THE EFFECT OF GIVING CLASS TIME FOR READING ON THE READING
ACHIEVEMENT OF FOURTH GRADERS AND THE EFFECT OF USING A
COMPUTER-BASED READING MANAGEMENT PROGRAM ON THE
READING ACHIEVEMENT OF FIFTH GRADERS

DISSERTATION

Presented to the Graduate Council of the
University of North Texas in Partial
Fulfillment of the Requirements

For the Degree of

DOCTOR OF EDUCATION

By

Rochelle Peters, B.S., M.E.
Denton, Texas
May, 1998

This study investigated the problem that educators have throughout the state of Texas. The problem educators have is that reading scores continue to fall short of state expectations. This study investigated the effectiveness of 90 minutes of class time given for reading to students who use the Electronic Bookshelf Program and the effectiveness of the use of the Electronic Bookshelf Program, which is being sold to school districts throughout the nation. The literature review focused on the effectiveness of independent reading on reading achievement, and the effectiveness of using computer-based reading programs to increase reading achievement.

The experimental groups and the control groups were randomly selected which allowed for a true experimental design to be used. Two hypotheses were tested using the analysis of covariance.

In this study the first finding was that students which used the Electronic Bookshelf Program and received an additional 90 minutes of reading time did not have a significantly higher reading achievement than those students which used the Electronic Bookshelf Program and did not receive an additional 90 minutes of reading time. Data collected and analyzed did not support research studies that advocated that increased time spent reading significantly affected reading achievement. The second finding was that the students who used the Electronic Bookshelf Program did not have a significantly higher reading achievement than those students who did not use the Electronic Bookshelf Program. The second finding did not support the research studies that suggested that the use of computer-based programs made a significant difference in reading achievement. Suspension of either treatment is not recommended at this time based on this one study.
Based on these findings and conclusions, the following recommendations were made for further research. Conduct longitudinal studies that describe the long term effect of giving student class time to read or of using computer-based management programs on the reading achievement of students below grade level, at grade level, and above grade level. Compare students' attitudes toward reading who use computer-based reading programs or who are given increased time for reading with students' attitudes toward reading who do not use computer-based reading programs or who are not given increased time for reading. Conduct longitudinal studies that describe the long-term effect of using computer-based reading programs on the reading achievement of students based on their learning styles. Compare the cost effectiveness of computer based reading programs to themselves and to reading programs which are not computer-based.
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ACKNOWLEDGEMENTS

I would like to acknowledge my mother—Hilda Whitlock, 1921-1988—whose care, concern, determination, and ability to be a risk-taker has been an inspiration in all my educational endeavors. I would also like to thank my dad—Richard I. Whitlock, 1910-1993—whose high expectations never gave me a chance to give any project less than my best.

A sincere thanks to my committee chair, Dr. Roger Ditzenberger, for his help, patience, and support throughout this study. I would also like to thank my committee members, Dr. Jon Young, Dr. Mickey Wircenski, and Dr. William Brookshire.

I would like to recognize a friend, Dr. John R. Knue, and his wife, Carol, for their personal support and interest that has been most reassuring.

My sincere appreciation to every child with whom I have been in contact with in an educational setting. Their eagerness and abilities to challenge have created in me a driving force that shall never allow me to stop learning and growing.

Finally, my deepest gratitude goes to a special friend, Ted Coleman, who always believed in my goals.
TABLE OF CONTENTS

LIST OF TABLES.................................................................vii

Chapter

I. INTRODUCTION............................................................1
   Background
   Statement of Problem
   Need for Study
   Purpose of the Study
   Hypotheses
   Delimitations
   Limitations
   Definition of Terms
   Summary

II. LITERATURE REVIEW..................................................8
    Introduction
    Historical Perspective on Reading in the Elementary School
    Reading Achievement
    Effective Reading Environments
    Educational Use of Computers
    Electronic Bookshelf Program
    Summary

III. RESEARCH METHODOLOGY..........................................26
    Introduction
    Research Sample
    Research Design
    Instrumentation
    Data Gathering
    Data Treatment Analysis
    Summary
### IV. DATA ANALYSIS AND DISCUSSION OF RESULTS

- Introduction
- Results Obtained from Hypothesis I
- Results Obtained from Hypothesis II
- Summary

### V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

- Introduction
- Summary
- Conclusions
- Recommendations

### APPENDIX

A. Parent Permission Letter for Hypothesis I

B. Parent Permission Letter for Hypothesis II

**REFERENCES**
LIST OF TABLES

Table Page
1. Means and Standard Deviations for Hypothesis I..................36
2. Analysis of Covariance for Hypothesis I ..................................37
3. Means and Standard Deviations for Hypothesis II..................37
4. Analysis of Covariance for Hypothesis II...............................38
CHAPTER I

INTRODUCTION

Background

Dress (1995) supported the belief that the ability to read is one of the most important life skills, if not the most important life skill that a person can have in our society. According to Unwin (1995), literacy is the key that opens the door of opportunity for young people; illiteracy breeds stagnation and unrealized potential. Many children who can read, do not like to read, and do not choose to read for pleasure. Alliterate is the term to describe people of all ages who feel this way (Briggs, 1986). Reading books, both in school and out, is a reliable predictor of reading achievement, and reading disabilities are a major source of academic underachievement in school-age children (Jordan, 1994).

Turner (1992) believed that students who have difficulty reading are less likely to engage in future reading activities. Many of these students display a condition called "learned helplessness" in which they have low expectations, attribute success to factors beyond their control, and are generally apathetic toward reading. Turner also believed that the lack of motivation to read is not limited to only poor readers; both good and poor readers are reluctant to engage in independent and recreational reading. According to Cutting (1992), good readers generally are motivated and interested. Poor readers lack desire, interest, and motivation. Good readers have the ability to set purpose and choose appropriate strategies before, during, and after reading; whereas, poor readers approach all reading the same. Good readers select what is important and hold information for future consideration. Poor readers do not hold information in abeyance and do not select what is important in the passage. Educators are called to structure the reading activity so that all students practice the procedures that good readers use.

More and more children can read, but are choosing not to read (Trelease, 1985). Trelease noted that educators have concentrated their energy on teaching children how to
read, and they have failed to address the attitudes of good readers. Turner (1992) found that students do not read to the extent that they could because of (a) lack of interest, (b) inappropriateness and scarcity of material, (c) lack of reading ability and past failure in reading, (d) a non-reading environment in both the home and school, (e) inappropriate instruction, and (f) conflicting values on the importance of reading.

Alexander and Filler (1976) also believed that when students do not read well, they have a self-defeatist attitude and a negative outlook, and they are viewed as failures. These authors, along with Turner (1992), believed that failure in reading makes the learner feel inferior or incompetent and promotes negative self-esteem within the student. Not having the ability to read can be a great handicap that is often more easily recognized as a handicap by those who cannot read than those who can read. It is important for anyone in society to have reading ability.

Turner (1992) believed that an uninformed populace is on the horizon because student language skills are declining, newspaper readings are declining, textbooks are being simplified, and television is influencing so many with its presence. Wallace (1995), however, believed that computers are driving readers back to reading, and that there is a resurgence in reading. Dress (1995) contended that without the basic skill to read, one does not fit comfortably into society.

States have implemented tests to assess student achievement in reading. Reading achievement is defined as a process by which the reader constructs meaning while interacting with the printed page (Fitzpatrick, 1994). The purpose of the reading tests was to improve reading achievement. In the state of Texas, the Texas Assessment of Academic Skills (TAAS) test was developed to assess the performance of Texas elementary students in reading, math, and writing. The TAAS reading test is given at the end of the school year by the state of Texas and supplies information relating to the effectiveness of the school's instructional reading program. The reading achievement section of the TAAS test is concerned with specific reading skills such as word meaning, supporting ideas, summarization, relationships and outcomes, inferences and generalization, point of view, propaganda, and fact and opinion (Texas Education Agency, 1994).
Turner (1992) believed that students live up to the expectations adults have for them when it comes to reading; therefore, if not much reading is expected of students, they do not do very much reading. Carver and Leibert (1995) believed that the best way to improve one's reading is to read, and that pupils will make their best gains in reading when the material they read is close to their reading level, because that level is neither too easy nor difficult.

Children must spend time reading to become proficient readers (Martinez & Nash, 1991). These authors found that even 10 minutes a day spent by children reading would increase reading achievement substantially. However, teachers have a difficult time convincing students to read for pleasure when families do not value reading, according to Turner (1992). Both school and home literacy environments are significant in making a difference in fostering the interests of children to read.

The Electronic Bookshelf Program is a literature-based/computer-based reading motivation/management system that encourages students to read highly recommended children's and young adult literature for pleasure and/or credit. The program claims to increase reading achievement and to motivate students to read a greater quantity and a better quality of books. According to Dress (1995), these two factors will help to foster a lifelong love of reading. The Electronic Bookshelf Program is based on the following three steps: (a) The student selects a book of his/her choice, (b) the student reads the book at his or her own pace, and (c) the student takes a multiple-choice test over the book on the computer.

