Reading comprehension evaluated through electronic storybooks and traditional print storybooks

Erika Lynn Crescenzo

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READING COMPREHENSION EVALUATED THROUGH ELECTRONIC STORYBOOKS AND TRADITIONAL PRINT STORYBOOKS

by
Erika Lynn Crescenzo

A Thesis
Submitted in partial fulfillment of the requirements of the Master of Science in Teaching Degree of The Graduate School at Rowan University June 2005

Approved by

Date Approved 4/23/05
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The purpose of this study was to determine whether electronic text storybooks, when compared to printed storybooks, effect students' comprehension skills. Reading comprehension is a process by which the reader constructs meaning with the text. With electronic texts, the computer is able to control the number of words that are displayed to allow the student to read at their own pace. Dramatization along with special text features used in electronic storybooks presents the text in a way that differs from the traditional printed storybook. These changes grasp the readers' attention both visually and verbally. Eliminating the decoding of the text also permits the student to focus on comprehension. Whether the text is printed or electronic may impact the student's reading comprehension skills. This was a quantitative study that was based solely on the results of comprehension test scores. The scores compared the printed text group with the electronic text group.

After analysis of the scores, the central tendency scores were significantly higher in electronic storybook group versus the traditional text group. The mean, median, and the mode averaged between 8 and 12 point higher on the reading comprehension tests in the electronic storybook group. However, a t test for independent samples was also analyzed, but proved to be not significant at the .05 probability level.
ACKNOWLEDGEMENTS

The following individuals have made tremendous efforts in supporting and assisting me in the completion of this thesis. To them I owe my greatest gratitude.

To my parents, for their patience, encouragement, and financial support. They taught me to never give up. Their support has given me the inner drive to complete this study and program.

To my fiancé, Paul, who supported me throughout this study. My love for him is immeasurable. I thank him for all his encouragement through the many difficult times.

To Dr. Robinson, my advisor, for his guidance, time, and critiques throughout this strenuous project and program.

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Chapter I

SCOPE OF THE STUDY

Introduction

"Not only have the look and feel of books changed, but how books are being written has changed." (Matthew, 1997, p. 263) There are numerous CD-ROM storybooks that are printed in both electronic and the traditional text. Many elementary classrooms are using the alternative electronic format to help enhance student’s reading comprehension. (Chen, Ferdig, Wood, 2003) There are scores of books that are not even being printed in the traditional text format anymore. In order to enjoy a particular book, reading it electronically might be the wave of the future. Online electronic bookstores have the capability to download the books directly to your personal computer, not even having to go to the library or bookstores. (Matthew, 1997)

This change is going to have an impact on how our students read in the future. "Electronic storybooks are becoming prevalent in education as one way to teach students about content, literary features such as narrative structure, and even technology itself.” (Chen, Ferdig, Wood, 2003, p. 1) Electronic storybooks allow the students to fantasize and make their own connections, which will ultimately help retain information in the story. "These electronic storybooks take traditional oral or print stories, and add graphics, sound, animation, and video to create new interactive storybooks.” (Chen, Ferdig, Wood, 2003, p. 1) The change in format has led many educators to the debate about the effects that these modifications could have on reading. (Jonassen, Hernandez-
Serrano, 2002) The conversion from print to electronic text seemingly is the new wave of our ever-changing society. Therefore, introducing students to the electronic textbooks at a younger age may encourage their motivation of reading. (Byers, Doty, Popplewell, 2001)

There are a number of studies that have been conducted using electronic storybooks. Reinking (1987) stated:

Until more research can be carried out that systematically confronts the difference between reading with and without a computer, we will be less likely to move forward in our understanding of how the computer expands options for reading and learning from text. (p. 11).

Purpose of the Study

The purpose of this study was to determine whether electronic text storybooks, when compared to printed storybooks, effect students’ reading comprehension skills. Many readers use their prior knowledge to connect to the information that they are reading. Whether the text is printed or electronic may impact the student’s reading comprehension skills. With electronic texts, the computer manages the number of words that are displayed and allows the reader to read the text at their own pace. (Matthew, 1997) Electronic texts also present a literal rather than symbolic connection between the student and the text. In addition, the organization of electronic texts allows “for nonlinear presentation of the material, which combines text and graphics in powerful ways.” (Matthew, 1997, p. 264) Reinking and ChanLin (1994) sum up the differences between electronic and print texts by stating that “electronic texts change the nature of writing and reading by expanding the possibilities for presenting written prose and graphical information.” (p. 209) Therefore, changes in the format to electronic print can
potentially have an affect on reading comprehension.

