen, 2012; Jones, & Brown, 2011; Larson, 2010; Martinez-Estrada, & Conaway, 2012; Maynard, 2010), have found that students prefer the additional features of interactive eBooks over traditional printed text; however, studies have failed to prove that these additional text features increase student reading achievement over traditional printed text. There has not been enough evidence to show that student reading achievement increases in the general education classroom when students read from an interactive eBook rather than a traditional printed text. This study was conducted to determine if the additional text features of interactive eBooks in the general education classroom increased student reading achievement and student motivation over traditional printed text. The results of this study did not provide significant evidence that the additional text features of interactive eBooks increase reading achievement over traditional printed text. The results of the study did indicate that while students prefer the additional text features of interactive eBooks, use of interactive eBooks did not increase student motivation.

According to Prensky (2001), "today's students think and process information fundamentally differently from their predecessors" (p. 1). Twenty-first century students do not learn the same way as their teachers did when they were students. Yet most schools continue to teach without taking into account the needs of the 21st century student. The same is true in the reading classroom. Changes need to be made to better meet the needs of the 21st century reader.

Is the incorporation of technology the answer? The appropriate use of technology in the classroom can be a challenge for the 21st century teacher. Technology in the classroom can be appealing to educators. However, determining the benefits of technology and asking whether those benefits outweigh the traditional tools of instruction is very challenging. One specific technology issue educators are currently debating is whether or not interactive eBooks benefit student learning over traditional printed text.

Because eBooks are relatively new, the research up to this point has been inconclusive as to whether interactive eBooks truly increase reading achievement and student interest over that of printed text. Yet despite inconclusive data, schools are in the process of deciding if interactive eBooks should replace printed text whether in libraries or in the classroom.

Problem

There are really two separate but correlating issues here. The first issue is that 21st century students have different needs than ever before. Who are these learners? How are 21st century students different? How can educators best meet the learning needs of 21st century students? According to Prensky (2001), our students are digital natives and we, as educators, are digital immigrants. Digital natives learn differently than digital immigrants do and therefore, cannot be taught in the same way as digital immigrants were taught.

The second issue is the appropriate use of technology in the classroom to effectively meet the learning needs of 21st century learner. Because the 21st century student learns differently, does that mean they read and comprehend differently? Are interactive eBooks more effective for 21st century learners than printed text in increasing reading achievement and student interest? Knowledge about the effect of interactive eBooks on student reading achievement and interest is lacking. This study attempted to determine the effectiveness of interactive eBooks in the general education classroom.

Research Questions

Specifically, this study sought an answer to the following overarching question: Does the use of interactive eBooks increase the reading achievement and interest of elementary students in the general education classroom? To address this overarching question, the following questions were asked:

1. Do the additional text features of interactive eBooks in the general education classroom increase student reading achievement over traditional printed text?
2. Do the additional text features of interactive eBooks in the general education classroom increase student interest over traditional printed text based on pre-test/post-test results?

Definitions

The following definitions are provided by the researcher, unless otherwise indicated, to promote clarity throughout this study:

Basic Reading Inventory (BRI): set of diagnostic tools individually administered that are used to help teachers determine reading achievement. The BRI tests oral reading, silent reading, and listening level. The BRI collects data regarding phonemic awareness, phonics, fluency, vocabulary, and comprehension.

Digital Immigrants: people who did not grow up with digital technology.

Digital Natives: people who grew up with digital technology.

eBooks: "An EBook (also spelled Ebook, ebook, eBook, e-book, or e-Book) is electronic text (also known as etext or e-text) that is available in a digitally encoded format readable via an electronic device" (Wexelbaum, Miltenoff, & Parault, 2011, p. 2). "eBooks feature adjustable text size, highlighting, bookmarking, note taking, dictionaries, and reading aloud software" (Weber & Cavanaugh, 2006, p. 59).

Electronic Books Onscreen Interface (EBONI): a 20-month program funded under the JISC DNER Program for Learning and Teaching, and developed to study student eBook design preferences.

Interactive E-book Learning System (IELS): a program developed to study the use of interactive eBooks in correlation with student learning.

Literature Review

Technology is changing. Education is changing. The resources available are changing. The role of the teacher in education is changing. The role of the student in education is changing. Educators must be prepared to teach a new kind of student. "Today's students are no longer the people our educational system was designed to teach" (Prensky, 2001, p. 1). Teachers may be "immigrants" of technology, but 21st century students are "natives" of technology. According to Huang, Liang, Su, & Chen (2012), the younger generation has grown up and is familiar with new technology; they are likely to have different expectations and behaviors towards it. Huang et al. (2012) conducted a study of 166 elementary school students using the Interactive E-book Learning System (IELS) and their research noted how easily students adapted to interactive eBooks as well as their high level of preference for the electronic format.

Twenty-first century learners are very different from 20th century learners. Twenty-first century students may need different approaches to instruction and different learning tools to excel. According to McHugh (2013), teachers in all areas of education are continually dealing with a student make-up that are more wired and that grew up in a techno-drenched environment that has trained them to think and process information in very different ways. McHugh (2013) indicated that 21st century students learn differently and may need different learning tools to be successful. "Today's brains are shaped by various information streams -- sometimes referred to as memes -- constantly popping and sparking and competing for attention. This new generation of digital learners -- call them the MEdia Generation -- take in the world via the filter of computing devices" (McHugh, 2013, p. 1).

One major component to student success in learning is engagement. Typically if there is a lack of engagement, there is a disconnect in learning. Twenty-first century students learn differently in part due to the fact that they are engaged differently in the classroom. Prensky (2001) noted:

> More and more of our students lack the true prerequisites for learning--engagement and motivation--at least in terms of what we offer them in our schools. Our kids do know what engagement is: Outside of school, they are fully engaged by their 21st century digital lives. If educators want to have relevance in this century, it is crucial that we find ways to engage students in school. Because common sense tells us that we will never have enough truly great teachers to engage these students in the old ways--through compelling lectures from those rare, charismatic teachers, for example--we must engage them in the 21st century way: electronically. (p. 9-10)

Teachers need to be ready to evaluate their current teaching practices to better meet the

needs of their students. According to Massy and Wilger (1998), "Optimizing the use of information technology requires faculty to change what they clearly prefer to leave untouched" (p. 53). Prensky (2005) agreed, noting that our students aren't "little versions of us" (p. 8). Prensky (2005) recognized that our students are so different that we can no longer rely completely on our 20th century knowledge or training to best educate our 21st century students.

Martinez-Estrada and Conaway (2012) concurred that both technology and education are changing. "Just as the arrival of information technology (computers, Internet, satellite communication, and mobile devices) has transformed the everyday life and habits of most people, educational technology experts predict that before the year 2015 the eReader will be the largest platform used in university education" (p. 126).

Martinez-Estrada and Conaway (2012) piloted an eBook project for one semester at the Tecnologio de Monterrey, a university with an enrollment of over 90,000 students on 33 campuses. Each student and professor was given a Kindle eBook to use during the spring semester of 2010. At the end of the semester, all participants were given a survey regarding the eBook project. Eighty-eight percent of the professors indicated that they believed that the eBook positively influenced the teaching and learning process. Sixty-six percent of students indicated that the eBook had a positive impact on the classroom experience. Eighty-five percent of the students indicated that they read more with the eBook than without the eBook (Martinez-Estrada & Conaway, 2012). Overall, Martinez-Estrada (2012) and his team of researchers found the eBook project to be successful and have decided to continue using eBooks in the future. Without a doubt, technology has impacted education. In the same way, interactive eBooks may impact the reading classroom.

