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## Multimedia Prereading Strategies

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# MULTIMEDIA PREREADING STRATEGIES

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A Project Report

Presented to

The Graduate Faculty

Central Washington University

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In Partial Fulfillment

of the Requirements for the Degree

Master of Education

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by

Mary J. Wise

December, 1996

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Prereading activities are important in enabling students to comprehend and enjoy the books they read. Teachers are always in need of good prereading activities, and the increasing popularity of computers offers opportunities to fill this need, however, technology is not keeping up with educators' needs in this area. While there is an overwhelming quantity of commercially produced computer software programs, they are invariably generic in nature. No software relating to prereading strategies appears to be available. A CD containing multimedia prereading activities was produced to accompany a selected list of elementary level trade books. The CD is intended to be kept in the school library and to be used either directly with students or as a model for classroom teachers to create their own multimedia activities.

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## CHAPTER 1

### INTRODUCTION

Prereading activities are important in enabling students to comprehend and enjoy the books they read. Many teachers use prereading strategies with students, but the implementation of prereading strategies is not universal. Teachers are always in need of good prereading activities, and the increasing popularity of computers offers opportunities to fill this need. Surprisingly, technology is not keeping up with educators' needs in this area. While there is an overwhelming quantity of commercially produced computer software programs, they are invariably generic in nature. These software programs can be stories from books, plots of films, and/or general information about topic areas. The needs of teachers and students are frequently not met by commercially produced educational multimedia programs (Gregory, 1995). There do not appear to be any software programs specifically aimed at developing prereading strategies for use with specific reading materials.

Prereading strategies include activities that prepare students for reading stories by activating and developing prior knowledge that is relevant to the text. This is accomplished through a combination of prompt questions,

modeling strategies, and presenting or reviewing relevant topic information based on what the students already know. Such activities introduce the vocabulary and concepts students are likely to encounter in the reading selections. Many teachers currently use thematic units incorporating several curricular areas of learning. They may collect books on a subject, for an area of study, or a list of titles of literature. After the teachers compile the lists, they prepare activities containing strategies to introduce topics from the books to the students. This is an area where a good software program would be useful as an instructional aid; however, commercial software of this kind is not available. The alternative is to produce customized multimedia prereading activities locally. These multimedia activities may be kept in the school library, where teachers and students could check them out to use in the classroom. Teachers might then use them as models to create their own multimedia projects to emphasize what their students are studying.

One computer which lends itself to the development of such programs is the Macintosh. HyperStudio is a simple and relatively inexpensive multimedia authoring software program for use on the Macintosh. The students could even create their own programs. These resulting programs could be an ever increasing addition to the school library's resources and to those of the

individual classroom teacher. Students enjoy using multimedia, and what they enjoy, they learn more quickly.

### Statement of the Problem

The problem investigated in this study is the need for prereading activities to help students become successful readers. This relates to the possibility of developing multimedia prereading strategies for the computer that will assist teachers in preparing students to read stories and text. While there are many commercial CD-ROM products in the marketplace, they are primarily for either entertainment or general education and information. Actual prereading multimedia programs need to be developed. No commercial products were found that act solely as prereading activities. While there are “books” on CD, these are usually just a retelling (or an original story) of a book in CD form.

### Purpose of the Project

The purpose of this study was to develop multimedia prereading activities using CD-ROM technology that will assist teachers in preparing students to read stories. This multimedia activity will be put onto a CD, which could be kept in the school library, and lent to teachers and students.

The CD activities can be used as a pattern to create multimedia prereading activities, or simply be used independently by students.

### Limitations of the Project

Because there is a limit to the amount of data that can be stored on a compact disc, the amount of information in the multimedia activity has been limited to what can be stored on one CD. Discs produced commercially can hold more information because of the technology used to obtain graphics, sound, and video files. There are several commercially produced authoring programs available, such as Link Way, HyperCard, SuperCard, Persuasion, Course Builder, Authorware Professional, Macro-Media Director, ToolBook, and HyperStudio (Gregory, 1995). The authoring program used to produce the CD in this project was limited to HyperStudio because the other authoring programs mentioned are expensive and more difficult to use, and they are not all available in the Macintosh platform. HyperStudio might also be more readily available in schools than other more difficult and expensive programs. Another limitation was the lack of video clips available on the appropriate topics. Given the absence of sophisticated video equipment and proximity to the subjects, these were not possible to produce.

### Definition of Terms

For the purposes of this project, the following terms have been defined:

#### CAI

Computer assisted instruction program.

#### CD-ROM

Compact Disc Read Only Memory. A form of storage characterized by high capacity (approximately 600 megabytes) and the use of laser optics to read data, rather than magnetic means (such as cassette or video tape).

#### Hypermedia

A computer based software system for organizing and storing information to be accessed non-sequentially (Perzylo & Oliver, 1992).

#### HyperStudio

A multimedia authoring tool commercially produced for the Macintosh and PC by Roger Wagner.

#### Hypertext

Text that is linked to further information. When the user clicks on certain words, information pertaining those words.

### Multimedia

An element of hypermedia which integrates audio, graphics, animation and text utilizing the computer as a control and presentation platform (Perzylo & Oliver, 1992).

### Prereading Activity

An activity that prepares students for reading by activating their prior knowledge that is relevant to the text through a series of questions which prompt students to relate the information to themselves (Flood, Jensen, Lapp, and Squire, 1991).