Statement of the Hypothesis

Third grade students who experienced Electronic Storybook Reading Exercises (ESRE), will score significantly higher on a reading comprehension test, than third grade students who experienced Traditional Print Reading Exercises (TPRE).

Limitations of the Study

The following were limitations that influenced the results of the study:

1. One of the limitations that occurred was a student had prior exposure to the text. Therefore, the student received higher test scores on the comprehension test.

2. Another limitation that affected the study was the students' knowledge of technology and his/her ability to interact and maneuver with a computer. Therefore, the student received higher test scores on the comprehension test. Students who can easily maneuver with the computer were able to click on words and interact with the storybook with more ease, which led to a deeper understanding of the characters, setting, and plot.

Definition of Terms

The following terms were used in the study:

*Baumesiter's 3-point scale* – It is a scale used for the reading comprehension test. Students receive two points for correct responses, one point for partially correct responses, and zero points for an incorrect or missing response. (Baumeister, 1992)

*Electronic storybook* – A story in which the students can interact with the words that are read from the computer. This occurs by clicking on the word in question causing the computer to define or say the word.

*Morrow's 10-point retelling scale* – It is a scale on which two points are given for five of the following items: characters, setting, plot, resolution, and sequencing. (Morrow, 1985)

*Open-ended questions* – the students' ability to answer questions that allow them to create meaning with the story. These meanings are created through feelings and
emotions that may occur from prior life experiences. In view of the fact that every individual has their own unique personal experiences, there cannot be a fully acceptable right or wrong answer.

*Reading comprehension* – the students’ ability to create meaning with the story. The meaning will be based on story retelling and open-ended questions.

*Story retelling* – the students’ ability to explain the story including characters, setting, plot, and resolution.

*Sequencing* – the students’ ability to put the events in the story in the order as they occurred.

*Traditional text storybook* – a book that is printed on paper that the student reads page by page.
Chapter II

REVIEW OF THE LITERATURE

Introduction

This study was to determine if electronic storybooks significantly effected students’ reading comprehension skills versus students’ who read a traditional text format. The study tested whether or not students who experienced the ESRE scored significantly higher on reading comprehension tests than students who read the TSRE. After each reading, the students took the same comprehension test in order to analyze the scores of the two groups. The researcher examined other studies that were conducted on reading comprehension through the use of electronic storybooks. Represented through the studies are the fundamental differences between electronic and traditional printed texts. These differences can change the way students read and write in the classroom. (Reinking, ChanLin, 1994).

Chapter II is a review of the literature found that examines the findings of other researchers that compared scores of electronic format with the traditional format.

Interactive CD-ROM Storybooks

Doty, Popplewell, and Byers (2001) conducted an investigation of try to answer the crucial question: Does reading comprehension increase through an interactive CD-ROM book versus the traditionally printed book? The study was investigated through the use of a second grade class. The students’ comprehension was determined through a
series of oral questions that immediately followed the reading of the book. The scores were based on the Morrow's 10-point scale. The students were divided into two groups: the text group and the computer group.

In the text group, each student previewed the story. The teacher worked one-on-one with any student that needed extra help. The students were informed that questions would be asked about events that took place in the story. Then, the students individually read the book. In the computer group, the teacher showed the students how to click on words for pronunciation or definition, and how to turn the page with the mouse. The teacher informed this group also, that questions would be immediately following about important parts of the story. Then, the students individually read the book from the CD-ROM. In this study, the CD-ROM did not narrate the story. The children had to read the story on their own.

The results proved that the students who read the CD-ROM storybook had higher scores on the comprehension tests than the students who read the printed book, but there was no difference in the oral retelling. The findings were in accordance with other studies which suggested “...that students who could request help from the computer while reading scored higher on comprehension measures than those students reading the same text from a conventionally printed book.” (Byers, Doty, Popplewell, 2001, p. 378).

Doty, Popplewell, and Byers were focused on the “effects of reading comprehension when reading shorter and easier narrative text versus longer and more difficult narrative texts printed pages as compared to reading the same narrative texts using interactive CD-ROM software presented by the computer.” (2001, p. 374). Even though the tests were presented on paper, the “analysis of variance revealed significantly
higher comprehension scores when students were reading the longer and more difficult narratives from the computer.” (Doty, Popplewell, Byers, 2001, p. 374). This is evidence that the computer software was key to producing higher comprehension scores in this study.

