

Summer 1998

## **[Using Multimedia Technology in Elementary Student Presentations of Literature Research and Reviews]**

Judy Ann Staples

Follow this and additional works at: [https://digitalcommons.cwu.edu/graduate\\_projects](https://digitalcommons.cwu.edu/graduate_projects)



Part of the [Curriculum and Instruction Commons](#), [Educational Technology Commons](#), [Elementary Education Commons](#), and the [Language and Literacy Education Commons](#)

---

## TABLE OF CONTENTS

Chapter		Page
I	BACKGROUND OF THE STUDY.....	1
	Introduction.....	1
	Statement of the Problem .....	2
	Purpose of the Study.....	2
	Significance of the Study.....	2
	Definition of Terms.....	3
	Organization of the Remainder of the Study.....	5
II	REVIEW OF SELECTED LITERATURE.....	6
	History of Reading Comprehension.....	6
	Effects of Background Knowledge on Reading Comprehension.....	9
	Schema and Reading Comprehension Instruction.....	21
	Summary of the Literature Review.....	24
III	PROCEDURES.....	27
	Project Background.....	27
	Population.....	27
	Equipment and Software.....	28
	Technology Preparation.....	28
	Reading Preparation.....	29
	Design Preparation.....	31
	The Project.....	31
IV	PROJECT.....	34
V	SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS.....	35
	Summary.....	35
	Conclusions.....	36
	Recommendations.....	36
	REFERENCES.....	37
	APPENDIX.....	41

# CHAPTER I

## BACKGROUND OF THE STUDY

### Introduction

The background knowledge or schemata available to a student about a subject area largely determines the depth and breadth for understanding of materials and stories read involving that area. Reading demands that students construct meaning from information contained in an author's words and the knowledge they already possess. Recent research (Pearson & Dole, 1987) suggests that experiential background may be the single most important factor in determining the meanings that students construct from their reading.

More important than vocabulary or comprehension skills are the experiences the reader has stored as background. These experiences, are stored largely as language and retrieved through the thought processes as understanding and/or expressive language. The broader a reader's experiences about subjects related to the written text, the larger the related vocabulary, and the more inferences and connections to concepts the reader is able to make. New ideas are integrated into the reader's prior knowledge becoming part of the schema, allowing connecting links between the reader and the author of the text. The closer the reader's schema is to the author's schema the greater and more accurate the understanding. However, in spite of this knowledge about schemata, teachers often simply read or tell students a few facts that relate to a story or text, then assign reading tasks. The expectation is that the students will incorporate these poorly assimilated facts with the words on the page to gain meaning.

Many children, because of their limited background of experiences and lack of related vocabulary, cannot make the necessary connections and fail to understand the written message. Comprehension is incomplete or totally lacking. One way that needed background knowledge might be improved before reading is through the use of multimedia technology.

### Statement of the Problem

The problem investigated in this study is the role background knowledge about a topic plays in reading comprehension and how current multimedia technology could be used with students in classrooms to produce needed schema for reading. There is a need for background knowledge to allow students to connect the author's ideas to the reader's own prior experiences. Teachers often tell students a few facts and expect them to understand the text. Teachers need to find ways to help students develop a more in-depth background knowledge before reading. Technology seems to be one tool that will motivate students and can be used to integrate curriculum areas. A student authored multimedia presentation on topic backgrounds for literature books could be developed. When completed, the multimedia project would be pressed to a CD for future students to access the information before reading specific books to improve comprehension.

### Purpose of the Study

The purpose of this study was to help third grade students develop multimedia presentations using current technology to improve the related background knowledge and literary awareness of students for six different literature books. A second purpose was to use the authoring system, HyperStudio, to develop an interactive compact disc which future students could access before reading specific literature books to enhance reading comprehension.

### Significance of the Study

Background knowledge available to the reader determines, to a great extent, a reader's understanding of the text. The literature review of background knowledge and how it relates to reading comprehension, should help teachers understand the importance of developing students' schema or background information before asking

them to read. Because students come to classrooms everyday with widely divergent schemas, teachers need to develop the prior knowledge of students before they read. This enables a reader to make connections between the author's ideas and their own. They are thus able to construct a closer meaning to that of the author than they would without background preparation.