### RAM

In computer science, acronym for Random Access Memory. Semiconductor-based memory that can be read and written by the microprocessor or other hardware devices. The storage locations can be accessed in any order (Microsoft Encarta, 1994).

## ORGANIZATION OF THE REMAINDER OF THE PROJECT

Chapter II contains a review of selected literature pertaining to prereading activities and commercially available products. Chapter III describes the process of creating the CD-ROM and its form. Chapter IV discusses the CD containing the prereading activities, entitled "Special Fieldtrip." Chapter V contains the summary, conclusions, and recommendations. The Appendix is an annotated list of books to be read by students after completing the multimedia prereading activity. The CD itself is contained in a pocket at the end of this project.



## CHAPTER II

### REVIEW OF SELECTED LITERATURE

#### PREREADING

The purpose of this study was to develop multimedia prereading activities using CD ROM technology that will assist teachers in preparing students to read stories. For years, educators have recognized the importance of prereading activities. As Patton (1992) pointed out, prereading activities involve the activation of prior knowledge. This activation of prior knowledge was important because students needed a context to tie in with their own experiences in order to comprehend the material they were reading. When the students tied the reading in with their own personal experiences, their discussion of school topics became more animated, more like discussions of their favorite sports, movies, and hobbies. Patton also explained how students can begin prereading by discussions of relevant topics and by role playing.

Students need to plan before they start to read, just as people make plans before they start a journey. They choose a route and decide what sights they will see. A well planned prereading activity will provide the traveler (reader) with the background necessary for a successful journey (reading comprehension). If prior knowledge is not activated, the student has difficulty

understanding the reading because there is nothing to connect the story line with the mind. According to Kueker (1990) students store memories, concepts, ideas, and relationships, and use them when needed to make necessary connections.

“...Prereading activities include: the mental set (set induction or motivation), background information and key concepts, essential vocabulary, and thoughts toward the story to be read,” (Kueker, 1990, p. 6). Prereading activities motivate students’ interest in the story, establish objectives of the reading exercise, and clarify the vocabulary and concepts of the story.

“Piquing interest in and raising expectations about the meaning of texts create a context in which students will read with purpose and anticipation,” (Vacca & Vacca 1996, p. 173). Chapter overviews, graphic organizers, creating perspectives, guided imagery, and anticipation guides are all prereading activities which will increase reading comprehension, according to Vacca and Vacca (1996).

Davis (1994) conducted research involving the effectiveness of directed reading activities (DRA) in preparing students to read. Sixty third grade students and sixty fifth grade students were randomly assigned to two treatment groups in each grade level. The control group at each grade level received DRA’s. The experimental group at each grade level received a

modified story map as a prereading procedure. Students in this group were given a prereading activity which included story mapping and questions which led the students to think about the concepts in the story.

The primary differences between the DRA and story mapping prereading was that the story mapping activity contained vocabulary and the DRA did not, and that the teacher using story mapping directed class discussion of the story map and used an overhead projector to present the completed visual display. After they read the story, the third graders' reading comprehension had increased significantly, compared to the group using the DRA, although there was no difference in the comprehension of the fifth graders. This is just one more example of the importance of prereading activities for students in lower grades.

Eleventh grade students in basic skills classes were the subjects of a study to determine the effectiveness of prereading activities on literature comprehension (Usen, 1993). Four randomly selected classes were chosen at a particular urban high school. Two of the classes were control classes and the other two were experimental classes. The experimental classes received rereading activities prior to reading The Tell-Tale Heart and Anne Frank: The Diary of a Young Girl. The activities included brainstorming, vocabulary instruction, and a story map. The control group did not receive any prereading

activities. Although the difference was not statistically significant, the experimental groups did score somewhat higher in comprehension than did the control groups.

Denner and McGinley (1992) discussed a study they conducted using story impressions as a prereading writing activity with junior high school students. The students were divided into three groups: the control group, the first experimental group, and the second experimental group. The control group did not receive any prereading activities. The first experimental group was given a set of clue words from the story to be read and asked to write a predicting story of their own. The second experimental group was given a set of clue words from the story to be read, but was not asked to write a predicting story. The results were that after reading the assigned story, the group given clue words and asked to write their own predicting stories scored higher on comprehension than the group given clue words, but no predicting story to write. The control group scored lower than both experimental groups.

It does appear that prereading strategies which include vocabulary, background knowledge, and some focus, such as predicting text before students read stories or text will improve comprehension of what is read. In the next section the use of technology and its possible value to students by incorporating technology with education is discussed.

## TECHNOLOGY

In the past, students did not learn about what they read until after they had read it. Today students are being helped by using prereading activities to learn about what they will read before they read. As traditional and new educational strategies are being used in the classroom, the classroom itself is changing radically because of technology. Technology in the classroom has changed and is continuing to change in school classrooms, libraries and laboratories. With these changes has come the potential for all students to strengthen their learning possibilities, regardless of their social or economic situations. The computer with CD-ROM capabilities provides a technology which increases the ease of using references and databases, particularly some of the interactive possibilities available. It offers the ability to supplement standard materials with exciting, easy to use programs (Opitz & Reising, 1994).