CD-ROM Storybooks versus Traditional Print

Matthew (1997) conducted two experiments that compared the reading comprehension of students who read from the CD-ROM storybook and than another from those who read from the conventionally printed texts. The first experiment involved 37 pairs of third-grade students. One student was in the experimental group and the other in the control group. The decision to assign one student in each group was administered randomly. There were 17 pairs of boys and 20 pairs of girls. To assess that all the students were at the same reading level the Primary 2, Reading and Comprehension Subtest of the Metropolitan Achievement Test, Seventh Edition (MAT7) was used. The results suggested, “differences in the raw scores were no greater than two points.” (Matthew, 1997, p. 266). The purpose of this experiment was to determine whether reading comprehension is increased through electronic storybooks versus the traditionally printed storybooks.

In the second experiment, the study used 30 of the same third-grade students from the first experiment, 15 boys and 15 girls, who only read the traditionally printed storybook. The purpose of this study was to determine if the students who read both electronic and printed texts would have higher comprehension scores than those that just read the electronic text.
The procedure in both experiments was similar. Prior to reading, the students were involved in a discussion of possible questions that they should think about while reading. The open-ended questions were written by Pearson and Johnson’s taxonomy of comprehension questions, which included three types: textually explicit, textually implicit, and scriptually implicit. The scores for the open-ended questions were based on Baumeister’s three-point scale, which is two-points for correct, one-point for partially correct, and zero points for wrong or unanswered.

After the reading, the students answered their prereading questions and wrote a story retelling. In this retelling, the students were told that a friend wanted to read this book and they had to write down every detail that they remembered. The story retellings were based on Morrow’s 10-point scale. This scale is determined when two points are given for discussing each of the five aspects: setting, theme, plot, resolution, and sequence.

The results found in the first experiment showed a significant difference in the story retelling comprehension scores but no significant difference in the open-ended questions. Matthew (1997) discussed the data in the retelling as “a statistically significant difference between the experimental (M=24.99) and control (M=23.17) groups, t=2.12, df=36.” (p. 267). In the second experiment, the research showed that students who read both electronic and printed texts had higher reading comprehension scores, in both retelling and open-ended questions, than those who read only electronic texts.

As a result, CD-ROM storybooks can be effective in helping children with their reading comprehension, particularly their retelling. “This study found that using both
electronic and print texts as complements to each other facilitates the different learning
styles found in the classroom.” (Matthew, 1997, p. 269).

Emergent Readers using Electronic Format or Traditional Format

Bus and de Jong (2002) conducted a study across four different kindergarten
classrooms using a regular paper book and an electronic printed text. The participants
were selected from four different kindergarten classrooms of the same school. Any
student that was diagnosed with a learning disability was not able to participate in the
study. After the researchers picked their sample, they divided them into three groups:
low, middle, or high level emergent readers. This dissection was based on a series of
tests such as letter, rhyming, word dictation, and word reading.

Students from each level were randomly selected and placed in one of four
groups: regular book group, restricted computer group, unrestricted computer group, and
the control group. In both of the computer groups, the children explored the same
electronic book. The electronic book included games in addition to text and pictures.
The difference was the restricted groups were not allowed to play with the games, while
the unrestricted groups were. The games were indirectly related to the story. The regular
book group was using the text format of the electronic book. The control group was not
discussed in what part they would be contributing to the study. According to the
researchers, “The unrestricted condition is therefore most representative for how children

Initially, in the regular book group, the children listened to an audiotaped reading
of the book while following along on their own. The tape included instructions when to
turn the page and pointed out pictures on the pages. During the interactive readings, the researcher read the book. In the unrestricted group, the researcher explained the options and the different game features. In the restricted group, the students were introduced to the text and how to turn the pages. They were informed not to click on the game buttons. When the students did click on the game option accidentally, the researcher stopped the game loading immediately.

After six-15 minute sessions, the difference in the number of readings was dramatic. In the book format, the students read the book 6 times as opposed to the electronic format where they read the text 2 to 3 times in the restricted group, and 1.5 to 2.5 times in the unrestricted groups. The research showed that electronic formats have a stronger appeal to the present age range than does the book text, but a decrease occurs in the amount of reading. The electronic format attracts the attention of this specific age group, 4-5 year olds. The results for the unrestricted students showed that the students spent 43% of the time playing the games.

Bus and de Jong (2002) concluded that electronic storybooks “dramatize the word and story meanings, thus supporting internalization of story content and a book’s vocabulary.” (p. 146). Exaggerating the story captures the children’s attention and allows them to grasp a better understanding both visually and verbally.

