Spring 2002

An Investigation Into Computer Technology and Commercial Software: The Effects of Fourth Grade Reading Comprehension Based on Two Different Modes of Presentation

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AN INVESTIGATION INTO COMPUTER TECHNOLOGY AND COMMERCIAL SOFTWARE: THE EFFECTS OF FOURTH GRADE READING COMPREHENSION BASED ON TWO DIFFERENT MODES OF PRESENTATION

by

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A Thesis submitted to the Graduate Committee of the Department of Education and Human Development State University of New York College at Brockport in partial Fulfillment for the degree of Master of Science in Education

Spring Semester, 2002

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ABSTRACT

The purpose of this study was to investigate the potential of commercially produced software. It evaluated the effectiveness of two different treatments and explored the relationship this may have upon increasing students' reading comprehension among fourth grade students. The subjects involved were forty heterogeneously grouped fourth grade students from a rural school setting school.

The students were divided into two groups. A total of sixteen stories were read. The first group, *Treatment A*, utilized the computers, paired with comercially produced software, to complete eight reading passages. The second group, *Treatment B*, read the same stories but relied on non-computer methods to complete reading passages. On the third week of the study, the final eight stories were read where *Treatment A* and *Treatment B* switched. *Treatment A* relied on non-computer methods to complete reading passages while *Treatment B* utilized the computers to complete the reading passages.

The difference between the computer and non-computer modes of presentation were compared using a two sample equal variance t test to see if there was a significant difference between the mean scores of each story read for both modes of presentation. The results of this study indicated that there was a statistically significant difference between the posttest scores for *Treatment A* and *Treatment B*. It can be concluded that the integration of commercial software,

paired with computer technology, improved students' reading comprehension when compared with non-computer methods.

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CHAPTER I

Introduction

It is important for teachers to provide appropriate information and to provide individualized practice to students to achieve specific instructional objectives. Instructional activities that accompany the objectives are intended to help students attain mastery in any given subject area. One means teachers can use is computer technology, which can enable the teacher to supplement and to reinforce skills to be learned in many areas.

During the past decade, there have been many advances in technology. Computers in the classroom have significantly increased. In 1997, schools averaged one computer for every six students nationwide. In comparison, ten years ago there were approximately one computer for thirty students (Education Week, 1998). As public education undergoes this transition in technology, so do the skills of students. Teachers and students in classrooms today need to learn how to make effective use of technology and its many potentials. More importantly, computers need to be used in constructive ways that influence and promote meaningful learning among students.

These advances in technologies have had a great impact upon achievement in many academic areas. Computer technology, which incorporates educational materials that combine text with images, sounds, and motion, offers many potential benefits that may improve learning. Children have many different

opportunities to learn through different contexts. Teachers and students are capable of integrating technologies such as electronic books and multimedia to strengthen reading and vocabulary skills.

The full potential of technology can have a tremendous impact on reading achievement. Using computers to reinforce reading skills enables developing readers to learn at their own pace. Various computer programs can be utilized to help students build grammar and vocabulary skills. Schools in Tennessee, for example, have found much success using technology to reinforce and improve reading skills. Using technology as a partner to reading has resulted in noticeable growth for students concerning their reading abilities (Pittner & Coit 2000).

As computers become an integral part of our classrooms, teachers need to determine if there are uses of computers that are supported by research. For the purpose of this study two distinct features of technology that may promote reading achievement were examined. Investigations into electronic books and multimedia were explored. The objective was to examine possible benefits of computer technology concerning reading achievement. This will serve as a foundation that will support the effectiveness of other computer applications. Next, research will studied to show if technology has any useful advantages in aiding the struggling reader. This is important as well. Computer technology should have advantages for a diverse population of students. Finally, a third element will be explored. This part of the study will identify any useful advantages regarding commercial software and its effectiveness upon reading

comprehension. For computer technology to be truly effective, teachers need to know what research has been done in these areas so optimal learning can be achieved from such systems.

Purpose

The purpose of this study was to investigate the potential of commercially produced software. It evaluated the effectiveness of two different treatments and explored the relationship this may have upon increasing students' reading comprehension among fourth grade students. Related to this objective, students answered multiple-choice questions. The primary focus of this intention relates to the many components of state and local exams in terms of its format. In this case, will commercially produced software assist students achieving mastery when given a variety of tests where multiple-choice questions are present? It is for this reason that the intent is to concentrate on non-literal types of questions and look at the potentials of commercially produced software.

Research Question

Does commercial software improve reading comprehension among fourth grade students?

Null Hypothesis

There will be no statistically significant difference between the posttest mean scores of each story for Treatment A and Treatment B.

Need for the Study

With these increasing advances in computer technology come new paradigms of teaching that incorporate its use and acquisition. These technologies, through various studies, have demonstrated to be a powerful potential to support literacy learning in schools. The preceeding studies explored different topics of technology which were all based on one common theme: to improve reading skills among students. The skills by which students improve their reading are varied. The types of technologies explored dealt with different facets of reading. Hypermedia, multimedia, and electronic books all dealt with improving creative thinking, vocabulary development, fluency, word recognition, and comprehension based the way these different modalities of technology were used.

It was discovered that multimedia and hypermedia play a role with literature acquisition. Students can access a wide array of technologies to complement student projects or to bring richness to the literary environment. In this context, multimedia is paired with response-based classrooms. Students are

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encouraged to build meaning and develop understanding. It can potentially assist students to see and experience the responses of others by utilizing video, audio, graphics, and text. Finally, students are permitted and encouraged to make connections based on their own experience to what they read and discuss.

Related to multimedia, hypermedia also plays a role in literacy and comprehension. Hypermedia technologies are somewhat different. In this case, students create documents containing presentations with any combination of text, hypertext, graphics, audio, and video. These documents, created by students, demonstrate an awareness and an understanding of story elements and comprehension. They have the ability to express information in a meaningful, unique way.

Other technology experiences that influence reading are related to electronic books. It was found that students have the option to hear stories read to them electronically. Here, the students can learn and improve vocabulary awareness through animations or examples. By learning in this type of context, reading skills also improve. The students are interested to take part in the learning process in ways that are unique and meaningful.