When technology first began to become available in classrooms, everyone expected teachers to introduce it gradually to students. Laframboise and Klesius (1994) discussed the fact that some teachers were very enthusiastic about technology, and eagerly adopted it into their classrooms as fast as they could, while others were more cautious, preferring to wait and see what it could do first. As teachers and other educators became more familiar

with computer programs, they began to evaluate the programs based on what they could do to facilitate instruction for the students, while at the same time there was a need for teachers to acquire the skills to teach the new material. The ideal media center (school library) needed to contain not only books, but also computer stations with books on interactive multimedia CD's, a CD-ROM reference area, and a television production studio. While not all schools could afford a production studio, it is recommended that they have a couple of encyclopedias on CD, as well as a yearbook, United States and world atlases, and databases on history and animals. Reference databases are beneficial because the entire database is updated with each new disc, not with annual supplements. Searching can be done by highlighting words or clicking on pictures, instead of having to know all the correct terminology and spelling. Students can print only the information they need.

Many teachers are skeptical about computers and some of the newer technology for good reason; they have some basis for skepticism. They remember the 1980's, when computers were supposed to be the new miracle teaching aid. Many of those old computers are now gathering dust, while traditional teaching methods continue to be used (Kirby, 1994).

Kirby (1994) also believes there is a need for schools to be more proactive in planning for technology. He sees a need to look at changing

definitions and perceptions of school, to provide opportunities for students with higher skill levels to advance, to provide practice which makes sense and is needed, to change the roles and activities of teachers and administrators, and to improve methods of assessment. These changing definitions include re-evaluating the use of computers in the classroom. Kirby finds that many teachers and administrators are unwilling or uncomfortable making these changes.

For the last 500 years, schools and teachers have been in charge of information and knowledge. New technology can be frightening and also wonderful because it is not under control of teachers (Weiss, 1996).

Dwyer (1994) discussed a 1986 project which he conducted as part of the program Apple Classrooms of Tomorrow (ACOT). The purpose of the project was to give each participating student and teacher two computers (one for home and one for school) and to see how the routine use of technology by teachers and students affected teaching and learning. Despite fears to the contrary, after two years the researchers discovered the following:

- Teachers were not technologically illiterate. They utilized technology for personal work and growth.
- Children did not become isolated socially. Computer usage generated more cooperative work in the classroom.

- Children's interest in computers did not fade after the initial exposure. They continued to use the computers heavily, even after the newness of the activity wore off.
- Even young children did not find the keyboard intimidating. With a few minutes of daily keyboard practice, young students were proficient in a few weeks.

Several years after the above project, the students at the school involved were still performing traditional school activities: lectures, recitations, writing and math assignments. They were taking notes, however, with laptop computers.

Educational computing is having a great impact on teaching and learning (Swan & Mitrani, 1993). Computers enable students to learn at their own pace and to use individualized programs. At first glance, technology seems to offer to do what we've always done, just somewhat faster and better.

The first computers were viewed as simply a source of electronic text books. As computer technologies and software have developed, their potential has become more apparent. The more technology can do for us, the more we want it to do. Computers reduce the role of the teacher being the central focus of the classroom. Despite the fact that Batson and Bass (1996) reported that many teachers are attempting to minimize their roles as the center of attention and to maximize their roles as facilitators without the introduction of computers, these teachers are in the minority. Computers became prominent in classrooms in the mid 1980's, when students began to communicate with



each other through a local area computer network (LAN). “New technologies are providing us a ‘bigger’ and more visible space in which to conduct intellectual work, the nature of which, for many fields, long ago began to outgrow the printed page, the blackboard, and the conventional classroom” (Batson & Bass, 1996, p. 45).

One of the most important and popular developments in CD technology is interactive multimedia CD-ROM. Interactive multimedia is a comparatively new form of hypermedia. Perzylo and Oliver (1992) quote Jonassen in defining hypermedia: “...a computer based software system for organizing and storing information to be accessed nonsequentially” (p.226). Interactive multimedia is an integration of audio, animation, text, and graphics, using the computer as a means to collect and display them. Users of multimedia programs have a higher degree of control over the information than over that of standard print text books. The information is presented in a non-linear format, instead of sequentially. A disadvantage is that learners are left to use multimedia without direction, allowing them to choose inappropriate information, without finding what they really need. Four things are important to keep in mind regarding multimedia instruction: Teachers are important in the learning process because of their personal guidance working with students, students seem to learn well in groups when using computers, the direction

controlled by the program is sometimes more effective than the learner controlling the direction, and learners' differences will affect the learning outcomes. There seem to be more positive outcomes when learning is done in small groups.

The effectiveness of multimedia programs depends on the quality of the design. Sound is the first choice of many students over other media when using multimedia programs. Video is the second most popular choice, then photographs, graphics, and finally text. Text must be an integral part of the design of multimedia programs, and must be presented to students in a way that the other media encourages them to read the text. Perzylo and Oliver explain that a skilled teacher can use multimedia effectively in classroom instruction, because of the depth of the information available.

Interactive technology--software which allows users to respond by making choices and directing the program--is important because it gives students control over their own learning. It allows them to take responsibility in an area which formerly had been dictated to them by a teacher or teachers by allowing them to choose the order and pace of the information presented. But interactive technology must hold students' attention, as well as have meaningful content in order to be useful. Interactive technology is especially beneficial to students with learning disabilities, according to Laurillard and

Taylor (1994). It can be adapted to their individual learning styles.

Interactive technology can be useful only when it is supported by meaningful feedback and by other effective classroom methods.