Effects on Reading Comprehension

The process of comprehension is facilitated by four major approaches. Many researchers suggest that the child’s prior knowledge must be activated in order to assist them in comprehending the text (Matthew, 1997). Speedy word recognition is also
crucial for the child to become fluent in both reading and comprehension. Word recognition was prominent in all of the studies that used an electronic format. With the many different special text features, "electronic book options may support internalization of written word features and stimulate the development of word recognition." (Bus, de Jong, 2002, p. 146). Self-questioning when reading the text is also an important part of the comprehension process. This allows the children to become involved with the text and create their own pace for learning. "Self-questioning is a continuous, integral part of the reading process that occurs before, during, and after reading." (Matthew, 1997, p. 264). Matthew suggests that activities that take place after a reading promotes a clarification of details and ideas from the story and helps in the comprehension process. "Putting ideas into words allows students to take ownership of them, and talking helps clarify ideas and thoughts." (Matthew, 1997, p. 264).

Matthew (1997) stated "the narration, online definitions, sound effects, and animations provide immediate, consistent, support to students as they read. This support allowed them to focus on their meaning rather than decoding as they read." (p. 269). In addition to enhancing comprehension, Reinking (1994) feels that the use of CD-ROM storybooks can help meet diverse individual needs of students; the decoding burden is eliminated, and students can access help as often as needed. The sound effects, manipulations, and animation may encourage comprehension. (Matthew, 1996).
Chapter III

METHODS

Introduction

Third grade students, who experienced reading an ESRE, will score significantly higher on a reading comprehension test, than third grade students who experienced TPRE. According to the research, this significant differences in the test scores is based on the backing that electronic storybooks offer rather than traditional printed texts. The belief that electronic storybooks encompass “narration, online definitions, sound effects, and animations provide immediate, consistent, support to students as they read.” (Matthew, 1997, p. 269). This change in format has led many educators to the debate about the effects that these modifications have on reading. (Jonassen, Hernandez-Serrano, 2002) The conversion from print to electronic text is seemingly the new wave of our ever-changing society. This change is going to have an impact on how our students read in the future.

Sample

The sample was taken from an elementary school in southern suburban New Jersey. The students were from a low socioeconomic community and the families consisted of mostly single working mothers. The subject were from a third grade class that consisted of 12 girls and 11 boys. The students’ ranged in reading levels from low to high. Their reading levels were determined from their second grade teacher’s use of a Reading Inventory.
Procedure

In order to conduct this study, the researcher received permission from the principal of the school (see appendix A). The permission was granted to conduct the study using a third grade class, consisting of 12 girls and 11 boys. The 23 students in the class were assigned to either the experimental (ESRE) or control group (TPRE). The selection for the grouping was determined by the recommendations of the teacher from the prior year. Each student was labeled high, medium, or low in his or her reading level. The students' were placed in these categories through reading assessments, grades, ability to complete tasks, and motivation. Each student was matched with a partner that was similar in reading comprehension levels (see appendix B). In a class of 23, there were 11 pairs with one group containing three students. One of the partners in each of the pairs was assigned to the experimental, while the other was in the control group. In the group of three, two students were assigned to the experimental group (see appendix B).

Once the groups were arranged, then both groups read the same book *Wake Up, Scooterville*. One partner read a traditionally printed book while the other read the electronic version. There was no instruction regarding the use of the electronic storybook. All of the students were familiar with the features and processes of the computer. In the ESRE group, the students had access to only one feature. They were able to click on a word that was not recognizable and the computer read the student that word only. All other features of the electronic storybook were turned off in order to allow them to read the text on their own.
Each day one student experienced ESRE and the other student experienced the TPRE (see appendix C). There were no discussions on the story, *Wake Up, Scooterville*, so as to get a strict comparison of what the students learned directly from the book without any class discussion. Then the students took a reading comprehension test.

In order to attain the most accurate results, another study was conducted with the story, *Amalia and the Grasshopper*. The same procedures followed from the prior story. The students that experienced ESRE now experienced the TPRE and the students who experienced the TPRE experienced the ESRE (see appendix D). Each day one experienced the ESRE while the other experienced the TPRE (see appendix E). Each student answered a series of questions from a reading comprehension test (see appendix F). Similar questions from *Wake Up, Scooterville*, were applied to *Amalia and the Grasshopper*. Baumeisters 3-point scale and Morrow’s 10-point scale were used again as a basis for assessing the students’ scores.

**Description of the Instrument**

The reading comprehension test consisted of six questions (see appendix F). The first five questions consisted of the story retelling, based on Morrow’s 10-point scale. Each item was worth two points. (Morrow, 1985) The answers had to include each of the following items in the retelling:

1. The first item was the major characters. The students must have been able to name all of the characters in order to receive the full two points.

