5-1994

The Effects of a CD-ROM Computer Storybook Program on Head Start Children's Emergent Literacy

Susan Talley
Utah State University

Follow this and additional works at: https://digitalcommons.usu.edu/etd

Part of the Family, Life Course, and Society Commons

THE EFFECTS OF A CD-ROM COMPUTER STORYBOOK

PROGRAM ON HEAD START CHILDREN'S

EMERGENT LITERACY

by

Susan Talley

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Family and Human Development

Approved:

ACKNOWLEDGMENTS

It is impossible for me to adequately acknowledge all the people who have made the completion of this project possible. There have been many people who have not only been supportive of the project, but have also encouraged me by putting valuable resources, time, and energy into making the project a success. Special thanks goes to Jay Hildebrand and Brooke Levy of EduQuest, an IBM subsidiary, who generously arranged for the donation of three computers and software; all of the volunteers and staff at the Head Start Family Service Center, Morningside Preschool, and Kevin Ausen, Leah Erives, Kurt Gunnell, Quinn Nielsen, Hector Mendiola and his wife, Margarita. I have especially enjoyed working closely with Lori Anderson, Kathryn Bell, and Tom Morgan, who have all been exemplary models as professionals in their field. Also important were all the cheerful Head Start teachers and assistants that allowed us to disrupt their classes and remove children during their free play time.

It is especially important to me to extend a special thanks to Tom Lee, my major professor, who showed an extraordinary measure of trust in my capabilities upon our first meeting, which gave me the courage to enroll in graduate school, and who continues to buoy my spirits every day; David Lancy, my co-chair and principal investigator, who took a lowly graduate student under his wing and provided me with the richest academic experience possible; and Shelley Lindauer, who quietly provides me with a standard of excellence to pursue. I would also like to thank Rod and

Miriam Egan and Roxane Pfister, who willingly helped with the statistical analysis and methodological advice, and who provided moral support as well.

Most importantly I would like to thank my dad, whose sound advice is always welcome, my mom, who will always take the time to listen--they are both true examples of life-long learners, and finally, my friends (who are my family away from home) and colleagues for their encouragement, moral support, and patience. Any success I may find in life I owe to all of you.

This research project was funded by Utah State University through the State of Utah, Research Development Grant # 2-10377 to David Lancy, Ph.D.

<div align="right">Susan Talley</div>

CONTENTS

LIST OF TABLES

ABSTRACT

The Effects of a CD-ROM Computer Storybook

Program on Head Start Children's

Emergent Literacy

by

Susan Talley, Master of Science

Utah State University, 1994

Major Professor: Dr. Thomas R. Lee
Department: Family and Human Development

This study examined the effects of a computer CD-ROM storybook program on 73 Head Start children in Logan, Utah. A variation on the two-group pretest/posttest design was used to determine if there was any increase in emergent literacy skills after spending an average of 15 minutes per day for an average of 12 days on the computer.

Previous research suggests that a child's home environment is integral to the preschool child's emergent literacy development. A parent questionnaire designed for assessing information regarding the child's literate environment at home was administered. Mean scores indicated that those children scoring highest on an aggregate score of four questions from the parental questionnaire also scored highest on three assessments of emergent literacy, supporting previous research that children who have been read to at home are more prepared to learn reading in the classroom.

Posttest scores indicated an increase in scores for the experimental group over the not-well-read-to control group on all three assessments. Two of the three measures indicated statistically significant differences from the well-read-to control group ($\underline{p} = < .05$). One of the most interesting findings, however, was that the experimental group's assessment scores increased over the not-well-read-to control group, but did not exceed the well-read-to control group's scores, further supporting the evidence discussed above that children who are read to in the home have an advantage over those children who are not.

From these results, it was determined that computers cannot take the place of effective instruction in the home; however, when used appropriately in the classroom, the results of this study suggest that it is useful to integrate computers in the preschool classroom to augment the emergent literacy instruction already taking place.

(107 pages)

CHAPTER I

INTRODUCTION

Since the 1970s when functional literacy first began being assessed, Americans have been concerned about literacy in this society. How is it that a child can go completely through the schools without being able to read? Functional literacy tests show that a substantial portion of the population, up to 30%, has difficulty coping with common reading tasks and materials (Stedman & Kaestle, 1991). Job-literacy measures also show that workers' literacy skills are not adequate for the reading demands of their jobs. The absence of functional literacy affects the economy, productivity, and perhaps the most damaging of all, the individual's ability to find gainful employment and to be self-sustaining.

Unlike many other countries, all children in the United States are required to attend school and are given instruction in reading; however, it is clear that not all children are learning to read (Harman, 1987). Evidence suggests that this can be traced to the child starting school with little or no familiarity with books. Teale and Sulzby (1986) have suggested that the primary belief held in the 1930s indicated that teaching reading should not begin until the child entered school. Research shows that print awareness, and the child's ability to recognize meaning associated with print, is typically measured before or during first grade, and is a strong indicator of the child's ability to acquire reading skills by the end of the first grade (Huba & Kontos, 1985).

Minority children and children in poverty are especially likely to lack reading readiness skills (Harman, 1987; Heath, 1983). Stedman and Kaestle (1991) argued that the schools have never excelled at educating minorities and the poor. This may

be because, as Harman (1987) suggested, reading is an activity that has a strong cultural base and as Heath (1983) asserted, children in lower socioeconomic status (SES) homes do not have the same exposure to literacy materials as children in middle class homes.

Heath suggested that middle class parents tend to invest in their children's reading success by providing books, spending time reading with their children, taking them to the library, and modeling reading behavior during their own leisure time. In her 1983 study of "Maintown," a middle-class, suburban community, Heath showed how adult-child interaction pivots around books and "book-talk." She noted the large library of picture books, bedroom furnishings patterned with literary characters and themes, and the complexity of the bedtime story ritual.

Poorer, less well-educated parents may be only marginally literate: They may not believe or recognize that reading to children, modeling reading behavior, and encouraging reading are essential for children's literacy development. These parents may not be able to afford books or frequent libraries (Nickse, 1990; Nickse & Englander, 1985). Furthermore, research by Lancy and his associates (Lancy, Draper, & Boyce, 1989; Lancy & Bergin, 1992) has shown that when those parents who do not often read to their children are asked to do so, they sometimes use a "reductionist" strategy, which typically includes behavior that requires the child to sound out the letters rather than relying on the pictures to give the child clues to the text. This forces the child to rely exclusively on sound/letter correspondence as the

only legitimate decoding strategy, which may possibly do more harm than good (Lancy & Bergin, 1992).

Even given this situation, studies show that parents of children in lower SES homes can improve their children's literacy opportunity and encourage their children to read. Many programs are currently being offered around the country that address the issue of assisting young children in becoming literate. For instance, programs such as Running Start (funded by the Chrysler Corporation), PACE (funded by the State of Kentucky), and the Boston University program (funded by the U.S. Department of Education) suggest that this problem must be addressed at every level in society (Lancy & Talley, 1994).

In sum, there is a growing body of research that locates the origins of illiteracy in the child's out-of-school experience with storybooks. Those children who are well-read to in the home have a greater advantage than those children who are not. The extent and nature of their reading experience in the home is a powerful predictor of the child's interest in books and success in subsequent reading instruction (Teale & Sulzby, 1986). For this reason, educators may want to focus efforts on increasing the amount and quality of reading in the home as well as to incorporate storybook programs within preschools. In those cases when the child is not able to receive an adequate reading background in the home, efforts to compensate through the educational system should perhaps focus on compensating for the lack of reading promotion in the home. Computers may be one way to do that.

Computers are becoming more prevalent in today's classrooms in order to prepare the nation's children for the future in technology (Clements, 1985). There were some promising studies in the late 1960s suggesting a link between emergent reading skills and the use of computers. Atkinson and Fletcher (1968) (as cited in Clements, 1985) found that exposing young children to a computer reading program resulted in a significant increase in young children's test scores on alphabet recognition and verbal ability. There has been some concern, however, that computers are not developmentally appropriate for preschool-aged children (Thouvenelle, 1994). Even so, with the technology being constantly updated, the question becomes whether or not it is possible to use computers to help augment the instruction that children are getting and for what age groups.

The purpose of this study is to address this question: If children are not read to at home, or are read to using a reductionist strategy, will a computerized program as part of an early childhood education curriculum provide enough exposure for the child to acquire the necessary skills to compensate? This study will examine the question of whether or not a computerized version of classic storybooks on compact disks provides the necessary reading and literacy exposure to Head Start children. The dependent variable to be studied in this case is the child's emergent literacy skills, and the independent variable is the IBM "Stories and More" CD-ROM program.

CHAPTER II

LITERATURE REVIEW

Recently, attention has been drawn to the nation's literacy levels and the notion that society is fast becoming a nation without literacy. Millions of dollars are being spent each year on volunteer programs, textbooks, reading programs, and research (Harman, 1987). It seems that society is quick to point an accusing finger at the public school system; however, studies are not conclusive that the public school system is failing. Critics of the schools accept test scores at face value without taking into account changes in the population of the test-takers. For instance, college entrance examination scores dropped during the 1960s. The SAT's College Board Advisory Panel determined, in part, that this was partially due to the fact that more minority and low-income students were taking the test (Stedman & Kaestle, 1991). They also argued that the literacy rate of high school graduates is not dropping; it is more likely that there is an increase of students graduating with lower reading skills that, previously, may have dropped out. Harman (1987) reported that the average level of education among Americans is at 12.8, one of the highest in the world. The national problem of functional illiteracy indicates a gap between grade level attained and grade level of reading ability. Stedman and Kaestle (1991) suggested that this gap can be attributed to the fact that reading achievement at specific grade levels is not standardized.

It seems that the nation as a whole continues to be concerned with a student's reading competency because of its far-reaching effects in the child's future education.

Poor reading skills are many times interpreted as a developmental delay as the child progresses into elementary schools and the public school system. As this country moves into a more technical society, the ability to read is more and more integral to the individual's success in the work force. Reading levels that are considered to be adequate today will be marginal by the year 2000, and as more jobs require higher levels of literacy, past levels of competency will become increasingly inadequate (Adams, 1992).

There is a wealth of literature available discussing the processes involved for children to learn to read. With all the extant research and money being spent on literacy programs, research, and textbooks, one would predict a drop in illiteracy in this country. Even taking into consideration the fact that the literacy requirements are rising (Adams, 1989), it is important to recognize that the literacy needs in this country are not being met. While this is a school system responsibility (Harman, 1987), Teale and Sulzby (1986) indicated that the lack of literacy instruction in the home comes from the belief that it is appropriate to wait for the child to enter school before teaching reading rather than provide an environment at home that is conducive to acquiring reading skills. Therefore, if there is an impact to be made on the level of literacy in the nation, it would seem appropriate to focus on the home environment to facilitate effective change.

Literacy Begins at Home

In past years, it was thought that teaching reading should be reserved for children as they enter school (Teale & Sulzby, 1986). Tough (1983) has

recommended, however, that educators need to focus on the early years as a period of great potential for the development of language, and for laying the foundations for reading. The child's parents are integral to this development. If the children do not see adults model reading, then it is unlikely that reading will become part of their everyday life (Harman, 1987; Heath, 1983; Teale and Sulzby, 1986). Teale (1986) found that reading and writing function as components of the social activity of the adults and children rather than one isolated event. Moreover, Teale and Sulzby (1986) indicated that literacy is deeply entrenched in the culture of the family as well as the community. From this, it is important to determine that literacy is not necessarily a function of skills and drills that can be learned in schools; instead, it is a concept of family and community (Harman, 1987; Heath, 1983; Teale & Sulzby, 1986). For this reason, the bedtime storybook ritual is a key factor in helping young children learn to read (Clark, 1976; Elardo, Bradley, & Caldwell, 1975; Morrow, 1988; Teale, 1978; Walker & Kuerbitz, 1979). Storybook reading, in this sense, is a parent or other significant adult taking the time to read the child a storybook as a cultural activity rather than a teaching event (Teale & Sulzby, 1986).

Storybook Reading

The attempt to examine the relationship between children's experience at home and their success in learning to read has been more prevalent in the last 20 years than has been previously. For instance, Donachy (1976) studied 96 preschool children divided into three groups: The first group received a 4-month program administered by mothers at home and the second group received a 4-month program administered

by the local primary school; the third group was assigned to a control group. When the children's scores on the Stanford-Binet and Reynell Developmental Language Scales (RDLS) were compared with the control group, the first group showed significant gains on both scales, the second group showed significant gains on the Stanford-Binet but not RDLS, and the third (control) group showed no significant gains on either measure.

In 1966, Durkin published the results from two longitudinal studies of children who learned to read at home. Her results showed that those children who had been taught at home demonstrated higher achievements in reading than equally bright children that did not have the same opportunity to be read to in the home (cited in Durkin, 1969). Margaret Clark (1976) found similar results in her study of 32 five-year-old children. The children that scored the highest on Schonell's word recognition test (cited in Clark, 1976), had been read to at home.

Bernstein (1971) suggested that the link between social class and educational achievement is explained, in part, by the student's understanding of language and meaning and Tough (1983) indicated that many school children are at a disadvantage because of the language used in their homes. It is clear that achievement in education depends upon skills of reading and writing which, at later stages of education, must draw extensively on children's abilities to use language in comprehending texts, search and retrieve information from books, and display knowledge through the written word.

Some of the research documenting the importance of reading at home to young children includes information discussing specific skills that are being enhanced by the practice of the bedtime story ritual.