Interactive media must include in their design the following elements:

- High quality sound and visuals are important for motivation and sustaining attention.
- Interactivity and pupil support are necessary to maintain productive on-task activity.
- Activity off the computer may encourage a more reflective approach than activity on the computer (Laurillard & Taylor, 1994, p.170).

Students enjoy using interactive media, primarily because the variety of media available, i.e., graphics, sounds, and video, can be important for students to grasp various concepts about the subject matter. A student viewing a video of how gears work can understand the process far better than if that student is reading about the mechanism in a book. Students learn more quickly when they can recognize things on the screen and can use their own experiences to build upon, as they read about them. Laurillard and Taylor add that alternating graphics, sounds, words, and motion helps students relate better to the concepts being taught and the interactive nature helps them practice their understanding.

In a conventional book, the information on the page is unresponsive and static. An electronic version of a book can be dynamic. It can react to the reader, and it can be different every time it is read. The two main features to consider in creating an electronic book are fabrication and application. Electronic books can be either magnetic media or optical disc. Compact discs (CD-ROMs) have become very popular because of both durability and compact storage. It is important to design an electronic book based on well-founded models and design guidelines. Most electronic books use the mouse as a point device. The user can “click” on a portion of screen and the program will perform an action, change screens, play an audio file, show a video clip, etc. Electronic books are extremely useful for transferring information and knowledge. Hypermedia (using multimedia) will continue to be a major format for electronic books because of its versatility, ease of use, and high quality product (Barker & Giller, 1991). Rosenzweig and Brier (1993), discussed the three advantages CD-ROM has over print equivalents: large storage capacity, the ability to store and read visual images and sound, and the ability to link together quickly pieces of information from different sources.

The strength of multimedia lies in its non-linear design, enabling the user to view the information in any order (Gregory, 1995). Multimedia programs are multi-sensory. They appeal to auditory and visual senses through

sound effects, voice, music high quality graphics, colors, animation, etc. The most meaningful multimedia programs are those which incorporate several disciplines into the program around the central theme. The non-linear design of multimedia allows the user to make decisions about the order in which to view the information. It matches the way the human mind processes information. The human mind does not think in linear terms, but in ways of association, according to Gregory (1995). When students move through instructional programs, they usually think of questions or tangential information needs. They can go directly to the section in the program which pertains to their question or interest. When they have found what they need, they can return to the main menu, or wherever they else they want to go. Mobility of this kind is impossible with traditional linear computer programs.

Multimedia instructional technology accommodates learners with a variety of learning styles. Multimedia programs developed by students and teachers can encourage higher order thinking and learning. Students who develop their own programs create their own goals and solve their own problems. Students can help each other with their problems in developing programs. Gregory (1995) explains that teachers can help students analyze their own thinking strategies and come to their own conclusions, rather than learning about the conclusions of others.

Hypertext allows the user to browse through related topics, regardless of the order in which the topics are presented. In hypertext, a pointing device (the mouse) is usually used to select items or topics which are to be further examined (Barker & Giller, 1991). Electronic books allow extensive search features that allow the user to locate any word or phrase quickly in the program. Resource collectors enable the users to collect different files (video, sounds, still images, text) and play them back in the order selected.

CD-ROMs require new learning and thinking from teachers because many teachers are used to teaching in a sequential manner (Rosenzweig & Brier, 1993). CD-ROMs will not replace teachers, rather they will enhance teachers' access to educational materials and methods.

Computer technology is not intended to be a replacement for the teacher. Multimedia software simply gives students an opportunity for learning individually, which might not happen in the ordinary course of classroom instruction (May, 1994).

One of the most important changes in teaching content areas has been a move toward increasing the use of multiple resources, instead of using just a single text book (Manning and Manning, 1995). Computers should be used as tools to build students' skills and knowledge, not just as automated worksheets. Computer software for elementary students should be easy to use,

interesting, and appropriate for age and development level. Some teachers think that computer technology will replace books. But Manning and Manning believe it is far more likely that books and computers will coexist side by side, enhancing each other. Interactive technology in the classroom is just at the beginning of its development.

Soon after relatively inexpensive computers became available, people began to explore their potential for creative use of text, graphics, sound, and animation. According to Clyde (1995), as the products were developed to make the creation of multimedia easier and less expensive, it was possible for children to create their own multimedia programs. Computer based literature allowed the students to work through the material at their own pace, and in the order they preferred. Multimedia software products may have hidden buttons in the picture, so that students click on objects to make sounds, run videos, define words, etc.

Most multimedia software developers have indicated that graphics will enhance student learning. Chao, Cennamo, and Bruanlich (1996) explain that recall abilities are enhanced when graphics are something relevant to the lesson, or when they relate to concepts from the text. In their study, thirty-five international students were randomly assigned to one of two groups. One group received a lesson supplemented with graphics and the other group

received the same lesson without graphics. Students in the group receiving supplemented graphics scored significantly higher in the post-test than did the students who did not receive supplemented graphics. The conclusion of the study was that graphics are extremely important when teaching rules, concepts, and verbal information to learners who are not familiar with the topic, especially when they are learning the information in a second language.

Forms of media are changing and new ones are constantly being developed. High density floppy disks and large capacity CD's are just the beginning of what will be developed in the future (Weiss, 1996). Schools can take examples from libraries, universities and national companies when it comes to staffing with the new technology in mind.