2. The second item was the setting, in which the students were able to place the characters with a location and time to receive the full two points.

3. The third item was the theme, in which the students were able to identify the event that initially sets up the character’s problem or objective.
4. The fourth item was the resolution, in which the student had to answer how the character solved the problem or attained the objective.

5. The last two points were based on the sequence, in which the students placed the order of events in the story in the correct progression.

The sixth question was an open-ended question, in which the reader had to relate to the text in a meaningful way. The students' had to develop some type of feeling and possibly relate this feeling with the character to an experience in their own life. Answers to the open-ended question were based on Baumeister's three-point scale. Two points were given for correct responses, one point for partially correct responses, and zero points for an incorrect or missing response. (Baumeister, 1992)
Chapter IV

ANALYSIS OF FINDINGS

Introduction

Researchers have come to an agreement that CD-ROM storybooks are beneficial in the classroom. "Studies found that using both electronic and print texts as complements to each other facilitates the different learning styles found in the classroom." (Matthew, 1997, p. 269). The effects of electronic storybooks on students' reading comprehension was the nature of the study. The subjects were exposed to two treatments, ESRE and TPRE. A comprehension test was given to each student focusing on story retelling, sequencing, and open-ended questioning. Students who experienced the ESRE will score significantly higher than the students who experienced the TPRE. The hypothesis suggests the reason for this increase in score was mostly contributed to the special features in the CD-ROM storybook, the animation of the characters, and the elimination of the decoding factor.

Results of Comprehension Test Scores

Each student took two tests, one after experiencing the ESRE and the other one after the TPRE. Analyses of the central tendency measures were used to determine the significant differences of scores on the ESRE over the TPRE. A t test was also performed on the test data. In order to determine the significance, the raw data had to be scrutinized. Table 1 and table 2 show the raw scores for the first and second study along
with the high, medium, low category that was originally placed on them from their prior years teachers. The reason why this is necessary to indicate is that the low group has more problems with decoding as opposed to the high reading group. When the students in the low reading group show a higher score on the ESRE than the TPRE, it specifies that comprehension has taken place, eliminating the decoding problem.

In table 1, the students read the book, *Wake Up, Scooterville* by Judith Stamper is part of the Wiggleworks collection. This book is leveled for the third grade reading level.

<table>
<thead>
<tr>
<th>Experimental Group (ESRE)</th>
<th>Control Group (TPRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>83</td>
</tr>
<tr>
<td>Medium</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>75</td>
</tr>
<tr>
<td>Low</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>67</td>
</tr>
</tbody>
</table>

In table 2, the students who experienced the TPRE, now experienced the ESRE. The students who experienced the ESRE, in the second part of the study experienced the TPRE. In the second study, the students read *Amalia and the Grasshopper* by Jerry Tello, this is on a second grade reading level.
The researcher analyzed the types of questions that students answered incorrectly on the comprehension tests. There were three types of questions that were used in the study: story retelling, sequencing, and an open-ended question. Using these types of questions on a test will demonstrate comprehension that was attained during reading by the student. The story retelling had a possible 184 points, each test had 8 points that would have satisfied the retelling section. The sequencing portion of the test carried a possible 48 points. The open-ended question also totaled 48 points. For example, out of 184 points, the students in the ESRE missed 13 total, which would give them a 92.9 average in the story retelling as opposed to the TPRE group who missed 20 total points and received an average of an 89.1. In table 3, the number of miscues support the
hypothesis that third grade students who experienced the ESRE will score significantly higher than the students who experienced the TPRE.

Table 3

Number of Questions Missed by Categories

<table>
<thead>
<tr>
<th>Study 1 — Wake Up, Scooterville</th>
<th>Study 2 — Amalia and the Grasshopper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questions</td>
<td></td>
</tr>
<tr>
<td>ESRE</td>
<td>Study 1 ESRE 13 Sequencing 8 Open-ended 5</td>
</tr>
<tr>
<td>TPRE</td>
<td>Study 2 TPRE 20 Sequencing 9 Open-ended 6</td>
</tr>
</tbody>
</table>

The researcher analyzed the central tendency measurements, which include the mode, median, and the mean. Using the measures of central tendency is a way of describing the data as a single number. (Airasian, Gay, 2003, p. 414)

Table 4

Measures of Central Tendency

<table>
<thead>
<tr>
<th>Study 1</th>
<th>Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESRE</td>
<td>TPRE</td>
</tr>
<tr>
<td>Mean</td>
<td>82.0</td>
</tr>
<tr>
<td>Median</td>
<td>75.0</td>
</tr>
<tr>
<td>Mode</td>
<td>75.0</td>
</tr>
</tbody>
</table>

The data includes a large difference in all three of the central tendencies that were calculated. In both studies, the ESRE showed a higher mean, median, and mode than the TPRE. In both studies, the low reading group experiencing the ESRE had a mean score over 20 points higher than when the TPRE was experienced. This is sufficient evidence to support the hypothesis. There was a significant difference between third grade
students who experienced ESRE than third grade students who experienced TPRE when it came to a reading comprehension test.