These studies provided relevant insight concerning computer technology and its potential through various modalities. The studies that were examined looked at different fundamentals of computer technology. These were broad categories that encompassed many different elements. Although these were all important in establishing a basis for this study, there was little investigation

pertaining to the use of commercial software and how it affects reading comprehension. More importantly there needs to be confirmation that any significant increase in comprehension due to the successful use and integration of such software packages may have great relevance in the classroom. Students would be afforded the opportunities to further increase their skills that would ensure mastery not only related to state and local exams but teacher expectations and outcomes as well.

Definition of Terms

Reading Comprehension: This refers to the students' ability to read passages then answer multiple choice questions based on text read. Evaluation will be based on literal types of questions.

Stickybear's Reading Comprehension Software: This computer software contains many high interest multi-level stories that capture the interest of children. It teaches them reading comprehension skills. Students are able to practice reading skills through this interactive software. It includes a report card, printable story and question sets for off-screen use.

The program may be fully customized. The starting level of difficulty and number of tries allowed for answering questions can be set individually for any number of students. Students advance automatically to higher levels with each successful experience. The program tracks the progress of students with printable report cards.

Teachers may customize the program to include their own exercises. A custom access position allows teachers to enhance the program and to record the results. Exercises contained in the program and custom exercises, created by the teacher, may be printed at any time for use as tests, take-homes or worksheets.

Presentation 1, Stickybear Comprehension Software: This pertains strictly to reading/language arts software installed on various computers. Through the use of this software, students are capable of reading various passages and then answering questions based on what they have read. In addition, opportunities to activate built-in features to aid in the retrieval of information to correctly answer the questions are another feature assessable to students.

Presentation 2, Printed Versions from Stickybear Comprehension Software: This pertains to the same stories from the commercially produced reading/language arts software. Stories are printed from the software and made available to the students. Stories are read and questions answered off-screen from the computer. (See Appendix A)

CHAPTER II

Review of the Literature

<u>Electronic Books</u>

The term electronic books have varying definitions among people. Some educators may imply that electronic books are simply software that talks. For others, it involves a CD-ROM full of interconnected pictures, text, movies and sound. Both ideas do suggest truth to the notion of electronic books. In order to understand electronic books and apply a universal definition, criteria need to be established for deciding whether apiece of software is or is not an electronic book.

First, an electronic book must have electronic text and it needs to be presented to the reader visually. The electronic text might be built into a notebook computer or available on a floppy disk or CD-ROM. Software with only pictures does not apply.

Secondly, the software must incorporate the metaphor of a book. For example, most electronic books have a table of contents, screens of text are referred to as pages, and readers might be able to add bookmarks or make margin notes. The language derived from electronic books helps the readers to use the program effectively. The readers are familiar with non-electronic features of books. The electronic books the readers are reading, "feels" like a real print-based book.

Next, software for electronic books has to focus on an organizing theme. Some electronic books duplicate the same organizing theme of existing books. For example, The Way Things Work (DK Multimedia, 1995) is an animated and interactive version of David McCauley's book by the same name.

Finally, when media other than text are available, they are primarily used to support or enhance the text. These books follow versions of popular children's illustrated books. Electronic books can read aloud individual words, phrases and stories, can pronounce individual syllables in a word, and can provide animated clues to word meanings (Higgins & Cox, 1998). These books contain the same words and illustrations as printed books. They contain many added multimedia enhancements. Children can interact directly with the text and images. The text and images are presented in an interactive format that utilizes the computer to add pronunciation and verbal definitions for selected words. Students are able to listen and respond to text and may choose to re-listen to specific words, sentences or sections.

Electronic books vary considerably by design. The electronic books published by Discis Knowledge provide pronunciation and verbal definitions for selected words. Another publisher of electronic books, Broderbund, has designed word animation features into their books that are intended to help children learn the meanings of unfamiliar words (Broderbund, 98). Others, such as the Living Books Series also produced by Broderbund, offer many other options, such as second-language versions and the choice of playing with hidden games and

specialized effects. When utilizing electronic books in these capacities, students have a greater propensity to learn, verify guesses, and may promote reading achievement among students (Penso, 98).

When evaluating and applying standards of electronic books, they have been found to be an integral part of reading programs in many schools today (Higgins, 1998). Students are capable of completing tasks such as improving reading comprehension, vocabulary, writing sentences or summaries about electronic pages read, and develop story maps. In addition, electronic books can make reading less frustrating and therefore more enjoyable. They can provide decoding practice as students make progress toward fluency (Reitsma, 1988).

Students possessing an adequate foundation of alphabet knowledge, print concepts, and phonological awareness but who have delays at the decoding stage may benefit from electronic trade book activities. A series of studies conducted at the National Reading Research Center and summarized by McKenna (1996) investigated the effectiveness of phonics mini-lessons embedded in electronic books. Children who clicked on an unfamiliar word while reading were provided with digitized pronunciation of the word. This was repeated often to build word-meaning skills. These mini-lessons had no discernable effect on beginning readers' knowledge of phonics. However, it was discovered that repeated readings of the electronic stories led to substantial gains in the number of sight words students acquired.

Matthew (1997) obtained mixed results when comparing third grade students' reading achievement. She investigated electronic and print versions of the same book. She concluded that children who read Discis electronic books performed significantly better on story retelling than a matched group who read printed books. Although students preferred print books to electronic books, it was reported that students made significant progress concerning their reading comprehension when utilizing electronic books. In addition, Moore and Smith (1996) examined the differences between electronic books and printed books on fourth grade children's performance on story comprehension. In their study, they reported a significant interaction between the book format and the difficulty level of the story. When print stories are extensive, they concluded that the CD-ROM format was more effective. The CD-ROM version allowed the students to read portions of text that was easier while difficult areas could be read electronically. This would allow the students to then go back and reread the passage, which ultimately increased fluency and comprehension.

A third study conducted by Standish (1992) compared the reading achievement of two unequally matched groups of second grade children. One group read electronic books while the second group read printed books. She found no difference between the two groups' scores on the reading portion of the Metropolitan Achievement Test. McKenna (1996) found some evidence that primary children will acquire a greater sight word vocabulary after repeatedly accessing the pronunciations of words through electronic books. The more times

the student clicks on an unfamiliar word in order to hear it pronounced, the more quickly that word will enter their sight vocabulary.

In conclusion, enabling students to learn in this capacity, electronic books have been effective in increasing vocabulary skills. Students who received vocabulary instruction in conjunction with electronic books performed significantly better than those students who did not receive instruction (Higgins 98).