Paging through multimedia products should be fun, and students should be able to do so without much instruction. There should not be an overload of text ("Newsweek Inter-office Memorandum," 1995). There should be hot links. These are common in books that have been developed especially for hypermedia. Most multimedia lessons end with tests.

A fast growing market of commercial software is programs designed for children in the kindergarten through fourth grade range. These programs cover a variety of interests and are still relatively moderately priced. Children are willing and eager to spend hours in front of computer screens, especially when



many of the characters in the CD-ROM products are already familiar to them from television, movies, etc. A good instructional CD requires months of intensive research and preparation, including the collaboration of educators, engineers, artists, and programmers. As popular as educational programs are, there will be even more selection in the future, including possibilities for three-dimensional animation, full screen video, and virtual reality (Carmona, 1995b).

With the technology changing rapidly, the skills needed to retrieve information are changing (Perzylo & Oliver, 1992). Johnson (1995) points out that the school librarian should be the first person the classroom teacher thinks of to answer technology questions. The school library of the future will contain a variety of resources, combining printed material, audio visual, and computer programs. The school library, or media center, should be the center of learning and information in the school. Librarians should see themselves as technological resources for teachers who need help with technology, as well as with traditional printed sources. Teachers, parents, and administrators are becoming aware of how valuable an asset a technologically aware librarian is to have in the school district, according to Johnson (1995). Educators need to be aware of the importance of integrating technology skills into the classroom with their other subjects. Teachers and librarians share the responsibility for

teaching technology integration in content areas. Students must learn technology skills along with traditional library skills.

Teachers don't always have all the teaching aids they need in their own classrooms. Educational technology requires many accessories, such as CD-ROM drives, videodisc players, camcorders, paper, and printers. Many times the cost of these accessories is more than the purchase price of the original equipment (Van Horn, 1995). This is a good argument for placing equipment and software in the school library (or media center), where all students and teachers have access to them.

The use of computers in schools results in more cooperative learning which is student centered in nature, and allows more individualized instruction, according to Swan and Mitrani (1993). The use of computers in school is having a greater impact on learning than just in ease of use. The computer is not just a sophisticated typewriter, it actually has an impact on students by their using it. Marshall McLuhan's theory of people internalizing the medium of communication is being borne out.

Rieber (1996) described his study, using a computer-assisted instructional program (CAI), in which he investigated whether animated graphics are distracting to students when they are used purely for cosmetic purposes in computer based tutorials. Each of 365 fifth grade students was

randomly assigned to take a tutorial about Newton's Laws of Motion. One group received high distraction from graphics, the second group received medium distraction, and the third group received no distraction while taking the tutorial. The theory was that at best cosmetic graphics would help to gain the students' attention, and at their worst, they would distract the students from the instructional material. The results of the study demonstrated that even though there was no difference in performance with cosmetic graphics, students were unable to ignore the graphics completely. Rieber (1996) related that the cosmetic graphic object did attract the students' attention, but did not enhance their learning. It did, however, slow down their response time, which means that the students' attention was attracted by graphics. It follows that graphics meaningful to the content probably would have benefited the students' learning.

As can be seen from the literature, prereading activities can increase students' reading comprehension and students respond well to multimedia activities. There do not, however, seem to be any commercially available products specifically created as prereading strategies.

## CHAPTER III

### METHODOLOGY

The purpose of this study was to develop multimedia prereading activities using CD- ROM technology that will assist teachers in preparing students to read stories. For this project a multimedia prereading activity was created. This multimedia activity was created in CD-ROM form. The intent is that it will be kept in school libraries, and to serve as a model for other prereading activities. It was designed to be used with elementary age students. Teachers may check out the original program, or may choose to use it as a guide to create their own activities, based on their own reading lists. The CD-ROM can also be used by students to create their own prereading, reading, or postreading activities. If the classroom contains equipment with multimedia capabilities, this will be an excellent opportunity for children to practice their technology skills, along with content self-instruction to be used with elementary level students.

The multimedia prereading activities are primarily designed to develop background information for different books and to use some prior knowledge to do so. They are divided into four categories: Friendship, Fun Words, Pigs, and Spiders. These categories correspond with the four sections in the CD-ROM, entitled Friendship Avenue, Fun Word Way, Pig Place, and Spider

Street. There is an annotated reading list, each entry of which is marked with the category to which it corresponds. The title of the overall prereading activity is "Special Fieldtrip." The vehicle between topics is a jeep which picks up the student for a special field trip. The students then choose which of four places they will visit: Spider Street, Fun Word Way, Friendship Avenue, or Pig Place.

The decision to create the multimedia prereading activity was made when it became apparent that there was a lack of commercially produced computer assisted prereading activities. Most of the commercially produced products are intended as information on one topic or one book only. The content of the CD to be produced for this project required an overview of several topics, which would relate to a variety of books at varying levels of difficulty. After reviewing published research to examine prereading strategies, computer aided instruction, and the possibilities of multimedia for students, the format of the CD was chosen. Four categories were selected based on children's interests, on skills which would come in useful later in their education, and on the relatively large numbers of books available in those areas. The aim was not to cover those topics exhaustively, but to give a brief introduction to them, and to encourage students to think about those topics and related experiences while reading books from the reading lists.