Socioeconomic Factors

Heath (1983) studied two working-class communities and found that it is a combination of economics and social class that have a greater impact on the student's reading acquisition than what is taught in the classroom. This information is supported by Stedman, Tinsley, and Kaestle (1991), who analyzed longitudinal data collected since 1929 by the U.S. Department of Labor. Their study indicates that it is the family's income, ethnicity, and educational level that correlate with the amount of reading materials in the home. These factors may be somewhat independent of each other. For example, even though there are homes where the parents are lower income, but are college students, books are prominent in the home and the parents spend much of their time reading and modeling reading behavior. In this situation, lower income does not indicate lower education. Carlson (1990) documented that there are three factors most likely to affect school performance: (a) the increase in single-parent families, (b) the employment of both parents in more than 70% of nuclear families, (c) the high divorce rate (cited in Smith, 1991). Therefore, all aspects of the child's home life must be taken into consideration when determining "at-risk" populations for reading skills and school readiness and, in general, lower SES is a risk factor for poor development of reading skills.

Computers in a Preschool Setting

Technology in the classroom and at home is becoming more and more common. As life in America becomes more computerized, there is a possibility of using computers in every aspect of life. In order to produce a productive work force, it is necessary to teach computer use to the students, which means that there will be an increase of computers and technology in the classroom. Computers have a definite impact on children. It is getting more common to see children spending hours in front of video games rather than outside inventing new baseball rules, new forms of tag, or other childhood games. If computers and technology are going to be used to teach children, it is important that the technology be developmentally appropriate (Ainsa, 1989; Davidson, 1989). Clements (1985) suggested that computers are quickly becoming as common as blackboards, crayons, and pencils in the classroom. The questions that become of primary concern in this case are: (a) "should computers be used in a preschool setting?" and (b) "how appropriate is it to use computer technology to teach preschool children to read?"

In 1984, Sue Bredenkamp, director of professional development of the National Association for the Education of Young Children (NAEYC), stated: "We have been concerned about the appropriate use of technology with children,...but it is my belief that this age group is not a critical period for getting technology" (Early Childhood and School Success, 1993, p. 23). More recently, however, Bredenkamp also indicated that the NAEYC was preparing to make formal recommendations on using computers by July of 1993. A computer search of NAEYC recommendations

from 1986 - 1994 failed to locate these recommendations and a telephone call to the

NAEYC confirmed this. A position statement is currently in progress, and is due to

be released in the near future.

In 1984, a Head Start Task Force had determined that computers could not

meet the developmental needs of children and recommended that Head Start funds

should not be used to purchase computers for the classroom (Wolverton, Plutro, &

Bewick, 1994). In 1987, a partnership was formed between Head Start and IBM in

order to study the effects of computer applications in the preschool and to provide

computer experience to the children in order to help them succeed in later life

(Waxler, 1994). Head Start was an ideal vehicle in this case because of the emphasis

on parental involvement in the classroom and the child's education. In 1990, after

completion of the study, the recommendation regarding using computers in the Head

Start classroom was changed to include computers in the classroom when used as just

another learning center (Molloy, 1994). Since that time, the Head Start Bureau and

the NAEYC have been investigating ways to use the computer in developmentally

appropriate ways (Davidson, 1989; Thouvenelle, 1994; Wolverton et al., 1994).

Because of the new technology, computers have been determined to be a "useful

learning tool depending on the quality of the software, the amount of time the

computer is used, and the way in which it is used" (Waxler, 1994, p. 10). Waxler

also believes that the benefits to children should be of primary concern, and that the

total cost of using computers in the classroom should be carefully evaluated before

making an investment in the classroom.

Strickland, Feeley, and Wepner (1987) have suggested that the use of computers in reading instruction is often a powerful motivating force in and of itself. They feel that students who are highly motivated because of their interest in a topic will frequently expend an enormous amount of effort to comprehend a text that they might otherwise have abandoned. Miller, Blackstock, and Miller (1994) suggested that computers that can "read" storybooks to children in the classroom is a great improvement over the teacher reading storybooks to the class because the computer is able to more closely emulate the home environment by providing answers to the children in a private, nonthreatening way.

IBM's Stories and More

IBM's program "Stories and More" is designed to capture students' interest in stories, and provides them with a highly involving and enjoyable learning experience. The books are read by a human voice, not a computerized speech synthesizer. By combining educational advantages with the fun of technology, children are able to have storybooks read to them without the human error of "reductionist" strategies or the time limitations of a busy parent.

The programs involved in the 1987 study by Head Start provided several recommendations for using computers in a preschool setting. First, the software should be age appropriate in content and approach. Second, the software should be used independently, without a great deal of assistance from the teacher or other adult. Third, there should be a continual visual display. Fourth, the pictures are used to represent words or ideas. Fifth, there should be clear and simple instructions. Sixth,

the use of the program should not depend on reading skills. Seventh, the software should present open-ended exploration and child choices. Finally, the program should offer varying levels of difficulty (Wolverton et al., 1994).

The "Stories and More" software follows these recommendations. The program begins by giving the child a hands-on experience with using the mouse by starting with a tutorial. During the first session, basic functions of the keyboard and navigating around the program are taught. During the tutorial, the children learn what a mouse is, what its functions and limitations are, and the basic parts to the computer. All this is done using a human voice and a cartoon character mouse called "IBM Mouse." After the tutorial and basic instruction from an adult, the child is usually sufficiently competent to run the program without further intervention.

The software is designed to be used individually or in pairs. The child types in his/her own name (with minimal assistance), and the computer asks the child if he/she is working with a partner. If the child clicks on yes, then the partner may type his/her name into the computer. From that point on, both children may use the computer and the program.

As soon as the child types in his/her name, actual pictures from the story come onto the screen, or the child has the option of choosing a new story from the menu. The menu displays arrows suggesting that the child may want to go forward, go backward, go to the "library" or click on a stop sign indicating "stop for today." If the child chooses the library menu, then the child is treated to five screens with four sections displaying four titles to books with color pictures the child may choose from.

With each story, there is a "Starting Off" activity that gives the child a chance to experience a variety of options that allow the child to manipulate parts of the story prior to actually reading the story. For instance, in "The Three Billy Goats Gruff" the child starts off with an activity that allows the child to create the scene of the three billy goats crossing the bridge. The program requires a sequence of events, helping reinforce portions of the story to the child. In this case, the child must first put the bridge over the river, then put the water in the river bottom, then put the billy goats in front of the bridge according to size. On the next screen, the child has the opportunity to create a "troll." They can change heads, bodies, and feet indefinitely or until they choose to move on to the story.

Need for the Study

There is a wealth of suppositions, educated guesses, and blanket statements about the importance and value of using computers in an educational environment. There are as many that suggest appropriate software to use with plenty of recommendations for possible use as well as many educational goals these programs will attain (Anselmo & Zinck, 1987). However, there is a dearth of scientific, empirical study on the use of computers in the classroom (Goodwin, Goodwin, Nansel, & Helm, 1986). There are even fewer studies specifically discussing the advantages and disadvantages of a computer storybook program and its subsequent effect on preschool children's emergent literacy.

Two recent empirical studies were conducted using computers and literacy training. One, conducted by Ainsa (1989), studied a parent component that provides

computer literacy instruction for parents in order to help their child. Their objectives were to receive training on the computers, assist in the classroom as well as reinforce language skills at home, and finally, to keep a work book of the child's progress. Statistical analyses suggested that the experimental group showed significant gains in the posttest over the control group for the children. Unfortunately, the discussion on the measurement and statistical procedures is limited and the design of the study uses different tests for the pre- than for the posttest. The author did not state whether the pre- and posttest were testing the same skills. Therefore, it is unclear if the children who received computer exposure indicated a gain in test scores because of their experience on the computers or because of increased parental involvement in the child's literacy skills.

Another study by Miller et al., (1994) investigated the use of CD-ROM storybooks on four children at 8 years of age. However, the study did not address specific reading skills obtained, nor did it use any established assessment measures. Their criteria for success were the number of requests for computerized help during their computer reading session and the number of miscues while reading hardcovered books. Their reasoning for not using a skill-based assessment was the fact that because they were using computers, there were no precedents regarding the types of outcomes they could expect.

Miller et al., used two measures: One was to count how many times the child accessed the help function on the computer, and the other measure was derived from an analysis of errors in oral reading or Goodman and Burke's (1972) Reading Miscue

Inventory (RMI) (as cited in Miller et al., 1994). The RMI is based on the notion that competent readers tend to not correct miscues that do not interfere with understanding the text, but they do correct mistakes that affect comprehension.

Each of these measures indicated that the children reduced the number of either requests for help or miscues by the end of the fourth session. However, with only a sample size of four subjects, and with minimal comparison, it cannot be assumed that the computer had positive effects on their measurement or if there are other variables that are influencing their results. There are many questions that come to mind suggesting other factors. For instance, are the hardcover books the children are reading during the "testing" familiar to the child? Are they more familiar by the fourth session than the first reading session? Is the child really requiring assistance on the specific words or is the novelty of being on the computer and investigating its functions the real reasons for accessing the computerized help? None of these questions were examined in the article, indicating flaws in the study.

Therefore, this study will investigate the influence of a computer CD-ROM storybook program on three measures assessing emergent literacy. By evaluating a portion of the child's current reading skills, applying the computer intervention, and then evaluating the same reading skills, it can be determined if there is, in fact, any increase in emergent literacy skills.

Reading storybooks to children at bedtime is important to the child's future literacy development as it emerges, and some parents are unable to read to their children in a manner that promotes a love of books and good reading skills (Lancy &

Bergin, 1992); therefore, examining the impact of a computer storybook program on preschool children would be a possible solution to a lack of reading in the home.

Research Questions

It is anticipated that the children in the intervention group will score higher on the final assessment instruments than those children in the control groups. This translates into four main questions: Question #1: Will children who come from families that report a more literate environment at home, as measured by the parent questionnaire, also score well on the emergent literacy measures? Question #2: Will the children in the experimental group increase their story comprehension abilities more than those children in the control groups? Question #3: Will children in the experimental group increase their ability to recognize significant concepts about printed language (specifically, the front of the book, the concept that print, not pictures, tells a story, and the functions of punctuation) more than the children in the control group? and finally, Question #4: If children are exposed to a computer reading program, will they become more aware of environmental print than the control group?

CHAPTER III

METHODS

In determining the methods for this particular mode of research, it was important to take two items under consideration. First, to test the suitability of a computer reading instruction program of the child's emergent literacy skills, it was necessary to find a group of lower SES children that fit the model of being "at-risk" since, according to the literature, children from lower income homes are at greater risk of entering school without having exposure to reading storybooks. Head Start was identified as providing this population for this study, because the Head Start program was developed for a lower income population and their income requirement applies to 90% of their total enrollment. Because of confidentiality restrictions, it is impossible for us to gain access to the records indicating which families of the sample population do not fall into the lower income category. Therefore, the 10% that did not fall into the low income category will be treated no differently than the other 90%.

Second, because this study is testing a specific application, it was necessary to identify an experimental design that provided the most control without being obtrusive. A variation on the two-group pretest/posttest design was chosen and was divided into three phases. All children whose parents signed an approval form for the study were assessed during Phase I of the project. Because each of the assessments tests a specific characteristic of emergent literacy skills, an aggregate score was obtained by summing the total of all the assessments. Based on those results, the

children were divided into three groups: Those children who scored in the top 20%
of each class were assumed to be well-read-to and assigned to the well-read-to control
group; the remaining 80% of each class were randomly assigned to either the not-
well-read-to control group or not-well-read-to experimental. The not-well-read-to
experimental group consisted of 28 students, the not-well-read-to control group
consisted of 32 students, and the well read-to control group consisted of 13 students.
The experimental group received the treatment (Phase II) beginning January 27 and
continued until March 3. At the end of Phase II, all children were assessed again and
the children assigned to the control groups were brought to the computers (Phase III).
By using this design, it was possible to identify the impact of the computer program
on the children's emergent literacy skills as measured by the assessments.

Because the study was designed to be a variation on the two-group
pretest/posttest design, it was important to keep the experimental sample as large as
possible, but still have an adequate comparison for children who are determined to be
well-read-to. By removing the top scoring students from the highest 20%, the
majority of students were available to be randomly assigned to either experimental or
control groups, protecting the sample size as much as possible.

Sample

Subjects. The study sample consisted of 85 Head Start children and their
parents, all living in the Logan Cache Valley area. Eighty-one agreed to participate
in the study, but by posttest, attrition left 73 children in the study: 36 girls and 37
boys. All of the children were 4 years old by the start of school in September.

Parents were included in the study in order to attempt to identify current reading practices with their children and to assist with the implementation of the computer program. By assessing parental attitudes toward reading, it was possible to more closely assess the subsequent impact on their child. Because the computers were not located in the classrooms, there was also a parental component to the project by using parent volunteers to take the children to the computers.

Children in the Head Start program were chosen for this study for several reasons. One of them is their age group in relation to their reading experience and skills. By the age of 4, children are in the beginning stages of literacy development and are beginning to demonstrate an awareness of print and that it plays a definite part in adult life (Sulzby, 1985). It is also an age that indicates a parental influence on the child's literacy experiences without extensive contamination by outside influences like the schools or media. Secondly, Head Start typically attracts many different types of cultural backgrounds within their program, and because of the homogenous society of Cache Valley, it was possible to obtain a more diverse population through the Head Start program than other private preschools. Because of the close proximity to the University, the population provided a sample of children who were low income by choice (the parents are students), as well as children who were from a range of ethnic backgrounds, and children who came from generations of lower income families.

Demographics. It is important to discuss the demographic background of Logan because of the economic and social characteristics of the community and its

impact on the children studied. The research literature indicates that the socioeconomic level of the child's family is a strong indicator of whether or not the child has been read to (Heath, 1983; Morrow, 1988; Teale and Sulzby, 1987).