Electronic books also have the potential to be modified to meet the needs of the student. For example, electronic books often allow students to choose their own font and font size. This could be especially helpful for students with vision impairments. Some electronic books are written in multiple languages allowing the reader to decide, for example, whether to read the text in English or Spanish. Other features might allow students to add their own documents and images to the book or annotate the text with personal observations in the form of notes improving reading comprehension (Anderson-Inman & Horney, 1997).

<u>Multimedia</u>

Students are able to create response-based practices in literature with the aid of technology to enhance the process of literary understanding among students. Response-based practices in literature are responsive to the need for new forms of thinking and learning. Students in the response-based classroom

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learn not just about literature, but apply other practices to show mastery and understanding of information learned. Students respond through class discussions, journal writing and through multimedia. Multimedia captures students' interests through the use of sight, sound, animation, and response. Incorporating the use of multimedia can be very motivating for the students because it deviates from the mundane workbooks and text with which students are all too familiar. Multimedia invites students to create interactive and exploratory classroom experiences that should improve achievement among students (Tackas, Reed, Wells, & Dombrowski, 1999).

Improving reading achievement among students, through the use of commercial software accessed through multimedia, have many advantageous effects upon reading achievement. As previously noted, multimedia incorporates computer based technology that integrates text, graphics, animation, audio, and video. Students are able to listen to a variety of popular children's books at the computer. Digitized speech permits these books to be read by a variety of different voices, ranging from child-like to adult. The stories read are enticing and enthusiastic. As the book is read, individual words are highlighted, drawing attention to the link between speech and print. Important literary skills develop through repeated exposure to storybook reading, including an understanding of the purpose of reading, knowledge of print conventions, vocabulary and story schemas, and an interest in reading. By combining text with images, sounds, and

motion video, it offers students many potential benefits that may also improve success in the area of reading achievement.

Determining its value and effectiveness in reading achievement, Miller, Blackstock, and Miller (1994) determined that multimedia increased students' vocabulary and sight words. In their study, they observed four third-grade children who worked with CD-ROM storybooks over five sessions. These students read the same electronic story tailored to his or her interest and reading level during each session. When students did not understand word meanings, they received assistance from the researcher. This was in the form of verbal instruction. In addition, students were able to click on unfamiliar words in the story to hear them pronounced. By utilizing the features of the program, students learned many of the words they previously could not read. Meskill (1995) experienced similar results in a familiar study and also concluded response-based activities, through multimedia, enhanced the learning process related to vocabulary.

Researchers have discovered mixed results when investigating the acquisition of multimedia. As previously noted, multimedia incorporates many different technologies. It does not just pertain to having the computer read books with varying features. Students are able to incorporate multimedia to create projects that integrate text, graphics, animation, audio and video to convey ideas. Information from the computer can complement and enhance literary understandings. Also, the use of commercial software can be accessed where

students acquire additional reading opportunities that foster a greater awareness toward language and literary events.

There are many potentials of multimedia that support, complement, and enhance reading achievement. First, multimedia can provide a means for easing students into literary work. This can be accomplished when software provides access to supporting visual information. Students see thought provoking images that they can respond to which facilitates the discussion of text. This will aid in their comprehension and recall of the story (Langer, 1990). Next, students are encouraged to build meaning and develop understandings. Students are given visual tools with which to explore, expand, and clarify.

Okolo and Hayes (1996) discovered that multimedia could provide students with nearly instantaneous assistance with features of the text. Features of multimedia books may improve students' literacy learning by providing facilitation with basic word recognition and vocabulary skills. Digitized speech can be used to read or re-read words, phrases, sentences, and pages upon the request of the user. These types of activities can provide definitions, syllabication, and links between potentially ambiguous words, animated illustrations, and prompts to promote more sophisticated comprehension strategies.

Multimedia Book Reviews

Another advantage of multimedia is its use in creating book reviews. Kreiger (1991/1992) determined that students dislike writing conventional book

reports. He discovered that students are encouraged to read less and may avoid genres and topics that may prove unappealing. These traditional forms of book reviews require low personal involvement and discourage risk-taking. In contrast, multimedia book reviews increase the amount of diversity of independent reading. These book reviews foster many aspects of the conventional book report and encourages more personal engagement (Reinking & Watkins, 2000)

Creating multimedia book reviews reshapes the structure of how they are created and for whom they are created. Book reports are generally created for the teacher and read by the teacher. Multimedia book reviews are intended for a larger audience that might include other students, parents, or even uses of the World Wide Web. One of the clear advantages of digital reading and writing through multimedia book reviews is to engage students positively in meaningful communicative experiences (Bruce & Rubin, 1993).

Another important aspect of the multimedia book review is that they are conceptually related to book reports. Like a conventional book report, students complete multimedia book reviews after they have read a book they have selected to read independently. Unlike a conventional book report, multimedia book reviews are created with the aid of a computer, which allows graphics and sound to accompany textual information. Also, the multimedia book reviews can be compiled into a searchable database available to students, teachers, parents, and others. This creates a meaningful purpose and a concrete audience for students' work. Also, it provides an appealing device for students to become aware of one

another's reading and to find books they might like to read (Reinking & Watson, 2000).

Disabled Readers

The use of technology also has many benefits toward students who have reading difficulties. By utilizing the computer through various learning modalities, either electronic books or multimedia practices, the computer can have positive motivational influences on struggling readers. Roth and Beck (1987) found that the game-like format of their Hint and Hunt and Construct-A-Word programs had positive motivational effects on students. Instead of less-motivating teacher-directed instruction in decoding skills, or workbook practice, the game-like format allowed for engagement and set up a challenging environment for the students.

A second argument for choosing computer-based interventions with less skilled readers has to do with the amount of time-on-task necessary for positive learning effects. Independent computer instruction allows for more time-on-task than traditional methods. Jones, Torgesen and Sexton (1997) found substantial increase in both speed and accuracy of decoding skills among struggling readers in first through third grades when utilizing the computer after ten weeks of daily fifteen-minute sessions of computer-based instruction. They also concluded that improvement in decoding individual words led to improvements in reading connected text.

Next, Wise and Olson(1994) investigated the use of corrective feedback in a study using a voice synthesis system in which whole words and syllabic units were used in word learning. The computer pronounced the words or word segments while highlighting the matching text on the monitor. Wise discovered that poor readers made about twice the gains in word recognition and decoding skills as those in control groups receiving regular classroom or traditional remedial reading instruction.