Many studies (Chong, Lim, & Ling, 2009; Ciampa, 2012; Coyle, 2008; Huang, Liang, Su, & Chen, 2012; Jones, & Brown, 2011; Larson, 2010; Martinez-Estrada, & Conaway, 2012; Maynard,

2010) give evidence that interactive eBooks can have a very positive impact on student interest. According to a study done by Jones and Brown (2011), students preferred eBooks over traditional printed text because of the larger range of titles they could choose from as well as the additional text features available. The students in the study became quickly familiar with the eBooks and welcomed the technology into their reading classroom. In this study, 22 third-grade students read one traditional printed text novel and two interactive eBook novels. The participants were asked to complete a satisfaction survey as well as reading comprehension tests for each book. Results indicated that while students preferred the eBooks, the reading achievement tests did not show a significant increase in student achievement when using an interactive eBook.

The changes made to meet the needs of the 21st century learner must also be made in the reading classroom. After the pilot program implemented at the Tecnologico de Monterrey in San Luis Potosi, Mexico, Martinez-Estrada and Conaway (2012) stated, "We conclude that the tablet device increased student engagement in the learning process in our study, improved student satisfaction and experience in the courses using the Kindle, and appealed to a new digital generation of students" (p. 133). One way to meet the needs of the 21st century learner in the reading classroom may be the use of interactive eBooks over traditional printed text.

Interactive eBooks are more commonly used in schools today, but this hasn't always been the case. The electronic book was born in 1971. According to Lebert (2009), the eBook was one of the first steps of Project Gutenberg. The eBook didn't originally take off because of some reluctance from publishers and readers. However, with the invention of the Internet and advancements in technology, eBooks have become increasingly popular (Lebert, 2009, p. 4). The electronic book is already over forty years old, but it has had a short life compared to the traditional printed book. Printed text has dominated the classroom until recently. Now, computer companies

are racing to develop the most new and improved eReader. Duncan (2010) noted,

> The competition for content and the race to develop the 'killer' e-reader have both reached a frenetic pace. Amazon, Google, Apple, Sony- the global leaders in computing and personal electronics are all scrambling to be the first or the best in developing the next big thing in the electronic books arena. After years of resisting the eBook, publishers are now scrambling to go online because, like the music industry before them, they have suddenly realized they may have just two choices- go digital or die. (p. 44)

One reason for the race to make the most effective interactive eBook is that the educational market for eBooks is rapidly growing and expanding.

One of the possible benefits of interactive eBooks over printed text is the eBook's extra features. Interactive eBooks have a variety of features that printed text does not allow. For example, interactive eBooks technology provides adjustable font size, a built-in dictionary, and text-to-speech features. These features make interactive eBooks better able to meet the diverse needs of students in the general education classroom. According to Larson (2010), eBooks have the potential to create new learning and teaching possibilities that were not available before. Coyle (2008) stated that eBooks seem to be more flexible and accessible that paper texts. She also indicated that eBooks can also better support personalized learning.

According to Martinez-Estrada and Conaway (2012), the benefits of eBooks over printed text are that eBooks cost less than the printed version after the initial cost, there is a larger availability, eBooks are more appealing to students, and eBooks allow students to download newspapers and other classroom materials. Martinez-Estrada and Conaway (2012) claimed that the additional features available with interactive eBooks make them a more effective option in the reading classroom than traditional printed text.

Larson (2010) conducted a qualitative study involving 17 second-grade students in the midwestern United States. The study attempted to determine if digital readers increase reading achievement. Students in this study took turns reading from the eBooks in the class's reading curriculum instead of reading with traditional printed text. Data was collected through Larson's (2010) field notes, interviews with the participants and the classroom teacher, and respective parents. "Although research on the use of this medium is in its infancy, the results of this study appear promising in using digital reading devices as a means to foster literacy development and offering a glimpse into the unique minds of individual readers" (p. 22). Because the use of interactive eBooks is a relatively new, there have been few studies done to prove their benefits. However, the research that has been done is very promising in the digital direction.

Teaching reading in the general classroom presents some challenges. One of the major challenges is addressing the needs of all students, gifted and struggling. Interactive eBooks may be the answer to differentiation. According to Weber and Cavanaugh (2006),

> EBooks can provide an avenue for parents and teachers to help gifted readers grow intellectually. By using eBooks, teachers, parents, and students can create often at no cost, a greater diversity in the available reading material; including materials at a wide range of readability levels…These electronic forms of books and libraries are expanding opportunities for students to have access to books. Using these resources, a reader can often find related titles, such as other books in a series or by the same author, which may not be available at either the school or local public library. (p. 59)

One possible way to meet the diverse demand of our gifted or struggling readers is with a wider variety of reading level options that eBooks provides over printed text.

Another challenge that needs to be addressed in the general education reading classroom is the challenge of providing accommodations for readers with learning disabilities. Weber and Cavanaugh (2006) used data from a variety of educational research studies to prove to teachers and parents who homeschool that interactive eBooks will better meet the needs of their gifted and advanced reader over printed text. The researchers concluded that eBook programs can provide reading accommodations for students with reading difficulties. The additional features of interactive eBooks meet the demands of readers with learning disabilities because of the scaffolding they provide. Most eBooks provide the features to highlight, take notes, and create drawings (Weber & Cavanaugh, 2006, p. 61).

Student motivation is a key to student reading success. One major aspect of increasing student interest in reading is focused on getting students motivated to read. According to Ciampa (2012), early childhood readers' motivation to read, along with the books they choose to read, impact their literacy achievement and willingness to read. Ciampa (2012) conducted a qualitative study of eight first grade students. She collected data regarding their classroom reading experiences, student engagement with online eBooks, and post-program attitudes towards electronic book reading. Each participant read using an interactive eBook for ten 25-minute sessions for 15 weeks. Data from students, teachers, and parents was collected through questionnaires, interviews, field notes, and observations. Results of the study indicated that "reading software with multimedia enhancements, motivational aspects, and constructivists methods of instruction can promote reading motivation among beginning readers" (Ciampa, 2012, p. 25).

Maynard (2010) conducted a pilot study on the impact of eBooks on younger children's reading experiences in order to determine if interactive eBooks would increase motivation for reading in reluctant readers. The participants of her pilot study consisted of three families, each

with two children ranging from 7-12 years of age. Each family was given an eBook for a two-week period. Each family was interviewed prior to the study and again after the study was complete. Results of the study determined that while all the parents preferred traditional printed text, half of the children involved preferred an interactive eBook over traditional printed text. One of the seven reluctant readers was motivated by the interactive eBook to read more post study (Maynard, 2010, p. 247).

Maynard (2010) stressed the importance of reading in early childhood, promoting a love for reading, as well as building a foundation of acquiring knowledge. Maynard (2010) wrote, "Reading is an integral part of the way we learn and it is important to understand how best to encourage children to read for enjoyment as well as when they are required to for other reasons" (p. 247). "Research has shown that young people who enjoy reading do it more frequently and tend to become skilled at it, so schools have an important role to play in trying to encourage children to read for enjoyment" (Maynard, 2010, p. 237).

All educators can agree that encouraging students to read often is beneficial for young readers. However, some students lose interest in reading. After conducting her pilot program, Maynard (2010) wrote, "The electronic book can add more to the text and pictures in terms of animation, sounds, and a narrator, which may render it attractive to children, particular those for whom visual literacy has become very significant. Electronic books might, therefore, have the power to bridge the gap between print and other media, and thereby encourage reading in those children who are reluctant readers" (p. 239).