Logan has a population of 33,874 and is the county seat of northern Utah's primarily agricultural Cache Valley. The total population for Cache Valley is 73,208 (Utah Data Guide, 1994). One factor that should be considered is the presence of Utah State University, which has a student population of approximately 16,000. The student population accounts for approximately one fifth of the entire population of Cache Valley. Also located in the area are several manufacturing plants, including food processing plants. The population of Head Start families come primarily from the factory, student population, local retail stores, or low-paying human services positions (i.e., child care providers, social services workers).

Location. The Bear River Head Start had three main sites of operation, Richmond, Brigham City, and Logan, and was planning to expand services into southern Idaho during the course of the project. The central headquarters is the Logan office, which included a parent service center designed to help families pass their General Educational Development Test (GED) or receive technical skills, parenting skills, or literacy training.

The entire project was located at the Logan Head Start office where there were five classrooms with 15 children in each classroom. The computers were housed in the parent service center for three reasons: One was that the computers were more secure in the parent service center than in the children's classrooms. Secondly, it

allowed the parents to have access to the computers after the children had their chance. Finally, it provided us with more control over which children received time on the computers.

Instruments

Five measures were used to assess the level of the child's previous reading experiences for the pretest. After researching assessment measures available, it was discovered that few emergent literacy measures have been developed. However, it was determined that there were three measures that could be adapted for the children, and two measures seemed to be very well suited to assessing emergent literacy. Because emergent literacy is not necessarily a linear phenomenon (Hiebert, Cioffi, & Antonak, 1984), it was of primary concern to choose several measures to assess different aspects of the child's reading ability. This was preferable to choosing one assessment that identified many different aspects of emergent literacy because one comprehensive assessment would be difficult for a 4-year-old to complete and stay on task. For this reason, five different measures were chosen that could be given to the children either together or separately depending on the child's attention span, interest in the "games," and availability.

Print awareness test. The Print Awareness Test was developed by Mary Huba and Susan Kontos in 1985 (see Appendix A). The test is designed to identify the level of print awareness in the child's everyday environment. This test was developed specifically for this age group and was ideally suited to preschoolers because of its relatively short time to administer and minimal verbal response. According to Huba

and Kontos, the validity was assessed in three ways: first, by determining developmental progression of scores indicating expected changes in performance; second, by determining variability within scores; and third, by examining correlations among other test scores. Internal consistency was estimated using the Kuder-Richardson procedure (KR-20).

Concepts about print. The second assessment to be used is the Concepts About Print using the Stones (Clay, 1979a) book. This measure was developed to assess reading skills in school-age children, but the pilot test indicated that it would be appropriate for preschool children as well. The measure takes approximately 5 to 7 minutes to complete and asks questions that indicate a familiarity with books and the printed language. Some of the questions asked attempt to evaluate whether or not the child can recognize the front of the book; can identify the concept that print on the page can sometimes tell a better story than pictures; can tell the differences between letters and words, and between capital and lower case letters; and can tell the uses for punctuation. Clay (1979b) reported a Kuder Richardson rating of .95, a test/retest reliability coefficient of .73-.89, and a corrected split-half coefficient of .84-.88. A scoring sheet was developed by the project staff to be used with the test. This helped to ensure consistent testing, as well as assured coding accuracy (see Appendix B).

Picnic. The third assessment used was Picnic, a wordless picture book by Emily Arnold McCully (1984). The procedure for administering the test was developed by Lynne Putnam (1994) to measure student progress when comparing three different early literacy programs. Sulzby (1985) suggested that young children's

emergent reading behaviors are consistent across storybooks and indicate a general understanding that seems to be conceptual rather than a stimulus/response to promptings (as cited in Putnam, 1994). Putnam designed the assessment originally for kindergartners and to be very low stress for the children. Her original design called for the tester to ask the child to retell the story to a stuffed animal while the tester audiotaped the assessment. Because this study is working with preschool-aged children, and because we did not have a standard room for assessments, it was determined that the tester would score the retelling while the child went through the book, rather than wait to hear the audiotape. In this way, the audiotape was used as a shadow scoring.

The assessment began by the tester telling the child, "This is a special book that you can 'read' because there are no words in the book. By looking at each of the pictures, you can figure out a story. I would like you to take the book, look at each of the pictures, and when you are through figuring out the story, tell me and we will go through the book together." The child is required to look at the pictures independently, and then, with minimal prompting from the tester, the child tells the story as he/she turns the pages. If the child does not speak, the tester encourages the child by saying, "What is happening on this page?" The purpose of the assessment is to determine the child's ability to follow a story line, construct a cohesive story, recognize a plot or problem to be resolved, summarize events, and identify relationships between characters. Each of these interactions was audiotaped while the child "told" the story and the tester scored the test. In this way, the tester could

replay the tape at the end of the day and recode any questionable answers. Once again, a scoring sheet was developed to help assure accuracy and consistency in coding. An example of the scoring sheet as well as the protocol can be found in Appendix C.

Title recognition test. The fourth assessment was an adaptation of Stanovich and West's (1989) Magazine Recognition Test (MRT) and Author Recognition Test (ART). Cunningham and Stanovich adapted this measure for elementary school-aged children in 1991 using children's book titles, which has been shown to be a powerful predictor of the child's exposure to print. This measure has been tested on fourth, fifth, and sixth grade children using 39 children's book titles, 14 of which are foils. Cronbach's alpha reliability of the measure was .82 for that age group. To get appropriate book titles for this adaptation, a listing of most popular books for 4-year-old children was obtained from the children's librarian at Logan Public Library; 21 of the most popular titles were chosen, including 7 foils. The list was then reviewed by another children's librarian at Edith Bowen Laboratory school at Utah State University in order to incorporate her suggestions ensuring popularity of the titles chosen (see Appendix D for an example of the TRT). A pilot test conducted at Morningside Preschool indicated that the test showed a high measure of validity. Because the sample size for the pilot test was too small to make an accurate judgment, and because the majority of pilot tests indicated such a high validity, it was determined to administer the test as part of total testing battery planned for the Head Start population.

Story retelling. The final assessment consisted of the children bringing favorite books from home and retelling the story while looking at the pictures. This measure has been used previously by Lancy and Talley (1994) and others (Amato & Zigler, 1973; Mandler & Johnson, 1977; Stein & Glenn, 1979). Sulzby found that when children from ages two to six were asked to "read" a favorite storybook, their speech could be considered as a first act of reading. Teale and Sulzby (1986) indicated that these "readings" can be viewed as developmental stages which consisted of strategies like labeling and commenting on items in discrete pictures, weaving the child's interpretation of pictures into a "story," creating a story using actual words from the story, and finally, attending to and decoding the actual story. The child's progress will be measured based on an adaptation of Teale and Sulzby's four stages (see Appendix E for an example of the scoring protocol).

Parent questionnaire. Included with each of these measures was a parent questionnaire designed to gain information from the parents regarding their own reading practices as well as their habits and practices with their children (see Appendix F).

Project Design

The project was divided into three phases. The first phase was spent collecting data from the parents, bringing the children into the assessments, and dividing the children into test groups. The second phase was the computer intervention where the children were brought in three pairs to the computers to do "Starting Off" activities, reading a story, or going to the "Library." This portion of

the project involved parent and student volunteers helping the children get to and from the computers as well as ensuring that the children stayed on-task and unfrustrated. The third phase consisted of performing the posttests and analyzing the data collected.

Phase I--Data Collection

The assessments were completed by two graduate students who had trained in each of the measurement instruments by becoming familiar with the protocol, practicing independently the assessments, administering the assessments to each other, and finally, pilot testing each of the assessments on seven children between the ages of 3 and 5 at Morningside Preschool in Logan, Utah. With parental permission (see Appendix G), the testers removed the children from their regular classroom similar to the procedure planned for Head Start. Each of the testers took turns administering a test while the other tester shadow scored. By using this procedure, the testers obtained an interrater reliability on the Concepts About Print measure of 92.5%, and 100% on both the Print Awareness Test and Title Recognition Test. However, the Title Recognition Test showed problems with validity in that many times the children would respond positively to the question regardless of their experience with the book.

Pretest interrater reliability. During the data collection phase of the project, approximately one third of all subjects were shadow scored four out of the five assessments. A Pearson's correlation coefficient was performed between the tester scores and the shadow scores. On the Picnic pretest, the correlation indicates $r = .94$, suggesting very high interrater reliability. For the Concepts About Print pretest, a Pearson's r correlation between assessment and shadow score indicates a very high

correlation ($r=.92$), and for the Print Awareness Test, the Pearson's r indicates that there is a high correlation between the assessment and shadow score ($r=.93$)

No pretest interrater reliability was established on the TRT and the Story Retelling.

Posttest interrater reliability. Because doing each of the assessments on the total sample of children was determined to be too time intensive, and because two of the five assessments were determined to be less effective, the TRT and Story Retelling procedures were dropped from the study. The Story Retelling assessment proved to be very appropriate; however, it was difficult to get the children to bring books from home. Many times the children would forget, and then would take a book from their classroom shelf. This defeated the purpose of trying to test the ongoing process of being read-to in the home. Therefore, the testers used only the Concepts About Print, Print Awareness Test, and Picnic for the posttest. The same procedures and testers were used as in the pretest, and reliability was assumed to be the same.

Home environment questionnaire. A home environment questionnaire was developed and given to each of the parents at the beginning of the study (see Appendix G). Included with this questionnaire was the parental approval form so it was possible to achieve a 94.5% response rate to the questionnaire.

Procedure

Prior to the first day of school, on September 6, Head Start had a parent orientation night. An overhead presentation of the project was prepared in order to

inform the parents of the study, to provide them with some information about the computer program that would be available to their children through the project, and to distribute the parental consent forms and questionnaires (see Appendix G). For 4 weeks, questionnaires were collected. After receiving the first 36 questionnaires, a reminder letter was sent out on October 4. A third reminder letter was sent October 18 until 81 consent forms were received from the parents. Out of 85 total Head Start children, this is a 95% participation rate. Due to some of the children moving or dropping out of the Head Start program, the final sample consisted of 73 children.

The first component of Phase I consisted of involving the parents in their child's literacy. The Family Service Center brought the parents together at the local Head Start Center for a literacy night barbecue and instruction. The Family Service Center, which is an integral part to the Head Start program, biannually hosts a literacy night. All parents of Head Start children (center-based as well as home-based) are strongly encouraged to attend. In order to accommodate the study, the Family Service Center scheduled their first literacy night for September 29, 1993, to provide us with the opportunity to spend an evening with the parents. For the parent education sessions, Dr. Lancy used "Reading with Children," a 30-minute video similar to a commercially produced video series called "Parents as Partners in Reading," which was developed at the Center for Applied Cognitive Science at the University of Toledo. The video was complemented by a brief lecture from Dr. Lancy stressing the importance of reading to young children and specific strategies for doing so. Volunteers then read several excerpts of humorous children's books to

model appropriate reading practices with young children and to help instill a desire

for reading within the family. Project staff were available to answer any questions

the parents may have had regarding their child's participation in the study.

After receiving parental approval, a schedule was set up with each of the

teachers at Head Start for the project staff to come to their classrooms during free

play time. During the first visit, the project staff were introduced to the children as

"friends" and that they were here to "play games" with the children. During that

first visit, the project staff spent approximately 20 minutes getting to know the

children in each class in order to reduce anxiety when the children were removed for

assessment. Then, during the next 11 weeks beginning October 4, the children were

taken out of the classroom to a designated testing area and were assessed with each of

the assessments listed above.

Phase II--Computer Intervention

The second phase of the project consisted of dividing the children into a well-

read-to-group and a not-well-read-to group based on the data collected during phase

one. After collecting pretest data, the scores on each of the assessments were added

together to create a composite score. Twenty percent of the children (N=13) with

the highest composite scores in each class were placed in the well-read-to group

(group 3). The balance of the children were randomly assigned to either the

experimental (N=28) (group 1) or the control group (N=33) (group 2). To ensure

that the correct groups were being used for analysis, an ANOVA using the LSD

multiple range test was performed on the pretest scores. In all three assessments, the

well-read-to control group's mean scores were highest and the experimental group's mean scores were lowest. In the case of the Print Awareness Test and the Concepts About Print, mean scores were significantly higher than both of the not-well-read-to groups (experimental and control). The experimental group scored significantly different than either of the control groups on the Picnic assessment, indicating that the group assignments were correct.

In order to prepare the volunteers to help with the computers, a 1-hour volunteer training session on how to use the computer, what was the purpose of the study, and what are some appropriate ways to help the children use the computer program was given prior to starting the children on the computer. Project staff were available to answer any questions regarding using the computer, and reading to the children. Parents' phone numbers and schedules were collected from all parents that were interested in helping with the project. If any parents were unable to come to the initial training session, the project director trained them in a one-on-one session prior to permitting them to work with the children.

Three times per week, three pairs of students were taken to the interactive storybook "center." A parent or a student volunteer would get each of the groups of children, take them to the computers, and monitor the child's experience to ensure that the child remained unfrustrated and on-task. The volunteers were given lists of names without explaining which group the children were assigned to. They were also instructed on tips for working with the children. A yellow rope was made available from Head Start for the volunteers to bring to the classroom, and the children quickly

learned to hang on to their knot on the rope while going to the computers. It was stressed that the volunteer should not intervene with the child's computer experience and allow them to direct which story to read and how long they stayed at the computer. As soon as a child began to tire and requested to return to the classroom, the sessions were concluded and the children were escorted back to their teachers. It is important to note that many times there was only one volunteer in attendance; therefore, some of the children were required to wait a few minutes while the other children finished their stories. The volunteer would keep a log of which children were at the computer and any behaviors they felt were appropriate to share with the project director.