Computers, primarily at the elementary level, can help students acquire a more extensive sight vocabulary and provide effective individualized support for problem readers. They have the ability to listen and manipulate the text to acquire repeated pronunciation of words, word meanings, and syllabication. All of these components help build fluency among struggling readers that will ultimately build strengths in reading comprehension.

CHAPTER III

Research Design

Purpose

The purpose of this study was to investigate the potential of commercially produced software. It evaluated the effectiveness of two different treatments and explored the relationship this may have upon increasing students' reading comprehension among fourth grade students. Related to this objective, students answered multiple-choice questions. The primary focus of this intention relates to the many components of state and local exams in terms of its format. In this case, will commercially produced software assist students achieving mastery when given a variety of tests where multiple-choice questions are present? It is for this reason that the intent is to concentrate on non-literal types of questions and look at the potentials of commercially produced software.

Question

Does commercial software improve reading comprehension among fourth grade students?

Null Hypothesis

There will be no statistically significant difference between the posttest mean scores of the two treatments.

Methodology

Subjects:

Heterogeneously grouped fourth grade classes from a rural Western New York school district will be participating in the study. There will be forty fourth grade students that will serve as both *Treatment A* and *Treatment B*.

Materials:

There will be two classroom and four library computers used in this study. The machines will have the appropriate reading comprehension software installed. This will serve as the first mode of presentation. Printed copies of the computer software programs will also be available. This will serve as the second mode of presentation.

Procedures:

Forty fourth grade students will be divided into two groups. The first group, *Treatment A*, will utilize the computers. This relates to *Presentation 1* to complete reading passages. They will read three stories the first week and answer questions. They will utilize the various components built into the software to aid in completeing questions. These options include clicking on certain words to her them pronounced. Also, each question has a help function. When this option is activated, the electronic story comes into view. The student will then be able to read a segment of the story to help them answer questions that are difficult. Students may also choose to activate this function to check answers to the questions before making their selection. The second group, *Treatment B*, will be engaged with *Presentation 2*. The same three stories will be read with one exception. The stories will be printed copies from the software. The stories and questions remain the same but they will not have the same types of options that the first group had when answering questions on the computer. When finished reading, they too will answer the same questions but on separate paper. They will be scored acccordingly.

On the third week of the study, *Treatment A* will read the next eight stories in the series. This time, they will not use the computers. Instead of *Presentation 1*, they will switch to *Presentation 2*. Printed copies from the software will be read and questions will be answered. Questions will be answered and scored by

the researcher. *Treatment B* will read the same three stories but this time they will switch to *Presentation 1*. They will use the computers to read and answer questions using the built-in features to aid them in completing questions. Results will be scored and printed. *Treatment A* and *Treatment B* will continue to switch in this fashion for two additional weeks. At the conclusion of the fourth week and a total of 12 stories read results for both *Treatment A* and *Treatment B* will be compared. Students will be encouraged to take whatever time is needed. The reading activities for both presentations are not timed. It should take an estimated twenty minutes to complete one reading passage.

Prior to the start of the study, students will be taught how to use the appropriate software. Features of the software will be reviewed. Students will have the opportunity to practice using the software to become familiar with the procedures and capabilities that will aid in its use. Students using the software will be encouraged to use these features when completing questions.

In addition, students have been receiving instruction regarding strategies when reading nonelectronic text. Students are encouraged to use these strategies when reading and answering questions from the non-electronic text as well as going back to check answers in the story.

Analysis of the Data

The data were analyzed quantitatively. The data were comprised of scores from comprehension questions from both modes of presentation. Scores from

both *Treatment A* and *Treatment B* were compared. A t-test was run for each set of scores to determine any significance between the two different modes of presentation.

CHAPTER IV

Analysis of the Data

Purpose

The purpose of this study was to investigate the potential of commercially produced software. It evaluated the effectiveness of two different treatments and explored the relationship this may have upon increasing students' reading comprehension among fourth grade students. Related to this objective, students answered multiple-choice questions. The primary focus of this intention relates to the many components of state and local exams in terms of its format. In this case, will commercially produced software assist students achieving mastery when given a variety of tests where multiple-choice questions are present? It is for this reason that the intent is to concentrate on non-literal types of questions and look at the potentials of commercially produced software.

Research Question

Does commercial software improve reading comprehension among fourth grade students?

Null Hypothesis

There will be no statistically significant difference between the post-test mean scores of each story for Treatment *A* and Treatment *B*.

Findings and Interpretations

The difference between the computer and non-computer modes of presentation were compared using a two sample equal variance t-test to see if there was a significant difference between the mean scores of each story read for both modes of presentation. The scores obtained for both treatments are categorized in appendices 2, 3, 4 and 5. The eight separate results for *Treatment A* and the eight separate results for *Treatment B* are displayed in the following tables:

Treatment A

Table 1

t-Test: Two-Sample Assuming Equal Variances
TREATMENT A - STORY A

	COMPUTER	NON-COMPUTER
Mean	0.90	0.81
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.01	
Hypothesized Mean Difference	0.00	
df	38	
t Stat	2.35	
P(T<=t) two-tail	0.02	
t Critical two-tail	2.02	

A calculated t score of 2.35 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story A*. The mean score for the computer presentation was 0.90 and the mean score for the non-computer presentation was 0.81.

Table 2

t-Test: Two-Sample Assuming Equal Variances
TREATMENT A - STORY B

	COMPUTER	NON-COMPUTER
Mean	0.92	0.83
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.01	
Hypothesized Mean Difference	0	
df	38	
t Stat	2.24	
P(T<=t) two-tail	0.03	
t Critical two-tail	2.02	

A calculated t score of 2.24 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story B*. The mean score for the computer presentation was 0.92 and the mean score for the non-computer presentation was 0.83.

Table 3

t-Test: Two-Sample Assuming Equal Variances
TREATMENT A - STORY C

	COMPUTER	NON-COMPUTER
Mean	0.95	0.79
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.01	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	4.55	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

A calculated t score of 4.55 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story C*. The mean score for the computer presentation was 0.95 and the mean score for the non-computer presentation was 0.79.

Table 4

t-Test: Two-Sample Assuming Equal Variances
TREATMENT A - STORY D

	COMPUTER	NON-COMPUTER
Mean	0.95	0.81
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.01	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	3.83	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

A calculated t score of 3.83 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story D*. The mean score for the computer presentation was 0.95 and the mean score for the non-computer presentation was 0.81.