A $t$ test was conducted for independent samples. $T$ tests for independent samples were performed on the two sets of data to determine if there was a significant difference at a probability level of .05. The comparisons were made between the ESRE and the TPRE. The results in table 1 and table 2 are shown in table 5. Both groups showed a significant change from the ESRE compared to the TPRE but not at the probability level of .05.

<table>
<thead>
<tr>
<th>Study 1</th>
<th>Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T$-test</td>
<td>0.083304</td>
</tr>
<tr>
<td>Number of pairs of scores</td>
<td>11</td>
</tr>
<tr>
<td>Degrees of freedom</td>
<td>10</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>17.11</td>
</tr>
</tbody>
</table>

A $t$ test for independent samples was used to determine the difference between the ESRE and TPRE groups. A $t$ value of .0833 and .0755 were calculated for both of the studies. This determined that there was no significant difference at the .05 level. The data in the analysis does not support the hypothesis. There was not a significant difference between the students who experienced the ESRE and the students who experienced the TPRE.
Chapter V
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This study investigated the effect of electronic storybooks versus the traditional print storybook on reading comprehension. The electronic storybook was defined as a story that was read from the computer that allowed the students to click on specific words causing the computer to define or say the word. “These electronic storybooks take traditional oral or print stories, and add graphics, sound, animation, and video to create new interactive storybooks.” (Chen, Ferdig, Wood, 2003, p. 1) The change in format has led many educators to the debate about the effects that these modifications could have on reading. (Jonassen, Hernandez-Serrano, 2002) The conversion from print to electronic text seemingly is the new wave of our ever-changing society. Therefore, introducing students to the electronic textbooks at a younger age may encourage their motivation of reading. (Byers, Doty, Popplewell, 2001)

Summary of the Problem

The study investigated the effects of electronic storybooks versus traditional print storybooks in the classroom. The goal of the study was to answer the question, “Will students who experience electronic storybooks score significantly higher on a reading comprehension test than students’ who experience a traditional print storybook?”
Summary of the Hypothesis

The hypothesis stated that the students in a third grade class who experienced the electronic storybook reading exercise (ESRE) will score significantly higher than the students who experienced the traditional print reading exercise (TPRE).

Summary of the Procedure

In order to conduct this research, there were two studies that occurred with the same students. The class was divided into two groups. In a class of 23, there were 11 pairs with one group containing three students. One of the partners in each of the pairs was assigned to the experimental, while the other was in the control group. In the group of three, two students were assigned to the experimental group. Students were partnered with another student of their own reading level. One group read the electronic storybook while the other student read the traditional printed book. After the readings each student took the same comprehension test. The comprehension test focused on story retelling, sequencing, and one open-ended question.

Summary of the Findings

The research was focused on finding a significant difference in the test scores between the ESRE and TPRE. Using the raw test scores, the researcher conducted a central tendency measurement. This is to simplify the scores and use the data as one single number. According to the findings, the mean averaged 8.9 points higher on the ESRE than the TPRE. The median averaged 8.5 points higher on the ESRE than the
TPRE. The mode averaged 12.5 points higher on the ESRE than the TPRE. This showed significant differences between the two test scores, supporting the hypothesis.

A $t$ test for independent samples was also calculated during the study. $T$ tests for independent samples were performed on the two sets of data to determine if there was a significant difference at a probability level of .05. The $t$ value did not meet the .05 probability level by .029 average between the scores. In this test, the scores were not significant at the proposed probability level.

Conclusions

The results of the study indicated that there was a significant difference in the central tendency measurements when electronic storybooks are compared to traditional printed storybooks. The study supports results of previous studies that have also shown the positive significant difference when using electronic storybooks in the classroom as opposed to the traditional texts.

The study showed that according to the results of the $t$ test that there was not a significant difference between the two groups. This supports the knowledge that electronic storybooks can serve as complements to each other, facilitating the different learning styles in the classroom.

In conclusion, electronic storybooks can increase students' scores in reading comprehension. The reason for this increase was mostly contributed to the special features in the CD-ROM storybook, the animation of the characters, and the elimination of the decoding factor.
Implications and Recommendations

Electronic storybooks have proven to be a successful tool used in the classroom. There have not been many studies using the electronic storybooks and further research might be the key to finding how successful they can be for young readers.