The computers were housed in the Family Service Center upstairs from the classrooms at Head Start. There were three computer stations complete with one IBM Eduquest Forty Educational Computer and the "Stories and More" software with 36 on-line stories, all donated to the project by IBM. Two sets of headphones, and two chairs for the children to work individually or in pairs were placed at each station. A clipboard was provided at each computer station for the volunteers to log comments, behaviors, or problems during the computer use. The room was also used as a meeting/conference/training room, but because the computers had headphones, relatively little noise emanated from the computer stations. The computer carrels themselves consisted of soundproof material; therefore, outside noise was a minimum. The noise restriction was seldom a problem while using the computers. The children

were able to work with each other, talking back and forth with their partner or other children at the other stations while the rest of the room was relatively unaffected.

Phase III--Data Analysis

Phase III was set aside to analyze data collected during the posttesting session and to compare pre- and posttest data. For ethical reasons, it was also determined to be an ideal opportunity for the children assigned to the control groups a chance to use the CD-ROM storybook program. The children in the not-well-read-to group were brought next to the computers in the same fashion, and finally, the children in the well-read-to control group were brought to the computers.

Coding and preparation of the data. The data on all three assessments used were coded dichotomously; 1 if they answered correctly, 0 if not. Data were entered into the computer by ID number, tester ID, and date. The VAX SPSS computer package was used to analyze all data.

Coding of parent questionnaire. Four variables that were deemed most appropriate to create an aggregate variable ("homeread") were extracted from the parent questionnaire. The criterion for selecting variables to be included was that it should directly address the question "What factors are directly associated with reading to children?" The following four questions were chosen for the aggregate variable:

1. "Does someone read to this child?" The possible answers were Yes or No.

2. "If someone reads to the child, when was it started?" The possible answers were Infancy, After he/she could talk, or Recently.

3. "How often is this child read to?" Sometimes, Often, or Daily.

4. "Some children grow very attached to books. About how many children's picturebooks do you have in your home?"

The fourth question was recoded to reflect interval level data. If the answer was between 1-39, it was coded as "1"; 40-99 coded as "2"; and 100 and up coded as "3." Missing answers were coded as "999." The data on the other three questions were recoded so that positive answers were scored as "1" and negative answers were scored as "0." For instance, if someone reads to the child, the score would be "1," "0" if not.

Analyses. Frequencies on each of the assessments indicated that none of the pre- or posttest data showed a normal distribution. For this reason, paired t tests were used to compare the pre- and posttest scores on each of the assessments for each group. The paired t test has been shown to be robust against violations of assumptions of normality (Norusis, 1990).

To assess differences between groups on the three assessments, a series of one-way ANOVA's was run. To determine which groups differed, ANOVA LSD tests were run to identify significant differences between test groups.

CHAPTER IV

RESULTS

Overview

From January to May, 1994, the "Stories and More" program was implemented at Bear River Head Start. Seventy-three children were introduced to the program and overall, the program was determined to be a success. It is important to discuss a number of issues relating to the outcome of the project.

First, the computers were donated to Head Start by IBM; therefore, many of the problems of finding the appropriate computers, software, and peripherals were avoided. Even so, the fact that there were only three computers precluded the option of having a computer in each classroom. For this reason, the computers were located in the Head Start Family Service Center because staff at the Center were willing to do some remodeling that included installing carrels, complete with sound-proof dividers, tables, and chairs. It was also a good choice because the room was more secure than the classrooms or other areas.

It is interesting to note that even though the computer project seemed to be an ideal opportunity for Head Start, the principal investigator and the project director noticed that the teachers seemed to be hesitant and more than a little skeptical at first. One teacher was concerned that the project would disrupt her class; however, as the study progressed, the teachers became more supportive, even allowing their assistants to help bring the children to the computers and spend some time observing the

children's computer activity while, at the same time, discussing the computer component of their curriculum with the parents.

One of the most difficult obstacles to overcome in the study was getting the parent permission letters back in a timely manner. Part of the problem was a language barrier for three of the families. It was determined that a letter in Spanish would help to alleviate this problem. Therefore, a letter was drafted in Spanish and delivered to each of the Spanish-speaking families at Head Start. One family returned the first letter partially filled out, but never returned the letter that had been drafted in Spanish. Another family returned their letter almost immediately after receiving it, but also only partially filled out. The other Hispanic family never returned any of the letters even after the teacher had approached the family about their child's participation in the study.

Two minor problems occurred at the outset that needed to be resolved. One was the fact that the room the Family Service Center provided for the computers was old and had not been upgraded to meet the electrical code, so the wiring in the room was inadequate to run all three computers and overhead lighting at the same time. In order to keep from delaying the study, the project director purchased an extension cord that drew on the power from another source to run the computers until the Family Service Center room could be rewired.

The other problem that required attention was acquiring appropriate headphones for the students. The project director made an arrangement with Head Start to provide three headphones if the project could provide three other headphones.

The project director determined that the fastest course would be to purchase regular headphones from the local computer supplier, and Head Start already had a surplus of headphones ideal for the computers. The regular headphones supplied by the project were acceptable in terms of quality of sound and cost; however, the children preferred to use the educational headphones provided by Head Start because of the snug fit. Unfortunately, the educational headphones provided by Head Start had a fatal design flaw that caused a short in the wiring and did not last through the project. By this time though, the other headphones were not required because we were only bringing three to four students at a time to the computers.

Once the computers and furniture were in place, it was important to train project staff, parents, and volunteers. The project director hosted a computer demonstration session with the preschool teachers and Head Start staff. The material provided by IBM was clear, simple, and easy to use. Therefore, using the computers and instructing the teachers was not a difficult task. This demonstration session was not designed to show the teachers how to use the computers; it was merely a demonstration to inform the teachers what the children would be doing on the computer. In this way, the teachers were able to help calm the child's fears about going to the computer with the volunteers by providing some clues regarding the activities available on the computers.

As soon as the project was in full swing, it was discovered that as much as the parents were interested in participating in the project and allowing their children to have exposure to the computers, it was difficult getting them to commit to a time to

help bring the children to the computers. It was found that the parents were unreliable so the project director recruited two students from Utah State University. One was a graduate student in Family and Human Development who helped to bring the children to the computers and observe their behavior. This student also assisted with reviewing and developing assessment materials. The other student was an undergraduate also from the Family and Human Development Department who was interested in doing practicum work toward his bachelor's degree. It was determined to involve him as the Parent Coordinator, responsible for ensuring that there was always someone available to work with the children every day. He was also responsible for informing the parents of any changes in the project, and helping to maintain accurate records of the children's visits.

As soon as the children arrived at the computer stations, they would find a chair or a partner and begin to type in their names. It was not at all uncommon for the children to have typed in their name before the volunteer could get there to help. Most of the children learned very quickly how to type in the letters of their name. It was interesting, however, that some children consistently misspelled their names the same way every time and others misspelled their names differently every time. Some of the children that had very long names had a more difficult time learning to type their names in, but, for the most part, they were very successful in logging on to the computers with very little assistance from the volunteer.

The children also varied in learning to use the mouse. Some of the children already had some experience with using a mouse and were adept at understanding its

use; however, there were other children that had a very difficult time trying to master the hand-eye coordination. By using the mouse, and watching the screen, it seemed that many of the children increased in fine motor skills. For example, Bethany[1] had a difficult time trying to make the arrow move where she wanted it to be and keep it there while trying to push the mouse button at the same time. Most children were able to handle this task quite easily with one hand, but Bethany needed to resolve this problem by using two hands--one to position the mouse, the other to click on the mouse button. By the end of her computer experience, Bethany was able to make the mouse do what she wanted it to; however, her skills were still not as advanced as the other children and she still needed to use both hands.

Initially, the children were encouraged to find the computer station they felt comfortable with and were also allowed to determine who their partners would be. It was soon discovered that although this was very appropriate in most cases, there were some children that had a great deal of difficulty working in pairs. It was also found that some of the children caught on more quickly than others, which frustrated the children that were not grasping the concepts as fast. For example, Brandon would sit at the computer and let his partner completely take over regardless of who the partner was. He would patiently watch the screen and suck his thumb. After watching him passively sit for a few sessions with several different partners, it was determined to allow him to have some time on his own or with the volunteer. In this way, the volunteer was able to encourage him to use the mouse, but was not able to take over, forcing him to take the lead.

Once Brandon had a chance to get some experience on his own using the computer, he was allowed to choose a new partner to join him. The end results were much more encouraging. Brandon would take an active part in using the mouse, even getting to the point where he would assert himself to his partner in order to get his fair share of control over the mouse.

Another issue that should be discussed was the amount of time the children were exposed to the computer, both in length of sessions and number of weeks the children would require to complete all stories.

Because the current research is sparse, the project director and principal investigator were not sure how long a computer session should last. The NAEYC recommendations suggest that it is appropriate to allow the children to determine the learning center they would like to play at and when to move to a new learning experience (Bredekamp, 1988). Given this information, the children were allowed to determine when to leave their computer experience. Unfortunately, because there was typically only one volunteer with the children at a time, those children interested in leaving first were required to wait a couple of minutes while the rest of the children finished up their projects. For the most part, this approach worked very well. On a few occasions, the volunteer provided activities for the children to do while the rest of the children finished up their computer storybooks.

"Stories and More" included a total of 36 stories in the program. Sixteen of the stories included activities along with the storybooks and the other 20 stories were included in a "Library" section that only involved the storybook.

There were several questions that seemed impossible to answer at the outset of the study. One question was whether or not the children would want to read every story in the program, or if they would only read a few; another was whether or not the children should be directed to specific stories as they finished one. Because the principal investigator and project director did not know if it was reasonable to expect that every child should read each story, the NAEYC recommendations once again set a guideline for appropriate answers. It was decided to allow the children to choose which stories they would read, and at the end of a given period of time (8 weeks), the experimental group would stop the computer exposure and all children would receive a posttest. The time period was set by determining how long it would take to allow for all three groups to participate in the computer experience, including posttest time.

One child, Jeremy, completed every story, possibly because he had previous experience with computers, learned how to manipulate the program more quickly than the other students, and spent a considerable amount of total computer time without a partner. It was determined early in Jeremy's experience, that in order for the child paired with Jeremy to have a fair chance at the computers, Jeremy should be allowed to use the computers alone most of the time. Several times he was required to sit with a partner and was observed to be very helpful to his partner, but very frustrated with his inability to go at his own pace. For these reasons, it was determined that Jeremy should have the opportunity to move at his own pace as much as possible.

Moving the children to and from the computers also proved to be more of a problem due to the staff and time limitations of Head Start. Some of the children felt

deprived when requested to leave the class to go to the computers. Other children would misbehave during the walks to and from the computer and were restricted from computer time the next day. Other children were eager to go with the volunteer and behaved very well going to and from the computers. A tactic that seemed to work well was to give each of the children a temporary ink stamp on their hands for participating in the project at the end of every session. This was an ideal way to occupy the first few children that completed the stories until the rest of the children were able to finish their story. It soon became a sign of prestige among the children to have project stamps on the children's hands. The project director observed several children showing off their stamps, then other children would beg to come. This also served as an enticement for the children to want to come to the computers.

It was difficult to control six children with only one volunteer available to walk the children to and from the computers, and some of the children would try to run away from the rest of the group. This was resolved by providing a yellow rope and explaining to the children that coming to the computers was a privilege and they must hold on to a knot on the rope and not let go. If they were to run away or let go of the rope, they would not be allowed to return the next day. The project director also noted that as the volunteers tried to use more positive language rather than negative remarks, the children were much more receptive to suggestion. For instance, notes from the project provide an example: "I try hard to say, 'Oh, you're doing such a beautiful job walking down the stairs' and they do it so much better whether or not they were doing it right in the first place. I find it interesting to see

how quickly positive reinforcement makes an effect on these children. They're so impressionable."

The computers were delayed in coming from IBM so it was not possible to pilot test the computer program with preschool-aged children prior to putting the experimental group on the computer for the first time. Therefore, the children in the experimental group experienced a short period of experimentation while the project director determined the best course of action. For instance, the program was developed for an older age group; therefore, it was necessary to determine how much of the program should be used with preschoolers. The storybook portion of the program was very appropriate, but the activities that accompanied the program were determined to be too advanced for this age group. After giving the children a short period of exposure to each of the four components of the program, it was determined that the last two components, "Thinking About" and "Going Beyond," were too advanced for the children, and the option of accessing these two components was removed from the menu.

Another problem that required some time to resolve was the option of allowing the child to determine the next course of action at the end of every story or activity by setting the program to return the child to the menu or to follow a sequential order. Because of the desire to follow NAEYC recommendations, it was determined that there should be as much choice as possible for the children in determining the child's next story. Unfortunately, this resulted in the children getting hung up in the transitions between stories and not having the maximum amount of exposure to the

program. It was determined that providing the child with the choice of doing the story or the activity was enough of a choice for this age group. The decision resulted in less frustration for the child, and ultimately, more time spent in actual computer activity.

On the average, the children spent approximately 12-15 minutes on the computer actively engaged in a learning session. This did not include time spent in logging on, or on transitions. The total average time from "Please enter your name" to "Stop for Today" was 20-35 minutes. The average time spent doing the mouse tutorial was approximately 30-35 minutes.

The project notes suggest that the mouse tutorial seemed to be very enjoyable for the children. The project director observed this by the number of times the child would return to the tutorial. If the volunteer noticed that the child would refuse to do a story and only participate in the tutorial, the volunteer would encourage the child to choose another story in order to get some exposure to the other options on the program. Once the child found that the activities and stories were also enjoyable, he/she would occasionally go back to the tutorial and find it to be less interesting and would cut the tutorial short in order to get back to the stories.

If this study were to be replicated, it could be implemented in about the same way as it was in this study. The only problem that should be discussed was that the "Stories and More" program was not developed for the preschool child. The project staff resolved this by adapting the current program to become more developmentally appropriate by eliminating two of the four activities available. Another storybook

program may be used that may only have the stories without the extra activities. Any other problems experienced were minor.