Not only can interactive eBooks potentially increase student motivation to read more, further research studies (Chong et al., 2009; Martinez-Estrada & Conaway, 2012) also shows that the features of interactive eBooks attract students over traditional printed text. Chong et al. (2009)

conducted a study that investigated students' preferences for eBooks. The participants of this 20-month study consisted of approximately 100 students, lecturers, and researchers at MMU. Results of the study showed that 94.9% of the participants found the bookmark, highlight, and annotation functions useful. Eighty-seven percent of the participants found the cross-referencing between contents and index page useful. Eighty-four percent of the participants found the cross-referencing between pages useful. According to Chong et al. (2009), the results indicated that the features of eBooks "had a positive effect on the sense of engagement, memorability, and likeability among the students" (p. 213). Twenty-first century students tend to prefer digital text over printed text because of the interactive features.

After the pilot program implemented at the Tecnologico de Monterrey in San Luis Potosi, Mexico, Martinez-Estrada and Conaway (2012) stated that "When the pilot project had concluded, we were pleased that the survey results indicated that nearly three-fourths of the students participating (94%) had reported that the Kindle improved their classroom learning experience. Likewise, nearly all the students indicated that they would recommend use of the Kindle to other students. Student learning and engagement apparently had increased in the classes where they used the device" (p. 132). The results of both Chong and Martinez-Estrada studies show that student learning and engagement increased with interactive eBooks, and student preference played a major part in that.

Even though some research supports the benefits of interactive eBooks, there are also a variety of barriers of interactive eBooks over printed text. After interactive eBooks are purchased, the cost of purchasing electronic books over printed text is considerably lower. However, the initial cost of purchasing eBooks can be too substantial for schools.

In addition to the initial cost of purchases interactive eBooks, some critics claim that interactive eBooks shouldn't replace printed text because interactive eBooks are not an improvement. According to Coyle (2008), the problem with some eBooks that are used in the classroom is that they are not interactive. Some eBooks are simply books on a tablet and don't offer significant learning benefits. A school cannot and should not provide the financial support for a new form of technology that is not improving student learning.

Another barrier of interactive eBooks is the use of technology itself. Educators need to determine an appropriate balance of technology in our classrooms. According to Monke (2006),

> What we need from schools is not balance in using high technology, and effort to balance children's machine-dominated lives… As a result of increased time spent with computers, video games, and TV, the current generation of elementary students will experience an estimated 30 percent fewer face-to-face encounters than the previous generation. Thus, teachers may be employing the very devices for remediating reading problems that helped cause the problems in the first place." (p. 335)

Another barrier of interactive eBooks is the lack of research that directly supports that interactive eBooks increase student reading achievement to a *great enough extent* to justify the purchase. Huang et al. (2012) developed an Interactive E-Book Learning System (IELS) to conduct a study on the correlation of interactive eBooks and elementary student learning. Through the IELS study, Huang et al. (2012) referenced Woody, Daniel, & Baker (2010), "It is still essential to evaluate all manner of using eBooks as learning tools before adopting them as a substitute for printed textbooks, that is to say the sound methods of carrying out such evaluations still require more study" (p. 704). Before schools implement interactive eBooks instead of traditional printed text, it's possible that more studies need to be conducted to show that there is a great enough

increase in reading achievement in the general education classroom.

Some educators favor traditional printed text or interactive eBooks in schools. Donatich (2009) is an advocate of the printed text. He stated, "Searching around in an electronic text, you can skim, cut, paste, but you will read things out of a deliberate context and sequence. You will get to the 'nut' more quickly, but you will miss learning how the author arrived at her conclusions" (p. 335). Critics of the interactive eBook are concerned that digital readers will replace printed text and that replacement is a step in the wrong direction for education.

According to studies conducted by the Electronic Books Onscreen Interface project (EBONI), "Several students also commented that it is difficult to read text against white backgrounds due to the glare from the computer screen" (Chong et al., 2009, p. 214). Two investigations by the EBONI project evaluated the usability and functionality of eBooks, and the second investigation was done in order to determine if learning was affected. The participants of the study were 166 elementary students. Previous studies indicated that students preferred interactive eBooks over printed text because of the additional features. However, this study determined that some students do not prefer interactive eBooks over printed text because of the glare. Also, some students prefer reading off paper rather than a screen. The study also determined that using eBooks or traditional printed text did not affect reading accuracy. However, eBooks can assist individual learners.

In conclusion, studies have not yet proven that the use of interactive eBooks increase student reading achievement. According to Larson (2010), although eBooks have been available for almost 20 years, studies examining the correlation between eBook text and student achievement are still few and the results are conflicting. Before schools implement interactive eBooks in replacement of traditional printed text completely, further studies need to be done.

Methods

Participants

The participants in this study were 16 students from a small Christian school in the Midwest. The participants were in sixth grade. The 16 students were randomly divided into two groups, Group A and Group B. The participants remained in the same group throughout the course of the study. The participants' make up was largely homogenous in ethnicity and socioeconomic status.

Materials

For this study, the participants read *Banner in the Sky* and *Incredible Journey*. The participants in Group A read *Banner in the Sky* using in an interactive eBook format using the app Read2Go. The participants in Group B used the same app while reading *Incredible Journey*. In order to determine the reading achievement results for each of the participants, the students were assessed using the Basic Reading Inventory (BRI) at three different points throughout the study. The BRI are a set of diagnostic tools that are used to help teachers determine reading achievement. The BRI tests oral reading, silent reading, and listening level. The BRI collects data regarding phonemic awareness, phonics, fluency, vocabulary, and comprehension. The results of the BRI place students into the following categories: independent reading level, instructional reading level, and frustration reading level.

Design

The independent variable of this experiment was the reading medium. The dependent variable was the BRI. The confounding/ nuisance variables were the participants' prior knowledge, the participants' IQ, the participants' previous experience with interactive eBooks, and possible test anxiety.

Procedures

The research design for this study was quasi-experimental, comparing the results of Group A and Group B based on the results of the BRI and the reading medium used by each group. For the study, the students were split up into two groups randomly. Group A read novel one from an interactive eBook, while Group B read the same novel from a traditional printed text. The interactive eBook included unique features such as adjustable text size, highlighting, bookmarking, note-taking, pop-up definitions and pronunciations of words, automatic page turning, and the option of read-aloud narration. The students were familiarized with the unique features of the interactive eBook. An initial observation was made to identify each student's baseline prior to the experiment. Observations were also made after each novel was read. Group A read the second novel from a traditional printed text while Group B read the second novel from an interactive eBook. The results from Observation 1, Observation 2, and Observation 3 were then compared.

Results

This study was designed to answer two questions: Do the additional text features of interactive eBooks in the general education classroom increase reading achievement over traditional printed text? Do the additional text features of interactive eBooks in the general education classroom increase student interest over traditional printed text based on pretest/posttest results?

Table 1 shows the summary of Group A participants' reading performance in word recognition (isolation). Observation 1 states the results from the first round of testing. This testing was done before the study. Observation 2 states the results from the second round of testing. This testing was done after Group A read the first novel using the interactive eBooks. Observation 3 states the results from the third round of testing. This testing was done after Group A read the second novel using traditional printed text. The data listed shows the grade level at which the

student was no longer at an independent level in terms of word recognition. Independent reading level is a level in which the student is able to read the word list easily without any help from the teacher.

Results indicated that one student in Group A remained at the same independent reading level between O1 and O2. Five students in Group A improved one grade level between O1 and O2. Three students in Group A improved two grade levels between O1 and O2. No students in Group A scored at a lower grade level between O1 and O2.