Much of the research that was conducted during this study was from the 1990’s. In the prior decade, computers were not as abundant as they are in the current year. Many families have computers at home and children are on computers everyday. The motivation that was once very high to use the computer is now, a lot lower due to the abundance of computers. Current research is needed to fully understand the effects that electronic storybooks can have on reading comprehension.

The researcher did notice more willingness to read the electronic version versus the traditional text version. Roughly fifty percent of the students were more apt to ask to use the computer version. Reading the text on the computer is more appealing than the traditional printed text. Determining the motivational factor in further research would be interesting.

In this research, due to the staff constraints, the research was not able to calculate the number of times that a student used the narration feature or online definitions. For the students that were in the low reading group, it would have been beneficial to record the number of times that they might have had a decoding issue.
REFERENCES


APPENDIX A
PERMISSION GRANTED TO CONDUCT STUDY AT ELEMENTARY SCHOOL
February 9, 2005

Institutional Review Board Member,

I grant permission for Erika Crescenzo to conduct her research at the George L. Hess Educational Complex.

Sincerely,

[Signature]
Lisa Dagit
Principal

LD;llp
APPENDIX B
EXPERIMENTAL GROUP (ESRE) AND CONTROL GROUP (TPRE) CATEGORIES
FOR STUDY 1 – WAKE UP, SCOOTERVILLE
### Study 1 – *Wake Up, Scooterville*

<table>
<thead>
<tr>
<th>Experimental Group (ESRE)</th>
<th>Control Group (TPRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High</strong></td>
<td></td>
</tr>
<tr>
<td>James</td>
<td>Nicole</td>
</tr>
<tr>
<td>Hugo</td>
<td>Amber V.</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td></td>
</tr>
<tr>
<td>Brittany</td>
<td>Christopher</td>
</tr>
<tr>
<td>Ashjonet</td>
<td>Tiffany</td>
</tr>
<tr>
<td>Melissa</td>
<td>Justin</td>
</tr>
<tr>
<td>Zachary</td>
<td>Asia</td>
</tr>
<tr>
<td>Amber R.</td>
<td>Caitlin</td>
</tr>
<tr>
<td>Jeremy</td>
<td>Jose</td>
</tr>
<tr>
<td>Robert</td>
<td>Emmalee</td>
</tr>
<tr>
<td>Connor</td>
<td></td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td></td>
</tr>
<tr>
<td>KayDee</td>
<td>Aziz</td>
</tr>
<tr>
<td>Abigail</td>
<td>Chloe</td>
</tr>
</tbody>
</table>
**Study 1 – Wake Up, Scooterville**

<table>
<thead>
<tr>
<th>Experimental Group (ESRE)</th>
<th>Control Group (TPRE)</th>
<th>Reading Comprehension Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1: James</td>
<td>Nicole</td>
<td>James &amp; Nicole</td>
</tr>
<tr>
<td>Day 2: Hugo</td>
<td>Amber V.</td>
<td>Hugo &amp; Amber V.</td>
</tr>
<tr>
<td>Day 3: Brittany</td>
<td>Christopher</td>
<td>Brittany &amp; Christopher</td>
</tr>
<tr>
<td>Day 4: Ashjonet</td>
<td>Tiffany</td>
<td>Ashjonet &amp; Tiffany</td>
</tr>
<tr>
<td>Day 5: Melissa</td>
<td>Justin</td>
<td>Melissa &amp; Justin</td>
</tr>
<tr>
<td>Day 6: Zachary</td>
<td>Asia</td>
<td>Zachary &amp; Asia</td>
</tr>
<tr>
<td>Day 7: Amber R.</td>
<td>Caitlin</td>
<td>Amber R. &amp; Caitlin</td>
</tr>
<tr>
<td>Day 8: Jeremy</td>
<td>Jose</td>
<td>Jeremy &amp; Jose</td>
</tr>
<tr>
<td>Day 9: Robert/Connor</td>
<td>Emmalee</td>
<td>Robert, Connor, &amp; Emmalee</td>
</tr>
<tr>
<td>Day 10: KayDee</td>
<td>Aziz</td>
<td>KayDee &amp; Aziz</td>
</tr>
<tr>
<td>Day 11: Abigail</td>
<td>Chloe</td>
<td>Abigail &amp; Chloe</td>
</tr>
<tr>
<td>Day 12:</td>
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<td></td>
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APPENDIX D
EXPERIMENTAL GROUP (ESRE) AND CONTROL GROUP (TPRE) CATEGORIES
FOR STUDY 2 – AMALIA AND THE GRASSHOPPER
Study 2 – *Amalia and the Grasshopper*