**Statement of Problem**

The problem educators have is that reading scores continue to fall short of state expectations. Programs and methods which have been used have increased reading achievement, but not to the extent that the state of Texas requires. The state of Texas set a goal that 90% of its students who take the TAAS test would pass by the school year 1996/1997 (Texas Education Agency, 1997a). This goal was not met; consequently, educators have a need to evaluate and research programs and methods which have made the difference that the state expects in reading achievement. The method which was evaluated in this study is increased time spent actually reading. The program evaluated in this study
is the Electronic Bookshelf Program. The company claims that this program will increase reading achievement scores (The Electronic Bookshelf, 1995). Did increased reading time increase reading achievement, and did using the Electronic Bookshelf Program improve reading achievement?

Need for Study

According to Vaughn (1994), independent reading is not a frill. Independent reading helps students refine reading skills and strategies as they apply them to meaningful text. Independent reading helps students build prior knowledge on many topics which, in turn, helps them improve their reading achievement.

Jordan (1994) stated that persistent reading problems are likely to affect a student’s academic achievement. He holds the belief that, if neglected, these reading problems may result in poor self-esteem, indifference, and lifelong under-achievement. Students with inordinately slow rates of reading may have difficulty keeping pace with assignments in content areas, which can lead to secondary problems with motivation. Jordan’s studies have found that poor readers have smaller vocabularies than do good readers, and that they are less skilled at using the context clues to derive word meaning. By middle elementary school, literacy skills become essential tools for learning in content area subjects.

With the push for increased student achievement, educators find it more and more necessary to refine strategies, methods, and or programs that have increased student achievement. How educators spend their time on instruction can be one of the key factors for increasing student achievement in reading. Studies by the Electronic Bookshelf Program company have been completed showing the significance of using the Electronic Bookshelf Program on the reading achievement of students. No independent studies have been completed showing the significance of giving students class time to read or the significance of using the Electronic Bookshelf Program on the reading achievement of students.

Educators are expected to increase reading achievement; therefore, it is necessary to conduct independent studies that evaluate the effectiveness of the Electronic Bookshelf Program and the effectiveness of using class time to allow students to read independently. Reading achievement has increased, but not as much as it needs to increase. As educators
are asked to spend money on instruction and programs, it is necessary to evaluate the instruction and the programs used. In this study, the Electronic Bookshelf Program is the program evaluated and the method of instruction was independent reading using 90 minutes of class time. In order to continue the use of the program and the method of instruction, the effectiveness of each was evaluated.

**Purpose of the Study**

The first purpose of this study was to determine the effectiveness of the reading achievement of fourth grade students when giving students, who use the Electronic Bookshelf Program, ninety minutes of class time to read. The second purpose of this study was to determine the effectiveness of the usage of the Electronic Bookshelf Program on the reading achievement of fifth grade students. As educators look for programs and methods that help students improve reading achievement, the programs in use must be evaluated. It is a challenge to continue improving reading achievement. As gains are made, it is important to discover exactly which programs and methods make the differences and enable students to become better readers. Programs used thus far have produced some gains; however, most reading experts feel it is necessary to show even more continuous increases in reading achievement. Educators must determine exactly what programs and methods make a difference, so that implementation will enable students to make the gains necessary to become successful students in our educational system and in the work force. The Electronic Bookshelf Program is just one technology program that is used to manage the volume of reading done by students. This study will determine if the implementation of the program makes a difference in reading achievement. Technology is never implemented without large sums of money. Is the money being used on technology making a difference? According the Texas Education Agency (1997a), the reading achievement of students is not where it needs to be at this time; therefore, educators must continue to research, evaluate, and, in turn, use the methods and programs that are proven to result in the most gains.
Hypotheses

Given the purpose of the study, the following two hypotheses were tested:

Hypothesis I

The experimental group which used the Electronic Bookshelf Program and received 90 minutes of daily class time for reading will score significantly higher on the reading achievement test than the control group which used the Electronic Bookshelf Program and did not receive 90 minutes of daily class time for reading.

Hypothesis II

The experimental group which used the Electronic Bookshelf Program will score significantly higher on the reading achievement test than the control group which did not use the Electronic Bookshelf Program.

Delimitations

There are two delimitations which were used by the researcher for this study. The first was to limit the study to two classes in fourth grade and two classes in fifth grade. Second, the participation from the classes was limited to those students who had a TAAS score at the beginning and end of the semester.

Limitations

Three limitations were presumed by the researcher for this study. First, there was no way of knowing what, if any, other books the students read. They may have obtained other books through bookstores, other libraries, or a variety of other sources. Second, there was no way of knowing whether or not the students actually completed the books they checked out from the library. Third, the experimental group was exposed to the treatment (90 minutes of class time a day) for approximately 90 school days, which may not be sufficient time to influence reading achievement.

Definition of Terms

For this study, selected terms are defined in this section. Additional terms are defined at the time of their use, as necessary, in the remaining chapters. The following operational terms are listed in alphabetical sequence, not order of importance.
**Electronic Bookshelf Program**

The Electronic Bookshelf Program is a literature-based/computer-based reading motivation/management system.

**Reading**

Reading is defined as the student reading, not reading instruction given to the student by the teacher or another source.

**Reading Achievement**

Reading achievement is defined as the ability to understand and interpret written text.

**Texas Assessment of Academic Skills Test**

A test that is a criterion-referenced program which represents a comprehensive assessment of the instructional targets delineated in the essential elements which involve higher-order thinking skills and problem solving abilities.

**Summary**

The background for this study supports the belief that students must learn to read and want to read in order to succeed in our society. Successful students spend time reading and successful teachers promote reading by providing literature that can be read and enjoyed by students in the classroom. The problem educators have in Texas is that reading achievement does not meet state expectations. The need to know what works best to increase reading achievement gives us the purpose of this study which is to determine the effectiveness of giving students increased time for independent reading and to determine the effectiveness of using computer-based reading programs. The first hypothesis was to determine the effectiveness of giving students 90 minutes of class time to read on the reading achievement of fourth grade students who used the Electronic Bookshelf Program. The second hypothesis was to determine whether or not the use of the Electronic Bookshelf Program, a computer-based reading management program, affects the reading achievement of fifth grade students. In Chapter II, a review of the literature describes the history and current status of elementary reading and provides substantial support for both hypotheses.
CHAPTER II

LITERATURE REVIEW

Introduction

The literature review was conducted to specifically address these two hypotheses:

Hypothesis I

The experimental group which used the Electronic Bookshelf Program and received 90 minutes of daily class time for reading will score significantly higher on the reading achievement test than the control group which used the Electronic Bookshelf Program and did not receive 90 minutes of daily class time for reading.

Hypothesis II

The experimental group which used the Electronic Bookshelf Program will score significantly higher on the reading achievement test than the control group which did not use the Electronic Bookshelf Program.

The theoretical base or framework for this study is founded on the theory, discussed by Martinez and Nash (1991), that children must spend time reading in order to improve reading achievement. Carver and Leibert (1995) believed that the best way to improve one's reading is to read. Students will make their best gains in reading when the material they read is close to their reading level. The Electronic Bookshelf Program claims that its literature-based/computer-based motivation/management system is a tool that motivates children to read more books and higher quality titles while improving test scores.

The following forms of literature were reviewed to support the purpose of the study and the two hypotheses: (a) refereed and non-refereed journals, (b) periodicals, (c) books, (d) state government legislation and policy, (e) Educational Information Resources Clearinghouse (ERIC) documents, (f) dissertation abstracts, (g) dissertations, and (h) other general information about reading achievement.

The literature review addresses five areas. First, it provides a brief history of reading in elementary schools. Second, the literature review explores reading achievement.
Third, the literature review covers effective reading environments. Fourth, it elaborates on the educational use of computers. Fifth, it covers a review of the Electronic Bookshelf Program.

**Historical Perspective on Reading in the Elementary School**

Heilman, Blair, and Rupley (1994) explained that, historically, reading was seen as a passive process which depended on the development of hierarchical skills. Instruction was focused on decoding skills, and the students did not progress until each set of skills was mastered. Cheek, Flippo, and Lindsey (1989) called this a “skills-based” approach.

Reading was viewed as a collection of skills and subskills, and some reading researchers tried to differentiate these skills into a scope-and-sequence (hierarchy) type of relationship (that is, what skill would be taught at what grade level and in what order), and attempts were made to dissect skills into smaller component parts and subparts. (p. 12)

According to Cheek et al. (1989), this concept emphasized decoding and comprehension and was from the writer’s perspective, thus, it was a “test-based perspective” (p.12), i.e., basal instruction.