The prereading activities were created especially for the multimedia format based on the topics of the four categories of selected books to be read by the students. They were designed to be used either by the teacher with students, as a model to create other such activities for the students, or by the students themselves. Students could go through the multimedia prereading activities individually or in small groups, while the rest of the class engages in other classroom activities. They could take turns choosing which activities to view. They could then select books to read from the reading list, or the teacher could assign books from the reading list.

In finding information, sounds, pictures, and video for the product, books, musical CD's, scanned photographs, and pictures from the World Wide Web were used. Voices were recorded and videos were created, using a program called AdobePremier. Adobe Photoshop was used to modify photographs to be used in the project. In creating the entire project, a product called HyperStudio was used, which comes in both Macintosh and PC versions.

HyperStudio was chosen because it is relatively inexpensive (approximately \$140.00), it works very well with Macintosh computers, which are more common in elementary schools than PC's, and it runs on machines with 16 megabytes of RAM. This is a program which would be more likely to

be available to school libraries and teachers than would other multimedia authoring programs, such as ToolBook, Macromedia Director, Macromedia Authorware, and M-Tropolis. A major advantage of HyperStudio is that it is relatively simple to use, enabling school librarians, classroom teachers, and even students to create their own multimedia prereading activities, using the CD created as a model. A PowerMac computer was used to create the multimedia prereading activities for this project.

After completing the HyperStudio multimedia components, the activity was transferred onto a CD. The CD includes a small program to run the HyperStudio program, so that it can be used without the necessity of loading HyperStudio software on every computer on which it is used. The CD was recorded on equipment in the Instructional Media Center at Central Washington University.

Although HyperStudio is simple to use, it took several months to create the finished product. Searching, recording, and creating multimedia is an extremely time-consuming activity. It is recommended that any teachers or students who want to create their own multimedia prereading activities start out on a smaller scale, perhaps with only one topic, or referring to only one book. Also if the computer used does not have adequate RAM, the program

will run very slowly and will not allow many videos, sounds, or scanned pictures to be included.

A major disadvantage in creating multimedia products is the fact that they take up so much storage space. Even a CD, which can hold approximately 500 megabytes, may not be large enough to accommodate an extensive program. A CD produced by teachers or students cannot hold as much information as a commercially produced CD. This is because commercial producers of multimedia have access to expensive software which compress the media while storing it on the CD, then expand it for viewing/listening when selected from the CD. This is a good reason that teachers and students would want to limit the scope of their productions. If there is a lot of media required for a project, it might better to divide it onto two or more CD's.

The CD produced is included at the end of this project.



## CHAPTER IV

### PROJECT

The purpose of this study was to develop multimedia prereading activities using CD- ROM technology that will assist teachers in preparing students to read stories.

The product of this project is the CD, "Special Fieldtrip," which contains multimedia prereading strategies employing prior knowledge and background information relating to selected trade books on the accompanying reading list. The CD contains a map menu with four sections (destinations): Pig Place, Friendship Avenue, Spider Street, and Fun Word Way. The CD is included at the end of this project.

## CHAPTER V

### SUMMARY, CONCLUSIONS, RECOMMENDATIONS

#### SUMMARY

The purpose of this study was to develop multimedia prereading activities using CD- ROM technology that will assist teachers in preparing students to read stories. The final product of the project was a CD containing multimedia prereading activities which accompany a selected list of elementary level trade books. The CD is intended to be kept in the school library and to be used either directly with students or as a model for classroom teachers to create their own multimedia activities.

Prereading activities are important in enabling students to comprehend and enjoy the books they read. Among the most important research findings are that prior knowledge and related vocabulary development are the most important factors in students understanding what they read (May, 1994). Teachers are always in need of good prereading activities, and the increasing popularity of computers offers opportunities to fill this need; however, technology is not keeping up with educators' needs in this area. While there is an overwhelming quantity of commercially produced computer software

programs, they are invariably generic in nature. No software relating to prereading strategies appears to be available.

## CONCLUSIONS

Having developed this CD for use with elementary age students, it was concluded that:

1. Research supports the importance and necessity of prereading activities which integrate print, sound, pictures, and video into one product which captures the attention of students.
2. Many teachers may not have access to the research, resources, and amounts of time required to produce one prereading activity package.
3. Commercial materials in this area are not available.

## RECOMMENDATIONS

On the basis of this study it is recommended that:

1. Prereading activities utilizing multimedia be used in the classroom to prepare students to read.
2. Time and resources, when available, be given to classroom teachers to enable them to help develop some multimedia prereading activities.

3. Commercial producers of CD's examine the possibility of creating such products for the field of education.

## BIBLIOGRAPHY

- Barker, P., & Giller, S. (1991). An electronic book for early learners.  
Educational training technology international, 28(4), 281-290.
- Batson, T., & Bass, R. (1996). Teaching and learning in the computer age.  
Change, 28(2), 42-47.
- Boehm, D. (1994). The Graph Club to WiggleWorks: Guaranteed fun ... AND  
good for you! The Writing Notebook, 11(4), 46-47.
- Bruning, D. (1995). Tour the solar system. Astronomy, 23(9), 86.
- Carmona, J. (1995a). New software packages bring music to students' ears.  
THE Journal, 23(3), 12-15.
- Carmona, J. (1995b). New titles five youngsters a head start on learning. THE  
Journal, 22(10), 10-14.
- Chao, T., Cennamo, K. S., & Bruanlich, E. A., (1996). The effects of graphics  
in computer-assisted instruction for teaching rules. International Journal  
of Instructional Media, 23(1), 41-51.
- Clyde, A. (1995). Children's books on CD-ROM. Emergency Librarian, 22(5),  
52-54.
- Darlin, D. (1995). Reprieve. Forbes, 156(2), 62-64.

