

The effect of electronic book use on reading enjoyment and comprehension in 4th grade students at an urban public school.

Jennifer D. Burke

Kennesaw State University

Introduction

Electronic books for children are now not only widely available but also being touted as a silver bullet to increase reading comprehension. Furthermore, literacy skills today have evolved from reading and writing to include interaction with numerous modes of communications, mostly online. Today's students will need to successfully navigate a wide range of formats and text in order to compete for education and jobs with students from all over the world. Indeed, children have become so accustomed to accessing information in snippets that the concept of book as aesthetic object may be changing (Woods, Lushington & Chrichton, 2007). However, not all kinds of books can be translated into electronic format with full functionality with the same success as traditional print books. Only a small percentage of books, especially reference materials and textbooks, are actually sold in electronic format (Crestiani, Landoni & Melucci, 2005). The emerging ebook business is more about delivery than format, and the quantity of electronic books available for children are still relatively limited. At the same time, nearly two-thirds of fourth grade students in the United States are not reading at grade level, and there are significant gaps in reading ability among Hispanic and African-American children (Guernsey, 2011). Electronic books have been seen as a tool that can help close the gap for these students.

In many schools, many students are reading below grade level. This is partly due to lack of concerted instruction, but I believe it is also because they have not been sufficiently exposed to entertaining books that capture their attention and motivate them to read more for pleasure, which would improve their reading skills through practice. Students often do not see the importance of reading for fun, partly because most of their reading focuses on learning and assignments. They may not live in a household where reading is enjoyed and encouraged. Even among households with computers, including tablets and smart phones, technology is used

largely for entertainment. I hypothesize that if more students had easy access to high-quality electronic books they would be more likely to read for enjoyment, strengthening their reading skills and improving their confidence and interest in reading.

The question of how ebooks impact student learning has a very practical application for a media specialist. Reading comprehension is critical for student learning across the curriculum and in all grades. If this study can demonstrate through action research in my school specifically how ebooks impact learning, increase student motivation, and encourage reading for pleasure, additional expenditures can be justified to add to the library's ebook collection and ensure the purchase of ebooks that incorporate the features that are most effective for learning and provide topical coverage in depth to support our curriculum. It is not the intent of this study to measure the depth of understanding student have about a text.

The purpose of this research is to determine in what ways reading electronic books affects students' reading comprehension and vocabulary. Most experimental research in this area has been conducted with kindergarten and first grade students and indicates that giving students time to explore and read a considerate electronic book several times improves both their word-reading ability and vocabulary. Research conducted with older students has been focused on what factors influence their choice of electronic books. An examination of how motivation and engagement with electronic books affects reading comprehension would yield significant benefit to reading instructors and others seeking to understand best practices for implementing the use of electronic books into classroom instruction. However, little research appears to be available on what effect reading electronic books has on upper elementary students.

RUNNING HEADER: THE EFFECT OF ELECTRONIC BOOK USE

In Centennial Place Elementary School's instructional plan, improvement in reading comprehension and vocabulary has been targeted across all grades and in all subjects. Because ebooks can be used in several classrooms simultaneously across grades, they support consistency in classroom instruction by allowing teachers to share the same texts, but with technological features that support learning and reading comprehension. Practical research could yield insights into the best ways we could further incorporate ebooks into classroom instruction at my school, and could help other media specialists in Atlanta Public Schools make purchasing decisions as we share the results of this research.

For this project I will collaborate with several classroom teachers to incorporate a larger, more diverse pool of students for data collection. I will observe and document 4th grade students' interaction with electronic books that are readily available from online sources in school and at home that can be used on tablets or computers, without a specific reading device.

This research will seek to address the following questions:

- Are students more motivated to read electronic books than print books?
- How does reading electronic books affect elementary students' reading comprehension and vocabulary?
- How does student motivation contribute to students' experiences reading electronic books?

This research design will combine the strengths of both quantitative and qualitative research to address both questions. Giving priority to quantitative data will have greater benefit for students, as teaching colleagues are more likely to support the use of ebooks when that practice is supported by data.

Key terms used in this study

An ebook is defined in this study as a commercially available electronic book available either through online purchase or lending (as from a library), that can be read using a computer, tablet, or a specialized reading device. Multimedia eBooks are electronic books that include text, video, activities, audio, pictures, notation and highlighting features (Crestani, Landoni & Melucci, 2005). Online books most commonly consist of digitized books whose copyright has expired. They are typically represented in *portable document format* (PDF), an inexpensive, stable format that is not platform dependent (Crestiani, et al, 2005, p.194).