Results indicated that four students in Group A remained at the same independent reading level between O2 and O3. One student in Group A improved one grade level between O2 and O3. Two students in Group A scored at two grade levels lower between O2 and O3. One student in Group A scored at three grade levels lower between O2 and O3.

Table 1
Summary of Group A Participants' Reading Performance in Word Recognition (Isolation)

Student	Observation 1	Observation 2	Observation 3
Student A1	9	11	11
Student A2	8	8	8
Student A3	9	10	11
Student A4	10	11	9
Student A5	9	11	8
Student A6	8	9	7
Student A7	6	7	7
Student A8	6	7	7

Table 2 shows the summary of Group B participants' reading performance in word recognition (isolation). Observation 1 states the results from the first round of testing. This testing was done before the study. Observation 2 states the results from the second round of testing. This testing was done after Group B read the first novel using the traditional printed text. Observation 3 states the results from the third round of testing. This testing was done after Group B read the

second novel using an interactive eBook. The data listed shows the grade level at which the student was no longer at an independent level in terms of word recognition. Independent reading level is a level in which the student is able to read the word list easily without any help from the teacher.

Results indicated that three students in Group B remained at the same independent reading level between O1 and O2. Three students in Group B improved one grade level between O1 and O2. One student in Group B improved two grade levels between O1 and O2. One student in Group B scored at a lower grade level between O1 and O2.

Results indicated that three students in Group B remained at the same independent reading level between O2 and O3. One student in Group B scored at a lower grade level between O2 and O3. One student in Group B scored at two grade levels lower between O2 and O3. One student scored at three grade levels lower between O2 and O3. One student scored at four grade levels lower between O2 and O3.

Table 2
Summary of Group B Participants' Reading Performance in Word Recognition (Isolation)

Student	Observation 1	Observation 2	Observation 3
Student B1	9	11	7
Student B2	7	7	8
Student B3	11	12+	12+
Student B4	9	8	8
Student B5	7	7	7
Student B6	10	11	10
Student B7	9	10	7
Student B8	9	9	7

Table 3 shows the t-Test: Paired Two Samples for Means in Word Recognition (Isolation) for Group A (Observation 1-2). Results indicate that there was a significant difference between Group A's mean scores while participants read using the interactive eBooks.

Table 3
t-Test: Paired Two Sample for Means in Word Recognition (Isolation) for Group A (Observation 1-2)

	Variable 1	*Variable 2*
Mean	8.125	9.25
Variance	2.125	3.0714286
Observations	8	8
Pearson Correlation	0.936627908	
Hypothesized Mean Difference	0	
Df	7	
t Stat	4.965095559	
P(T<=t) one-tail	0.000814091	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.001628182	
t Critical two-tail	2.364624252	

Table 4 shows the t-Test: Paired Two Samples for Means in Word Recognition (Isolation) for Group B (Observation 1-2). Results indicated that there was no significant difference between Group B's mean scores while participants read using traditional printed text.

Table 4
t-Test: Paired Two Samples for Means in Word Recognition (Isolation) for Group B (Observation 1-2)

	Variable 1	*Variable 2*
Mean	8.875	9.375
Variance	1.839285714	3.6964286
Observations	8	8
Pearson Correlation	0.897155059	
Hypothesized Mean Difference	0	
Df	7	
t Stat	1.527525232	
P(T<=t) one-tail	0.08523533	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.170470661	
t Critical two-tail	2.364624252	

Table 5 shows the t-Test: Paired Two Samples for Means in Word Recognition (Isolation) for Group A (Observation 2-3). Results indicated that there was no significant difference between Group A's mean scores while participants read using traditional printed text.

Table 5
t-Test: Paired Two Samples for Means in Word Recognition (Isolation) for Group A (Observation 2-3)

	Variable 1	*Variable 2*
Mean	9.25	8.5
Variance	3.071428571	2.8571429
Observations	8	8
Pearson Correlation	0.675139951	
Hypothesized Mean Difference	0	
Df	7	
t Stat	1.527525232	
P(T<=t) one-tail	0.08523533	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.170470661	
t Critical two-tail	2.364624252	

Table 6 shows the t-Test: Paired Two Samples for Means in Word Recognition (Isolation) for Group B (Observation 2-3). Results indicated that there was no significant difference between Group B's mean scores while participants read using interactive eBooks. The P(T<=t) two-tail results were 0.11 which is >0.05.

Table 6
t-Test: Paired Two Samples for Means in Word Recognition (Isolation) for Group B (Observation 2-3)

	Variable 1	*Variable 2*
Mean	9.375	8.25
Variance	3.696428571	3.3571429
Observations	8	8
Pearson Correlation	0.577884111	
Hypothesized Mean Difference	0	
Df	7	
t Stat	1.842609449	
P(T<=t) one-tail	0.053965533	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.107931065	
t Critical two-tail	2.364624252	

Table 7 shows the summary of Group A participants' reading performance in word recognition (context). Observation 1 states the results from the first round of testing. This testing was done before the study. Observation 2 states the results from the second round of testing. This testing was done after Group A read the first novel using an interactive eBook. Observation 3 states the results from the third round of testing. This testing was done after Group A read the second novel using a traditional printed text. The data listed shows the grade level at which the student was no longer at an independent level in terms of word recognition. Independent reading level is a level in which the student is able to read the words in a reading passage easily without any help from the teacher.

Results indicated that two students in Group A remained at the same independent reading level between O1 and O2. Four students in Group A improved one grade level between O1 and O2. One student in Group A improved two grade levels between O1 and O2. One student in Group A improved four grade levels between O1 and O2.

Results indicated that four students in Group A remained at the same independent reading level between O2 and O3. One student in Group A improved one grade level between O2 and O3. Three students in Group A scored one grade level lower between O2 and 3.

Table 7
Summary of Group A Participants' Reading Performance in Word Recognition (Context)

Student	Observation 1	Observation 2	Observation 3
Student A1	6	6	8
Student A2	5	6	5
Student A3	4	8	7
Student A4	6	8+	8
Student A5	8+	8+	8+
Student A6	7	6	7
Student A7	6	7	7
Student A8	6	7	7

Table 8 shows the summary of Group B participants' reading performance in word recognition (context). Observation 1 states the results from the first round of testing. This testing was done before the study. Observation 2 states the results from the second round of testing. This testing was done after Group B read the first novel using a traditional printed text. Observation 3 states the results from the third round of testing. This testing was done after Group B read the second novel using an interactive eBook. The data listed shows the grade level at which the student was no longer at an independent level in terms of word recognition. Independent reading level is a level in which the student is able to read the words in a reading passage easily without any help from the teacher.

Results indicated that one student in Group B remained at the same independent reading level between O1 and O2. Three students in Group B improved one grade level between O1 and O2. One student in Group B improved two grade levels between O1 and O2. Two students in Group B improved three grade levels between O1 and O2. One student in Group B scored at a

lower grade level between O1 and O2.

Results indicated that six students in Group B remained at the same independent reading level between O2 and O3. One student in Group B improved two grade levels between O2 and O3. One student in Group B scored one grade level lower between O2 and O3.

Table 8
Summary of Group B Participants' Reading Performance in Word Recognition (Context)

Student	Observation 1	Observation 2	Observation 3
Student B1	6	8+	7
Student B2	5	8+	8
Student B3	8+	7	7
Student B4	5	6	8+
Student B5	5	6	6
Student B6	6	7	7
Student B7	5	8+	8+
Student B8	8	8	8

Table 9 shows the t-Test: Paired Two Samples for Means in Word Recognition (Context) for Group A (Observation 1-2). Results indicated that there was no significant difference between Group A's mean scores while participants read using interactive eBooks.