Overtime, cognitive psychologists caused us to take a second look at our conception of the reading process. According to Cheek et al. (1989), “reading was described as a natural process and as a part of the other language processes, and within these contexts there was considerable interest in the students’ psycholinguistic experiences” (p. 13).

Dole, Duffy, Roehler, and Pearson (1991) provided a concise summary of this thought:

The cognitive views of reading present a different view of the reader. The traditional view assumes a passive reader who has mastered a large number of sub skills and automatically and routinely applies them to all texts. The cognitive view assumes an active reader who constructs meaning through the integration of existing and new knowledge and the flexible use of strategies to foster, monitor, regulate, and maintain comprehension. The only thing that becomes automated in the newer view is the disposition to adopt strategies to the particular constraints in the act of comprehending a particular text. (p. 42)
Dole et al. (1992) stated that knowledge is not acquired "as a collection of abstract entities but rather is constructed in the context of the environment in which it is encountered. Context is integral to understanding" (p. 1). According to Baker (1979), good readers actively construct meaning and monitor their own comprehension by questioning, reviewing, revising, and reading the material more than once. Saracho (1983) purported that there was evidence which indicated that knowledge about cognitive strategies used during reading helps students glean awareness of their involvement and role in the reading process. Frank Smith (1972) believed that for a student to be a fluent reader, the student must learn to use nonvisual information while at the same time attend to print. This author referred to background knowledge as "nonvisual information" (p. 178), and stated that "reading is possible only when the reader can bring sufficient nonvisual information to bear to reduce the amount of visual information as economically and efficiently as possible" (p. 178).

Comprehension instruction was based on constructivist principles (Flood & Lapp, 1990). The experiences of the readers have great significances, as they are the building blocks for the construction of meaning while reading text. Thus, teachers must assume and develop instruction on the premise that students are active learners involved in creating meaning out of the information presented.

The theories of constructivism and whole language education are compatible. Whole language theory has been implemented by reading teachers since the early 1970's (Cheek et al., 1989). Raines (1995) presented the works of Piaget and Vygotsky:

Learners make predictions by sampling information, then confirming or rejecting their predictions. If the learner's predictions are confirmed or verified, the information is assimilated and they continue sampling. If their predictions are rejected, they must either abandon or adjust their predictions and sample for additional information. New information may cause learners to organize their thinking into new constructs or schemata, indicating a process of accommodation. The depth of learning will be determined by the quality of the predictions, the samples of information, and the prior knowledge of the learners. (p. 5)
Raines (1995) believed that whole language teachers perceive reading as the process of interacting with text, relating to prior knowledge, and creating meaning. At the present, in elementary school we see this theory applied to reading instruction. Heilman et al. (1994) identified the six following strands in elementary reading curriculum: "(1) word meaning; (2) word recognition; (3) comprehension; (4) reading study skills; (5) recreational or independent reading; and (6) literature. Each strand is fostered through instruction and an abundance of practice in meaningful text" (p. 9). These strands are interwoven in daily instruction and better developed by reading quality literature.

Reading Achievement

Leland and Fitzpatrick (1994) concluded that reading books both in school and out is a reliable predictor of reading achievement, and that students who choose not to read are at risk in terms of past, present, and future learning. Anderson, Fielding, and Wilson (1988) believed that the vast amount of research on the affective domain has allowed educators to know with great certainty that children who have made positive associations with reading tend to read more often, for longer periods of time, and with greater intensity than those children with negative associations. Anderson et al. (1988) believed that this deeper engagement in reading translates into superior reading achievement. Henk and Melnick (1995) concluded that when children feel negatively about reading, their achievement tends to suffer. They also believed that these children will either avoid reading altogether or read with little involvement.

Bloome (1985) suggested that reading is not only a communicative process, but also a social process. He argued that this process includes social relationships among people, among teachers and students, among parents and children, and among authors and readers. He claimed that the values attributed to reading in today's classrooms may involve both the social status and social position of the reader, and that poor readers may be viewed as outcasts and nonparticipants and act accordingly over time at school and in social environments.

The primary goals of reading instruction are reading for pleasure and information. Turner (1992) believed that gains in reading ability, vocabulary development, and reading comprehension are each directly related to the amount of leisure time spent on reading.
"Free voluntary reading is one of the most powerful tools we have in language education" (Krashen, 1993, p. 1). Independent reading empowers the students. Hardt (1993) contended that books were not conceived for the purpose-filled end of teaching language. Literature becomes a focus of the reading instruction in order to facilitate receptive and expressive language growth. The richness and joy of literature should become the center of literacy teaching. Children who read a great deal read more effectively. Their reading is impacted, and their total language portfolio is impressive (Hardt, 1983).

Pollak (1994) suggested that when educators give reading real world applications and allow student-centered classrooms to flourish, they provide an environment in which students' need for power, freedom, belonging, and fun are fulfilled. When these needs are addressed, motivation becomes intrinsic, and students no longer interact with teachers who tell them exactly what they must do, but instead thrive in surroundings that help them meet their needs. Schubert and Togerson (1972) suggested that when students are supported as readers and writers within the school environment, when learning parallels learning outside of school, when learning is authentic, and, therefore, serves a real function, then students begin to engage actively as learners. It is then that they begin to construct and share and build on knowledge rather than simply receive it. Comprehension instruction takes place not in directed reading instruction, but in the application of learned skills when reading in natural text.

Wepner (1993) gave us another reason for independent reading.

This brings us to another educational advantage of literature as content; it develops children's concept of story, thus aiding the comprehension of narrative text. Children... who read good literature regularly, learn to think along with the author, anticipating character and plot development. They expect to find a problem to be solved and predict ways the main character will work things out. (p. 155)

Garofalo (1995) believed that average reading levels of students appear to profit, in terms of reading test scores and improved reading attitudes, from having daily periods of reading time to read material of their choice. He thought that when these daily periods of reading time are given to students to read material of their choice, along with focused activities, the increase is more dramatic. Time also seems to be a factor. The longer
independent reading is employed, the more successful the reading achievement of students. Reading should permeate the entire curriculum as students engage in reading, writing, speaking, listening, thinking and problem-solving activities (Fitzpatrick 1994). Just giving students a number of minutes to read is not enough to impact reading. Leu and Kinzer (1991) pointed out that the more interested children become in books, the more time they will invest in reading, both inside and outside of school; therefore, committed readers will become better readers. Independent reading motivates a love for reading as it promotes a habit of reading (Sanacore, 1992).

**Effective Reading Environments**

Ciani (1981) examined the possibility that although reading ability may be low, reading interest does not need to be. He believed that students read at higher levels when they are reading material of interest to them, and that reading interesting material stimulates further reading. Building instruction around high-interest materials and activities allows a student to explore literature that excites him or her, and this in turn increases potential for positive attitudes in low-ability students.

According to Palmer and Codling (1994), individuals try to attain goals they value and they think they can achieve, based on their beliefs about their competence in a particular situation. Guiding students to set individual goals and to compete with their own performance will develop a true community of learners (Castle, 1994). Realistic goals represent achievement that is just slightly higher than past performance and that is attainable within a given period of time. Castle believed that students must have access to a sufficient quantity of books and other print materials on a wide array of topics and a variety of levels. Time to select and use materials is also critical for producing readers who can and do read. Cecil (1989) found that when teachers set high expectations in reading, poor readers were challenged and encouraged to do their best and managed to tackle tasks that seemed impossible.

Wisendanger and Bader (1989) asked 189 children, ages 9 through 12, what motivated them to read. Most of the students said they wanted to be rewarded for reading. The most popular rewards all involved allowing the students more flexibility and independence. Students wanted a choice. They found that for higher ability students who
already like to read, stars and names on bulletin boards would not cause them to read more. These students’ comments were in line with research which suggested that providing extrinsic rewards to intrinsically motivated students has negative effects, perhaps because it replaces a deep motivation with a temporary one. Teachers will not get students to read more by creating a publicly displayed competitive atmosphere.

Extrinsic rewards are typically used to increase student motivation. These rewards vary depending on student interest and must be meaningful in order to be effective (Epanchin et al., 1994). Kerr and Nelson (1989) defined extrinsic rewards as consequences that strengthen or increase the frequency of behavior they follow. According to Kohn (1996), “giving rewards for compliance can be tracked back to B. F. Skinner’s view of all organisms, including us, as devoid of ourselves. We are nothing more than ‘repertoires of behavior’ that can, in turn, be completely explained in terms of things (‘environmental contingencies’) outside of us” (p. 69). Slavin (1991) stated that “another implication of expectancy theory is that all students must have a chance to be rewarded if they do their best, but no student should have an easy time achieving the maximum reward” (p. 346-7). The Electronic Bookshelf Program uses extrinsic rewards. Schools that use this program develop a way for students to redeem the points they earn. Rewards vary greatly, but they are all extrinsic in nature.