Using new technology to help develop this background before reading is one way to facilitate interest and needed knowledge. With the ease of a CD available for small groups or individuals to use, students can access background information before reading specific literature books to improve understanding of the story. This frees the teacher from giving just a few related facts, developing new materials for each text, or just handing out the reading materials with no background developed.

### Definitions

Apple ColorOne Scanner: software for the computer to run the scanner, download and edit digital images.

Authoring tools: computer programs that are used to create multimedia projects (Multimedia Learning Tools, 1996).

Avid VideoShop: a QuickTime editing program for creating and editing visual images both still and moving from a video recording (Multimedia Learning Tools, 1996).

AverKey: software to view the computer screen on a television.

Card: a screen of information in a hypermedia program, which is referred to as a "stack" (Ward, 1994).

Digital camera: a video camera that can produce one image at a time rather than a rapid succession of images (Agnew, Kellerman, & Meyer, 1996).

Expository text: a writing form having the primary purpose of explaining or giving information (Cooter & Reutzel, 1996).

HyperStudio: a multimedia authoring software, designed for grades 3-12 (Multimedia Learning Tools, 1996).

Hypertext links: the capability of organizing content so that users can navigate through the material in multiple ways (Agnew, Kellerman, & Meyer, 1996).

Kid Pix: a multimedia authoring tool designed especially for young children (Multimedia Learning Tools, 1996).

Microsoft Word: word processing software for the computer.

Multimedia: a computer-controlled presentation of some combination of audio, video, animation, graphics, still photography, and/or text (Ward, 1994).

Multimedia authoring program: a computer program that enables a user with little or no programming experience to construct (author) multimedia presentations (Ward, 1994).

Narrative text: a form of writing in which the author tells a story, either factual or fictional, in prose or verse (Cooter & Reutzler, 1996).

Photo Enhancer: digital camera software used to download and edit digital images from the camera into the computer.

Scanner: a device that optically reads text, graphics, and photos and transfers them in digital form to a computer (Ward, 1994).

Schemata: knowledge already stored in memory (Anderson & Pearson, 1984, p. 255) such as concepts, beliefs, expectations, and processes (McNeil, 1992, p. 19).

Scriptually implicit questions: “. . . derived from and related to the text and necessarily require the reader to refer to prior knowledge to generate an answer” (Pearson, Hansen, & Gordon, 1979, p. 202).

Software: programs and instructions that direct the functions of computers (Ward, 1994).

Stack: a file that contains one or more cards, along with any buttons, graphics, sounds, and other multimedia elements that have been placed on those cards (HyperStudio Software for a Mediacentric World, 1997, p. 5).

Story grammar: “. . . abstract linguistic representations of the ideas, events, and personal motivations that comprise the flow of narratives” (Pearson & Fielding, 1991, p. 821) (e.g., setting, problem, goal, action, outcome).

Textually explicit questions: “questions derived from the text by performing a wh-transformation on some immediate constituent of a sentence in the text” (Pearson, Hansen, & Gordon, 1979, p. 203).

Transitions: a visual effect that happens between stacks or cards (HyperStudio, 1994).

Zip Disk: a computer disk with 100 megabytes of memory used for storing text, image, sound and video files.

### Organization of the Remainder of the Project

Chapter II is a review of literature related to background knowledge. Chapter III describes the procedures used to produce the project. Chapter IV is the CD containing the student authored multimedia project. Chapter V presents the summary, conclusions and recommendations from this study.

## CHAPTER II

### REVIEW OF SELECTED LITERATURE

The purpose of this project was to help third grade students develop multimedia presentations using current technology to improve the related background knowledge and literary awareness of students for six different literature books. A second purpose was to use the authoring system, HyperStudio, to develop an interactive compact disc which future students could access before reading specific literature books to enhance reading comprehension.

This chapter contains a literature review of background knowledge. A brief history on the view of reading comprehension, findings on how background knowledge affects comprehension, teaching reading comprehension with background knowledge applied, and a summary of research findings will be presented.