- Davis, Z. T. (1994). Effects of prereading story mapping on elementary readers' comprehension. Journal of Educational Research, 87, 353-361.
- Denner, P. R., & McGinley, W. J. (1992). Effects of prereading activities on junior high students' recall. Journal of Educational Research, 86(1), 11-19.
- Dwyer, D. (1994). Apple classrooms of tomorrow: What we've learned. Educational Leadership, 51(7), 4-10.
- Flood, J., Jensen, J. M., Lapp, D., & Squire, J. R. (Eds). (1991). Handbook of research on teaching the English language arts. New York: Macmillan.
- Gregory, D. C. (1995). Art education reform and interactive integrated media. Art Education, 48(3), 6-16.
- Johnson, D. (1995). The new & improved school library. School Library Journal, 41(6), 36-39.
- Kirby, B. M. (1994). The big picture. Vocational Education Journal, 69(6), 44-46.
- Kueker, J. (1990). Prereading activities: A key to comprehension. East Lansing, MI: National Center for Research on Teacher Learning. (ERIC Document Reproduction Service No. ED 360 785)

- Laframboise, K. L., & Klesius, J. E. (1994). The acquisition of computer fluency by an elementary school faculty: Infusing technology into the curriculum. International Journal of Instructional Media, 21, 305-317.
- Laurillard, D., Taylor, J. (1994). Designing the stepping stones: An evaluation of interactive media in the classroom. Journal of Educational Television, 20,(3), 169-184.
- Manning, M, & Manning, G. (1995). Resources in the content areas. Teaching PreK-8, 26(2), 100-101.
- May, S. A. (1994). Back to school with multimedia. Compute!, 16(9), 62-65.
- Microsoft Encarta [Computer software]. (1994). Redmond, WA: Microsoft Corporation.
- Multimedia. (1995). T.H.E. Journal, 23(5), 50-54.
- Newsweek inter-office memorandum. (1995, October). Digital Media, 5(5), 24-25.
- Nicastro, L. (1995). Making the grade in Nebraska's ESU #3. Network Computing, 6(8), 112-114.
- Opitz, A. M., & Reising, R. W. (1994). The electronic classroom. Clearing House, 68(2), 104.

- Patton, L. (1992). Into the woods: the impact of pre-reading activities. East Lansing, MI: National Center for Research on Teacher Learning. (ERIC Document Reproduction Service No. ED 344 204)
- Perzylo, L., & Oliver, R. (1992). An investigation of children's use of multimedia CD-ROM product for information retrieval. Microcomputers for Information Management, 9, 225-239.
- Rieber, L. P. (1996). Animation as a distractor to learning. International Journal of Instructional Media, 23(1), 53-57.
- Rosenzweig, R., & Brier, S. (1993). Why read a history book on a computer? Putting "who built America" on CD-ROM. History microcomputer review, 9(2), 9-14.
- Swan, K. & Mitrani, M. (1993). The changing nature of teaching and learning in computer-based classrooms. Journal of Research on Computing in Education, 26(1), 40-54.
- Usen, T. (1993). The effects of prereading activities on reading comprehension. East Lansing, MI: National Center for Research on Teacher Learning. (ERIC Document Reproduction Service No. ED 355 498)
- Vacca, R. T., & Vacca, J. A. L. (1996). Content area reading. New York: HarperCollins.



Van Horn, R. (1995). Teachers and stuff. Phi Delta Kappan, 76, 786-789.

Weiss, A. M. (1996). System 2000. Phi Delta Kappan, 77, 408-415.

## APPENDIX

### READING LIST

- Angell, J. (1978). Tina Gogo. Scarsdale, NY: Bradbury Press.  
Living in a small resort town where her family runs a restaurant, eleven-year-old Sarajane meets and befriends an unusual girl with a mysterious past. **FRIENDSHIP**
- Brown, M. C. (1979). The cloud over Clarence. New York: Dutton.  
A special birthday present helps Clarence rid his days of accidents and forgetfulness. **FRIENDSHIP**
- Calhoun, M. (1977). The witch's pig: A Cornish folktale. New York: William Morrow and Company.  
An adaptation of a Cornish folktale that tells of the misfortunes that befall a man who tries to outwit a woman thought to be a witch. **PIGS**
- Carle, E. (1985). The very busy spider. New York: Philomel Books.  
The farm animals try to divert a busy little spider from spinning her web, but she persists and produces a thing of both beauty and usefulness. **SPIDERS**
- Clardy, A. (1984). Dusty was my friend. New York: Human Sciences Press.  
Eight-year old Benjamin remembers his friend Dusty, who was killed in a car accident, and tries to understand his own feelings about losing a friend in this way. **FRIENDSHIP**
- Freschet, B. (1972). The web in the grass. New York: Charles Scribner's sons.  
A small spider spins a web and waits to catch insects. She interacts with the animals around her, builds a nest, and hatches baby spiders, who scurry away to start their own lives. **SPIDERS**
- Gordon, S. (1978). Crystal is my friend. New York: Harper & Row.  
When Susan invites Crystal to spend the night, both learn the meaning of friendship. **FRIENDSHIP**

Hall, L. (1985). Just one friend. New York: Scribner's.