According to Chance (1992), in order to get many students to the point where learning is self-satisfying, extrinsic rewards may have been used first. Another point of view is present by Kohn (1996), who stated:

Students may have become dependent on extrinsic devices. The more you control people, such as with bribes and threats, the more you feel you have to control them, because they have grown accustomed to either doing what someone else tells them or to rebelling. It takes time and effort to help students construct their own reasons to act responsibly and generously. (p. 142)

There are two main problems with using extrinsic rewards. First, students too often work for the reward itself and not the satisfaction of mastering the material. Secondly, students may become dependent on the reward giver (Ames, 1995). As Kohn (1996) stated, “extrinsic rewards...actually undermine the intrinsic motivation that
promotes optimal performance” (p. 69). In other words, reward kills interest. Intrinsic motivation, on the other hand, is “a powerful predictor how good a job someone will do in the workplace or how successfully he or she will learn in school” (Kohn, 1996, p. 69).

Schlessinger (1984) believed that as students learn to enjoy reading, their motivation shifts from external to internal, and their reading skills, vocabulary, composition skills, and general knowledge are greatly improved. Castle (1994) found that as students discover the intrinsic rewards of literacy, shared learning sparks new interests and new explanation.

Numerous reports seem to have a common factor when it comes to motivating students to read (Castle, 1994; Lessene, 1991; Schlessinger, 1984). That factor is that students need a role model. They need to observe for themselves that reading is valuable. Parents serve as role models for early literacy development. As children watch their parents, they have the opportunity to see that books, magazines, and newspapers are an enjoyable and regular part of daily life (Dumast & Aldridge, 1995). Parents need to understand that two simple activities, (a) increasing the amount of daily independent reading their child does, and (b) reading to their child, have the strongest possibility of affecting progress (Castle, 1994).

Lesene (1991) gave several suggestions for developing quality lifetime readers. Lesene, like Castle (1994), believed that children need role models to emulate. Teachers and parents must be readers. School must not only reflect the importance of reading, but also assist in developing an appropriate home environment by informing parents of appropriate materials and resources. Lesene suggested referring parents to publications for students, inviting them to do a read aloud or book talk during class, and sending home a list of books which would make good gifts for special occasions. Students need to see adult role models reading. Adults need to talk to students about books, the books read to them and the books they read. Lifetime readers are made, not born, and the love of reading is not innate; it is a habit that must be cultivated.

Labbo and Teale (1990) believed that reading to a younger child helps an older student with reading problems to develop positive reading behaviors. Reading to a younger student gives the poor reader the feeling that he or she has made a positive
contribution to another human being, which often results in an increase in the confidence and self esteem of the older student. According to Henk and Melnick (1995), how an individual feels about herself or himself as a reader could clearly influence whether reading would be sought or avoided, the amount of effort that would occur during reading, and how persistently comprehension would be pursued.

**Educational Use of Computers**

According to Levine (1989), an increasing number of studies of technology use in schools focus on the implementation process and provide a basis for preliminary recommendations regarding the use of technology to support education change. Those who market technologies recognize the unfortunate situation taking place, where technologies are purchased for technologies' sake rather than as a means to an instructional goal, as indicated by two software marketers interviewed by Levin (1989):

> Schools find it hard to know where they're going with computers. No one knows. Schools are really just trying to keep up. Despite all the advice that says to look at the courseware first, schools never look at software first. (They acquire computers and then search for software.) They're so quick to spend money, they end up doing it haphazardly. (p. 24)

Technologies, per se, do not embody a particular set of curricular or pedagogical goals. The writing of Cuban (1986) and Cohen (1988) suggested that unless the school staff starts out with an instructional goal, any technology bought and implemented is most likely to be used to reinforce the status quo. Piele (1989) argued that this is exactly what happened with microcomputers in most schools, where they became a drain on resources and just added to the burdens of teachers who already were trying to do too much.

Unless teachers have a clear vision of how the technology can improve teaching and learning, teachers will find little incentive to tackle the technical and scheduling problems that are associated with technology. Calfee (1991) argued that education reform or change requires the involvement of not just the classroom, but of the school as a whole. In order for students to experience a new kind of education that places real value on extended intellectual effort and problem solving, this kind of thinking needs to be encouraged not just in one unit or one class, or even in one year, but throughout the student’s school
experience. This requires a school's teachers to come together and to work with administrators to develop a unifying set of goals. Although principles may be embodied somewhat differently in different classrooms, adherence to a consistent set of principles can unify the school.

Given reformers' goals, a) use of authentic, challenging multidisciplinary tasks, and b) promotion of active learning and collaborative work, schools will find that there is much they can start doing to prepare students for this kind of work without technology. For example, they may have students work on collaborative research projects with traditional paper-based tools. Some schools found that a common set of instructional goals to work towards was important in maintaining project identity and momentum when they encountered the inevitable delays in the delivery of hardware and software (Stearns, Hanson, Ringstaff, & Schneider, 1991). Such activities prepare students and teachers for their new roles in subsequent technology-enhanced projects. Moreover, they start moving the school toward education reform now, without waiting for the approvals, funding, delivery, and training that precedes the use of new technology.

Wiske, Niguidual, and Shepard (1988) interviewed 76 teachers concerning their experiences with integrating technology into their classrooms. The teachers were nearly unanimous in concluding that, initially, the use of computers made teaching more difficult. They not only had to plan how technology could be incorporated into their lessons, but also had to work through the logistical problems of deciding which students could use the computers at what times.

Hardware and software problems are also common in the early stages of technology implementation. Evaluations of the Model Technology Schools in California (Stearns et al., 1991) documented similar problems and found that the presence of on-site assistant for the technology is critical for success. Districts found that moving technical assistance personnel from a central site out into the schools during the implementation process was also important in making curricular and instructional improvements.

Many of the early technology enthusiasts dreamed of the "teacher-proof" system, embodying sound principles of teaching and learning and engaging students directly, without the interference of a teacher whose knowledge base might be incomplete or whose
pedagogy might be faulty. Studies of classroom implementations of technology have demonstrated that this goal was unrealistic and could not be supported. Teachers can subvert practically any kind of instructional material to their own goals and ways of teaching (Cuban, 1986). At the same time, even the best software programs will be inadequate for many circumstances. Zorfass (1991) described the abysmal failure of the Carmen Sandiego program with a class of inner-city students who were not fluent in English and knew little about geography, American culture, or how to use reference materials. Lacking the needed background, they could not engage in the kind of problem solving the game was designed to evoke. Only when the teacher developed an instructional program around the software, having students work in small groups rather than individually, and teaching skills and knowledge needed to play the game, were students able to profit from the game.

Only after teachers were given training in how to work the multimedia content into their lesson plans did teachers start effectively using the technology available to them (Yoder, 1991). If the technology and its content did not pose challenges to teachers, the new curricula and teaching strategies associated with education reform did pose challenges. Introducing complex multidisciplinary projects and a strong element of student control meant opening the door for students to explore content areas that were unknown to the teacher. Acting as a coach for small groups of students working cooperatively requires diagnostic and management skills which are not called on when teaching is equated with lecturing. Smith and O'Day (1990) pointed out that pre-service education for teachers does not equip them for these roles. Teachers need support for deepening their knowledge of content areas for learning new teaching skills. Both outside advisors and fellow teachers trying to implement the same or similar innovations should serve as advisors.

Parents and business representatives, seeing how technology has transformed the workplace and concerned for the economic survival of their children and their community, have demanded schools to implement and use technology. Such calls for the infusion of technology into school are not usually accompanied by clear ideas concerning just what should be taught using technology or how it could be taught. The chances for success are
increased when parents and the community help set the instructional goals of the reform and understand the implications in terms of cost, other forgone activities, and likely effects of test scores.

The Effective Schools literature showing the value of parent and community involvement (Epstein, 1984; Herman & Yeh, 1983) implied that these groups should be made participants in the process of technology-supported education reform. Partnership meant sharing in developing the instructional goals of the reform and taking responsibility for helping to support them. This required much more than unfocused enthusiasm concerning computers or videoconferencing (Ubben & Hughes, 1992).

Obtaining community understanding and support will not always be easy. Education reform goals are based on a particular (constructivist) view of learning. This view is in direct contention with conventional notions of knowledge as a set of facts and teaching as the telling of facts. Cohen (1988) pointed out the prevalence of the conventional view:

Contrary to most reformers' beliefs, these (conventional) views elicit profound attachment from many children and adults...The conceptions and practices that reformers wish to replace are not simply obsolete, boring, and stupid impositions...Traditional approaches to instruction contain coherent and defensible views of knowledge, teaching, and learning...One part of this scholastic inheritance is the widely shared conviction that valid academic knowledge consists of facts. Facts are found in books and teachers' lectures. Efforts to suggest that there is more to academic knowledge than facts—that it consist of ideas about facts, or that facts have no meaningful status unless embedded in ideas about them, or that students are authors of ideas and therefore creators of academic knowledge--violate this view. For if knowledge does not consist of facts, well established and stored in authoritative locations, how can it be trusted? Anyone can make up ideas. If knowledge is composed or constructed—which is to say, made up—by little children, or even by schoolteachers, how seriously can it be taken. (pp. 256-257)
A misunderstanding of a project's intentions and likely outcomes has lead to community backlashes and killed school projects.