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group (ESRE)</th>
<th>Control Group (TPRE)</th>
</tr>
</thead>
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<tr>
<td><strong>High</strong></td>
<td>Nicole</td>
<td>James</td>
</tr>
<tr>
<td></td>
<td>Amber V.</td>
<td>Hugo</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td>Christopher</td>
<td>Brittany</td>
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<td>Tiffany</td>
<td>Ashjonet</td>
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<td>Justin</td>
<td>Melissa</td>
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<td></td>
<td>Asia</td>
<td>Zachary</td>
</tr>
<tr>
<td></td>
<td>Caitlin</td>
<td>Amber R.</td>
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<td></td>
<td>Jose</td>
<td>Jeremy</td>
</tr>
<tr>
<td></td>
<td>Emmalee</td>
<td>Robert</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Connor</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td>Aziz</td>
<td>KayDee</td>
</tr>
<tr>
<td></td>
<td>Chloe</td>
<td>Abigail</td>
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APPENDIX E
DAILY SCHEDULE FOR *AMALIA AND THE GRASSHOPPER*
<table>
<thead>
<tr>
<th>Experimental Group (ESRE)</th>
<th>Control Group (TPRE)</th>
<th>Reading Comprehension Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 13: James</td>
<td>Nicole</td>
<td>James &amp; Nicole</td>
</tr>
<tr>
<td>Day 14: Hugo</td>
<td>Amber V.</td>
<td>Hugo &amp; Amber V.</td>
</tr>
<tr>
<td>Day 15: Brittany</td>
<td>Christopher</td>
<td>Brittany &amp; Christopher</td>
</tr>
<tr>
<td>Day 16: Ashjonet</td>
<td>Tiffany</td>
<td>Ashjonet &amp; Tiffany</td>
</tr>
<tr>
<td>Day 17: Melissa</td>
<td>Justin</td>
<td>Melissa &amp; Justin</td>
</tr>
<tr>
<td>Day 18: Zachary</td>
<td>Asia</td>
<td>Zachary &amp; Asia</td>
</tr>
<tr>
<td>Day 19: Amber R.</td>
<td>Caitlin</td>
<td>Amber R. &amp; Caitlin</td>
</tr>
<tr>
<td>Day 20: Jeremy</td>
<td>Jose</td>
<td>Jeremy &amp; Jose</td>
</tr>
<tr>
<td>Day 21: Robert/Connor</td>
<td>Emmalee</td>
<td>Robert, Connor, &amp; Emmalee</td>
</tr>
<tr>
<td>Day 22: KayDee</td>
<td>Aziz</td>
<td>KayDee &amp; Aziz</td>
</tr>
<tr>
<td>Day 23: Abigail</td>
<td>Chloe</td>
<td>Abigail &amp; Chloe</td>
</tr>
<tr>
<td>Day 24:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX F
READING COMPREHENSION TESTS FOR *WAKE UP, SCOOTERVILLE* AND
*AMALIA AND THE GRASSHOPPER*
Wake Up, Scooterville

Directions: After reading the story, answer all the questions.

1. Who were the major characters in the story?

2. In *Wake Up, Scooterville*, where does most of the story take place or what was the setting?

3. What is the problem that occurs in the story?

4. How is the problem resolved?

5. Place numbers 1 to 6 before each sentence in the correct order as they occurred in the story.

   ___ All the people of Scooterville cleaned up Scooter Creek.
   ___ Alice went for a bike ride to think about the clues from the radio.
   ___ Alice won the contest.
   ___ The Johnson family turned on the radio.
   ___ Alice went to the radio show and received a new radio.
   ___ Alice solved the mystery.

6. How did the story make you feel and why?
Amalia and the Grasshopper

Directions: After reading the story, answer all the questions.

1. Who were the major characters in the story?

2. In Amalia and the Grasshopper, where does most of the story take place or what was the setting?

3. What is the problem that occurs in the story?

4. How is the problem resolved?

5. Place numbers 1 to 6 before each sentence in the correct order as they occurred in the story.
   ___ Amalia’s grandfather came to visit her.
   ___ Her grandfather showed her how to bend with her legs and push off really hard.
   ___ Amalia would practice everyday, but always missed the basket.
   ___ The grasshopper was sitting on the basket ball.
   ___ Amalia and her grandfather looked at the grasshopper.
   ___ Marcos gave Amalia a high-five.

6. How did the story make you feel and why?