Literature Review

One challenge in reviewing literature on this topic is found in the variety of terminology used. Electronic books can include any type of text accessible with a computer or electronic reading device. These might be digital picture books, as in the case of the International Children's Digital Library, or they could be CD-ROM stand-alone electronic multimedia books. E-reading devices, iPad, Nook, Kindle, e-book, e-reader, e-text, and tablet are used interchangeably and without definition throughout the literature and in promotional materials. Electronic books might incorporate a variety of features such as animations, narration, a dictionary, or pictures, designed to make the story more accessible to young children. Sometimes electronic books are more entertainment than education, and incorporate video and games that distract children from the story (deJong and Bus, 2004). At the other extreme, the majority of electronic books now available in the public domain are simply digitized text, sometimes with illustrations, that can be read online but offer no additional supporting features beneficial to

children, especially those who are beginning readers, are at risk of learning disabilities, or are learning to read in a second language.

This variety in format can lead to disparity of access, when students lacking e-reading devices or internet access cannot read the same e-text as classmates or students in other schools. At the same time, cash-strapped schools need to be able to provide access to lower income students, for whom the school environment provides the best support for acquiring literacy skills. Access to electronic books can also be problematic for students at risk of learning disabilities, or those who are visually impaired, especially when each different e-book might require a different process for turning pages, listening to narration, or accessing dictionary features (Baird & Henninger, 2011). Libraries must be especially vigilant in regards to purchasing electronic books to ensure quality materials that are accessible to the widest number of readers. Teachers are advised to be deliberate in their use of electronic books with young children, as developmentally appropriate practice in the use of technology with young children advises careful monitoring and instructional support.

Demands of technology use require expanded literacies including higher level conceptual skills; gaps are widening due to educational levels and income. In this review of literature authors found that technology can build knowledge and support higher level reading strategies and behaviors (Biancarosa & Griffiths, 2012). Technology can be a tool for mitigating literacy challenges, especially among low income students or those at risk of learning disabilities. Students need more than access to technology. Biancarrosa and Griffiths (2012) offered four policy recommendations for implementing the use of electronic books in instruction: insist on using e-reading technology that incorporates Universal Design for Learning, choose evidence-based electronic tools, make use of data provided about the devices as well as student use of the

materials, and provide teachers with systemic support for technology use. Baird and Henninger (2011) found similar challenges in their evaluation of ten interactive eBook applications developed for Apple iTunes. They note that electronic books available for this platform are applications developed by 3rd party designers, which leads to inconsistency in design and incompatibility in basic functionality. Guidelines for designers and developers are essential, similar to those ones applied for CD-ROM products. Their analysis pointed out that most recent studies have addressed the extent to which digital resources are used and how they affect sighted children's reading and understanding. Little attention has been paid to the use of commercially available electronic books by individuals with disabilities.

Researchers take widely disparate approaches to investigations into ways these products should be used. Additional research into this field is important both to inform teaching strategies that incorporate electronic books as well as provide insight into optimal development of ebooks. There is a significant body of research over the past 10 years that focuses on young children's comprehension and literacy development. These studies have been quite small and incorporated only one or two electronic books, and provided students with support from adults to ensure they can use the texts correctly.

In Israel, several studies have focused primarily on children's early reading ability (Korat & Shamir, 2007). In this widely cited research, researchers studied 128 Israeli kindergarten children randomly chosen from eight kindergartens: four from lower socioeconomic status neighborhoods and four from middle socioeconomic status neighborhoods. The students were then randomly placed into three different groups: one third of students read an ebook independently, one third of students were read to by an adult, and the third group received no special reading intervention outside of their normal kindergarten instruction. Pre- and post-

RUNNING HEADER: THE EFFECT OF ELECTRONIC BOOK USE

assessments were used to determine students' emergent literacy levels in vocabulary, word recognition and phonological awareness. For this study, the researchers created their own e-book corresponding to an already-published story. The ebook incorporated what they felt represented the best features of e-books: the option to read the story only, read the story with a dictionary feature for twelve difficult words, read the story and play supporting activities, and printing the story. Findings indicated that students who interacted with this carefully designed electronic book performed as well as students who worked with an adult on the same book. However carefully designed, this study did not consider the effects of commercially available, and therefore more widely used electronic books.