Table 5

t-Test: Two-Sample Assuming Equal Variances
TREATMENT A - STORY E

	COMPUTER	NON-COMPUTER
Mean	0.95	0.84
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.01	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	2.98	
P(T<=t) two-tail	0.01	
t Critical two-tail	2.02	

A calculated t score of 2.98 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story E*. The mean score for the computer presentation was 0.95 and the mean score for the non-computer presentation was 0.84.

Table 6

t-Test: Two-Sample Assuming Equal Variances
TREATMENT A - STORY F

	COMPUTER	NON-COMPUTER
Mean	0.95	0.81
Variance	0.01	0.03
Observations	20	20
Pooled Variance	0.02	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	3.34	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

A calculated t score of 3.34 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story F*. The mean score for the computer presentation was 0.95 and the mean score for the non-computer presentation was 0.81.

Table 7

t-Test: Two-Sample Assuming Equal Variances
TREATMENT A - STORY G

	COMPUTER	NON-COMPUTER
Mean	0.96	0.76
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.01	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	5.54	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

A calculated t score of 5.54 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story G*. The mean score for the computer presentation was 0.96 and the mean score for the non-computer presentation was 0.76

Table 8

t-Test: Two-Sample Assuming Equal Variances
TREATMENT A - STORY H

	COMPUTER	NON-COMPUTER
Mean	0.95	0.84
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.01	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	2.98	
P(T<=t) two-tail	0.01	
t Critical two-tail	2.02	

A calculated t score of 2.98 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story H*. The mean score for the computer presentation was 0.95 and the mean score for the non-computer presentation was 0.84.

Table 9

t-Test: Two-Sample Assuming Equal Variances
TREATMENT B - STORY A

	COMPUTER	NON-COMPUTER
Mean	0.92	0.73
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.02	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	4.73	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

A calculated t score of 4.73 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story A*. The mean score for the computer presentation was 0.92 and the mean score for the non-computer presentation was 0.73

Table 10

t-Test: Two-Sample Assuming Equal Variances
TREATMENT B - STORY B

	COMPUTER	NON-COMPUTER
Mean	0.92	0.75
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.01	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	4.38	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

A calculated t score of 4.38 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story B*. The mean score for the computer presentation was 0.92 and the mean score for the non-computer presentation was 0.75.

Table 11

t-Test: Two-Sample Assuming Equal Variances
TREATMENT B - STORY C

	COMPUTER	NON-COMPUTER
Mean	0.95	0.79
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.01	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	4.48	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

A calculated t score of 4.48 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story C*. The mean score for the computer presentation was 0.95 and the mean score for the non-computer presentation was 0.79.

Table 12

t-Test: Two-Sample Assuming Equal Variances
TREATMENT B - STORY D

	COMPUTER	NON-COMPUTER
Mean	0.95	0.73
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.01	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	6.11	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

A calculated t score of 6.61 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story D*. The mean score for the computer presentation was 0.95 and the mean score for the non-computer presentation was 0.73

Table 13

t-Test: Two-Sample Assuming Equal Variances
TREATMENT B - STORY E

	COMPUTER	NON-COMPUTER
Mean	0.94	0.74
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.02	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	5.14	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

A calculated t score of 5.14 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story E*. The mean score for the computer presentation was 0.94 and the mean score for the non-computer presentation was 0.74.

Table 14

t-Test: Two-Sample Assuming Equal Variances
TREATMENT B - STORY F

	COMPUTER	NON-COMPUTER
Mean	0.94	0.72
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.02	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	5.54	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

A calculated t score of 5.54 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story F*. The mean score for the computer presentation was 0.94 and the mean score for the non-computer presentation was 0.72.

Table 15

t-Test: Two-Sample Assuming Equal Variances
TREATMENT B - STORY G

	COMPUTER	NON-COMPUTER
Mean	0.93	0.75
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.02	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	4.64	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

A calculated t score of 4.64 was the result of the analysis. Since the critical value of t with a 95% confidence level is 2.02, the null hypothesis is rejected, concluding that there was a significant difference between the post-test scores of students' comprehension using the computer for *Story G*. The mean score for the computer presentation was 0.93 and the mean score for the non-computer presentation was 0.75.

Table 16

t-Test: Two-Sample Assuming Equal Variances
TREATMENT B - STORY H

	COMPUTER	NON-COMPUTER
Mean	0.97	0.78
Variance	0.01	0.02
Observations	20	20
Pooled Variance	0.02	
Hypothesized Mean Difference	0.00	
df	38.00	
t Stat	4.89	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

A calculated t score of 4.89 was the result of the analysis. Since the
critical value of t with a 95% confidence level is 2.02, the null hypothesis is
rejected, concluding that there was a significant difference between the post-test
scores of students' comprehension using the computer for *Story H*. The mean
score for the computer presentation was 0.97 and the mean score for the non-
computer presentation was 0.78.

CHAPTER V

Conclusions and Implications

Purpose

The purpose of this study was to investigate the potential of commercially produced software. It evaluated the effectiveness of two different treatments and explored the relationship this may have upon increasing students' reading comprehension among fourth grade students. Related to this objective, students answered multiple-choice questions. The primary focus of this intention relates to the many components of state and local exams in terms of its format. In this case, will commercially produced software assist students achieving mastery when given a variety of tests where multiple-choice questions are present? It is for this reason that the intent is to concentrate on non-literal types of questions and look at the potentials of commercially produced software.

Conclusions

The results of this study indicated that there was a statistically significant difference between the post-test scores for *Treatment A* and *Treatment B*. It can be concluded that the integration of commercial software, paired with computer technology, improved students' reading comprehension when compared with non-computer methods.

Implications for the Classroom

Commercial software, when paired with computer technology, has several positive implications for the classroom. It was discovered that students enjoyed using the computers. Through informal observations and anecdotal records, the students' overall attitude in this study was positive. First, students' appeared to be delighted when completing the activities at the computer than they were completing the activities at their seat. It appeared that students were pleased with the activities on the computer. They spent time reading the selections. They took advantage of the features of the software. This meant that certain words were activated so pronunciation of certain difficult words could be heard. When it came time to answer questions, many students activated the help feature. This allowed them to go back to the story and reread a portion of the passage. This offered assistance for the students to answer questions that were either difficult or to simply check their answer before a selection was made. In addition, some students asked questions about certain words in the text that were not recognizable to them. These particular words could not be selected for pronunciation.