Table 9
t-Test: Paired Two Sample for Means in Word Recognition (Context) for Group A (Observation 1-2)

	Variable 1	*Variable 2*
Mean	6	6.875
Variance	1.428571429	1.2678571
Observations	8	8
Pearson Correlation	-0.10614898	
Hypothesized Mean Difference	0	
Df	7	
t Stat	-1.43314068	
P(T<=t) one-tail	0.097464988	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.194929975	
t Critical two-tail	2.364624252	

Table 10 shows the t-Test: Paired Two Samples for Means in Word Recognition (Context) for Group B (Observation 1-2). Results indicated that there was a significant difference between Group B's mean scores while participants read with traditional printed text.

Table 10
t-Test: Paired Two Sample for Means in Word Recognition (Context) for Group B (Observation 1-2)

	Variable 1	*Variable 2*
Mean	6	7.25
Variance	1.714285714	0.7857143
Observations	8	8
Pearson Correlation	0.246182982	
Hypothesized Mean Difference	0	
Df	7	
t Stat	-2.54587539	
P(T<=t) one-tail	0.019166864	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.038333729	
t Critical two-tail	2.364624252	

Table 11 shows the t-Test: Paired Two Samples for Means in Word Recognition (Context) for Group A (Observation 2-3). Results indicated that there was no significant difference between Group A's mean scores while participants read using traditional printed text.

Table 11
t-Test: Paired Two Sample for Means in Word Recognition (Context) for Group A (Observation 2-3)

	Variable 1	*Variable 2*
Mean	6.875	7.125
Variance	1.267857143	0.9821429
Observations	8	8
Pearson Correlation	0.400064015	
Hypothesized Mean Difference	0	
Df	7	
t Stat	0.606976979	
P(T<=t) one-tail	0.281513902	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.563027804	
t Critical two-tail	2.364624252	

Table 12 shows the t-Test: Paired Two Samples for Means in Word Recognition (Context) for Group B (Observation 2-3). Results indicated that there was no significant difference between Group B's mean scores while participants read using interactive eBooks.

Table 12
t-Test: Paired Two Sample for Means in Word Recognition (Context) for Group B (Observation 2-3)

	Variable 1	*Variable 2*
Mean	7.25	7.375
Variance	0.785714286	0.5535714
Observations	8	8
Pearson Correlation	0.487377325	
Hypothesized Mean Difference	0	
Df	7	
t Stat	0.423659273	
P(T<=t) one-tail	0.342264168	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.684528336	
t Critical two-tail	2.364624252	

Table 13 shows the summary of Group A participants' reading performance in reading comprehension. Observation 1 states the results from the first round of testing. This testing was

done before the study. Observation 2 states the results from the second round of testing. This testing was done after Group A read the first novel using an interactive eBook. Observation 3 states the results from the third round of testing. This testing was done after Group A read the second novel using a traditional printed text. The data listed shows the grade level at which the student was no longer at an independent level in terms of reading comprehension. Independent reading level is a level in which the student is able to comprehend what they read easily without any help from the teacher.

Results indicated that two students in Group A remained at the same independent reading level between O1 and O2. Four students in Group A improved one grade level between O1 and O2. One student in Group A improved two grade levels between O1 and O2. One student in Group A scored one grade lower between O1 and O2.

Results indicated that four students in Group A remained at the same independent reading level between O2 and O3. Three students in Group A scored one grade lower between O2 and O3. One student in Group A scored two grades level lower between O2 and O3.

Table 13
Summary of Group A Participants' Reading Performance in Comprehension

Student	Observation 1	Observation 2	Observation 3
Student A1	7	6	6
Student A2	5	6	6
Student A3	5	7	6
Student A4	8	8	7
Student A5	6	7	7
Student A6	8	8	6
Student A7	6	7	7
Student A8	6	7	6

Table 14 shows the summary of the Group B participants' reading performance in reading comprehension. Observation 1 states the results from the first round of testing. This testing was

done before the study. Observation 2 states the results from the second round of testing. This testing was done after Group B read the first novel using a traditional printed text. Observation 3 states the results from the third round of testing. This testing was done after Group B read the second novel using an interactive eBook. The data listed shows the grade level at which the student was no longer at an independent level in terms of reading comprehension. Independent reading level is a level in which the student is able to comprehend what they read easily without any help from the teacher.

Results indicated that two students in Group B remained at the same independent reading level between O1 and O2. Three students in Group B improved one grade level between O1 and O2. Three students in Group B improved two grade levels between O1 and O2.

Results indicated that three students in Group B remained at the same independent reading level between O2 and O3. Five students in Group B scored one grade lower between O2 and O3.

Table 14
Summary of Group B Participants' Reading Performance in Comprehension

Student	Observation 1	Observation 2	Observation 3
Student B1	5	7	6
Student B2	7	8	7
Student B3	8	8+	8
Student B4	6	7	6
Student B5	4	6	6
Student B6	7	7	6
Student B7	5	7	6
Student B8	6	7	7

Table 15 shows the t-Test: Paired Two Samples for Means in Comprehension for Group A (Observation 1-2). Results indicated that there was no significant difference between Group A's mean scores while participants read using interactive eBooks.

Table 15

t-Test: Paired Two Sample for Means in Comprehension for Group A (Observation 1-2)

	Variable 1	*Variable 2*
Mean	6.375	7
Variance	1.410714286	0.5714286
Observations	8	8
Pearson Correlation	0.636445827	
Hypothesized Mean Difference	0	
Df	7	
t Stat	-1.92961246	
P(T<=t) one-tail	0.047488246	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.094976492	
t Critical two-tail	2.364624252	

Table 16 shows the t-Test: Paired Two Samples for Means in Comprehension for Group B (Observation 1-2). Results indicated that there was a significant difference between Group B's mean scores while participants read using traditional printed text.

Table 16

t-Test Paired Two Sample for Means in Comprehension for Group B (Observation 1-2)

	Variable 1	*Variable 2*
Mean	6	7.125
Variance	1.714285714	0.4107143
Observations	8	8
Pearson Correlation	0.851256531	
Hypothesized Mean Difference	0	
Df	7	
t Stat	-3.81293346	
P(T<=t) one-tail	0.003301328	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.006602656	
t Critical two-tail	2.364624252	

Table 17 shows the t-Test: Paired Two Samples for Means in Comprehension for Group A (Observation 2-3). Results indicated that there was a significant difference between Group A's mean scores while participants read using traditional printed text.

Table 17
t-Test: Paired Two Sample for Means in Comprehension for Group A (Observation 2-3)

	Variable 1	*Variable 2*
Mean	7	6.375
Variance	0.571428571	0.2678571
Observations	8	8
Pearson Correlation	0.365148372	
Hypothesized Mean Difference	0	
Df	7	
t Stat	2.375954817	
P(T<=t) one-tail	0.024586857	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.049173714	
t Critical two-tail	2.364624252	

Table 18 shows the t-Test: Paired Two Samples for Means in Comprehension for Group B (Observation 2-3). Results indicated that there was a significant difference between Group B's mean scores while participants read using interactive eBooks.