Data Analysis

The data were analyzed in several ways to understand the relationships between the variables. First, by examining the descriptive statistics (histogram, mean scores, and standard deviations), it was determined that the data did not follow a normal distribution. For this reason, pretest and posttest scores were analyzed separately using the ANOVA procedure to indicate statistically significant differences between the mean scores. To determine which group differences were significant, the LSD multiple range test was used. To determine whether or not the children had improved their emergent literacy skills over time, pre- and posttest scores were analyzed using a paired t test. Both the ANOVA and paired t test have been shown to be robust against violations of the assumptions of normalcy and equality of variance (Norusis, 1990). Finally, to determine the impact of the computer exposure, a Pearson's r was run on the posttest assessment variables versus the total computer time as logged in by the computer. The results will be presented in order of the research questions posed earlier and then a discussion regarding the computer exposure findings will be presented.

Question #1

Will children who come from families that report a more literate environment at home, as measured by the parent questionnaire, also score well on the emergent

literacy measures? A one-way ANOVA showed no significant difference between the three test groups and the mean scores on the "homeread" variable ($\underline{F} = .33$). The LSD procedure indicated that no two groups were significantly different at the .05 level. Mean scores by test group, however, suggested that the well-read-to group exhibited higher scores on the homeread variable than test groups 1 or 2 (see Table 1). It was hypothesized that if there was a larger sample size, or a sample more evenly distributed, the differences in mean scores would show significance.

Question #2

Will the children in the experimental group increase their story comprehension abilities more than those children in the control groups? This question was tested by using the Picnic assessment.

Table 1

Mean Scores for the Aggregate Variable "Homeread"

Group	Mean	SD
Experimental	9.0	2.27
Not-well-read Control	8.93	1.20
Well-read Control	9.25	1.22

An ANOVA performed on the pretest scores indicated that there were no significant differences in the mean scores obtained on <u>Picnic</u> within groups; however, the LSD multiple comparison procedure indicated that group one was significantly different than groups 2 and 3 (see Table 2).

Table 2

<u>ANOVA on Pre- and Posttest Mean Scores by Group</u>

Group	N	PAT		CAP		Picnic	
		$\overline{x}$	SD	$\overline{x}$	SD	$\overline{x}$	SD
Pretest:							
Experimental	28	6.714*	3.95	3.33*	1.59	6.75*	3.62
NWR Control	33	5.06*	3.97	4.00*	2.61	7.63*	4.53
WR Control	13	11.15	4.95	7.00	3.63	10.15	5.04
$\underline{F}$ prob		.00		.00		.07	
Posttest:							
Experimental	28	7.21	4.06	6.69	3.31	9.21	4.49
NWR Control	33	4.90**	3.74	5.18*	3.18	8.21*	3.81
WR Control	13	7.71	3.20	8.81	4.48	10.92	3.71
$\underline{F}$ prob		.02		.00		.11	

*indicates statistically significant differences from group 3 at the .05 level using the LSD multiple range test.
**indicates statistical significance from groups 1 and 3 at the .05 level.

The ANOVA performed on the posttest scores indicated that the treatment group's mean scores had risen higher than the control group, but not as high as the well-read-to group. The mean scores overall were not significantly different from each other, but the LSD procedure indicated that scores from test group 2 showed a statistically significant difference from test group 3.

To determine if there was any change over time, pre- and posttest scores were analyzed using a paired t test for each group (see Table 3). The results indicated a statistically significant difference between pre- and posttest scores, suggesting that the test group's scores improved more than the control group's scores.

Table 3

Paired T Test of Pre- and Posttest Scores Within Test Group

Assessment	Experimental Group	Not-Well-Read Control Group	Well-Read Control Group
Print Awareness Test	$p = .502$	$p = .832$	$p = .009$
Concepts About Print	$p = .000$	$p = .002$	$p = .030$
Picnic	$p = .008$	$p = .423$	$p = .430$

Question #3

Will children in the experimental group increase in ability to recognize significant concepts about printed language (specifically, the front of the book, the concept that print, not pictures, tells a story, and the functions of punctuation) more

than the children in the control group? This question was answered by analyzing the children's scores on the Concepts About Print assessment. The ANOVA procedure comparing the Concepts About Print scores by test group for the pretest indicated a significant difference in the means and the LSD procedure indicated that groups 1 and 2 were significantly different from group 3. The ANOVA procedure performed on the posttest scores indicated that the test group's scores increased more than the control group's scores, but not to the point of the well-read-to children. The LSD procedure indicates that group 2 was significantly different from group 3. The paired t tests procedure indicated change over time between pre- and posttests, showing a significant increase in mean scores for group 1 (see Table 3).

Question #4

If children are exposed to a computer reading program, will they become more aware of environmental print than the control group? To answer this question, the results from the Print Awareness Test were used. The ANOVA performed on the pre- and posttest scores showed some interesting results. The test group showed a slight increase in mean scores between pre- and posttest, but the not-well-read-to control group showed a slight drop, and well-read-to control group 3 showed a dramatic drop. Mean scores on the pretest show that the well-read-to group scored significantly higher by several points than either groups 1 or 2 (see Table 1). The ANOVA using posttest scores, however, shows that the well-read-to group's scores dropped down to within a few tenths of a point higher than test group 1. The paired

t test indicated no significant change in scores over time for groups 1 or 2, but a significant change in the negative direction for group 3 was observed (see Table 3).

The amount of time children in the experimental group spent using the computer was only modestly correlated with the Concepts about Print assessment ($r = .28$). Correlations between computer time and the other two assessments were minimal (Print Awareness Test, $r = .08$; Picnic, $r = -.01$). It is puzzling that computer time was not more throughly correlated with posttest scores, especially since the experimental group as a whole made significant improvements between pre- and posttest assessments. It may be that other factors like intelligence, which was not measured in this study, affected the children's scores.

A few factors were observed, however, that should be discussed. For instance, the range for computer exposure was very large due to our desire to adhere to NAEYC recommendations. Secondly, as the children and teachers discussed the child's computer experience with the parents, more interest was generated in reading to the children. For example, Crystal's father helped to bring the children to the computers and was one of the more reliable parent volunteers. However, neither he nor his wife attended the first literacy night where we introduced the concept of reading bedtime stories to their children as well as specific techniques for reading with their children. By the end of the study, the father reported buying some additional materials for his child. The project director also noted that they attended the last literacy night and took fervent notes. It may be that the intervention and

focus on reading had a positive effect on the other parents of children in the experimental group as well.

Variation among Subjects

As the results of the project are determined, it is important to discuss the individual differences among children as they experienced the computer. There were two children that seemed to be excessively active when brought to the computers. One child, DJ, would sit with his friend Dustin and could not keep his hands still. While Dustin would sign his name onto the computer, DJ would pound the keyboard, hit the computer screen, and chew on the cord from the computer to his headphones. The volunteers were forced to hold DJ's hands still while Dustin would sign on. As soon as the story began, DJ would become extremely engrossed in the story, the behavior would disappear, and sometimes DJ would even forget that it was his turn to control the mouse. It was the feeling of the project director that the problem with DJ may be a slight case of hyperactivity, which could be easily controlled by behavior modification techniques. DJ behaved very well toward the end of the project.

On the other hand, Cassidy would sometimes disrupt all of the rest of the children, refuse to sit at the computers, or request to leave as soon as she got there. The problem with Cassidy, however, was thought to be more of a discipline problem than a physiological one. It seemed that Cassidy was trying to control the adults around her and would misbehave if she did not get her way. This behavior was resolved by two methods. First, Cassidy was not treated any differently than the rest of the children. Second, if Cassidy chose to come to the computers, she was told that

she must sit and pay attention with the rest of the children. If she did not, she was not allowed to come to the computers the next day. For this reason, Cassidy's average computer time was very small compared with the other children.

Another interesting difference occurred between the boys and the girls in the study. Although there were no statistical differences between gender, there were some interesting observations as recorded in the project notes. For instance, it was noted that the boys tended to dominate the mouse when paired with a girl, but when paired with other boys, there tended to be more fighting over the use of the mouse, whereas the girls would be more likely to share. This generalization cannot apply to all children, however. For instance, Mary and Dean were paired together fairly frequently. During pretest, Mary seemed to be more quiet and shy than some children and Dean seemed to be more outgoing. When paired together, Mary would sometimes take over the control of the mouse while Dean was perfectly content to sit and watch. Mary would encourage Dean to try to use the mouse, but soon tired of questioning him and would completely dominate the control of the computer. It was interesting to notice that Dean was perfectly content to allow this to occur. However, when paired with other boys, Dean seemed to be very aggressive and willing to take turns controlling the mouse.

The total amount of time the children spent actually participating in the CD-ROM storybook activities and stories was monitored by the computer. A mean score was calculated by adding the total number of minutes on the computer and dividing by the total number of visits. Each child visited the computer an average of 12.36 times

with a range between 6 and 20. The mean number of minutes on the computer was 194.29 minutes with a range between 102 to 363. Each child read an average of 45 stories ranging from 22 to 83 (some of the children read several of the stories more than once).

The differences in computer participation were partly because children were required to leave their activities in the classroom during their free play time to go to the computers and so some of the children refused to go. In some cases, they were not interested in stopping the project they were currently involved in, and in others, the children were somewhat shy about leaving with the volunteers. Some of the children so looked forward to going to the computers, that as soon as the volunteer arrived, they dropped what they were doing to go. For this reason, there is a wide range of computer participation.

It is also important to identify some of the possible reasons for some children logging in more actual time on the computer stories. A few of the children learned to type in their name very quickly, including helping their partners to type in their names, but others required more assistance; therefore, the total time spent on the computer may be the same but the actual time on the stories was shorter. Also, because some of the children were more shy than others, it was necessary for the volunteer to help ensure that the children had a fair amount of opportunity to manipulate the stories. For example, one child, after having an especially difficult time trying to get her partner to relinquish the mouse, refused to come to the computers again. This was resolved by reassigning the child to a new partner and

requesting the volunteer to spend a little extra time with the child at the outset of the computer session. Even so, the child missed one week of computer time.

Finally, the number of stories the children read was a good indicator of the child's ability to grasp the concepts of the computer storybooks. Some of the children learned very quickly how to manipulate the program to access the stories they were interested in. Therefore, they were able to quickly go from one story to the next.

One problem that occurred more frequently at the beginning of the computer sessions was the child's tendency to sign off involuntarily. Of the four pictures on the screen that the child could choose from at the end of a story session, the "Stop for Today" was familiar to them because of the stop sign icon. If the child clicked on the stop sign, the child was exited from the program. Many times, the children would be frustrated that they had been kicked out of the program, and insisted on being returned to where they left off. Typically, signing on to the program required up to one minute, sometimes more if the child had difficulty typing in his/her name or getting a partner to cooperate. After two or three times experiencing this frustration, the children learned not to click on the stop sign until it was suggested by the volunteer to end the session.

CHAPTER V

DISCUSSION

Children who have been read to in the home had higher level reading skills than those children who did not have that opportunity. Because reading is such an important indicator for the child's future success in school, it is important to find methods that can compensate for this lack in the home. The first priority should be to educate parents on the importance of reading to the child, starting as early as possible, and reading to them in a manner that will make reading fun. Effecting this type of social change, however, will take many years and may never reach every home and child (Purcell-Gates, 1991).

This study supported previous research suggesting that children who were not well-read-to in the home do not score as well on reading assessments. It also supported previous research that reading storybooks to children can improve the child's emergent literacy skills. Finally, this study supported the notion that a computerized storybook program in an early childhood curriculum could provide increased reading skills for children in a developmentally appropriate way. By introducing computer storybooks into a preschool classroom, those children who have not had as much exposure to storybooks in the home can improve their emergent literacy skills in a way which may aid in their preparation for public school.

After analyzing the data, it was found that overall, the mean scores for the children in the test group increased more than the mean scores in the other two control groups. Even with this increase, the scores obtained by the children in the

experimental group did not surpass the scores obtained by the children in the well-read-to group. It is also interesting to note that on the Print Awareness Test, the test group was the only group showing an increase in their scores even though it was not significant. The other two control groups' mean scores on the Print Awareness Test decreased, and the decrease in mean scores for the well-read-to group was significant ($p = .008$). The explanation for this phenomenon is difficult to pinpoint. The computer storybook program did not necessarily focus on environmental print, which would obviously increase the child's mean scores, and all of the children were exposed to the same learning environment in the classroom. Also, the groups studied were randomly assigned from the entire Head Start population, so the difference cannot be attributed to one teaching style over another.

The Concepts About Print measure showed the most dramatic results. The increase of mean scores from pretest to posttest for the experimental group is the most significant ($p = .000$) of any of the comparisons between the other study groups' pre- and posttest assessments. A possible explanation for this could be some of the "Starting Off" activities where the child is presented with a word to put next to a picture, or place into a scene. When the child clicks on the word, it turns to a picture and the child can place it in the scene. The children are focused on what a word is and they are requested by the computer to click on words to find out their meaning. They quickly learn that there are words at the bottom of the screen that provide information and instructions.

The results also indicated an increase in the scores on the Picnic assessment. It could be argued that each of the children had exposure to the measure twice; therefore, they were more familiar with the story the second time around. The pretest scores, however, indicate that the experimental group scored significantly lower than either of the control groups, but at posttest, the not-well-read-to control group was significantly lower than either the experimental group or the well-read-to group. Once again, it was found that the test group increased their score ($p=.008$) significantly. Even though the other two groups increased their scores, the increase was not significant (see Table 3).

Limitations of the Study

As with any study, there are many limitations. The sample of subjects that are available for study, implementation of the intervention, assessments, and statistical analysis are all reasons to be cautious when making generalizations.