Studies of Dutch kindergarten students noted several positive developments in components vital to development of reading skills. These studies focused on children in low income neighborhoods whose first language was not Dutch. In one study, researchers found significant improvement in story understanding after four encounters with multimedia books. In particular, vocabulary increased as did children's understanding of implied story elements, which had been reinforced by multimedia components and animations but not reflected in the text (Verhallen, Bus & deJong, 2006). This study also noted that children with more improved language skills did not benefit from repeated exposure to multimedia text. Other than during focused research, children rarely read electronic books the same way each time unlike the normal manner in which adults read the same story multiple times, allowing children to benefit from the repetition. A study by Segers and Verhoeven (2003) focusing on vocabulary training by computer, which is a component often built into electronic books, can have positive effects in developing young children's word recognition skills. The Dutch studies used familiar children's books currently available in print and electronic format, more consistent with the learning

environment in schools, rather than developing an electronic book specifically for the research study.

A similar study in Great Britain used two commercially available electronic books to again measure student comprehension. Grimshaw studied 132 British children aged 9-11 reading extracts of two storybooks in print and electronic formats: *Magicians of Caprona* and *The Little Prince*. In this case, numerous other electronic stories were considered but these two stories were selected primarily because of their availability. This study supported previous findings indicating that text accompanied by animation and narration, with an age-appropriate glossary, improves reading comprehension. Students were more engaged and motivated using electronic books. (Grimshaw et al, 2007. p.598). Meanwhile, Donatich posited in his essay *Why Books Still Matter* (2009) that although research focuses on ways students learn from electronic books, comparisons between use of ebooks and print books indicate no significant difference in comprehension. He also points out that current reports about the demise of book reading assume nearly universal access to computers and ebooks, which is not accurate.

Lotta C. Larson has written extensively about student interaction with electronic texts and ways to incorporate these into classrooms. She believes reading instruction is undergoing transformation as new technology demands new literacy skills, and concurs with other researchers that traditional definitions of reading and writing are insufficient in today's world (Larson, 2010 p.16). Students today have a keen understanding of the possibility of combining modes and media to create knowledge, and teachers must seek alternative text sources including digital text and electronic books to support classroom curriculum needs. In one qualitative study, Larson observed the reading habits and interactions of two second grade girls in Iowa as they read the same story on two Kindle readers. The girls received detailed instructions for using the

optional features of the devices, and they both often used highlighting, note taking and the dictionary function. Her observations suggest that electronic book reading supports comprehension and efferent reader response, as young readers respond to digital text in distinctively personal ways. (Larson, 2010). Prior to studying these girls she observed individual interactions with electronic books by observing ten 5th grade students reading electronic versions of *Bud, not Buddy* and *Watsons go to Birmingham*. None of the students had read electronic books prior to this. These older students made ample use of the note-taking features for highlighting and annotating their copies. They did not concern themselves with writing conventions but focused on content to record their thoughts quickly. She found the electronic books encouraged students to interact with text and make their own meaning of passages (Larson, 2009). This work is consistent with that of Moyer (2011), who argues that real reading happens regardless of the format of the text, and that listeners interact with electronic text and audiobooks in much the same way as with traditional print books, engaging cognitive functions in different ways dependent on the format being read.

Other research referred to the effect of electronic books on motivation and engagement of students. One study of 199 Texas middle school students in a reading improvement program found significant increases for boys on the value of reading (Miranda, et al, 2011). Engagement in reading is critical to successful reading, yet older students are frequently uninterested in reading, partly because many are reading below grade level and have difficulty completing a text. Students involved in the study completed the Motivation to Read Protocol (Gambrell, et al, 1998) before and after using Kindle e-readers provided by the school. Student reported positive responses to using e-readers that were unrelated to reading instruction; one student reported it was nice to use the e-reader because the book he wanted was always available. The researchers

noted they faced a number of technological challenges with this project, and that further research is necessary to understand the gender differences that presented, as well as the effect of e-readers on comprehension. Estonian researchers had earlier documented gender differences in the way secondary students approach not only reading but the way they interact with technology (Mikk & Luik, 2005), which implies that the structure and format of electronic books is as important for older students as the subjects being addressed.

In their article about today's new breed of readers, Lamb and Johnson (2011) explained that careful consideration should be given to selection of appropriate electronic texts since there is such a variety currently available in numerous formats. The authors describe issues for consideration when selecting text and technology access, including format, platform, and subscriptions. Publishers and producers are beginning to predictably conduct their own research into the efficacy of their products. Librarians need to provide access to a wide variety of both digital and traditional texts to encourage deep reading. Licensing concerns and subscriptions can be significant challenges. Meanwhile, they note that although reading linear text will continue to be the foundation for learning reading, students require new skills to navigate new literacies, although taking time for deep reading is counter to interacting with multimedia and animation.