Table 18
t-Test: Paired Two Sample for Means in Comprehension for Group B (Observation 2-3)

	Variable 1	*Variable 2*
Mean	7.125	6.5
Variance	0.410714286	0.5714286
Observations	8	8
Pearson Correlation	0.737209781	
Hypothesized Mean Difference	0	
Df	7	
t Stat	3.415650255	
P(T<=t) one-tail	0.005600716	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.011201433	
t Critical two-tail	2.364624252	

Table 19 shows the summary of Group A participants' reading performance in reading rate at grade level. Observation 1 states the results from the first round of testing. This testing was done before the study. Observation 2 states the results from the second round of testing. This testing was done after Group A read the first novel using an interactive eBook. Observation 3 states the results from the third round of testing. This testing was done after Group A read the second novel using a traditional printed text. According to the BRI testing material, reading rate refers to the mean words correct per minute targets for average students in grades one through eight. Grade level the students participating in this study is grade six. The winter target reading rate is 140 for grade six. The spring target reading rate is 150 for grade six. Observation 1 and Observation 2 fall into the winter target reading rate. Observation 3 falls into the spring target reading rate.

Results indicated that five students in Group A increased their reading rate between O1 and O2. Student A1 increased by three correct words per minute. Student A4 increased by 22 correct words per minute. Student A6 increased by 17 correct words per minute. Student A7 increased by 16 correct words per minute. Student A8 increased by 18 correct words per minute. The researcher

found that three students in the Group A decreased their reading rate between O1 and O2. Student A2 decreased by 11 correct words per minute. Student A3 decreased by nine correct words per minute. Student A5 decreased by seven correct words per minute.

Results indicated that six students in Group A increased their reading rate between O2 and O3. Student A1 increased by 29 correct words per minute. Student A3 increased by 44 correct words per minute. Student A4 increased by 11 correct words per minute. Student A5 increased by six correct words per minute. Student A6 increased by 26 correct words per minute. Student A8 increased by four correct words per minute. Results indicated that one student in Group A decreased their reading rates between O2 and O3. Student A2 decreased their reading rate by 19 correct words per minute. Results indicated that one student's reading rate remained the same between O2 and O3.

Table 19
Summary of Group A Participants' Reading Performance in Reading Rate at Grade Level

Student	Observation 1	Observation 2	Observation 3
Student A1	139	142	171
Student A2	187	176	157
Student A3	136	127	171
Student A4	111	133	142
Student A5	153	146	150
Student A6	133	150	176
Student A7	150	166	166
Student A8	127	109	113

Table 20 shows the summary of Group B participants' reading performance in reading rate at grade level. Observation 1 states the results from the first round of testing. This testing was done before the study. Observation 2 states the results from the second round of testing. This testing was done after Group B read the first novel using a traditional printed text. Observation 3

states the results from the third round of testing. This testing was done after Group B read the second novel using an interactive eBook. According to the BRI testing material, reading rate refers to the mean words correct per minute targets for average students in grades one through eight. Grade level for the students participating in this study is grade six. The winter target reading rate is 140 for grade six. The spring target reading rate is 150 for grade six. Observation 1 and Observation 2 fall into the winter target reading rate. Observation 3 falls into the spring target reading rate.

Results indicated that five students in Group B increased their reading rate between O1 and O2. Student B3 increased by 12 correct words per minute. Student B4 increased by three correct words per minute. Student B5 increased by two correct words per minute. Student B7 increased by 19 correct words per minute. Student B8 increased by 17 correct words per minute. The research found that three students in Group B decreased their reading rate between O1 and O2. Student B1 decreased by 30 correct words per minute. Student B2 decreased by 11 correct words per minute. Student B6 decreased by 16 correct words per minute.

Results indicated that six students in Group B increased their reading rate between O2 and O3. Student B1 increased 30 correct words per minute. Student B2 increased 17 correct words per minute. Student B3 increased 14 correct words per minute. Student B5 increased eight correct words per minute. Student B6 increased 60 correct words per minute. Student B8 increased seven correct words per minute. Results indicated that one student in Group B decreased their reading rate between O2 and O3. Student B4 decreased one word per minute. The researcher found that one student's reading rate remained the same between O2 and O3.

Table 20
Summary of Group B Participants' Reading Performance in Reading Rate at Grade Level

Student	Observation 1	Observation 2	Observation 3
Student B1	206	176	206
Student B2	187	176	193
Student B3	188	200	214
Student B4	150	153	152
Student B5	115	117	125
Student B6	162	146	206
Student B7	117	136	136
Student B8	133	150	157

Table 21 shows the t-Test: Paired Two Samples for Means in Reading Rate for Group A (Observation 1-2). Results indicated that there was no significant difference between Group A's mean scores while participants read using interactive eBooks.

Table 21
t-Test: Paired Two Sample for Means in Reading Rate for Group A (Observation 1-2)

	Variable 1	*Variable 2*
Mean	142	143.625
Variance	503.1428571	455.125
Observations	8	8
Pearson Correlation	0.763644975	
Hypothesized Mean Difference	0	
Df	7	
t Stat	-0.30478451	
P(T<=t) one-tail	0.384696215	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.76939243	
t Critical two-tail	2.364624252	

Table 22 shows the t-Test: Paired Two Samples for Means in Reading Rate for Group B (Observation 1-2). Results indicated that there was no significant difference between Group B's mean scores while participants read using traditional printed text.

Table 22
t-Test: Paired Two Sample for Means in Reading Rate for Group B (Observation 1-2)

	Variable 1	*Variable 2*
Mean	157.25	156.75
Variance	1182.214286	685.35714
Observations	8	8
Pearson Correlation	0.872172922	
Hypothesized Mean Difference	0	
df	7	
t Stat	0.082001851	
P(T<=t) one-tail	0.468470366	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.936940732	
t Critical two-tail	2.364624252	

Table 23 shows the t-Test: Paired Two Samples for Means in Reading Rate for Group A (Observation 2-3). Results indicated that there was no significant difference between Group A's mean scores while participants read using traditional printed text.

Table 23
t-Test: Paired Two Sample for Means in Reading Rate for Group A (Observation 2-3)

	Variable 1	*Variable 2*
Mean	143.625	155.75
Variance	455.125	433.07143
Observations	8	8
Pearson Correlation	0.55772236	
Hypothesized Mean Difference	0	
Df	7	
t Stat	1.729977013	
P(T<=t) one-tail	0.063627153	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.127254307	
t Critical two-tail	2.364624252	

Table 24 shows the t-Test: Paired Two Samples for Means in Reading Rate for Group B (Observation 2-3). Results indicated that there was a significant difference between Group B's mean scores while participants read using interactive eBooks.

Table 24
t-Test: Paired Two Sample for Means in Reading Rate for Group B (Observation 2-3)

	Variable 1	*Variable 2*
Mean	156.75	173.625
Variance	685.3571429	1232.2679
Observations	8	8
Pearson Correlation	0.824079695	
Hypothesized Mean Difference	0	
Df	7	
t Stat	2.377638771	
P(T<=t) one-tail	0.024526054	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.049052108	
t Critical two-tail	2.364624252	

Table 25 displays the results from students' responses to the survey question that asked them to rate how beneficial the text feature of the eBook reader was prior to the treatment and after

the treatment. The results show that there was an overall increase in students' perceived benefit for the text feature.

Prior to the study, pretest survey results indicated that 11 students found the text-to-speech feature to be beneficial or very beneficial while only five students found the text-to-speech feature to be not beneficial or only slightly beneficial. Fourteen students found the choices of font size, color, and background to be beneficial or very beneficial while only two students found the choices of font size, color and background to be not beneficial or slightly beneficial. All 16 students found the bookmark features to be beneficial or very beneficial while no students found the bookmark feature to be not beneficial or slightly beneficial. Prior to the study, 12 students preferred reading from an interactive eBook while four students preferred a printed book. Eleven students believed that eBooks increased their motivation to read while five students disagreed.