Sample. The sample used was the most economically disadvantaged in the local area, but there are other areas nationally that are more economically disadvantaged. Many of the sample children had already had some exposure to a computer at home, and most of the classrooms at Head Start had a much older computer that the children had access to. Because the computers in the classroom are so old, and because there are many differences between the older computer and the newer computer that used the "Stories and More" program, it is unlikely that the computers in the classroom affected the results.

Implementation. There were two testers for the pre- and posttests that were familiar with the children as well as familiar with the assessments. This provided a great advantage in establishing rapport with the children. However, the testing location may have caused some of the assessments to be less reliable because there was no room set aside for assessments to be conducted.

Another consideration may be the length of time it took to complete assessments. It took 11 weeks to complete all five assessments for 81 children on the pretest. This was, in part, due to the fact that the testers were only allowed to remove children for a 1-hour period during the day for each class. Also, if the children were required to complete four assessments consecutively, the testing session sometimes took one-half hour per child, without the extra time spent removing the child from the classroom and walking to the assessment location. Unfortunately, it was difficult for the children to sit for that long of a period of time even if we were changing the task fairly often, so we spent a great amount of time walking children to and from the classroom. Furthermore, many times the teachers changed their schedule without notice in order to go on field trips or walks. This set back the time schedule even further. In any case, the children were tested in a random fashion, without regard to test group. Therefore, it is not likely that any maturing effect occurred for one group over another.

Assessments. Two of the three assessments were most successful. The Picnic book turned out to be the easiest to administer, but the most difficult to score reliably. Even after taping each interview, it was sometimes difficult to understand the child

over the noise of the testing area. Also, some of the more shy children had a difficult time telling us the story without many promptings. This was not perceived to be a problem with reliability because the child was prompted to speak anything rather than being prompted with specific events or leading words. For example, one child, who had a slight hearing problem, was very reluctant to discuss the pictures and just sat looking at the book without making any comment. As the tester turned the pages and asked "What is happening on this page?," suddenly the child became very involved in the story and soon took over turning the pages herself and talked constantly, almost to herself, about the pictures in the book.

This assessment is also an example of the creativity of some children and the problems of testing this age group of children. It was very apparent to the tester which children were more comfortable with story construction. For example, one boy, while looking through the book, noticed that the little mouse fell out of the truck and the family left her behind. He made the comment: "She's not safe! She fell out and she's not safe!" and refused to continue on with the story. Any pages he turned after this seemed to be too frustrating to him because the family did not notice that the baby had fallen out and there was a possible danger for the little mouse. Even though it was very apparent to the tester that the child had a very strong sense of story schema, the child did not score well on the test because of his refusal to continue with the assessment.

Implications for Use in the Classroom

There are many questions that arise out of this study. One of the most significant would be, is the program appropriate to be used in the public school system? What would be the cost? How easy would it be to implement such a program? What would be the impact on the teacher? Would more assistance be necessary in the classroom?

Because "Stories and More" was designed for the first through third grade population, and a significant increase in emergent literacy as measured by the assessments was evident, it would be appropriate to use the program for the first through third grade population. For this study, it was determined that preschoolers only needed the storybooks and simple activities to accompany the stories; however, there are two more segments to the program that were not used in this study. For instance, as soon as the child chooses a story to read, the child makes a choice to use the "Starting Off" activities, or to "read" the story. Following the story, the child has the option to continue on to a section called "Thinking About," which guides the child through similar activities like the "Starting Off" section but that are a bit more complicated by adding more words. Finally, the child has the choice of doing "Going Beyond" activities that incorporate writing and typing into the child's reading activity.

Whenever a new program is being considered for the public school system, the first question that arises is cost effectiveness. How much do the benefits outweigh the costs? Is it possible to provide a computer for every classroom? Would it be more appropriate to have a computer center for the entire school?

The purpose of this study was not a cost benefit analysis, nor was it possible to estimate the benefits of positively affecting children's emergent literacy; however, it would be important for each school or classroom to determine the importance they place on reading, and whether or not the cost of the computers, software, peripherals, and furniture are worth that cost. As class sizes and student/teacher ratios increase, technology costs may be less than teacher costs and may be one way to improve reading instruction in the classroom.

In this study, it was not feasible to provide computers for each classroom. Initially it was thought that the computers could be installed in a self-contained, portable station that could float from room to room. It was determined, however, that the cost of the furniture would be prohibitive, and finding an appropriate place to store the station would be difficult. For these reasons, it was determined that a computer center would be more appropriate for the Bear River Head Start. In this way, the computers could get the maximum amount of use. For instance, the teachers would be able to do some lesson plans on the computers, and the parents would be able to learn computer programs, including typing skills, while the children would still have the opportunity to use the computers during their free play time.

When determining whether or not to invest in a computer center, or computers for each classroom, some of these issues must be investigated. One of the most important factors would be volunteer help. If it is determined to use a computer in the classroom, is it possible for the teacher to leave the classroom and help one student on the computer or would it be appropriate to have a parent volunteer help as

it was done in our study? Furthermore, if it is decided to install a computer center, can all of the children in a classroom go at the same time, or would it be necessary to provide a helper to get the children to and from the computer center?

Finally, with the advance in home computers, would it be appropriate for parents to use computer reading programs at home? What would be some concerns that should be addressed with parents before investing in a computer storybook program? Because the results of this study indicated that those children in the experimental group significantly improved their assessment scores by exposure to the computers but still did not attain the level of the better-read-to group, it would be beneficial to emphasize the importance of parents reading to their children at home. The computer program should not be used in the home in place of the bedtime story, but rather as a supplement.

Home computers are fast becoming very common in most middle class homes; however, the literature suggests that the most reading assistance is required for lower income families. It is not likely that these lower income homes will be investing in computer storybooks for children when they currently do not participate in any of the lower cost activities that are designed to assist the emergent literacy of their child. If this were to become more commonplace, it may require a design change that would be similar to the VCR or Nintendo game set that hooks up to the television and provides some interaction with the story.

Recommendations for Future Research

The implications for future research are promising. The possibility of having a positive effect on every child's ability to learn is exciting, but the concept of providing reading successes for children opens up a broader topic of the future of computer use as an instructional tool for adults. It would be a benefit to investigate storybook reading to adults whose literacy level is lower than needed for adequate employment. As was noted, there is a great lack of scientific research on computers and education.

One of the first questions needing to be answered is regarding length of effects. Even though positive effects from exposure to the computer storybook program were found, will those effects last over time? Will those children that had been exposed to the program exhibit a greater understanding of those story concepts as they enter first grade? Does the effect hold over summer, 1 year, 2 years, or 5? A longitudinal study examining these effects would be worth investigating.

Another important question to be answered suggests that the computer should be in the classroom rather than in a computer center. Recommendations from the National Association for the Education of Young Children (Bredekamp, 1988) suggest that using the computer in a preschool should be no different that any other learning center in the classroom. Would having a computer center in each of the classrooms be more beneficial than having a computer center for the entire school? Because there is such a huge expense involved with computer systems, it would be important to investigate the gains earned from exposure to the computers in the classroom over

the gains earned from exposure to the computers in a learning center for the entire school.

It is also appropriate to discuss what the role of the parent volunteer in computer education programs is. Would having a parent assist with computer programs be beneficial to the child? Is it important for an adult to be present while a child is working on the computer? It was found in the present study that the computer assisted the children in their emergent literacy, but it still did not bring the children to the level of those children who were determined to receive more reading in the home. Would it make a difference if all exposure to the computers were assisted by parents? Is it possible to get every parent to participate?

There is a need to investigate the effectiveness of a computer-assisted educational program when used as part of an entire curriculum, rather than an isolated element as it was in the present study. The "Stories and More" program was designed for elementary school students in the whole language classroom. The present study examined the effects of just computer storybook reading to preschool children. IBM has prepared an entire manual with classroom activities, games, stories, songs, and projects to go with each of the stories on the computer. What would be the effects of studying a modified version for preschoolers and examining the differences between the impact of a whole language classroom with computer versus whole language classroom without computer versus computer only without whole language instruction?

There would also be a need to investigate the impact the computer may have on the cognitive development of the preschool child. It was evident to the project director that there were many cases where the child would begin using the computer without grasping the abstract concepts that using computers and visualizing programs require. However, during the course of the study, the researcher noticed more children able to understand these abstract concepts. For example, in the beginning, many of the children would have a difficult time trying to figure out what to do after the story ended. They were unable to visualize the computer menu or recognize that there would be something for them to do after the story had been read. At this point, the volunteer would help the child with the transition into another activity or story. After a while, the child would begin to determine sequential events, hidden concepts, and directional paths that would enable the child to obtain a desired result. This seemed to be a good example of a shift from preoperational to concrete operational thought. This approach could possibly help educators understand the needs of preschool children as they prepare for the public school system and, perhaps, provide a richer environment to stimulate that shift.

It would also be important to investigate the impact the computer would have on the child's fine motor skills. It would be very beneficial to determine if using the mouse would, in fact, improve hand-eye coordination as it was observed in this study. Because some of the children had some difficulty with this task, a computer program developed to exercise their fine motor skills may help those children with this type of developmental delay. In this way, it could be determined if developing fine motor

skills on the computer could improve the child's fine motor skills in other areas, such as using scissors, drawing pictures, and other activities.

Conclusions

Children's emergent literacy is of premium importance to parents and educators because of the overarching importance of reading in the child's education. According to the literature, reading storybooks to young children helps to improve the child's emergent literacy prior to entering school. Access to a CD-ROM storybook program will provide exposure to storybooks and this study has indicated that it is beneficial to the children to do so. Care must be taken to ensure that the computer and CD-ROM are not used as a replacement for the parent reading the storybook to the child, but more as a supplement to language activities that are already taking place.

Providing computers in the schools can help to compensate for a lack of support in the home, but it is also important to focus on stimulating the home environment. The current research has indicated that the richest experiences in emergent literacy are founded in a strong home environment; therefore, the focus for educators should always be to improve the home environment by educating the parents. Unfortunately, many of the efforts already in place seem to be affecting those parents already heavily involved in their child's learning. The problem seems to be age-old. In a country that prides itself on providing the opportunity for everyone to overcome the circumstances they are born into, some children grow up never realizing that there are even other options available to them. For this reason, it

seems that the responsibility does lie with the educational system. If the schools can provide exposure to some of those options, and create a desire in the children to make a different life for themselves, then it would seem that the goal of having a totally literate society can be met.

REFERENCES

Adams, M.J. (1992). Beginning to read: Thinking and learning about print. (A

   Summary). Center for the Study of Reading, The Reading Research and

   Education Center, University of Illinois: Urbana-Champaign.

Ainsa, P. (1989). Improving family literacy through technology in early childhood.

   Reading Improvement, 26, 266-269.

Amato, T., & Ziegler, E. (1973). The effectiveness of creative dynamics and

   storytelling in a library setting. Journal of Educational Research, 67(161),

   162-181.

Anselmo, S., & Zinck, R.A. (1987, March). Computers for young children?

   Perhaps. Young Children, pp. 22-27.

Bernstein, B. (1971). Class, codes and control (Vol. 1). London: Routledge and

   Kegan Paul.

Bredekamp, S. (1988, January). NAEYC position statement on developmentally

   appropriate practice in the primary grades, serving 5-through 8-year-olds.

   Young Children, pp. 64-84.

Carlson, A.C. (1990). Family questions. New Brunswick, NJ: Transaction.

Clark, M.M. (1976). Young fluent readers. London: Heinemann.

Clay, M.M. (1979a). Stones (3rd ed.). Auckland, New Zealand: Heinemann.

Clay, M.M. (1979b). The early detection of reading difficulties (3rd ed.). Auckland,

   New Zealand: Heinemann.

Clements, D.H. (1985, May-June). Early education principles and computer practices. Children Today, pp. 21-25.

Cunningham, A.E., & Stanovich, K.E. (1991). Tracking the unique effects of print exposure in children: Associations with vocabulary, general knowledge, and spelling. Journal of Educational Psychology, 83(2), 264-274.

Davidson, J.I. (1989). Children and computers together in the early childhood classroom. Albany, NY: Delmar.

Donachy, W. (1976). Parent participation in preschool education. British Journal of Educational Psychology, 46, 31-39.

Durkin, D. (1969). Reading and the kindergarten. An annotated bibliography. Newark, DE: International Reading Association.

Early childhood and school success (1993, February). Electronic Learning, 12(5), 23.

Elardo, R., Bradley, R., & Caldwell, B. (1975). The relation of infants' home environments to mental test performance from six to thirty-six months: A longitudinal analysis. Child Development, 46, 71-76.

Goodwin, L.D., Goodwin, W.L., Nansel, A., & Helm, C.P. (1986). Cognitive and affective effects of various types of microcomputer use by preschoolers. American Educational Research Journal, 23(3), 348-356.

Harman, D. (1987). Illiteracy: A national dilemma. New York: Cambridge Book Company.

Heath, S.B. (1983). Ways with words: Language, life and work in communities and classrooms. Cambridge, England: Cambridge University Press.

Hiebert, E.H., Cioffi, G., & Antonak, R.F. (1984). A developmental sequence in preschool children's acquisition of reading readiness skills and print awareness concepts. Journal of Applied Developmental Psychology, 5, 115-126.

Huba, M.E., & Kontos, S. (1985). Measuring print awareness in young children. Journal of Educational Research, 78(5), 272-279.

Lancy, D.F., & Bergin, C. (1992, April). The role of parents in supporting beginning reading. Paper presented at American Educational Research Association conference, San Francisco, CA.

Lancy, D.F., Draper, K.D., & Boyce, G. (1989, Spring). Parental influence on children's acquisition of reading. Contemporary Issues in Reading, pp. 83-93.

Lancy, D.F., & Talley, S. (1994). Stimulating/simulating environments that support emergent literacy. In D.F. Lancy (Ed.), Emerging Literacy from Research To Practice, pp. 127-156. Westport, CT: Praeger.