Researchers in Maryland took a different approach to the use of electronic books. Few studies have investigated children's responses to literature from an aesthetic perspective, although one identified the relationship that culture and environment have on children's reading habits. Additionally, many studies have examined school achievement and compared reading comprehension among countries but have not examined recreational reading, which is a stronger predictor of future academic success. School and public librarians need to understand how children respond to literature in order to effectively define library services and plan programs.

Therefore, these researchers undertook a longitudinal study of twelve children's responses to 241 self-selected electronic books found on the International Children's Digital Library, an internet-accessible library that is at once "everywhere and nowhere." Books in the ICDL are fiction and nonfiction, picture books and chapter books, representing literature and folk tales from around the world. Participants were selected from four schools in Germany, Honduras, New Zealand, and the United States and provided reviews of books using a response form that allowed ratings and comments. A major function of this research is to develop a greater understanding of children's recreational reading and attitudes relative to electronic books, which will help school and public librarians understand how children respond to electronic books so they can effectively define library services and plan programs.

Several conclusions about electronic books can be drawn from the literature. There are many different terms used to mean electronic books, but all descriptions refer to text that is accessible via computer or tablet. Studies of student use of electronic books support several generalizations. First, shared reading or partner interaction is important to student learning using both print and e-books, but there is no significant difference in reading comprehension between use of electronic books and adults reading aloud. Interaction is the critical factor, whether students are interacting with an electronic book or with an adult. Electronic books allow students to interact individually with a text, much as they might with an adult, and using electronic books supports students when individual interaction with an adult is not possible. Next, students tend to use the embedded dictionary function if available, either as a convenience or out of curiosity. Also, students from lower socioeconomic groups and students at risk of learning disabilities, or with lower literacy levels, can benefit more from use of ebooks that provide narration, supporting activities and the dictionary feature, which contributes to improved word recognition and

vocabulary. Four areas of reading development has been shown to be supported by use of electronic books: engagement, concept about print, vocabulary, and story comprehension. Using electronic books helps build confidence and models fluency, offering students support for more effective word attack strategies than attempting to sound out each letter, which is a strategy often employed by students with low reading ability. When phonological awareness activities in electronic books are available for younger children, they are less important and less likely to be used than other features. Furthermore, books with activities and games not related directly to the story have a negative effect on story comprehension as they distract the child from story. Activities and pictures must support story content. Finally, the format and design of the ebook is important. The best features of electronic books include a dictionary feature that has pictures and can be activated by children, a read-aloud feature with highlighted words, and an option that allows children to read on their own. For older students, the read-aloud feature with highlighted words continues to be important to reading comprehension and is supported by a note-taking function.

Methodology Design

This study will be completed using quasi-experimental, mixed methodologies at Centennial Place Elementary School, a public elementary school in the Atlanta Public School district. Centennial Place enrolls 514 students in kindergarten through 5th grade. Students at the school come from economically diverse backgrounds; about 58% are eligible for free or reduced price lunch, and nearly 60 students live in transitional housing for homeless families. The student population consists of 90% African-American students, 7% Caucasian, 2% Asian and 1% Hispanic. Approximately 51% of students are male, and nearly 70% of all families are female-headed households.

RUNNING HEADER: THE EFFECT OF ELECTRONIC BOOK USE

Thirty study participants, selected from four homerooms, will be randomly selected from among seventy-six 4th grade students at Centennial Place Elementary School. Students will then be randomly divided into two groups of fifteen, ensuring that each group contains a roughly equivalent number of boys and girls.

Students will be asked to complete a questionnaire documenting motivation for reading and engagement both before and after the reading exercise. This instrument is based on the *Motivation to Read Profile* (MRP) developed by Gambrell, et al. (1996), but specifically describing use of electronic media. The *Motivation to Read Profile* questionnaire is intended to be read aloud to students to prevent students of lower reading ability being confused by the questions, resulting in more capable readers being identified as more motivated. The researcher will meet with each student individually and read each question in the *Motivation to Read Profile*, allowing time for the student to mark his answer choices for each question.

All students will complete a pretest on vocabulary and story elements. The vocabulary pretest will consist of a multiple-choice test on the definitions and usage of ten words taken from the text. The test on story elements will consist of five multiple choice questions that can be answered with basic recall. Both vocabulary and story element tests are consistent in length and focus with online tests already familiar to students using *Accelerated Reader*, an online diagnostic and assessment tool developed by Renaissance Learning, Inc. that is widely used by elementary schools across the country. Using this style test will alleviate confusion caused by students facing an unfamiliar testing environment.