According to Schulz (1992), at the Belridge School in McKittrick, California, computers were purchased for school and home use for every student and teacher in the school. Laser-disc players, television news shows, and setting up administering computer-based presidential elections were innovations within the configuration. Two years later, when student scores on the Iowa Test of Basic Skills for the first year of the technology implementation were released, parents were shocked to see that their students scored no higher than before and slightly below the national median. Failing to consider the difference in focus between the technology-based projects and the standardized test, and the immaturity of the implementation at the time the students were tested, parents picketed the school and elected a new school board with the mandate to find a new “back to basics” principal. Computers were removed from student desks and pushed to the rear of the classroom or sold (Schulz, 1992).

Concern over the quality of education and the resolve to hold schools accountable for student learning have made assessment a “high-stakes” activity. Districts and schools are rewarded and punished on the basis of the average test scores of their students. In striving for compatibility across sites and for cost-effectiveness, the standardized tests which are used for these evaluations consist almost entirely of multiple-choice questions covering many discrete topics. Basic skills are stressed. To avoid favoring one curriculum topic over the other, test developers measure reading comprehension using material that is likely to be new to everyone. Therefore, particular knowledge that may have been learned, the ability to regulate one’s own sustained intellectual inquiry, and advanced skills generally go untested. The education system may unwittingly subvert efforts to teach more advanced skills by judging districts, schools, principals, and teachers on the basis of their students’ abilities to use technology-enhanced instruction which is aimed at very different learning outcomes than the test itself. (Means, 1994).

It is wise for educational innovators to confront the assessment issue as early as possible. Although district and state testing policies may be beyond local control, the school or classroom can at least take steps to collect additional assessment data which is
more compatible with the goals of their innovations. Good standardized measures of many advanced thinking skills are lacking, but schools can at least choose among the more appropriate subtests from standardized test batteries (e.g. reading comprehension as opposed to work attack skills, math problem solving as opposed to numerical operations) and can supplement these measures with writing samples, portfolios, and other concrete evidence of student achievement.

Chandler (1985) postulated that, “Computers are general purpose intellectual tools, are more widely available outside schools than inside them, and perhaps with wider implications for what and how we learn than whatever we do in schools in the name of extending literacy” (p. 4). Computers have transformed the way we read. Children have used computers to practice the basics, and adults have used them to improve speed and comprehension. Advanced technology has allowed us to study the reading process, and reading itself has changed the more text is in electronic form (Costanso, 1989).

Computers are used in a multiplicity of ways in the educational setting. In the early 1980’s, computers were seen as teaching machines. Early computer advocates such as Taylor (1980), provided educators with a vision for the potential of computers. He saw them as vehicles for instruction (tutor), assistance (tool), and creative problem solving (tutee). According to Strickland, Feeley, and Wepner (1987), in the tool mode the computer assisted in such areas as calculation, information retrieval, and word processing. As a tutor, the computer served basically as a reinforcement device. Finally, as a tutee, the computer user taught the computer by way of compatible programming language.

Strickland et al. (1987) stated that “Computers are appearing in ever-increasing numbers, teachers, including reading teachers, want to know how to use them easily, effectively, and efficiently” (p. xiii). These authors cited several uses of the computer in the classroom. As a tool, there are many software programs that provide for teacher utility, readability assessment, and informal reading assessment. These programs enable teachers to create skill exercises and tests, or to develop word games and puzzles. Packages that deal with readability assessment give a quantitative estimate for the difficulty of a text. There are many software packages available that provide for informal assessment of a variety of reading skills. In addition, Strickland et al. (1987) noted the time saving value of the
computer in creating filing systems for information management and retrieval. The retrieval factor applies not just to teachers, but also to student use. A common example in the elementary school is the electronic encyclopedia.

In the tutor mode, the computer works with software that has already been programmed to provide instructional assistance. In the literature this is often referred to as Computer Assisted Instruction (CAI). The early focus of this software was mathematics, which lent itself to this type of instruction, commonly referred to as drill and practice. Some software packages offer whole tests and promote more active student participation (Strickland et al., 1987). Such programs are referred to as interactive in that they elicit student reactions to presented text. This software encourages divergent thinking.

Using the computer as a tutee involves programming the computer to respond according to the user's commands. For the students, this involves thinking about the organization of ideas for the desired output. The literal inferential, critical, and creative skills involved have a high correlation to skills needed for reading comprehension (Strickland et al., 1987).

Educational uses for the computer have expanded over the past decade. At the same time, the United States has heard a cry for educational reform (Means, 1994). While the state of the art grew quickly, the state of practice did not. Practices have not kept up with technology. Means believed that the hope for the future lay in educators' revising instructional goals so that technology is not seen as an end in itself, but as a support in the entire curricular structure. Olson and Wise (1986) pointed out that ongoing innovations in technology would continue to provide for options in instruction.

Bronner (1997) stated that, given the price of technology and lack of data on the benefits, the conviction that computers are fundamentally altering the modern era, and that, therefore, children ought to be involved with them at the earliest possible age, is facing an intellectual backlash. According to Bronner, school systems nationwide have invested in high-priced machines and software with the conviction fostered by the White House that there is no greater good America can offer schoolchildren than computers.

Oppenheimer (1996) found that the work of one California task force concluded that more than any other single measure, computers and network technologies, properly
implemented, offer the greatest potential to right what is wrong with our public schools. Other options in the group’s report were reducing class size, improving teacher’s salaries and facilities, and expanding hours of instruction. All these options were considered less important than putting students in front of computers.

Sava (1997) concluded that the Education Department’s goal to have one computer for every five students is complicated and expensive. Today, we have one computer for every ten students, according to the department. Sava found that providing one for every five students, the Rand Corporation estimates, would require an annual investment of eight billion to twenty billion which includes the wiring of schools and teacher training. He also stated that the Milken Foundation found that sixty-one percent of registered voters would support a federal tax increase of a hundred dollars to speed technology in the schools. Ninety percent believe that schools with computers can better prepare students for jobs. Independent studies have shown that computers make no difference in achievement. Studies by computer program companies have shown that computers and computer programs do make a difference. In one New Jersey middle school, widely cited for raising achievement scores, the improvement occurred before computers were introduced and could, therefore, be attributed to other changes: longer class period, new books, after-school programs, and an emphasis on student projects (Sava, 1997).

Miller (1980) pointed out that how computers are used in language arts instruction is tied to a more fundamental issue of how the subject should be taught. Those teachers who ascribe to the whole language approach make use of the computer as a word processor, as an interactive device, and for computer-guided writing programs.

**Electronic Bookshelf Program**

The Electronic Bookshelf program relies heavily on the use of the computer as a tutor and a tool. The immediacy of the feedback and scoring of points make it attractive for use by students. Also, the computer program keeps track of individual students and class groups. It also prints various reports, making it a useful tool for the teacher.

The Electronic Bookshelf Program is based on three steps that the student will be required to follow. The student first selects a book of his or her choice. The student reads the book at his or her own pace. Lastly, the student completes a multiple-choice reading
test covering the content of the book. The student uses the computer to take the multiple-choice test.

Each student is allowed access to the computerized test using the Electronic Bookshelf Program. Each student finds his or her name from the data base and then chooses the title of the book he or she has read from a data base. The student then answers the multiple-choice questions on the computer. The student is allowed to change an answer if the student decides a mistake has been made while responding, but once the student moves on to the next question, the final answer is locked into the computer. After the student answers all questions on the test, the computer scores the test.

Students are awarded points for the book, that has directly related to the length of the book and the degree of difficulty. The student has to answer seventy percent of the questions successfully in order to receive a score. The student is able to assess the book test again if he or she can not successfully make a passing score for the test. The student can review the test questions. The test which is taken after the first try will have a different set of questions.

After the test is taken and scored, the student’s score is automatically added to his or her previous score, and then the student is able to assess his or her point total. The title of the book is added to the student’s book list after each successful test. Each student has control over the the choice and level of difficulty of each book he or she selects. Students can read as much as they want inside class or outside of class. Students accumulate points and receive rewards for collecting points.

The Electronic Bookshelf Program claims that students are motivated by selecting their own books, earning points, and working toward rewards. The computer management system offered by the Electronic Bookshelf promotes a familiarity and competency with technology for students in a school setting. Working with the computer to complete the multiple-choice test also challenges and motivates students to read, as claimed by the company.

Summary

The review of the literature does support the claim made by Pollack (1994) that when students are immersed with literature and take ownership of their own reading, they
become competent readers who are motivated to read. The process of becoming a good, mature reader is intricate. It is apparent that the act of reading promotes better readers. The challenge for educators is to find and use the most effective and developmentally appropriate means to promote reading achievement. Independent studies have shown that the use of technology in the classroom does not increase academic achievement. Studies done by companies that sell computer programs have shown that the use of technology in the classroom does increase academic achievement.