Mandler, J., & Johnson, M. (1977). Remembrance of things parsed: Story structure and recall. Cognitive Psychology, 9, 111-151.

McCully, E.A. (1984). Picnic. New York: Harper & Row.

Miller, L., Blackstock, J., & Miller, R. (1994). An exploratory study into the use of CD-ROM storybooks. Computers Education, 22(1/2), 187-204.

Molloy, M. (1994). Use of computers with Head Start children. National Head Start Bulletin, 42(10), 4.

Morrow, L.M. (1988). Young children's responses to one-to-one story readings in school settings. Reading Research Quarterly, 23(1), 89-107.

Nickse, R.S. (1990). Family and intergenerational literacy programs: An update of "The Noises of Literacy." (Report No. ED 327736) Columbus, OH, Ohio State University, ERIC Clearinghouse on Adult, Career, and Vocational Education. (ERIC Document Reproduction Service No. ED 327736).

Nickse, R.S., & Englander, N. (1985). Collaborations for literacy: An intergenerational reading project. Administrator's handbook. Boston, MA: Trustees of Boston University.

Norusis, M.J. (1990). SPSS Introductory Student Guide. Chicago, IL: SPSS.

Purcell-Gates, V. (1991, May). Emergent literacy in a non literate home: Problems and issues.. Paper presented at the Conference on Family and School Support for Early Literacy, Toledo, OH.

Putnam, L. (1994). Three different early literacy programs and their effects on inner city kindergartners' emerging sense of story. In D.F. Lancy (Ed.), Emerging literacy from research to practice, pp. 285-308. Westport, CT: Praeger.

Smith, C.B. (1991). Family literacy: The most important literacy. The Reading Teacher, 44(9), 700-701.

Stanovich, K.E., & West, R.F. (1989). Exposure to print and orthographic processing. Reading Research Quarterly, 24(4), 402-433.

Stedman, L.C., & Kaestle, C.F. (1991). Literacy and reading performance in the United States from 1880 to the present. In C.F. Kaestle (Ed.), Literacy in the United States (pp.75-128). New Haven. CT: University Press.

Strickland, D.S., Feeley, J.T., & Wepner, S.B (1987). Using computers in the teaching of reading, New York: Teachers College Press.

Sulzby, E. (1985, Summer). Children's emergent reading of favorite storybooks: A developmental study. Reading Research Quarterly, pp. 458-481.

Teale, W.H. (1978). Positive environments for learning to read: What studies of early readers tell us. Language Arts, 55, 922-932.

Teale, W.H., & Sulzby, E. (1986). Emergent literacy as a perspective for examining how young children become writers and readers. In W.H. Teale & E. Sulzby (Eds.), Emergent literacy: Writing and reading (pp. 173-206). Norwood, NJ: Ablex.

Thouvenelle, S. (1994, February). Do computers belong in early childhood? Scholastic Early Childhood Today, pp. 48-49.

Tough, J. (1983). Children's use of language and learning to read. In R.P. Parker & F.R.A. Davis (Eds.), Developing literacy: Young children's use of language (pp. 55-67). Newark, DE: International Reading Association.

U.S. Bureau of Census and Utah Governor's Office of Planning and Budget (1994). Utah Data Guide, 13(2), 2.

Walker, G.H., & Kuerbitz, I.E. (1979). Reading to preschoolers as an aid to successful beginning reading. Reading Improvement, 16, 149-154.

Waxler, T. (1994). Computers in the Head Start classroom...An update. Head Start

Bulletin, 42, 10.

Wolverton, E.D., Plutro, M., & Bewick, C. (1994). Considerations regarding

classroom computers. Head Start Bulletin, 42, 8-9.

ENDNOTES

1. All names of children have been changed to protect the identity of children participating in this study.

APPENDIXES

Appendix A:

Print Awareness Test

PRINT AWARENESS TEST

NAME_____SEX: M   F

CENTER_____LOCATION_____

BIRTH DATE_____AGE IN MO._____TEST DATE_____

SUBJECT'S RESPONSE (+ or -)	S (1)	C (0)	D (0)	
	Circle child's response			
PC1_____	B	C	A	S=Symbolic and most effective choice (e.g., look at label).
PC2_____	A	C	B	
PC3_____	B	C	A	C=Concrete, plausible, but less efficient choice (e.g., open it up
PC4_____	B	A	C	and taste it).
PC5_____	C	A	B	D=Unrelated distractor (e.g., bake a cake).

FOR THE FOLLOWING FIVE ITEMS, SEVERAL CORRECT RESPONSES ARE POSSIBLE . A CORRECT ANSWER CONTAINS A PRINT RELATED TERM WHICH MUST BE MENTIONED TO RECEIVE ONE POINT (E.G., IN VS1 "MARKS ON MEASURING CUP" RECEIVES 1 POINT, WHEREAS "MEASURING CUP" ALONE RECEIVES NO POINT.)
Circle correct response or write out what child says.

VS1_____recipe/on box/marks on measuring cup

VS2_____Make a list/write items down

VS3_____A letter/note/card

VS4_____Menu/card/pictures/sign on wall

VS5_____Name was on the picture

	(0)	(1)			(0)	(1)
PW1	PIC	WORD	PW4		PIC	WORD
PW2	PIC	WORD	PW5		PIC	WORD
PW3	PIC	WORD				

TOTAL POINTS:_____

The first section of the test consists of one sample question and five Picture-Choice questions (PC1 through PC5). For each, E reads the introductory question. S/he then points to each picture on the associated paper while reading the description of the picture provided in the multiple choice alternatives. (E should NOT read aloud the letter designating the alternatives: a), b), and c)). E begins this section by showing the child the card marked, "sample". S/he says to the child, "I want to ask you a question: If mom and dad want to know what movies are on at the theatre what is the best thing they can do to find out? Should they

   a) look in the newspaper
   b) go to the theatre and ask the person selling tickets
   c) look in the cupboard."

Regardless of the child's answer, E says "Good job. Now I want to ask you some more questions." E proceeds with items PC1 to PC5.

PC1.   Tom's mom wants to shop at Miller's Department store. How can she find out which store is Miller's? Should she

   a) buy a hamburger and eat it.
   b) look at the sign outside each store.
   c) go in every store and ask someone.

PC2.   One morning Dad looked in the cupboard and saw two new boxes of cereal. He wanted to eat the one called Crunchies. What is the best way to know which one is Crunchies? Should he

   a) look on the boxes.
   b) mow the lawn.
   c) open both boxes and eat some.

PC3.   If Jim's mother forgets the end of the Little Red Riding Hood story, what is the best thing for her to do? Should she

   a) buy some fruit.
   b) look in the book.
   c) go next door and ask the neighbor.

PC4.   Jane's dad is driving his car. He wants to know if he is on Baker Street. What is the best way for him to find out? Should he

   a) get out of the car and find someone to ask.
   b) look at the street sign.
   c) turn on the windshield wipers.

PC5.   Mom has a can of juice. If she wants to know if it has apple juice in it, what is the best way for her to find out? Should she

   a) open it up and taste it.
   b) bake a cake.
   c) look at the label on the can.

When administering the Verbal Situation questions (VS1 through VS5), E reads the question and records the subject's response. Repeating the question and probing for additional responses is sometimes necessary.

VS1. Mom is baking a cake. She needs to know how much water to put in the bowl. How does she find out how much water she needs?

VS2. Bill's Mom is going shopping at the grocery store. She needs to buy a lot of things. What can she do to help her remember to buy everything?

VS3. Mrs. Jones took a present to Mary. No one was home at Mary's house, so she left the present on the front porch. When Mary came home, she opened up her present and said, "Oh, what a nice gift Mrs. Jones gave me." How did Mary know that the gift was from Mrs. Jones?

VS4. Laura and her grandmother went to a restaurant for lunch. Grandma told Laura what foods the restaurant had. How did Grandma know what foods were there?

VS5. All the children at school painted pictures and put them on the wall. Then they went outside. When Sarah's mom came in, she looked for Sarah's picture and said, "I really like this painting." How did she know which one was Sarah's?

When administering the Picture-Word questions (PW1 through PW5), E places two index cards which correspond to the question in front of the child, making sure to place them on E's right (R) or left (L) according to the code on the back of the cards.

PW1. Which one these is a _story_ about a teddy bear?

PW2. My friend lives far away. If I wanted to tell him how fast my new car goes, which one these would I send him?

PW3. Last night I heard a joke on TV and I wanted to put it on paper just _exactly_ the way I heard it so I could tell it to you today. Which one of these did I make?

PW4. My grandfather lives in another town. If I wanted to tell him what my dog did today, which one of these would I send him?

PW5. Last night my little girl said to me, "This cake is scrumpdilyitious!" I wanted to put down exactly what she said. Which one of these did I make?

Appendix B:

Concepts About Print

Concepts About Print — Scoring Sheet

_____   code #

_____
Tester Name

                                        date tested _____

Page   [ ] Front of book
  2.   [ ] Start reading where?

  4.   [ ] Start reading where?
        [ ] Left-Right
        [ ] New line
        [ ] Word by word point

  6. [ ] Start/End
      [ ] Picture

  8. [ ] Where to begin/end?

  10. [ ] Whats wrong--read

  12. [ ] Start reading where?
       [ ] What's wrong? (p.12)
       [ ] What's wrong? (p.13)

  14. [ ] What's wrong?
       [ ] '?'

  16. [ ] '.'
       [ ] '.'
       [ ] ' " '
       [ ] 2 CAPITAL/ 2 small

  18. [ ] 'was' / 'no'

  20. [ ] 1 & 2 Letters
       [ ] 1 & 2 Words
       [ ] First & Last Letter
       [ ] 1 Capital letter.

Appendix C:

Picnic Protocol and Scoring

Tester _____

Picnic   Score   Sheet

Page
Anywhere- Family Relationships_____
1.
  Picnic_____
  Motive_____
2-5
  Mouse Fall_____
  Cause_____
  Left_____
6-9
  Specific Setting_____
10.
  Actions_____(summative/not a list)
11-13
  Lost M. affect_____
  Lost M. I.D._____(one who fell from truck)
  Looking for Food_____
14-15
  Time to eat_____
16-17
L.M. Eating_____
18-19
  Whose missing?_____
20-21
  Looking_____(summative)
  Affect_____
22
  Why leaving?_____
23
  Lost M. affect or action_____(not sleepling or laying down).
24-25
  Family looking_____
  Why Lost M.=moving_____(hears something, looking)
26-28
  Find!_____
  Affect_____
29 Forgot Toy_____
30 Have Picnic_____
  Give reason_____ (to have a picnic)

Appendix

Scoring Picnic Readings

SETTING THE STAGE: first few pages.....   (1.0 point)
   1/2 point - noting mice are getting ready to go on a picnic.
            (no credit if picnic is mentioned after problem occurs)
   1/2 point - attributing some kind of motive for, or thought given to,
            or wish to go on a picnic (e.g., "One evening they decided
            to go on a picnic.")

CHARACTER RELATIONSHIPS: throughout text   (0.5 point)
   1/2 point - recognizing family relationship among characters
            (indicated by "mother" and "father," etc. - anywhere in
            story; misidentification of some of the characters means no
            credit)

IDENTIFYING THE PROBLEM: pp. 2-5   (1.5 points)
   1/2 point - noting that mouse falls from truck
   1/2 point - noting cause (they went over a rock, or bump)
   1/2 point - noting that the others left, or that no one noticed one of
            the mice fell out (saying "truck left" is not enough)

IDENTIFYING THE SETTING: pp. 6-9 or anywhere (.5 point)
   1/2 point - correctly naming their location (a "farm," "meadow,"
            "park," or "the country" would be accepted; "grass," "a
            spot," or "picnic place" would be too imprecise to count)

SUMMARIZING FAMILY ACTION: p. 10 or pp. 14-15 (.5 point)
   1/2 point - summative statement of what they were doing -- e.g.,
            playing games, playing, having fun, exercising (no credit
            for "doing their stuff;" no credit for just listing separate
            activities, like "playing baseball")

SCENE SHIFT: pp. 11-13   (1.5 points)
   1/2 point - noting affect of lost mouse -- he is sad or scared --
            or noting why he is crying.
   1/2 point - clearly identifying lone mouse as the one who fell from the
            truck, or the "lost mouse," indicating linguistically that he
            is separated from the rest of the family.
   1/2 point - noting he is looking for food ("looking at flowers" does not
            count)

SUMMARIZING ACTION: pp. 14-15   (.5 point)
   1/2 point - indicating it is time for the family to eat; mother is
            calling them to eat, etc. (inventory of separate actions
            doesn't count)

SCENE SHIFT COMPARISON: pp. 16-17   (.5 point)
   1/2 point   -   identifying mouse's action as eating or about to eat (accept
                          eating "berries" or "fruit" or "flowers," but not "candy")

THE PROBLEM IS REALIZED: pp. 18-19   (1.0 point)
   1 point   -   family realizes someone is missing   (full point or nothing)

THE SEARCH: p. 20-21   (1.0 point)
   1/2 point   -   summative statement: family is looking for missing child
   1/2 point   -   noting they are upset or why they are crying
                    (just noting they are "crying" not sufficient for credit)

WHY THEY LEAVE: p. 22   (.5 point)
   1/2 point   -   noting why they leave: to find lost mouse.

SCENE SHIFT / CHARACTER AFFECT: p. 23   (.5 point)
   1/2 point   -   indicating lost mouse is resting, relaxed, not worrying;
                    ate too much and has a stomachache; or feeling sad and
                    missing/ thinking about family (no credit for "sleeping"
                    or "laying down")

THE SEARCH: pp. 24-25   (1.0 point)
   1/2 point   -   noting family is looking for lost mouse as they drive
   1/2 point   -   noting why lost mouse is moving: he hears sounds; he is
                    looking for his family, etc.