Following pretests, one group of students will read a selected printed book, and the other group will read the same in electronic format. Students will read each book two times in two

different sessions. Students reading electronic books will be allowed to choose how they interact with the book at each session; they may either read on their own or use the read-along feature of the book. As fourth grade students at Centennial Place are familiar with using a reading strategy incorporating Post-it™ notes, students reading print books will be allowed to employ that strategy if they choose.

After students have completed reading their books, they will complete vocabulary and comprehension post-tests to allow comparison of student comprehension and vocabulary pre- and post-condition. These tests will consist of the same vocabulary and story elements assessed during the pre-test but the questions will be presented in a different order to prevent students memorizing the short tests.

Finally, after all students have completed reading both the print and ebooks and taken post-tests, students will complete a short survey about their experience using ebooks for this activity. Students in the control group will be given the opportunity to read the ebook at during their next library visits and complete an *Accelerated Reader* quiz if they choose.

For this study, it is important to use books that are commonly found in school and public libraries, because these books have the widest availability to schoolchildren and families. Previous research used electronic versions of print books that were created specifically for the research study. Students participating in this study will read one picture book, *Crab Moon*, by Ruth Horowitz (Candlewick Press, 2000). This book was selected because it is a readily available, well-reviewed children's picture book available in both print and electronic formats through the school or public library at no additional cost. The book was written for an audience in second through fifth grade, reading at the mid-fourth-grade level, and includes specialized

vocabulary that is appropriately challenging for fourth grade students. Pre- and post-tests have been developed specifically to be use with this book for this research study.

To protect privacy of participants, no individually identifying information will be collected. No student's identity will be listed in the results. Summaries of results will describe only the racial/ethnic group with which children identify and whether participants are male or female. After students are selected for participation in the study they will be assigned an identifying number which will be noted on their survey responses to allow coding by gender and race. Students participating in the study will not be publicly identified and will be participating in reading and quiz activities not unlike normal daily activities. Students will complete activities before or after regular school hours or during normal library visits so as not to draw attention to their participation. During the study, completed consent documents and survey instruments will be kept in manila envelopes labeled by type of instrument and date, and stored in a locked cabinet when not being reviewed and analyzed by the researcher. Once the study is completed and data analyzed, consent documents and completed survey instruments will be maintained in sealed manila envelopes. These envelopes will be kept inside one large sealed envelope labeled with the title and date of the study. All data collection documents will be shredded three years after completion of the study, on or about May 24, 2017.

Proposed Analysis

Descriptive statistics analysis of results of the survey instruments will be conducted separately for each group, those fifteen students who read the print books and those fifteen who read the ebook. Student answers on the motivation survey will indicate their perceptions of themselves as readers. First, student responses to the reading motivation survey completed

RUNNING HEADER: THE EFFECT OF ELECTRONIC BOOK USE

before reading will be analyzed for the ten students who will read the print book. Separately, student responses to the reading motivation survey will be analyzed for the fifteen students who will the ebook. Each item in the motivation survey will be scored on a four point scale, with higher scores indicating a higher level of motivation and engagement.

Next, the results of the pre- and post-tests for vocabulary and story elements will be analyzed separately to determine whether there was a significant difference between the reading comprehension of students reading an ebook compared with those reading a print book. Since the purpose of a pre-test is to establish a baseline for data, it is not expected that students will correctly answer questions about story elements prior to reading the book.

The pre-test results from the vocabulary test for the fifteen students who read the print book will then be compared with those students' vocabulary post-test. Then, the pre-test results from the vocabulary test for the fifteen students who read the ebook will be compared with their vocabulary post-test results.

Next, results from the story element pre- and post-tests will be analyzed for each group. Again, the pre-test results from the story element comprehension test for the fifteen students who read the print book will then be compared with those students' story element comprehension post-test. Then, the pre-test results from the story element comprehension test for the fifteen students who read the ebook will be compared with their story element comprehension post-test results. Finally, student responses to the interest survey about ebooks will be reviewed and discussed descriptively.

It is expected that if reading an electronic book has a motivational effect on students and contributes to their closer reading of a text, then analysis of the pre and post-test data will reflect

an improvement in reading comprehension greater for those students than for those who read print text. Documented results from this study could influence library media center budgeting and purchasing allocations to ensure greater access to electronic books for more students across the school district.