#### History of Reading Comprehension

Considerable research has been published examining the relationship between background knowledge and reading comprehension since the late seventies. (Anderson, Spiro, & Anderson, 1978; Anderson & Pichert, 1978; Hansen & Pearson, 1983; Johnston, 1984; Lipson, 1982 & 1983; Pearson, 1985; Pearson, Hansen, & Gordon, 1979). All students in our classrooms have different and varied backgrounds. How well these students understand what they read may be largely dependent on the background knowledge possessed in the story area.

The way teachers have taught reading has changed considerably over the years (Pearson & Dole, 1987). Until World War I, successful reading was viewed as perfect oral reading. Children stood and read to the class and teacher and those who enunciated words clearly with good inflection were considered good readers. Their comprehension of what was read was assumed if their performance was adequate.



educational research looked at the act of reading, there was a shift away from oral reading toward silent reading.

A more scientific approach to educational research was developed by Edward L. Thorndike in 1910 (Robeck & Wallace, 1990). After the first standardized reading test was published in 1915, instruments for testing the results of reading materials and methods became available to teachers. Investigations of oral reading and silent reading were major research focuses during these early years. Research findings comparing oral and silent reading showed silent reading surpassing oral reading in reading rate and comprehension (Smith, 1965). Testing of World War I servicemen found a significant number of men entering the service lacking in reading ability (Mathews, 1966). Educators became concerned with such findings and began looking for ways to improve reading instruction. The instructional emphasis shifted from one or oral reading to practice in silent reading (Smith, 1965). Understanding of what was read gained considerable importance with this shift to silent reading (Venezky, 1984).

The movement towards silent reading left teachers wanting related work for students to complete after reading. To help this situation publishers developed supplemental materials for use with the basal readers. Questioning began to be used to check comprehension (Smith, 1965). The assumption was that if students practiced answering questions about the stories, comprehension would follow (Pearson & Dole, 1987).

Between 1935 and 1950 reading instruction reflected a look-say approach. "The old view of reading says that we proceed letter by letter to unlock sounds and combine them into words, then string the words into sentences; once the sentences are in oral form, comprehension automatically takes place. . . . Scant attention was paid to understanding a text beyond identifying the main idea from a paragraph. Reading comprehension difficulties were usually treated with more practice in decoding" (Orasanu, 1986, p. 1-2).

During World War II, many high school and college students entering the service were found to be deficient in reading. This finding led to an increase in investigative studies of reading disabilities, reading readiness, phonics and reading achievement. Diagnostic and remedial techniques were developed by Gray and Gates (Smith, 1966). Betts added his Informal Reading Inventory, a way to determine reading level, with his basal reader. Reading instruction practices had become more broad in content. Based on research results, teacher manuals and basals began to utilize more systematic instruction. Vocabulary was reduced and repeated, context clues and study of word structure were added. Comprehension was broken into skills and sub skills with students still answering questions at the end of reading (Smith, 1965).

“Yet research on comprehension processes was so sparse up to the 1950’s that even the phrase “reading comprehension” was seldom found” (Venezky, 1984, p. 13). Testing or teaching reading methods were referred to as reading comprehension. Researchers focused on eye movements and word perception as most important to reading.

The 1960’s and early 1970’s saw linguistic approaches where children learned to decode words “by translating graphic symbols (letters) on a printed page into an oral code (sounds corresponding to those letters)” (Pearson & Stephens, 1994, p. 23) so they could listen to themselves read accurately. The view of comprehension was that the text held the meaning and that readers hearing themselves read the text orally would produce comprehension. Therefore questions were not needed at the end of reading selections (Pearson, 1985).

Anderson and Pearson (1984) looked at factors which enabled readers to understand what they were reading. They began writing about the importance of background knowledge.

Psychologists simultaneously began conducting research into how humans stored and retrieved large amounts of information and how memory was organized.

The term “schema” was adopted to define an organized chunk of knowledge or experience often accompanied by feelings. It was considered to be a network of all experiences, cognitive abilities and emotions that one has. Out of this research developed a concept now referred to as “schema theory.” Schema theory suggested that learners possessed knowledge and used that knowledge to help in their understanding of text by allowing them to infer as they read, connecting new ideas with what was already known (Robeck & Wallace, 1990).