There was much more positive facial expression with those students engaged with the computer. Also, after completing the activities on the computer, students made positive comments about the given tasks. They made comments that they liked doing something different. They talked about particular stories or

elements of the software that was interesting to them. The students completing the tasks off the computer did not make these comments. The computers gave control to the students about what they were learning and they made decisions on how best to complete the activities. This clearly sends a message to the teacher that computers can be inspiring for students.

A second important implication is related to the enjoyment students receive when using the computers. Relating back to the initial study, an estimated amount of time was given to complete each story and set of questions. The researcher maintained that it might take twenty minutes to complete an activity. Through informal observations, it was discovered that students engaged with the computer activities took considerably longer than the estimated twenty minutes to complete each activity. Students in the second mode of presentation took considerably less than the twenty minutes to complete each activity.

Finally, the computer reading program served as a motivational factor for students. As students completed a reading passage and answered the questions, they were able to activate the report card feature. For each student, the computer keeps track of student progress. When this feature is activated, students can see their performance on the current activity as well as previously completed activities. This provides the students with immediate feedback. Through informal observations, it was discovered that students were activating this feature. They were checking their overall computer report card results after finishing selections. Students seemed to be quite pleased with their performance. This

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was especially true with the students who, in the beginning of the program, had missed several questions. As these students continued with the program, they discovered that they were doing much better. Students were excited about their success. This was an even greater benefit to the struggling readers. They discovered as well that they have been doing quite well. They were reading and comprehending the passages. In addition, they utilized reading strategies and the built-in features to gain optimal success. They received immediate gratification and were excited about their success. This seemed to be a considerable motivation for them. These factors were certainly not present with the second mode of presentation.

<u>Limitations for the Classroom</u>

Before computer technology can be implemented and integrated into the curriculum, several variables need to be addressed beforehand. Consideration into these ideas may profoundly affect the outcome of such processes as well as serving as a valuable asset toward the learning process.

Subsequently, the effect of computer software is dependent upon software packages that are available in today's market. Just as textbooks have their limitations, so does the software. Many of the current software packages for literature do not always meet the standards teachers are expecting. Software in this area has generally failed to consider the potential of connecting reading

experiences. When teachers decide to use commercial software to enhance or reinforce literary skills, they cannot simply send students over to a particular computer and have them begin. When computers are used in the classroom for education, several variables need to be taken into account. When teachers are going to use commercial software for the first time, much work is needed before hand to assure for a positive learning experience. Teachers need to become familiar with the commercial software that is of potential use to them. It takes time to examine a new piece of software, understand its operation and educational purpose, and plan for its use with particular children.

The success for any program is directly related to the software that is being used. This was a major underlining factor for this project. In this case, it was important to look at several different varieties of software and then decide on one that matches best with the intended learning outcomes. This was a lengthy process. Each piece of software had to be evaluated. It needed to be examined specifically to identify skill objectives and whether or not those skill objectives can be met. More importantly, it needed to match student interests. It needed to be simple to use, but offer a variety in terms of the stories and its features.

Just as important as the software itself, the activities need to be meaningful. As in the case of this study, stories need to be of high interest captivating student interests. Also, students need to appreciate the value of what they are doing and why it is important. They should understand that the activities they are doing are beneficial to them. Computers should not be used as a resource

to fill blocks of time. Without these important elements, reading stories on the computer is not any different than traditional means.

A final thought related to computer technology concerns the classroom arrangement. As the case for this study, there was not a computer lab where students could go to complete activities. The students relied on the computers in the classroom. This was probably the most challenging factor of this study. The classroom used in this study contained two computers that served twenty students. A rotating schedule had to be established that indicated the order as to when students were to use the computers to complete the software applications. As students finished, they left the computer and a different student then proceeded to the computer to accomplish their activities. This created distractions in the classroom. During the work period, there were students continuously moving about. This could make it difficult for other students to concentrate on their reading activities. Having a classroom with a larger bank of computers would certainly limit the distractions and possibly yield greater results. Despite these distractions, it did not appear that it inhibited the success of the study.

Finally, it would appear that when classrooms have small numbers of computers, it creates a longer process to complete all activities. When there are more than two computers, larger groups of students can be at the computer at one time. This would certainly be a benefit. Students are able to finish sets of activities sooner. This means that they can advance to new or different material quicker. This would help in maintaining enthusiasm and motivation.

Finally, the quality of computer technology is determined by how such practices impact classroom philosophies. Teachers do not all teach the same way and many may not be receptive to new innovations. In order for such computer software, especially software related to reading, to have the best impact, teachers need to arrive at common goals which supports and enhances their style of teaching and that is best suitable for their students.

Regardless of how well software packages are developed to support literacy, teaching the skills are determined by how such systems impact classroom philosophies and practices. Teacher perceptions concerning computer technology and software are not dependent on what the software itself can do, but more on what a class does with it. Teachers need to have a clear set of goals that incorporate skills, knowledge, and philosophies of the teacher to truly make an impact in the area of technology and literacy.

Implications for Further Research

Much of the research conducted in the area of technology has centered on decoding skills, vocabulary, word recognition and motivational factors concerning the use of computers in the classroom. Little research was conducted in the areas of comprehension related to electronic books and multimedia at the elementary level as well as the secondary level. This study looked at utilizing commercial software and its effects on comprehension at the elementary level. It would be of interest to investigate and determine any correlation between computer

technology and comprehension at the secondary level. This seems to make sense because literacy begins at the primary level and progresses through stages as students progress through school. However, research should investigate the impact of technology on secondary students as well as students who are having trouble in the process of reading. The arguments presented in this report do not answer such questions. It would be of interest to determine what effect computer technology has among this population of students concerning comprehension as well as other reading skills.

Another interesting study could concentrate on student perceptions of technology. Do students have different feelings and opinions about using computers versus traditional methods of learning and assessment? If so, would this make an impact upon their learning and achievement? It was certainly evident in this study that students were much more engaged utilizing the computers than relying on traditional methods.

Subsequently, future research should take into account children's affective response to the materials they are reading as well as their attainment of specific reading skills. Support for the joy of reading should be an important outcome associated with any reading outcome. It appears that computers can serve as a beneficial outcome and a great motivational factor that can improve reading skills. This was certainly evident in this study. As previously noted, students enjoyed using the computer to complete their reading activities. It would be of interest to investigate any correlation concerning students feelings about using the

computers and if this has an effect upon their achievement concerning such computer programs.