The Electronic Bookshelf Program addresses the issue of independent reading in a logical manner. The Electronic Bookshelf Program uses technology to motivate students to read independently. This program allows students to read at a wide variety of reading levels, to test at their own pace, and to use a point system to track performance.

The first purpose of this study was to determine the effectiveness on the reading achievement of giving students 90 minutes of daily class time to actually read when students use the Electronic Bookshelf Program. The second purpose was to determine if the implementation of the Electronic Bookshelf Program made a difference in the reading achievement of students. In this study, the Electronic Bookshelf Program is the program evaluated and the method of instruction was independent reading using 90 minutes of class time. In order to continue the use of the program and the method of instruction, the effectiveness of each was evaluated.
CHAPTER III

RESEARCH METHODOLOGY

Introduction
This chapter describes the procedures that were followed in completing this study. Specifically, this chapter includes the following sections: (a) research sample, (b) research design, (c) instrumentation, (d) data gathering, and (e) data treatment analysis.

Research Sample
The research sample consisted of two fourth grade classes and two fifth grade classes. The sample, administration, staff, and curriculum of all four classes were closely matched. Students were eliminated from both the experimental and the control groups if they were exempt from taking the TAAS test because they received Special Education services for reading.

For both hypotheses, one of the classes received the treatment, and the other did not receive the treatment. The subjects were randomly chosen for the study because the students were randomly selected for the classes. A table of random numbers was used to assign each student by chance to a class.

For Hypothesis I, the experimental group consisted of 20 students, of whom 10 were males and 10 were females. The experimental group received the treatment for one semester. The control group was made up of 22 students, of whom 9 were males and 13 were females.

For Hypothesis II, the experimental group consisted of 18 students, of whom 10 were males and 8 were females. The control group consisted of 16 students, of whom 8 were males and 8 were females.

Research Design
To test both hypotheses, an experimental randomized pretest-posttest control group design was used. This design was chosen because the study intended to examine a cause-effect relationship, because the manipulation of a variable was possible, because a
pretest was possible, and because a control group was possible. The use of a pretest as a
covariate allowed posttest differences to be attributed to the treatment and not to initial
differences between the two groups. The use of random selection allowed pretest-posttest
differences to be attributed to the treatment and not other variables such as age, aptitude,
prior education, socioeconomic class, or a measure of performance. A “true” experimental
design was used because randomization was possible.

Design number four (Campbell & Stanley, 1963) is the research paradigm that was
used in testing the first research hypothesis:

\[ RO_1 \times O_2 \]
\[ RO_1 \quad O_2 \]

\( O_1 \) represented pretest scores which were scores on the third grade TAAS test given
at the beginning of the semester to fourth grade students.
\( O_2 \) represented posttest scores which were scores on the third grade TAAS test
given at the end of the semester to fourth grade students.
\( X \) represented the treatment which was 90 minutes of daily class time given for
reading.

In this study, the independent variable was time given to reading and the dependent
variable was reading achievement.

Design number four (Campbell & Stanley, 1963) is the research paradigm that was
used in testing the second research hypothesis:

\[ RO_1 \times O_2 \]
\[ RO_1 \quad O_2 \]

\( O_1 \) represented pretest scores which were scores on the fourth grade TAAS test
given at the beginning of the semester to fifth grade students.
O2 represented posttest scores which were scores on the fourth grade TAAS test given at the end of the semester to fifth grade students.

X represented the treatment which was usage of the Electronic Bookshelf Program.

In this study, the independent variable was the Electronic Bookshelf Program and the dependent variable was reading achievement.

According to Borg and Gall (1989) the following steps are involved in using a pretest-posttest control-group design:

1. random assignment of research participants to experimental and control groups,
2. administration of a pretest to both groups,
3. administration of the treatment to the experimental group but not to the control group,
4. administration of a posttest to both groups. The experimental and control groups must be treated as nearly alike as possible except for the treatment variable (p. 495).

The pretest-posttest control-group design effectively controls for eight threats to internal validity: (a) history, (b) maturation, (c) testing, (d) instrumentation, (e) statistical regression, (f) differential selection, (g) experimental mortality, and (h) selection-maturation interaction.

Instrumentation

This section explains the instrument that was used in the study to measure reading achievement which was the Texas Assessment of Academic Skills test. The Texas Assessment of Academic Skills (TAAS) test provided pretest and posttest reading achievement scores. The TAAS test was administered to students at the beginning of the first semester and at the end of the first semester.

Reliability is the first and foremost technical characteristic of any measurement endeavor (Texas Education Agency, 1997b). Because the TAAS test provided observed scores which served as a proxy for direct measurement of underlying achievement levels, the scores contained some amount of error, and test reliability quantified this error. Test reliability indicated the consistency of measurement. TAAS test reliabilities were based on
internal consistency measures, in particular on Kuder-Richardson 20 (Texas Education Agency, 1997b). Kuder-Richardson 20 is a mathematical expression of the classical measurement definition of reliability. Most Kuder-Richardson 20 reliabilities are in the high .80 to low .90 range. The Kuder-Richardson 20 reliability for third grade reading was .909, and the Kuder-Richardson 20 reliability for fourth grade reading was .908 (Texas Education Agency, 1998).

The classical definition of reliability states that reliability is the ratio of true score variance to observed score variance, where the observed score variance is defined as the combination of true score variance and error variance (Texas Education Agency, 1997b). As error variance is reduced, reliability increases.

The standard error of measurement was calculated using both the standard deviation and the reliability of test scores and represented the amount of variance in a score resulting from factors other than achievement. The standard error of measurement was based on the premise that underlying traits, such as academic achievement, cannot be measured exactly without a perfectly precise measuring instrument. The standard error of measurement can be helpful for quantifying the margin of error that occurs on every test. It is particularly useful for determining a student's true score, which is assumed to fall within one standard error of measurement of the observed score 68% of the time (Texas Education Agency, 1997b).

Validity is the process of collecting evidence to support inferences from the use of the resulting scores from an assessment. The TAAS test validity was content-based and tied directly to the Texas Essential Elements which is the state-mandated curriculum. Advisory committees consisting of educators from districts across the state were formed for each grade and subject area and participated in all phases of test development. These committees worked together to develop test objectives, instructional targets, specifications, and test items. Field test data collected on the items was analyzed and committee members identified items that they deemed eligible for use on the tests. This process took place over a seven-year development process and at the end of 1995-1996 school year had included more than 4,600 Texas educators. The test construction process ensured the content validity of the assessment (Texas Education Agency, 1997b).
When discussing the validity of achievement tests, content and construct validity become somewhat obscured. Content validity describes whether the test objectives adequately represent what students should be able to do and whether the items, which are based on test objectives, measure intended responses. Construct validity is the extent to which a test can be said to measure a theoretical construct or trait. The construct tested was the mastery of academic content required by the state-mandated curriculum, the Texas Essential Elements. The essential elements in this curriculum reflect the operational definitions of subject-area curriculum which was required in this study. The construct validity was grounded in the content validity of the TAAS test (Texas Education Agency, 1997b).

The TAAS test was a criterion-referenced test. A criterion-referenced test is a measurement that relates test items to specific learning objectives. In this case, the specific learning objectives are described as essential elements in the state’s curriculum. Teachers in the state of Texas are required to teach the essential elements.

The reading section of the TAAS test consisted of the following six objectives: (a) the student will determine the meaning of words in a variety of written texts; (b) the student will identify supporting ideas in a variety of written texts; (c) the student will summarize a variety of written texts; (d) the student will perceive relationships and recognize outcomes in a variety of written texts; (e) the student will analyze information in a variety of written texts in order to make inferences and generalizations; and (f) the student will recognize points of view, propaganda, and/or statements of fact and nonfact in a variety of written texts. Each objective within the test contained three to four separate competencies which are described in the following paragraph.

Determining the meaning of words in a variety of written texts tested the following competencies: (a) knowledge of the meaning of prefixes and suffixes to determine the word meaning; (b) the use of context clues, such as synonyms, antonyms, definitions and explanations, descriptions or examples to determine the meaning of words; and (c) the use of context clues to determine the meanings of specialized or technical terms. Identifying supporting ideas in a variety of written texts required the following skills: (a) recalling supporting facts and details, (b) arranging events in sequential order, (c) following
complex directions, and (d) describing the setting of a story. Summarizing a variety of written texts required these skills: (a) identifying the stated or paraphrased main idea of a selection, (b) identifying the implied main idea of a selection, and (c) identifying the best summary of a selection. Perceiving relationships and recognizing outcomes in a variety of written texts involved identifying the cause or causes of a given event or a character's actions and predicting probable future actions and outcomes. Analyzing information in a variety of written texts in order to make inferences and generalizations tested the following: (a) the use of graphic sources for information, (b) drawing logical conclusion, and (c) understanding the feeling and emotions of characters. The last objective to be tested in the reading comprehension section of the TAAS was recognizing points of views, propaganda, and statements of fact and nonfact in a variety of written texts which require the student to be able to distinguish between fact and nonfact.