Post-test study survey results indicated that 15 students found the text-to-speech feature to be beneficial or very beneficial while only one student found the text-to-speech feature to be not beneficial or only slightly beneficial. All 16 students found the choices of font size, color, and background to be beneficial or very beneficial while no students found the choices of font size, color and background to be not beneficial or slightly beneficial. Nine students found the bookmark features to be beneficial or very beneficial while eight students found the bookmark feature to be not beneficial or slightly beneficial. Prior to the study, 13 students preferred reading from an interactive eBook while three students preferred a printed book. Nine students believed that eBooks increased their motivation to read while seven students disagreed.

Table 25
Pre- and Post- Survey Results

Question 1: I find the text feature to be

	Pre	Post
Not Beneficial	6.25%	0%
Slightly Beneficial	25%	6.25%
Beneficial	37.5%	56.25%
Very Beneficial	31.25%	37.5%

Question 2: I find the choices of font size, color, and background to be

	Pre	Post
Not Beneficial	0%	0%
Slightly Beneficial	12.50%	0%
Beneficial	68.75%	31.25%
Very Beneficial	18.75%	68.75%

Question 3: I find the bookmark feature to be:

	Pre	Post
Not Beneficial	0%	18.75%
Slightly Beneficial	0%	31.25%
Beneficial	37.50%	31.25%
Very Beneficial	62.50%	25%

Question 4: I prefer reading from a/an

	Pre	Post
eBook	75%	81.25%
Printed Book	25%	18.75%

Question 5: Do eBooks motivate you to read more?

	Pre	Post
Yes	68.75%	56.25%
No	31.25%	43.75%

Discussion

The purpose of this study was to determine if interactive eBooks increase student reading achievement and student interest over traditional printed text. The first research question attempted to determine if the additional text features of interactive eBooks in the general education classroom increase student reading achievement over traditional printed text.

The results of Table 3, Table 18, and Table 24 showed a significant difference between the mean scores while using interactive eBooks. The researcher found that eight students in Group A saw an increase in their word recognition (isolation) between O1-O2 after reading with an interactive eBook. Also, the researcher found that six students in Group B saw an increase in their comprehension between O2-O3 after reading with an interactive eBook. In addition, the researcher found that six students in Group B saw an increase in their reading rate between O2-O3 after reading with an interactive eBook. These results would suggest that the additional text features of interactive eBooks *do* increase reading achievement in terms of word recognition (isolation), comprehension, and reading rate.

However, the results of Table 10 and Table 16 showed a significant difference between the mean scores while using traditional printed text. The researcher found that six students in Group B saw an increase in their word recognition (context) between O1-O2 after reading with a traditional printed text. Also, the researcher found that seven students in Group B saw an increase in their comprehension between O1-O2 while reading with a traditional printed text. These results suggest that reading with traditional printed text increases reading achievement in terms of word recognition (context) and comprehension. Furthermore, the remaining tables, (1, 2, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 19, 20, 21, 22, and 23), showed no significant difference between the mean scores. The researcher found that while three isolated t-Tests showed a significant difference

between the mean scores after the participants read using an interactive eBook, the study remains inconclusive. There is not enough evidence to support that the additional text features of interactive eBooks increases reading achievement to a *great enough extent* considering only three out of 24 tests showed a significant difference of mean scores after the participants read using an interactive eBook.

The second research question attempted address student interest: Do the additional text features of interactive eBooks in the general education classroom increase student interest over traditional printed text based on pre-test/post-test results?

The results of Table 25 and Table 26 suggest that students continue to find the text-to-speech feature beneficial; more students find the choices of font size, color and background to be beneficial; however, fewer students found the bookmark feature beneficial. After the study was conducted, one additional student preferred reading from an interactive eBook; however, two fewer students said that eBooks increased their motivation to read. In conclusion, students found the additional text features beneficial to reading. Students typically prefer reading from an interactive eBook; however fewer students found the interactive eBooks motivational post-study than pre-study.

Conclusion

The purpose of this study was to determine if interactive eBooks increase student reading achievement and student interest over traditional printed text. Because of the inconclusive results from this study, the researcher would not recommend that general education classroom teachers replace traditional printed text with interactive eBooks. While some students find interactive eBooks motivational over printed text, the researcher has not found that interactive eBooks increase all areas of reading achievement. Instead, the researcher would recommend incorporating

interactive eBooks with individual students who would benefit from the additional text features.

Limitations

While conducting this study, the researcher found a variety of limitations. One limitation the researcher discovered was the issue of time. The researcher conducted this study over the course of 10 weeks.

A second limitation the researcher found was with the BRI testing material. The testing material for word recognition (isolation) was only available up to 12th grade. The testing material for word recognition (context), comprehension, and reading rate was only available up to 8th grade. At times the students tested at 12+ in word recognition (isolation) and 8+ in word recognition (context) and comprehension.

A third limitation the researcher found was the varying degree to which students were familiar with interactive eBooks. Some students had previous experiences, thus opinions, of the additional text features of interactive eBooks, while some students had no previous experience. This variation affected the results of pre-test/post-test survey results.

A forth limitation the researcher found was the small sample size. The research was limited to one class of 16 students for this particular study.

Suggestions for Further Study

Conducting this study over the length of a school year, rather than a two-month period would be more effective. An entire school year would likely yield a greater increase or decrease in results. Also, within an entire school year, more novels could be included into the study. This would help determine if one novel in particular played a role in the testing results.

Using a different app may be more convenient. One obstacle that came up during the study was complications with the Read2Go app. The Read2Go app proved to be user-friendly after it was

downloaded; however, acquiring permission to access the app was difficult. There were a variety of steps needed throughout to obtain full accessibility to the additional text features.

Additionally, the researcher suggests using different testing material other than the BRI. The BRI testing material only went up to grade 12 in some reading comprehension categories and grade 8 in others. This also led to inconclusive results.

The researcher also recommends using a larger sample size, as well as students from multiple grades. Having a larger sample size may yield to a wider range of results. Conducting this study with multiple grades will provide more opportunities for comparison.

References

Chong, P.F., Lim, Y.P. & Ling, S.W. (2009). On the design preferences for ebooks. *IETE Technical Review*, *26*(3), 213-222. doi:10.4103/0256-4602.50706

Ciampa, K. (2012). Reading in the digital age: using electronic books as a teaching tool for beginning readers. *Canadian Journal Of Learning And Technology*, *38*(2), 1-28.

Coyle, K. (2008). Managing technology. *The Journal of Academic Librarianship*, *34*(2), 160-162.

Donatich, J. (2009). Why books still matter. *Journal Of Scholarly Publishing*, *40*(4), 329-342.

Duncan, R. (2010). EBooks and beyond: The challenge for public libraries. *Aplis*, *23*(2), 44-55.

Huang, Y., Liang, T., Su, Y., & Chen, N. (2012). Empowering personalized learning with an interactive e-book learning system for elementary school students. *Educational Technology Research & Development*, *60*(4), 703-722. doi:10.1007/s11423-012-9237-6

Jones, T., & Brown, C. (2011). Reading engagement: A comparison between e-books and traditional print books in an elementary classroom. *International Journal of Instruction*, *4*(2), Retrieved from ERIC database. (ED522678)

Larson, L. C. (2010). Digital readers: The next chapter in e-book reading and response. *Reading Teacher*, *64*(1), 15-22. doi:10.1598/RT.64.1.2

Lebert, M. (2009). *A short history of ebooks*. Toronto, Canada: Net of French Studies (NEF).