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Appendix 1

Native American Homes

When most people think about Native American homes, they thing about teepees. But Native American homes came in many shapes, depending on where and how the Native Americans lived.

Native Americans in the Northeast built strong homes called wigwams. These wigwams often looked liked long houses. The wigwams of Southeast Native Americans sometimes looked like teepees. Native Americans in Florida covered their wigwams in palm leaves.

Native Americans who lived in the deserts of the Southwest built simple brush shelter for the dry, hot summer. In winter, these Native Americans built warmer homes of brush, logs, and mud. These homes were called hogans.

The teepees of the Native Americans of the Plains could be taken down easily. This was important to these tribes who moved around. The kind of home was called an earth lodge. To build an earth lodge, the Native Americans dug a deep hole in the ground. They made a roof of logs and mud to cover the hole. This lodge looked like a large mound of earth.

In the rainy Northwest, Native Americans built large wooden dwelling. These houses were set on poles. That way, if floods came, the houses were protected.

1. What is the main idea of the story?

   A. All Native Americans lived in teepees

   B. Some Native Americans lived in houses

   C. Native Americans made different houses to suit their needs

2. Wigwams looked like

   A. Long houses or teepees

   B. Hogans

   C. Earth lodges

   D.

3. Southwest Native Americans built

   A. Homes just like those of Northwest Americans

   B. Different kinds of homes for summer and winter

   C. Teepees

   D. Log cabins

4. Which sentence isn't true about the Native Americans of the Plains teepees?

   A. They are covered with Buffalo skins

   B. They could be moved easily

   C. They were the only homes Native Americans of the plains built

5. An earth lodge looked like

   A. Square house built out of mud

   B. Hogan

   C. Large mound

Mode of Presentation 1   **Treatment A**

Student	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score
1	A	4/5	B	5/6	C	5/5	D	5/5	E	5/5	F	5/5	G	5/5	H	5/5
2	A	5/5	B	6/6	C	5/5	D	4/5	E	5/5	F	5/5	G	4/5	H	4/5
3	A	5/5	B	5/6	C	5/5	D	5/5	E	4/5	F	4/5	G	5/5	H	5/5
4	A	4/5	B	5/6	C	5/5	D	5/5	E	5/5	F	5/5	G	5/5	H	5/5
5	A	4/5	B	6/6	C	4/5	D	4/5	E	5/5	F	5/5	G	4/5	H	4/5
6	A	5/5	B	6/6	C	4/5	D	5/5	E	5/5	F	5/5	G	5/5	H	5/5
7	A	5/5	B	6/6	C	5/5	D	5/5	E	5/5	F	4/5	G	5/5	H	5/5
8	A	4/5	B	5/6	C	5/5	D	5/5	E	4/5	F	5/5	G	5/5	H	5/5
9	A	5/5	B	6/6	C	5/5	D	5/5	E	5/5	F	5/5	G	5/5	H	5/5
10	A	5/5	B	4/6	C	4/5	D	5/5	E	4/5	F	5/5	G	5/5	H	4/5
11	A	4/5	B	5/6	C	5/5	D	5/5	E	5/5	F	5/5	G	5/5	H	5/5
12	A	5/5	B	5/6	C	5/5	D	5/5	E	5/5	F	4/5	G	5/5	H	5/5
13	A	4/5	B	6/6	C	5/5	D	5/5	E	4/5	F	5/5	G	5/5	H	5/5
14	A	4/5	B	6/6	C	5/5	D	5/5	E	5/5	F	5/5	G	5/5	H	5/5
15	A	5/5	B	5/6	C	5/5	D	5/5	E	5/5	F	4/5	G	5/5	H	5/5
16	A	4/5	B	6/6	C	5/5	D	5/5	E	5/5	F	5/5	G	5/5	H	5/5
16	A	5/5	B	6/6	C	4/5	D	5/5	E	5/5	F	5/5	G	5/5	H	5/5
18	A	4/5	B	6/6	C	4/5	D	4/5	E	5/5	F	4/5	G	4/5	H	4/5
19	A	4/5	B	6/6	C	4/5	D	4/5	E	4/5	F	5/5	G	4/5	H	4/5
20	A	5/5	B	5/6	C	5/5	D	5/5	E	5/5	F	4/5	G	5/5	H	5/5

Stories

A. A Special Dog   B. Spider's Web   C. A Proud American   D. What is Earth Made Of   E. Land Down Under

F. A Very Tough Job   G. The Bottom of the Earth   H. Up Up and Away

Student	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score
1	A	5/5	B	5/6	C	5/6	D	4/5	E	5/5	F	5/5	G	5/5	H	4/5
2	A	3/5	B	5/6	C	5/6	D	3/5	E	4/5	F	5/5	G	4/5	H	4/5
3	A	4/5	B	5/6	C	5/6	D	4/5	E	5/5	F	4/5	G	4/5	H	5/5
4	A	4/5	B	5/6	C	4/6	D	4/5	E	3/5	F	3/5	G	4/5	H	5/5
5	A	3/5	B	4/6	C	5/6	D	3/5	E	3/5	F	4/5	G	3/5	H	3/5
6	A	5/5	B	5/6	C	5/6	D	5/5	E	4/5	F	4/5	G	4/5	H	4/5
7	A	4/5	B	5/6	C	6/6	D	5/5	E	5/5	F	5/5	G	5/5	H	5/5
8	A	4/5	B	5/6	C	6/6	D	4/5	E	4/5	F	4/5	G	4/5	H	4/5
9	A	3/5	B	3/6	C	3/6	D	4/5	E	4/5	F	4/5	G	3/5	H	4/5
10	A	4/5	B	4/6	C	5/6	D	3/5	E	4/5	F	5/5	G	3/5	H	4/5
11	A	5/5	B	5/6	C	5/6	D	4/5	E	5/5	F	4/5	G	5/5	H	5/5
12	A	5/5	B	6/6	C	4/6	D	4/5	E	5/5	F	4/5	G	4/5	H	4/5
13	A	5/5	B	6/6	C	5/6	D	5/5	E	4/5	F	4/5	G	4/5	H	3/5
14	A	3/5	B	6/6	C	3/6	D	4/5	E	4/5	F	3/5	G	3/5	H	4/5
15	A	4/5	B	4/6	C	5/6	D	4/5	E	4/5	F	2/5	G	4/5	H	5/5
16	A	4/5	B	5/6	C	5/6	D	3/5	E	5/5	F	5/5	G	4/5	H	4/5
17	A	5/5	B	5/6	C	5/6	D	5/5	E	3/5	F	4/5	G	4/5	H	4/5
18	A	4/5	B	5/6	C	4/6	D	4/5	E	4/5	F	4/5	G	3/5	H	5/5
19	A	4/5	B	6/6	C	5/6	D	4/5	E	5/5	F	3/5	G	3/5	H	3/5
20	A	4/5	B	6/6	C	5/6	D	5/5	E	4/5	F	5/5	G	4/5	H	5/5