Just as sixteen-year old learning-disabled Doreen is about to be mainstreamed into a regular school, the loss of her best friend to another girl drives her to a desperate act. **FRIENDSHIP**

Jewell, N. (1975). Cheer up, pig! New York: Harper & Row.

Pig is sad and lonely because his friends are nowhere around. But he discovers he can enjoy himself by finding interesting things around him. **FRIENDSHIP; PIGS**

Kafka, S. (1971). I need a friend. New York: Putnam.

A little girl invents all sorts of clever ways to amuse herself. But she longs for a friend to play with. **FRIENDSHIP**

King-Smith, D. (1990). Ace, the very important pig. New York: Crown Publishers, Inc.

Farmer Tubbs' amazing pig, Ace of Clubs, eventually winds up on television for his cleverness. **PIGS**

King-Smith, D. (1985). Babe: The gallant pig. New York: Crown Publishers, Inc.

A piglet destined for eventual butchering arrives at a farmyard, is adopted by an old sheep dog, and discovers a special secret to success. **FRIENDSHIP; PIGS**

Lavine, S. A. (1966). Wonders of the spider world. New York: Dodd, Mead & Company.

Explains spider anatomy and behavior, telling how a spider spins a web, digs a tunnel, lives under water, hides in a flower, goes courting, and includes information about spiders in mythology, history, literature, and legend. **SPIDERS**

McNaughton, C. (1994). Making friends with Frankenstein: A book of monstrous poems and pictures. Cambridge, MA: Candlewick Press.

Presents a collection of silly, scary, and disgusting poems about monsters and other unusual creatures. **FRIENDSHIP**

Miles, B. (1986). Sink or swim. New York: Alfred A. Knopf.

An eleven-year old boy from New York City goes to New Hampshire on a Fresh Air Program for two weeks and has many new experiences in a small town. **FRIENDSHIP**

Morley, D. (1984). Marms in the marmalade. Minneapolis, MN: Carolrhoda Books.

A whimsical look, in verse, at the way words are put together, e.g. "Since PANcakes are always made in a PAN, are PANDas and PANthers too?"  
**FUN WORDS**

Park, B. (1985). Buddies. New York: Knopf.

A thirteen-year old girl goes to camp yearning to be popular, but is hampered by an unattractive cabin mate who wants to be her friend.  
**FRIENDSHIP**

Peck, R. N. (1974). Soup. New York: Knopf.

The adventures and misadventures of two boys growing up in a small Vermont town. **FRIENDSHIP**

Piper, W. (Ed.). (1972). Mother Goose: A treasury of best-loved rhymes. New York: Platt & Monk.

The Mother Goose rhymes have all been illustrated and grouped together according to common functions in children's lives in the following order: lullabies, learning rhymes, circle songs, game songs, chants and melodies, rhymes about places, rhymes about animals, rhymes about nature, and nonsense. **FUN WORDS**

Porte, B. A. (1989). Ruthann and her pig. New York: Orchard Books.

While visiting his cousin Ruthann in the country, Frank decides that her pet pig Henry Brown would be the perfect companion to ride with him on the school bus for protection against wild older kids. **PIGS**

Rinkoff, B. (1972). The watchers. New York: Alfred A. Knopf.

A loner, Chris has enough problems at home and at school without the uninvited company of the new boy downstairs. **FRIENDSHIP**

Sachs, M. (1985). Thunderbird. New York: E. P. Dutton.

Dennis, whose main interests include environmental protection and saving the world from nuclear holocaust, meets a girl whose only passion seems to be her 1957 Thunderbird car. **FRIENDSHIP**

Schechter, B. (1973). The toughest and meanest kid on the block. New York: Putnam.

Harry was the toughest and meanest kid on the block, until he learned the meaning of friendship. **FRIENDSHIP**

Slote, A. (1988). A friend like that. New York: J. B. Lippincott.

When eleven-year old Robby takes drastic steps to stop his widowed father from developing a new love interest, his friend Beth has to step in and help him come to terms with the situation. **FRIENDSHIP**

Sperling, S. K. (1985). Murfles and wink-a-peeps: Funny old words for kids. New York: Clarkson N. Potter, Inc.

Presents more than sixty obsolete words that are now seldom or never used, such as "flap-dragon" and "mucklender," and includes poems and a list of names to call people. **FUN WORDS**

Terban, M. (1982). Eight ate: A feast of homonym riddles. New York: Clarion Books.

A collection of original riddles, each using a homonym as the answer: bizarre-bazaar, foul-fowl, and similar pairs of words. **FUN WORDS**

Wagner, J. (1975). Aranea: A story about a spider. Scarsdale, NY: Bradbury Press.

An industrious spider spends her days and nights spinning perfect webs. **SPIDERS**

White, E. B. (1952). Charlotte's web. New York: Harper & Row.

When Wilbur, a young pig already bored with life, meets Charlotte the spider, he learns wonderful things and amazes all his friends. **FRIENDSHIP; FUN WORDS; PIGS; SPIDERS**

Zolotow, C. (1976). It's not fair. New York: Harper & Row.

It's not fair that everything about my friend Martha's life is the way I wish my life were. **FRIENDSHIP**