Limitations of study

The results of this study face several limitations. First, the sample group of students is quite small, only twenty students. Second, the books selected for use in the study are picture books, albeit picture books written at a fourth-grade reading level. As picture books by definition contain limited text with extensive illustrations, students can often infer story elements by studying the pictures. Additionally, most fourth grade students commonly read chapter books, those with at least six chapters and few illustrations. Also, there may be a study effect for students participating in the study; the fact that they were selected to participate in this study might influence students' inclination to describe themselves as motivated readers because they perceive that to be the "correct" answer that the researcher expects.

References:

- Biancarosa, G., & Griffiths, G.C. (2012). Technology tools to support reading in the Digital Age. *The Future of Children*, 22(2), 139-160.
- Baird, C., & Henninger, M. (2011). Serious play, serious problems: issues with eBook applications. *Cosmopolitan Civil Societies: An Interdisciplinary Journal*, 3(2), 1-17.
- Balpe, J. (2004). Toward a diffracted literature. *Leonardo*, 37(5), 385.
doi:10.1162/0024094041956033
- Clyde, L. A. (2005). Electronic books. *Teacher Librarian*, 32(5), 45-47.
- Crestani, F., Landoni, M., & Melucci, M. (2006). Appearance and functionality of electronic books: Lessons from the Visual Book and Hyper-TextBook Projects. *International Journal on Digital Libraries*, 6(2), 192-209.
- deJong, M.T. & Bus, A.G. (2004). The efficacy of electronic books in fostering kindergarten children's emergent story understanding. *Reading Research Quarterly*, 39(4), 378-393.
- Donatich, J. (2009). Why books still matter. *Journal of Scholarly Publishing*, 40(4), 329-342.
- Fast, K. (2010). Interaction and the epistemic potential of digital libraries. *International Journal on Digital Libraries*, 11(3), 169-207.
- Friese, E. G. (2012). E-books, E-readers and the questions they Kindle. *Knowledge Quest*, 41(1), 66-67.
- Gambrell, L.B., Palmer, B.M., Codling, R.M., & Mazzoni, S.A. (1996). Assessing motivation to read. *The Reading Teacher*, 49(7), 518-533.
- Grimshaw, S., Dungworth, N., McKnight, C., & Morris, A. (2007). Electronic books: children's reading and comprehension. *British Journal of Educational Technology*, 38(4), 583-599.
doi:10.1111/j.1467-8535.2006.00640.xt
- Guernsey, L. (2011) Are Ebooks any good? (2011). *School Library Journal*.
<http://www.slj.com/2011/06/books-media/ebooks/are-ebooks-any-good/>
- Houston, C. (2011). Digital books for digital natives: A tour of open access children's digital literature collections. *Children and Libraries*, Winter, 39-42.
- Huang, Y. (2012). Empowering personalized learning with an interactive e-book learning system for elementary school students. *Educational Technology Research & Development*, 60(4), 703-722.

RUNNING HEADER: THE EFFECT OF ELECTRONIC BOOK USE

- Juan Pablo, H., Benjamin B., B., Allison, D., Anne, R., Allison, F., & Yoshifumi, T. (n.d). The International Children's Digital Library: viewing digital books online. *Interacting With Computers*, 15(Interaction Design and Children), 151-167. doi:10.1016/S0953-5438(03)00005-5
- Killeen, E. (2011). Children and Reading. *Teacher Librarian*, 38(4), 60-61.
- Korat, O. (2010). Reading electronic books as a support for vocabulary, story comprehension and word reading in kindergarten and first grade. *Computers & Education*, 55(1), 24-31. doi:10.1016/j.compedu.2009.11.014
- Korat, O. A., & Shamir, A. (2007). Electronic books versus adult readers: effects on children's emergent literacy as a function of social class. *Journal of Computer Assisted Learning*, 23(3), 248-259.
- Lamb, A., & Johnson, L. (2011). Nurturing a new breed of reader. *Teacher Librarian*, 39(1), 56-63.
- Larson, L. C. (2008). Electronic reading workshop: Beyond books with new literacies and Instructional Technologies. *Journal Of Adolescent & Adult Literacy*, 52(2), 121-131.
- Larson, L. C. (2009). e-Reading and e-responding: new tools for the next generation of Readers. *Journal of Adolescent & Adult Literacy*, 53(3), 255-258.
- 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
- Lefever-Davis, S., & Pearman, C. (2005). Early readers and electronic texts: CD-ROM storybook features that influence reading behaviors. *The Reading Teacher*, 58(5), 446-454.
- Mardis, M., & Everhart, N. (2011). Digital Textbooks in Florida: Extending the Teacher-Librarians' Reach. *Teacher Librarian*, 38(3), 8-11.
- Massey, S., Weeks, A.C., & Druin, A. (2005) Initial findings from a three-year international case study exploring children's response to literature in a digital library. *Library Trends*, 54(2),245-265.
- McClanahan, B., Williams, K., Kennedy, E., & Tate, S. (2012). A breakthrough for Josh: how use of an iPad facilitated reading Improvement. *Techtrends: Linking Research & Practice to Improve Learning*, 56(4), 20-28. doi:10.1007/s11528-012-0572-6
- Miranda, T., Williams-Rossi, D., Johnson, K.A., & McKenzie, N. (2011). Reluctant readers in middle school: Successful engagement with text using the e-reader. *International Journal of Applied Science and Technology*, 1(6), 81-91.