In this study, the number of correct responses counted as the reading achievement score. The third grade version of the TAAS had 36 items; therefore, the reading achievement scores for Hypothesis I ranged from 0 to 36. The fourth grade version of the TAAS test had 40 items; therefore, the reading achievement scores for Hypothesis II ranged from 0 to 40.

Data Gathering

Data was gathered from the two classes for Hypotheses I, the experimental group and the control group, after the school district approved the release of the data. Again, data was gathered from the two classes for Hypothesis II, the experimental group and the control group, after the district approved the release of the data. A Use of Human Subjects form was submitted by the researcher and approved by the University of North Texas Institutional Review Board for the Protection of Human Subjects in Research. A Request to Conduct Research form was signed by the researcher and the Director of System Accountability for the school district. With the proper approval from the district, the following records for each of the groups involved in the study were released: (a) fourth and fifth grade grade class lists, and (b) fourth and fifth grade TAAS data from the beginning and the ending of the first semester of the 1997/1998 school year. Identification by student name, student identification number, or parent name was
eliminated after the student data was coded. The data was destroyed when no longer needed for the original purpose of the study. To ensure the confidentiality of student records, all district policies and procedures were followed.

Data Treatment Analysis

The data that was collected relevant to Hypothesis I was analyzed using the analysis of covariance. The covariate was reading achievement as measured by the pretest. The dependent variable was reading achievement, and the independent variable was class time given to reading. For Hypothesis II, the data was analyzed using the analysis of covariance. The covariate was reading achievement as measured by the pretest. The dependent variable was reading achievement, and the independent variable was the Electronic Bookshelf Program. For both Hypothesis I and Hypothesis II, the 95% confidence level ($p < .05$) was used as the criterion level for determining statistical significance.

Analysis of covariance is a statistical method for controlling variation for pretest differences among the groups. Borg and Gall (1989) gave the following definition of analysis of covariance:

Analysis of covariance (ANCOVA) is a procedure for determining whether the difference between the mean scores of two or more groups on one or more dependent variables is statistically significant, after controlling for initial differences between the groups on one or more extraneous variables. When the groups have been classified on several independent variables, the procedure can be used to determine whether each factor and the interactions between the factors have a statistically significant effect on the dependent variable, after controlling for the extraneous variable. (p. 753)

Analysis of covariance provides a post-hoc method of matching groups on such variables as age, aptitude, prior education, socioeconomic class, or a measure of performance (Borg and Gall, 1989). Using ANCOVA, the posttest mean of the experimental group is compared with the posttest mean of the control group, with the pretest scores used as a covariate.
Assumptions for using the ANCOVA procedure include a normal distribution, homogeneity of variance, homogeneity of regression, a linear relationship between the covariate and the dependent variable, measurement of the covariate is without error, and independence of observations in the population. According to Borg and Gall (1989) the effect of ANCOVA is to make the two groups equal with respect to one or more control variables. Because of randomization, initial differences were equalized; therefore, power was increased. The researcher controlled for initial differences by randomization, and ANCOVA was used for continuity.

The formula for ANCOVA (Hinkle, Wiersma & Jurs, 1994) follows:

\[ Y_{ik} = \mu + \alpha_k + \beta_w (X_{ik} - \mu_x) + e_{ik} \]

\( Y_{ik} \) represented \( i \)th score on the \( k \)th group.
\( \mu \) represented grand mean of the population.
\( \alpha_k \) represented effect of belonging to group \( k \).
\( e_{ik} \) represented random error associated with this score.
\( \beta_w \) represented regression coefficient representing the relationship between the dependent variable (\( Y \)) and the covariate (\( X \)).
\( X_{ik} \) represented subject’s score on the covariate.
\( \mu_x \) represented grand mean of the scores on the covariate.

Hinkle et al., (1994) states the following:

The formula illustrates the adjustment of the scores on the dependent variable when incorporating the covariate in the linear model. It also illustrates how regression analysis is incorporated in ANCOVA by adjusting the scores on the dependent variable. ANCOVA can be thought of as an ANOVA using adjusted scores (p. 496).
Summary

Chapter III described the process to be followed in conducting the research for this study. For Hypothesis I, an experimental group and a control group were used to determine the effectiveness of giving students ninety minutes in class for leisure reading on the reading achievement of fourth grade students who used the Electronic Bookshelf Program. For Hypothesis II, a control group and an experimental group were used to determine the effectiveness of using the Electronic Bookshelf Program on the reading achievement of fifth grade students. The experimental group was given a treatment over a period of one semester; the data was collected and analyzed. The data for each group was collected and analyzed within a short time after the semester ended. This chapter specifically described the research population, the research design, the instrumentation, the data gathering, and the data treatment analysis. The next chapter, Chapter IV, presents the results that were obtained when the hypotheses were tested.
CHAPTER IV

DATA ANALYSIS AND DISCUSSION OF RESULTS

Introduction

The primary purpose of this study was to determine the effectiveness of the reading achievement of fourth grade students when giving students, who use the Electronic Bookshelf Program, ninety minutes of class time to read. Another purpose of this study was to determine the effectiveness of the usage of the Electronic Bookshelf Program on the reading achievement of fifth grade students. The following two hypotheses were tested:

Hypothesis I

The experimental group which used the Electronic Bookshelf Program and received 90 minutes of daily class time for reading will score significantly higher on the reading achievement test than the control group which used the Electronic Bookshelf Program and did not receive 90 minutes of daily class time for reading.

Hypothesis II

The experimental group which used the Electronic Bookshelf Program will score significantly higher on the reading achievement test than the control group which did not use the Electronic Bookshelf Program.

This chapter has been organized into three sections. The first section covers the results obtained from Hypothesis I. The second section covers the results obtained from Hypothesis II. The third section provides a summary.

Results Obtained from Hypothesis I

The section which follows presents the results of the statistical testing for Hypothesis I, which stated: The experimental group which used the Electronic Bookshelf Program and received 90 minutes of daily class time for reading will score significantly higher on the reading achievement test than the control group which used the Electronic Bookshelf Program and did not receive 90 minutes of daily class time for reading.
As shown in Table 1, the adjusted mean for the experimental group was 32.301 and the adjusted mean for the control group was 32.772. These findings suggest that the group means do not differ. Since the group means do not differ, the null was not rejected.

Table 1

Means and Standard Deviations for Hypothesis I

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Mean</th>
<th>SD</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>20</td>
<td>28.700</td>
<td>5.948</td>
<td>31.750</td>
<td>3.007</td>
<td>32.301</td>
</tr>
<tr>
<td>Control</td>
<td>22</td>
<td>31.364</td>
<td>4.541</td>
<td>33.273</td>
<td>3.058</td>
<td>32.772</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>30.095</td>
<td>5.364</td>
<td>32.548</td>
<td>3.094</td>
<td></td>
</tr>
</tbody>
</table>

The analysis of covariance (ANCOVA) was performed in order to determine if there was a significant difference between the experimental and control groups' posttest performances, with the scores on the pretest as the covariate. The results are summarized in Table 2. The covariate was found to be significant ($F = 38.696$, $df = 1$, $p < .001$), but the treatment was found to not be significant ($F = .434$, $df = 1$, $p = .514$). These results suggest that the reading achievement did not differ between the two groups. The students who used the Electronic Bookshelf Program and received an additional 90 minutes of reading time did not have a higher reading achievement than those students who used the Electronic Bookshelf Program and did not receive additional reading time.
Table 2
Analysis of Covariance for Hypothesis I

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate - (pretest)</td>
<td>194.350</td>
<td>1</td>
<td>194.350</td>
<td>38.696</td>
<td>0.001</td>
</tr>
<tr>
<td>Between - (treatment)</td>
<td>2.180</td>
<td>1</td>
<td>2.180</td>
<td>0.434</td>
<td>0.514</td>
</tr>
<tr>
<td>Within</td>
<td>195.875</td>
<td>39</td>
<td>5.022</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>392.405</td>
<td>41</td>
<td>9.571</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results Obtained from Hypothesis II

The section that follows presents the results of the statistical testing for Hypothesis II which stated: The experimental group which used the Electronic Bookshelf Program will score significantly higher on the reading achievement test than the control group which did not use the Electronic Bookshelf Program.

As shown in Table 3, the adjusted mean for the experimental group was 32.860, and the adjusted mean for the control group was 34.283. These findings suggest that the group means do not differ. Since the group means do not differ, the null was not rejected.