Martinez-Estrada, P., & Conaway, R. N. (2012). EBooks: The next step in educational innovation. *Business Communication Quarterly*, *75*(2), 125-135. doi:10.1177/1080569911432628

Massy, W. F., & Wilger, A. K. (1998). Technology's contribution to higher education productivity. *New Directions For Higher Education*, (103), 49.

Maynard, S. (2010). The impact of e-Books on young children's reading habits. *Publishing Research Quarterly*, *26*(4), 236-248. doi:10.1007/s12109-010-9180-5.

McHugh, J. (2013). "Connecting to the 21st-century student." *Edutopia*. N.p., 09 Sept. 2005. Web. 08Dec. 2013.

Monke, L. (2006). The over-dominance of computers. *Educational Leadership*. *63*(4), 334-338.

Prensky, M. (2001) Digital natives, digital immigrants. *On the Horizon*. *9*(6), 1-6.

Prensky, M. (2001) Digital natives, digital immigrants, part II: Do they really think differently? *On the Horizon*. *9*(6), 1-9.

Prensky, M. (2005) Listening to the natives. *Educational Leadership*. *63*(4), 1-7.

Weber, C. L., & Cavanaugh, T. W. (2006). Promoting reading: Using eBooks with gifted and advanced readers. *Gifted Child Today*, *29*(4), 56-63.

Wexelbaum, R. S.; Miltenoff, P.; and Parault, S. J., "Ebooks and reading comprehension: perspectives of librarians and educators" (2011). *Library Faculty Publications*. Paper 2. Retrieved from http://repository.stcloudstate.edu/lrs_facpubs/2

Woods, C. A., Lushington, K., & Crichton, J. (2007). Readers' perceptions. *International Journal Of The Book*, *4*(1), 51-67.

Woody, W.D., Daniel, D.B., & Baker, C.A. (2010). E-books or textbooks: Students prefer textbooks. *Computers & Education*, *55*(3), 945-948.

Appendix A

Parental Consent Form for Reading Achievement Research

I am currently finishing up my graduate work at Dordt College. I hope to graduate with my master's degree in May of 2014. For my thesis paper, I am conducting an action-research study on interactive eBooks.

The purpose of this study is to determine if interactive eBooks increase reading achievement and student interest over that of traditional printed text. During this 2-month study, your child will be assessed by Ms. Sherry Runia using the Basic Reading Inventory. Your child will be assessed prior to reading our first novel, between novels, and after reading our second novel. Each BRI assessment will take approximately 10 minutes. All reading is done in correlation with our 6th grade reading curriculum. No additional reading will be required for this study. Your child will also fill out a pre-study and post-study survey regarding their opinions of the additional features interactive eBooks have to offer. Mr. Randy Ten Pas has approved this study.

It's completely up to you and your child whether or not he or she can participate in this study. There will be no harm or risks for your child besides a short amount of time they will miss while being assessed. Your child has the right to withdraw from this study at any time. Your child's BRI results and survey opinions will remain **completely anonymous**.

If you have any questions about my study, please contact me at 712-441-0403. If you have any questions in general about the ethics of the study, feel free to contact my professor Dr. Pat Kornelis, Chair of the Dordt College Institutional Review Board, at 712-722-6301. I will spend time explaining the study to your son or daughter. If your child has any questions, they will be answered during this time. If you and your child have decided to let him or her participate in this study, please read the statement below with your child and both sign your names. I really appreciate your help!

Kimberly Beimers, teacher

Randy Ten Pas, principal

I understand the information on this page and am willing to allow my child to participate in this study. I understand that he or she can withdraw at any time and his/her results will not be used. Please have your child return this form to Ms. Beimers by December 20, 2013.

_____	_____	_____
Printed name of child	Printed name of parent/guardian	Date
_____	_____	_____
Signature of child	Signature of parent/guardian	Date

Appendix B

Pretest Study Survey

1. I find the text-to-speech features to be
    a. Not Beneficial
    b. Slightly Beneficial
    c. Beneficial
    d. Very Beneficial
2. I find the choices of size, color and background to be
    a. Not Beneficial
    b. Slightly Beneficial
    c. Beneficial
    d. Very Beneficial
3. I find the bookmark feature to be
    a. Not beneficial
    b. Slightly Beneficial
    c. Beneficial
    d. Very Beneficial
4. I prefer reading from a/an
    a. eBook
    b. Printed Book
5. Do eBooks motivate you to read more?
    a. Yes
    b. No

Appendix C

Posttest Study Survey

1. I find the text-to-speech features to be
    a. Not Beneficial
    b. Slightly Beneficial
    c. Beneficial
    d. Very Beneficial
2. I find the choices of size, color and background to be
    a. Not Beneficial
    b. Slightly Beneficial
    c. Beneficial
    d. Very Beneficial
3. I find the bookmark feature to be
    a. Not beneficial
    b. Slightly Beneficial
    c. Beneficial
    d. Very Beneficial
4. I prefer reading from a/an
    a. eBook
    b. Printed Book
5. Do eBooks motivate you to read more?
    a. Yes
    b. No

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EDUCATION:

Masters of Arts Degree, Dordt College, Sioux Center, IA — May, 2014
Bachelor of Arts Degree, Dordt College, Sioux Center, IA — May, 2008
Major: Elementary Education — GPA 3.39/4.0
Endorsements: Middle School and Coaching
Field of Specialization: Social Studies
Awards: Dordt College Honors Scholarship
Sioux Center Municipal Utilities Scholarship

PROFESSIONAL EXPERIENCE/ ACTIVITIES:

Middle School Teacher, Hull Christian School, Hull IA — Fall 2008 – Present
6th Grade Homeroom Teacher
Taught 6th grade social studies, math, reading, English, and Bible.
Instructed 7th grade geography, and 8th grade American history.
Taught 6th-8th grade computers

Coordinator, Athletic Director Hull, IA — 2012-2014
Cooperating Teacher, Student-Teaching Program Hull, IA — Spring, 2013
Coach, 6th Grade Math Bee Hull, IA — Spring 2009, 2010, 2011, 2012, 2013
Mentor, 20-Hour Practicum Hull IA — Fall 2009

Student Teacher, Ontario Christian School, Ontario, CA — Spring, 2008
Taught 7th grade English and social studies.

Student Teacher, Rehoboth Christian School, Rehoboth, NM — Winter, 2008
Taught 4th/5th grade reading, social studies, and math.

RECENT COACHING EXPERIENCE:

Junior High Volleyball Coach, Hull Christian, Hull, IA — Fall 2008, 2009, 2010, 2011
H.S. Tri County AAU Volleyball Coach, Hull IA — Winter 2011, 2012
5th Gr. Tri County AAU Volleyball Coach, Hull, IA — Winter 2009, 2010
5th Gr. Tri County AAU Volleyball Coordinator, Hull, IA — Winter 2009, 2010

OTHER WORK EXPERIENCE:

Camp Foster YMCA, Spirit Lake, IA — Summer 2008, 2009
Teen Director, Store Director, Camp Counselor
Lutheran Lakeside Camp, Spirit Lake, IA — Summer 2006, 2007
Store Director, Craft Director, Camp Counselor

VOLUNTEER EXPERIENCE:

Tutor Time, Orange City, IA — 2005 – 2008
Big Brother/ Big Sister Program, Sioux Center, IA — 2004 – 2008