RUNNING HEADER: THE EFFECT OF ELECTRONIC BOOK USE

- Mikk, J. (2005). Do girls and boys need different electronic books?. *Innovations In Education & Teaching International*, 42(2), 167-180.
- Moody, A.K. (2010). Using electronic books in the classroom to enhance emergent literacy skills in young children. *Journal of Literacy and Technology*, 11(4), 22-52.
- Moyer, J. (2011). Digital literacies: what does it really mean to “read” a text? *Journal of Adolescent and Adult Literacy* 55(3), 253-256.
- Reuter, K. (2007). Assessing aesthetic relevance: Children’s book selection in a digital library. *Journal of the American Society for Information Science and Technology*, 58(12), 1745-1763.
- Segers, L., & Verhoeven, L. (2003). Effects of vocabulary training by computer in kindergarten. *Journal of Computer Assisted Learning*, 19, 557-566.
- Shamir, A. (2009). Processes and outcomes of joint activity with e-books for promoting kindergarteners' emergent literacy. *Educational Media International*, 46(1), 81-96.
- Shamir, A., & Baruch, D. (2012). Educational e-books: a support for vocabulary and early math for children at risk for learning disabilities. *Educational Media International*, 49(1), 33-47. doi:10.1080/09523987.2012.662623
- Shamir, A., & Shlafer, I. (2011). E-books effectiveness in promoting phonological awareness and concept about print: A comparison between children at risk for learning disabilities and typically developing kindergartners. *Computers and Education*, 57, 1989-1997.
- Verhallen, M.J., Bus, A.G., & deJong, M.T. (2006). The promise of multimedia stories for kindergarten children at risk. *Journal of Educational Psychology*, 98(2), 410-419.
- Wigfield, A., Guthrie, J.T., Perencevich, K.C., Tabaoda, A., Klauda, S.L., Mcrae, A., & Barbosa, P. (2008). Role of reading engagement in mediating effects of reading comprehension instruction on reading outcomes. *Psychology in the Schools*, 45(2), 432-445.
- Wood, C. (2005). Beginning readers’ use of ‘talking books’ software can affect their reading strategies. *Journal of Research in Reading*, 28(2), 170-182.
- Wood, C., Littleton, K., & Chera, P. (2005). Beginning readers’ use of talking books: styles of working. *Literacy*, n.v. , 135-141.
- Woods, C. A., Lushington, K., & Crichton, J. (2007). Readers' perceptions. *International Journal of the Book*, 4(1), 51-67.
- Wright, S., Fugett, A., & Caputa, F. (2013). Using e-readers and Internet resources to support comprehension. *Journal Of Educational Technology & Society*, 16(1), 367-379.

Zucker, T. C. (2009). The effects of electronic books on pre-kindergarten-to-grade 5 students' literacy and language outcomes: A Research Synthesis. *Journal of Educational Computing Research*, 40(1), 47-87.

Appendices

Appendix 1

Motivation to Read Survey

Student _____ Date _____

For each question, choose the answer that best describes how you feel about reading.