THE REUNION: pp. 26-28   ,   (1.0 point)
   1/2 point   -   indicating they find him: also "There he is," "He's safe,"
                    etc. ("They see him" is not enough to score, but "They
                    saw him and got him" would count)
   1/2 point   -   indicating group affect: they are happy, glad to have him
                    back, celebrating, etc. "They say, 'Yeah'" is accepted.
                    ("hugging" is insufficient; indicating just one member of
                    the group is happy is insufficient).

SOLVING MINOR PROBLEM: p. 29   (.5 point)
   1/2 point   -   he forgot his toy mouse and goes back to find it. (Credit
                    given for acknowledging either forgetting or retrieving toy.)

HAPPY RESOLUTION: p. 30   (1.0 point)
   1/2 point   -   recognizing they have a picnic.
   1/2 point   -   providing a reason (because they were hungry, because they
                    were all there, etc.)

Appendix D:

Title Recognition Test

Title Recognition Test -- Scoring Sheet

_____   ID #

_____

Tester Name

                              date tested _____

[ ] Happy Birthday, Moon
[ ] Ticky Ticky Timbo
[ ] The Berenstein Bears' New Baby
[ ] Clifford, The Big Red Dog
[ ] Goodnight Moon
[ ] Sam and the Giant Donut
[ ] Blueberries for Sal
[ ] Chicken Little
[ ] Corduroy
[ ] There's a Piglet on My Potty
[ ] Bread and Jam for Frances
[ ] There's a Nightmare in my Closet
[ ] The Tale of Peter Rabbit
[ ] A Duck in Disneyland
[ ] Curious George
[ ] Green Eggs and Ham
[ ] Brown Bear, Brown Bear, what do you see?
[ ] The Lost Shoe
[ ] Harry, the Dirty Dog
[ ] Are You My Mother?
[ ] It's Silly Willie
[ ] Danny and the Dinosaur
[ ] Ten Apples Up on Top
[ ] It's My Room!
[ ] Frog and Toad Stories
[ ] Little Bear
[ ] The Cat in the Hat
[ ] Ashleigh

Appendix E:

Story Retelling

Tester_____   ID#_____
                                 Date_____
STORY RETELLING
Scoring Sheet

Title of book:_____

Author:_____

Illustrator:_____

Who read it to
them?_____

Where did it come
from?_____
(school, home, library, grandma, etc.)

Type of book (e.g. Alphabet, Storybook, ID book)

Level I.   _____   Child says nothing relevant to book

            _____   Child talks about pictures; no story line

            _____   Child describes pictures plus some story line

Transition -- if child is at Level III, ask "Before you turn the page,
tell me what's going to happen next?" (ie "and then they. . .")

Level IV   _____   Coherent story line, child goes beyond pictures,
                     some evidence of drawing on text

Level V.   _____   Evidence of verbatim memory

Level VI.   _____   Can identify some words

Appendix F:

Parent Questionnaires

UTAH STATE UNIVERSITY · LOGAN, UTAH 84322-0730

Department of Sociology, Social Work and Anthropology
(801) 750-1230
FAX (801) 750-1240

8/30/93

Hello!

We'd like to introduce the Early Childhood Literacy Enhancement Initiative project. The project is aimed at assisting parents and teachers in their quest to get all children ready for reading. It has been funded by a grant from Utah State University and by the donation of 3 computer stations and the Stories and More© CDs by IBM.

The project has three phases. During phase one which will last through September, we are mainly interested in finding out about what kinds of literacy activities your child appreciates. We recognize that there are a variety of approaches and what works for one child won't necessarily work for another. We are particularly interested in hearing about any inventive or unique ideas you may have come up with so that we can share them with other parents. We'll hear more about this aspect of the project on Literacy Night--

During phase two, lasting through January, half of the Head Start enrollees will have the opportunity to interact with the Stories and More CDs on the computer several times a week during "Free Play." Stories and More is designed for children who cannot read and who've never worked on a computer. All they have to learn to do is push a button on the mouse to turn the page or, perhaps, to highlight a word they'd like to have repeated. The voices of noted actors read each story while full color reproductions of the actual pictures from well known children's books are displayed on the monitor screen. We anticipate that children will have a chance to "read" about 20 different stories, like *Frog and Toad are Friends* , *The Three Billy Goats Gruff* and *The Trouble with Elephants*. The children will be given a variety of easy exercises to do-- like "pretend reading"--on a regular basis, to monitor their progress. Individual children's identities and scores will never be made public.

During phase three, for the remainder of the year, children who have not yet experienced Stories and More -including those whose parents have witheld them from the research--will have their chance. Note that no child is required to participate and any child may quit at any time without penalty.

You will have an opportunity to observe the computer set-up and children interacting with these stories. Also, if you have any questions don't hesitate to call one of us: David @ 750-1322 or Susan @ 750-1552.

We need your support! ECLEI is an experiment and, as such, we must collect a wide variety of information about your child's experience with print before and during Head Start. We need your approval to interview your child, periodically, to determine how he/she is reacting to the literacy activities in school.
 []Yes, you have my approval for _____to participate in the research.
                              (child's name)
 	
 []No, _____may not participate.
 	
 _____
            (your signature)

As we mentioned, our first goal, in phase one, is to find out about the kinds of experiences your Head Start youngster has had prior to being enrolled. We would be grateful if you would fill in this questionnaire carefully. Put a check in the space that applies to your child.

Before we go further, please tell us the child's name_____.

Birthdate:_____Relationship to you: mother[]father[] relative[]other[]
Your
name_____Address_____

_____Phone_____

1. What about storybooks?
Does someone read to this child? yes[] no[].

If you answered yes, when was it started? infancy[] after he/she could talk[] recently[].

How often is this child read to? sometimes[] often[] daily[].

Is there a special time—like bedtime—for reading storybooks? yes[]no[].

Tell us more about this—like who reads to the child, or why the child likes or

doesn't like to be read to._____

_____

2. Television Programs. There are some children's programs, like Sesame Street, that help children with reading.

How often does this child watch Sesame Street? daily [] sometimes[] never[].

What other programs/videos does he/she watch?_____

_____

Comment on your child's TV viewing...like how much TV he/she watches. In what ways do you think it might be helpful for him/her—or harmful?

_____

_____

3.Favorite Books. Some children grow very attached to books. About how many children's picturebooks do you have in your home?_____.

What are some of his/her favorites?_____

_____

Does your child ever pretend to read to him/herself,to a doll or to...? yes[] no[]

4.The Library. Have you had occasion to use the library/bookmobile? yes[] no[] How often?_____. Would you like to comment about library services?
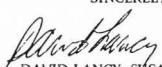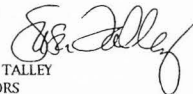
5. Reading Aids. Aside from storybooks, have you purchased any materials designed to prepare your child for reading? no[] yes[] Please tell us about this:

6. Your Ideas. What have you done with this child that seems to have affected his/her interest in literacy? Are these ideas your own? Did you learn of them--in church? from a magazine? from a neighbor? Please tell us about them:

7. You as a reader. One place to get ideas is of course your own experience. Tell us about your experiences as a reader and writer. What happened in school? Do you read for pleasure? What kinds of things? Do you find reading/writing a chore? Please tell us about yourself:

8.Pre-school/Day Care. Has this child been to pre-school or day care? yes[] no[]. If yes, please give us some details, especially concerning his/her experience with books:

SINCERELY,

DAVID LANCY, SUSAN TALLEY
PROJECT DIRECTORS

**RETURN THESE FORMS TO USU IN THE ENVELOPE PROVIDED
THANK-YOU**

UTAH STATE UNIVERSITY · LOGAN, UTAH 84322-0730

Department of Sociology, Social Work and Anthropology
(801) 750-1230
FAX (801) 750-1240

Noviembre 5, 1993

Hola!

Queremos dar gracias a todos ustedes que devolvieron nuestras formas de permiso de padre tan rapido. A todos aquellos padres que aun todovia no han tenido la oportunidad de llenar la forma de permiso o cuestionario, hemos mordado esas nuevas formas para su conveniencia. Si no tiene tiempo o quiere mas informacion acerca de las preguntas, por favor llame' a Susan por el numero telefonico de 752-8163. Ella es una de los directoras del projecto. Sera' feliz de ayudarles in quaquier manera posible. Lo sigiente son algunos detalles del projecto.

El projecto de la literacia en grandecido del niñez temprano tiene el proposito de assistir a los padres y los maestros a alistar a los niños para aprender a leer. Es fundado por un concesion de la Universidad del estado de Utah y tambien por computadora de IBM. IBM noss ha dado a tres computadoras y algunos programas.

Hay tres partes en el projecto. Durante la primera parte estamos inteesados en encountrar que actividades de literacia aprecia su niño o niña. Queremos compartir estos ideas con las demos padres.

Durante el segundo parte sus niños tendran la oportunidad de utilizar las computadoras a leer viente cuentos differentes. No es necesario tener conocimiento de las computadores o como utilizarlas. Vamos a notar el progreso de sus niños pero la identidad de ellos no sera conocido a la publica general.

Durante el tercer parte los que no han participado con el projecto tendran la oportunidad de utilizar las computadoras tambien. Ningun niño esta' requerido de participar y puede terminar en qualquier momento.

¡Necesitamos su apoyo! El projecto (ECLEI) es un experimento. Vamos a recoger mucha informacion acerca de las experiencas de su niño con leyendo. Esto va a pasar antes de y durante Head Start. Necesitamos su permiso a entrevisitar sus niños de vez en cuando.
Por favor llena una de las cajas con un cheque.
[ ] Si', doy mi permiso por participacion de _____
                                                        (nombre)
[ ] No, no puede participar _____
                                     (nombre)

_____   _____
firma de padre or madre   fecha

Como ha sido mencionado en la primer parte del projecto encountramos a que experiencias su niño, ha tenido antes de estar en Head Start. Estaremos muy agradicidos si llenara' el cuestionario con cuidado. Ponga una cheque en la caja que describa su niño o niña.

Por favor, diganos el nombre de su niño_____

fecha del nacimiento_____nombre del pariente y relación [ ] madre [ ] padre
     [ ] relatio [ ] otre
direction del pariente _____

_____ numero telefonico del pariente_____

1. Los Libros: ¿Algien lee a este niño? Si [ ] No [ ]

¿Si respondio con si', cuando lo empienzo? Infancia [ ] recientemente [ ]

Despues que el niño aprendio a hablar [ ]

¿Con que frequencia lee algien a este niño? De vez en cuando [ ] a menudo [ ]
a diario [ ]
¿Hay un tiempo especial como antes de dormir para leer cuentos? Si [ ] No [ ]

Diganos mas, — ¿Quien lee al niño y por que la gusta el niño or no le gusta a leer?

_____

_____

_____

2. Programas de Television: :
          ¿Hay programas como "Sesame Street" que ayuden a los niños a leer?
          ¿Como a menudo mira a la programa de "Sesame Street"?
          a diario [ ] de vez en cuando [ ] nunca [ ]
     ¿Que otras programs/videos mira su niño?
_____

_____

_____

3. Los Libros Favoritos: ¿Cuantos libritos con picturas tiene en su hogar/casa?_____

¿Cuales son aglunos titulos favoritos de los niños?_____

_____

4. La Biblioteca: ¿Ha visitado a la biblioteca? Si [ ] No [ ]

¿Como a menudo? _____

¿Le gustaria comentar del servicio de la
biblioteca?_____

_____

5. Las ayudas para leer: Aparte de los libros, ¿Ha comprado otras materiales que

preparan su niño a leer?   No [ ] Se [ ] Diganos de esto?

_____

6. Sus Ideas: ¿Que ha hecho con este niño para afectuar su interes en literacia? ¿Son sus
propias ideas? ¿Los aprendio en la iglesia? ¿de una revista? ¿de un vecino? Diganos de
los ideas.

_____   _____

_____   _____

7. Ud. Como uno que lee: ¿Puede encontrar unas ideas de sus proprias experiencias?
¿Que son sus experiencias como uno que lee y escribe? ¿Que sucedio en la escuela?
¿Lee para diversion? ¿Que libros o cosas? ¿Le gusta leer y escribir? ¿Es divertido? Por
favor diganos de ud.

_____   _____

_____   _____

8. Niñera por horas/cuidaniños: ¿Algien se cuida a su niño? Si [ ] No [ ]

¿Cuanto tiempo durante el dia?_____

Por favor diganos de las experiencias con libros especialmente
_____

Sinceremente,

David Lancy, Susan Talley
(Los directores del projecto)

Devvelven estas formas a USU en el sobre mandado. ¡Gracias!

Appendix G:

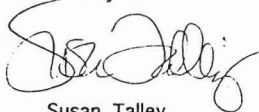Morningside Parental Approval

September 13, 1993

Dear Parents,

   The USU Department of Sociology in conjunction with the Head Start Program of Logan will be conducting a study examining pre-reading skills and the influence of a computerized pre-reading program.   Morningside School has been asked to participate in this study. During the week of September 20-24, 1993 Miriam Egan (a preschool teacher at Morningside) and Susan Talley (the program director) will be conducting pre-reading skill testing at Morningside. The testing will take about 15 minutes and is designed to be fun and interesting for the children. Testing will be videotaped to insure reliability. If you would like a copy of your child's test please send a video tape with your child's name on it. General information about your child's pre-reading skills will also be available to you. Your child's participation in the study would be greatly appreciated and would contribute to the development of effective pre-reading programs.

   If you would like your child to participate please sign the following and return it with your child to Morningside on September 20, 1993.

                    Thank you!

             Susan Talley   Miriam Egan

As parent or guardian of _____
I give my permission for him/her to be tested and videotaped in the Head Start Pre-reading study.

Name_____Date_____