Table 3
Means and Standard Deviations for Hypothesis II

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Pretest Mean</th>
<th>Pretest SD</th>
<th>Posttest Mean</th>
<th>Posttest SD</th>
<th>Adjusted Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>18</td>
<td>30.667</td>
<td>9.114</td>
<td>33.334</td>
<td>7.332</td>
<td>32.860</td>
</tr>
<tr>
<td>Control</td>
<td>16</td>
<td>28.118</td>
<td>7.175</td>
<td>33.750</td>
<td>4.155</td>
<td>34.283</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>33.529</td>
<td>5.966</td>
<td>29.429</td>
<td>8.212</td>
<td></td>
</tr>
</tbody>
</table>

The analysis of covariance (ANCOVA) was performed in order to determine if there was a significant difference between the experimental and control groups' posttest
performances with the pretest as the covariate. The results are summarized in Table 4. The covariate was found to be significant ($F = 33.889, df = 1, p < .001$), and the treatment was not significant ($F = .948, df = 1, p = .338$). The results suggest that reading achievement did not differ between the fifth graders who did use the Electronic Bookshelf Program and the fifth graders who did not use the Electronic Bookshelf Program.

Table 4
Analysis of Covariance for Hypothesis II

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates - (pretest)</td>
<td>604.543</td>
<td>1</td>
<td>604.543</td>
<td>33.889</td>
<td>0.001</td>
</tr>
<tr>
<td>Between - (treatment)</td>
<td>16.920</td>
<td>1</td>
<td>16.920</td>
<td>0.948</td>
<td>0.338</td>
</tr>
<tr>
<td>Within</td>
<td>553.008</td>
<td>31</td>
<td>17.839</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1174.471</td>
<td>33</td>
<td>35.590</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summary

This chapter presented the results obtained from the statistical analyses tests used to test the two hypotheses that were the focus of this study. For Hypothesis I, there was no significant difference in the reading achievement scores of the students who used the Electronic Bookshelf Program and received the treatment, 90 minutes of daily class time to read, and the students who used the Electronic Bookshelf Program and did not receive the treatment. For Hypothesis II, there was no significant difference in the reading achievement scores of the students who received the treatment, the Electronic Bookshelf Program, and the students who did not receive the treatment. The next and final chapter presents the conclusions and recommendations suggested for this study.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The Purpose of the Study, The Review of the Literature, The Research Methodology, The Data Analysis, and The Discussion of the Results are summarized in this chapter. Conclusions and recommendations were based on the results of the statistical testing for the following hypotheses:

Hypothesis I

The experimental group which used the Electronic Bookshelf Program and received 90 minutes of daily class time for reading will score significantly higher on the reading achievement test than the control group which used the Electronic Bookshelf Program and did not receive 90 minutes of daily class time for reading.

Hypothesis II

The experimental group which used the Electronic Bookshelf Program will score significantly higher on the reading achievement test than the control group which did not use the Electronic Bookshelf Program.

Summary

Purpose

The first purpose of this study was to determine the effectiveness of the reading achievement of fourth grade students when giving students, who use the Electronic Bookshelf Program, ninety minutes of class time to read. The second purpose of this study was to determine the effectiveness of the usage of the Electronic Bookshelf Program on the reading achievement of fifth grade students. A synopsis of research studies reviewed in Chapter II indicated that independent reading or the time spent reading increased reading achievement. The treatment for Hypothesis I was 90 minutes of class time reading. The Review of the Literature also indicated that classroom technology usage effectiveness was found to produce different results depending who conducted the
research. Studies by companies who distribute computer-based reading programs suggested that the computer programs caused significant improvement in reading achievement. Studies by groups other than the computer companies did not reflect significant reading achievement increases as the result of using computer-based programs. The treatment for Hypothesis II was the use of the Electronic Bookshelf, a literature-based/computer-based program.

Methods and Procedures

This study determined the effectiveness of giving students ninety minutes of daily class time to read on the reading achievement of fourth grade students who used the Electronic Bookshelf Program (Hypothesis I). The study also determined the effectiveness of students using the Electronic Bookshelf Program on the reading achievement of fifth grade students (Hypothesis II). Two hypotheses were tested using a true experimental design. TAAS tests were administered as pretests (given at the beginning of the semester) and posttests (given at the end of the semester).

Data that was collected relevant to Hypothesis I was analyzed using the analysis of covariance. The covariates were reading achievement, as measured by the pretest. The dependent variable was reading achievement, and the independent variable was class time given to reading. For Hypothesis II, the data was analyzed using the analysis of covariance. The pretest was reading achievement, as measured by the pretest. The dependent variable was reading achievement, and the independent variable was the Electronic Bookshelf Program.

Results

The reading achievement of fourth grade students who used the Electronic Bookshelf Program and who were given 90 minutes of daily class time for leisure reading was not statistically significantly higher than the reading achievement of fourth grade students who used the Electronic Bookshelf Program and who were not given 90 minutes of daily class time for leisure reading. Previous research concluded that time spent reading increased reading achievement. Perhaps changing the length of the daily period of time given to reading would give different results than the results obtained from this study. It might also be possible to show significant differences if tests were administered several
times during the study instead of just at the end of the study.

The reading achievement of fifth grade students who participated in the Electronic Bookshelf Program was not statistically significantly higher than the reading achievement of the fifth grade students who did not participate in the Electronic Bookshelf Program. Information distributed by the Electronic Bookshelf program supports the conclusion that using this computer-based reading management program increased reading achievement test scores. This study did not evaluate the use of the Electronic Bookshelf Program over an extended period of time. Perhaps different results would surface over a longer period of treatment.

Conclusions

The research that was cited concluded that independent reading or increased time spent reading increased reading achievement (Cullinan, 1992). Students must spend time reading to become proficient readers (Martinez and Nash, 1991). Reading achievement is improved when students have daily chunks of reading time to read material of their choice (Garofalo, 1995). In this study, the treatment, 90 minutes of class time spent reading, did not significantly increase scores on reading achievement tests.

Given these findings, questions should be raised regarding how much class time is spent on independent reading. In addition to those questions, additional questions should be raised regarding the costs of computer-based reading programs. Results of this study did not support research studies which suggested that the use of computer-based reading programs such as the Electronic Bookshelf Program made a significant difference in reading achievement. The findings of this study did not support research studies that advocated increased time spent reading significantly increased scores on reading achievement tests.

Generally, which reading programs give the best results should be a question that all educators seek to answer since best results Even though neither treatment supported increased reading achievement, suspension of either treatment is not recommended at this time based on the findings of this one study.
Recommendations

Given the findings and nature of this study, eight recommendations for further research are suggested here:

1. A study could be conducted that compares students' attitudes toward reading when given class time for reading with students' attitudes who are not given class time for reading.

2. Complete a longitudinal study that describes the long-term effect of giving students class time to read on reading achievement.

3. Conduct a longitudinal study that describes the long-term effect of giving students class time to read on the reading achievement of students below grade level, at grade level, and above grade level.

4. Complete a longitudinal study that describes the long-term effect of the usage of the Electronic Bookshelf Program on reading achievement.

5. A longitudinal study could be conducted that describes the long-term effect of the Electronic Bookshelf Program on the reading achievement of students below grade level, at grade level, and above grade level.

6. Complete a study that compares students' attitudes toward reading who use the Electronic Bookshelf Program or other computer-based reading programs to students' attitudes who do not use the Electronic Bookshelf Program or other computer-based reading programs.

7. Conduct a study that compares the cost effectiveness of the Electronic Bookshelf Program and other computer-based reading programs to themselves and to reading programs which are not computer-based.

8. A longitudinal study could be completed that describes the long-term effect of the Electronic Bookshelf Program on the reading achievement of students based on their learning styles.
APPENDIX A

PARENT PERMISSION LETTER FOR HYPOTHESIS I
Dear Parents,

During this school year, your fourth grade child will be participating in a study to determine the effectiveness of time given for leisure reading in the classroom.

All students will be encouraged to read certain identified trade books that we have in our school library. Upon completion, they will take a test over each book by using the Electronic Bookshelf Program.

If you have any further questions or concerns regarding this study, please call me. If you do not wish for your child to participate in the study, please contact me immediately. Thanks for your help.

Sincerely,

Rochelle Peters
APPENDIX B

PARENT PERMISSION LETTER FOR HYPOTHESIS II
Dear Parents,

During this school year, your fifth grade child will be participating in a study to determine the effectiveness of the Electronic Bookshelf Program, a computer based reading management program.

All students will be encouraged to read certain identified trade books that we have in our school library. Upon completion, they will take a test over each book by using the Electronic Bookshelf Program.

If you have any further questions or concerns regarding this study, please call me. If you do not wish for your child to participate in the study, please contact me immediately.

Thanks for your help.

Sincerely,

Rochelle Peters
REFERENCES


Palmer, B., & Codling, R. (1994). In their own words: What elementary students have to say about motivation to read. The Reading Teacher, 48(2), 176-178.