1. My friends think I am _____

- A very good reader
- A good reader
- An OK reader
- A poor reader

2. Reading a book is something I like to do.

- Never
- Not very often
- Sometimes
- Often

3. I read _____

- Not as well as my friends
- About the same as my friends
- A little better than my friends
- A lot better than my friends

4. I tell my friends about books I read.

- I never do this
- I almost never do this
- I sometimes do this
- I do this a lot

5. When I am reading by myself, I understand

- Almost everything I read
- Some of what I read
- Almost none of what I read
- none of what I read

RUNNING HEADER: THE EFFECT OF ELECTRONIC BOOK USE

6. I think reading is _____
- A boring way to spend time
 - An OK way to spend time
 - An interesting way to spend time
 - A great way to spend time
7. I worry about what other kids think about my reading _____
- Every day
 - Almost every day
 - Once in a while
 - Never
8. Reading is _____
- Very easy for me
 - Kind of easy for me
 - Kind of hard for me
 - Very hard for me
9. When someone gives me a book for a present, I feel _____
- Very happy
 - Sort of happy
 - Sort of unhappy
 - Unhappy
10. Knowing how to read well is _____
- Not very important
 - Sort of important
 - Important
 - Very important

Appendix 2

Sample Pre- and Post-test: Story Elements: *Crab Moon*

1. Daniel's mother told him that horseshoe crabs were
- As black as tar
 - More dangerous than jellyfish
 - Older than dinosaurs
 - As round as the full moon
2. What did Daniel and his mother have to do to see the crabs?
- Ask Dad to take them to Horseshoe Beach

RUNNING HEADER: THE EFFECT OF ELECTRONIC BOOK USE

- Row their tiny boat to Crab Island
 - Walk on the beach in the middle of the night
 - Ride their bikes to the beach at sunrise
3. What did Daniel’s mother explain to him about the crabs?
- The female crabs had one more pair of claws than males did
 - Only the female crabs came to the shore at night
 - The male crabs were twice as big as the females
 - The female crabs had smaller male crabs on their backs
4. When Daniel went to the beach in the morning, he found _____?
- Two great blue herons “with legs long as stilts”
 - Black seaweed that looked like streamers left over from a party
 - Thousands of crabs bobbing on the waves like bathtub toys
 - Dozens of people picking up crab eggs as if they were seashells
5. What was wrong with the lone crab that Daniel had to rescue?
- One of its claws was missing
 - A fishing line was snagged on its legs
 - It was trapped under a piece of driftwood
 - It was lying upside down

Appendix 3

Sample Vocabulary Pre- and Post-test: *Crab Moon*

For each word, choose the word or phrase that is the BEST definition of each word.

1. Cottage
- a small house with a single story
 - A tool shed with no windows
 - A building where farm animals are kept
 - A store where fishermen can buy bait
2. Path
- a sidewalk
 - a route along which something travels
 - directions how to travel to a place
 - a plan to do something fun
3. Marooned
- stranded
 - washed out to sea
 - hung up to dry
 - colored purple

4. Gentle
 - noisy and active
 - soft and mild
 - angry and loud
 - silent and still

5. Whisper
 - speak softly
 - cry
 - speak loudly
 - complain about the weather

6. Recede
 - chase after
 - pull back or move away or backward
 - follow
 - flow toward the beach

7. Arthropod
 - scorpions, spiders, insects and other joint-legged animals
 - a kind of fish
 - earthworms
 - a spiderweb

8. Wavered
 - blew in the breeze
 - waved slightly
 - flashed
 - moved rapidly back and forth

9. Snagged
 - caught on something
 - tangled up
 - folded up
 - rolled in a ball

10. Stilts
 - tree branches
 - tall poles for walking up high
 - boxes where toys are stored
 - a kind of boat

Interest survey about using ebooks

1. Do you have an electronic device at home (your own or your parent's) that you can use?
 - Yes, an iPad
 - Yes, a computer
 - Yes, a *Kindle* or *Nook*
 - Yes, a smartphone or iPhone
 - No, neither my parent nor I have one of these.

2. If you have one of these, have you ever read a book on it? (If you answered "no" to Question One, skip this one.)
 - Yes
 - No

3. Have you ever read a book or watched a book on a computer at school?
 - Yes
 - No

4. If you have a reading device at home, does your parent ever download books from an online bookstore or the library for you?
 - Yes
 - No

5. If you or your parent have not downloaded books on your tablet, why not?
 - It was too hard to do.
 - It costs too much.
 - I didn't know I could get books online.
 - Some other reason

6. Which of these books would you prefer to read most often?
 - Regular print books
 - Electronic books

7. Electronic books sometimes will read the story out loud. Have you ever listened to an electronic book read-aloud in class or at home?
 - Yes
 - No

8. Which of these features might help you decide to read an electronic book (choose one):
 - It will read out loud to me

RUNNING HEADER: THE EFFECT OF ELECTRONIC BOOK USE

- I can write notes on the screen that will stay in the book
 - I can make the words bigger or smaller, or change the color of some words
 - I can look up words I don't know in an online glossary
9. Do you think you might like to read more if you could use more electronic books?
- Yes
 - No