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Stories
A. Native American Homes
B. Native American Homes C. Planet X D. Seaweed Sandwiches E. Trial of Tears
F. Our National Bird
G. The Baby Robbery
H. Stagecoach days

Student	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score
21	A	5/5	B	5/6	C	6/6	D	5/5	E	5/5	F	5/5	G	5/5	H	5/5
22	A	5/5	B	6/6	C	6/6	D	4/5	E	5/5	F	5/5	G	5/5	H	5/5
23	A	5/5	B	5/6	C	5/6	D	5/5	E	4/5	F	5/5	G	5/5	H	4/5
24	A	4/5	B	5/6	C	6/6	D	5/5	E	5/5	F	5/5	G	4/5	H	5/5
25	A	5/5	B	6/6	C	5/6	D	4/5	E	5/5	F	4/5	G	5/5	H	5/5
26	A	4/5	B	6/6	C	6/6	D	5/5	E	5/5	F	4/5	G	4/5	H	4/5
27	A	4/5	B	6/6	C	6/6	D	5/5	E	5/5	F	5/5	G	4/5	H	5/5
28	A	4/5	B	5/6	C	6/6	D	5/5	E	4/5	F	5/5	G	4/5	H	4/5
29	A	3/5	B	6/6	C	6/6	D	5/5	E	4/5	F	5/5	G	5/5	H	5/5
30	A	5/5	B	4/6	C	6/6	D	4/5	E	5/5	F	4/5	G	5/5	H	5/5
31	A	4/5	B	5/6	C	5/6	D	5/5	E	4/5	F	5/5	G	4/5	H	5/5
32	A	5/5	B	5/6	C	5/6	D	5/5	E	5/5	F	5/5	G	5/5	H	5/5
33	A	5/5	B	6/6	C	5/6	D	5/5	E	5/5	F	5/5	G	5/5	H	5/5
34	A	4/5	B	6/6	C	6/6	D	5/5	E	5/5	F	5/5	G	3/5	H	5/5
35	A	5/5	B	5/6	C	6/6	D	5/5	E	4/5	F	5/5	G	5/5	H	5/5
36	A	5/5	B	6/6	C	5/6	D	5/5	E	5/5	F	5/5	G	5/5	H	5/5
36	A	5/5	B	6/6	C	6/6	D	5/5	E	4/5	F	4/5	G	5/5	H	5/5
38	A	4/5	B	6/6	C	6/6	D	4/5	E	5/5	F	4/5	G	4/5	H	5/5
39	A	5/5	B	6/6	C	6/6	D	4/5	E	5/5	F	4/5 ·	G	5/5	H	5/5
40	A	5/5	B	5/6	C	6/6	D	5/5	E	4/5	F	5/5	G	5/5	H	5/5

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Stories

A. Native American Homes   B. Native American Homes   C. Planet X   D. Seaweed Sandwiches   E. Trial of Tears

F. Our National Bird   G. The Baby Robbery   H. Stagecoach days

Student	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score	Story	Score
21	A	3/5	B	5/6	C	4/5	D	5/5	E	3/5	F	3/5	G	4/5	H	4/5
22	A	4/5	B	4/6	C	5/5	D	3/5	E	4/5	F	4/5	G	3/5	H	5/5
23	A	5/5	B	5/6	C	4/5	D	2/5	E	5/5	F	5/5	G	2/5	H	4/5
24	A	4/5	B	3/6	C	4/5	D	3/5	E	4/5	F	4/5	G	4/5	H	4/5
25	A	3/5	B	5/6	C	3/5	D	4/5	E	3/5	F	3/5	G	3/5	H	3/5
26	A	4/5	B	5/6	C	4/5	D	4/5	E	4/5	F	4/5	G	4/5	H	5/5
27	A	3/5	B	4/6	C	5/5	D	4/5	E	3/5	F	3/5	G	4/5	H	4/5
28	A	4/5	B	6/6	C	4/5	D	4/5	E	4/5	F	4/5	G	4/5	H	4/5
29	A	3/5	B	5/6	C	4/5	D	3/5	E	3/5	F	3/5	G	3/5	H	4/5
30	A	5/5	B	4/6	C	3/5	D	4/5	E	5/5	F	5/5	G	4/5	H	3/5
31	A	3/5	B	3/6	C	3/5	D	4/5	E	3/5	F	3/5	G	4/5	H	2/5
32	A	4/5	B	5/6	C	3/5	D	4/5	E	4/5	F	4/5	G	4/5	H	3/5
33	A	4/5	B	5/6	C	4/5	D	3/5	E	4/5	F	4/5	G	3/5	H	4/5
34	A	2/5	B	5/6	C	5/5	D	4/5	E	2/5	F	2/5	G	5/5	H	5/5
35	A	4/5	B	4/6	C	4/5	D	4/5	E	4/5	F	4/5	G	4/5	H	5/5
36	A	4/5	B	3/6	C	4/5	D	3/5	E	4/5	F	4/5	G	4/5	H	4/5
37	A	4/5	B	5/6	C	4/5	D	4/5	E	4/5	F	4/5	G	4/5	H	4/5
38	A	4/5	B	5/6	C	5/5	D	4/5	E	4/5	F	4/5	G	3/5	H	4/5
39	A	3/5	B	5/6	C	4/5	D	4/5	E	3/5	F	3/5	G	4/5	H	4/5
40	A	4/5	B	4/6	C	3/5	D	3/5	E	4/5	F	4/5	G	4/5	H	3/5

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Stories

A. A Special Dog   B. Spider's Web   C. A Proud American   D. What is Earth Made Of   E. Land Down Under

F. A Very Tough Job   G. The Bottom of the Earth   H. Up Up and Away