Anderson (1984) explained “. . . comprehension is a matter of activating or constructing a schema that provides a coherent explanation of objects and events mentioned in a discourse. In sharp contrast is the conventional view that comprehension consists of aggregating the meaning of words to form the meanings of clauses, aggregating the meaning of clauses to form the meanings of sentences, aggregating the meanings of sentences to form the meanings of paragraphs, and so on . . . The meanings of the words cannot be “added up” to give the meaning of the whole. The click of comprehension occurs only when the reader evolves a schema that explains the whole message” (p. 247).

Knowing how background knowledge affects comprehension has come to be an important topic of discussion in the area of reading. “Research is now underway to show how specific knowledge affects comprehension and to explore strategies to boost knowledge toward facilitating comprehension” (Beck & McKeown, 1985, p. 119). The next section presents research on the effects of background knowledge on reading comprehension.

#### Effects of Background Knowledge on Reading Comprehension

Bransford and Johnson (1972) completed four studies designed to investigate whether comprehension was dependent upon having appropriate schemata for the interpretation of the text. In the first study fifty high school students were divided into

five groups with ten students in each group. One group labeled “No Context (1)” just heard a tape-recorded passage. The “No Context (2)” group heard the same passage twice. Students in the “Context Before” group saw a picture, for thirty seconds before hearing the passage, with appropriate objects in place. The “Context After” group saw the same picture as the Context Before group only it was presented for thirty seconds after hearing the text. The “Partial Context” group saw correct objects contained in the appropriate picture only with the objects rearranged. All fifty students were told that they would be asked to recall a tape-recorded passage. After hearing the passage, students rated how easy it was to comprehend the passage. One meant very difficult to understand, four indicated moderate, and seven meant easy. Students then recalled the passage as close to word for word as they could given seven minutes time. Bransford and Johnson indicated that students’ comprehension and recall of the passage was low when appropriate information was not received before hearing the passage. According to Anderson (1984) “The experiment demonstrates that what is critical for comprehension is a schema accounting for the relationships among elements; it is not enough for the elements to be concrete and imageable” (p. 245).

In study two, three groups heard an ambiguously written passage on washing clothes with the topic specified as follows. The group “No Topic” just heard the passage, the “Topic After” group heard the passage and then received the article title. The third group, “Topic Before,” received the topic before hearing the passage. In study three, students heard the clothes washing passage from Experiment II only it was a longer version. There were only two groups, “Topic After” and “Topic Before.” In both studies, students rated the passage for ease of comprehension, then tried to recall the passage as closely as possible. Bransford and Johnson (1972), concluded for both experiments that the group had significantly higher recall and comprehension scores when a title or theme was given before reading.

The fourth study involved a topic about making and flying a kite. Material was presented using written sentences, but not in paragraph form. A "Topic Before" and "Topic After" group were asked to read the sentences, then rate difficulty of comprehension and to recall as much information as could be remembered. The researchers indicated that the "Topic Before" students had higher scores on comprehension than the "Topic After" students, and concluded that comprehension was low when the topic was given after hearing the passage. The researchers indicated prior knowledge must be activated while the process of comprehending is going on. In summary of studies two, three and four, Bransford and Johnson indicated "that prior knowledge of a situation does not guarantee its usefulness for comprehension. In order for prior knowledge to aid comprehension, it must become an activated semantic context" (p. 724). In a review of all four studies the researchers suggested that comprehension was dependent upon having appropriate schemata for the interpretation of the text.

Beck replicated the above study in 1986. She gave her master's level students the shorter version of Bransford and Johnson's "Washing Clothes." After reading the version, students had minimal recall of details. After the title "Washing Clothes" was revealed, understanding and recall of the passage improved. When students had a frame for connecting reading, comprehension was better. When background knowledge was withheld from the reader, passage comprehension was affected. Beck stated, ". . . even materials written with no intentional ambiguity are never complete in themselves. Readers must use background knowledge to fill in gaps, make inferences, determine what text information relates to what, and so forth. If a reader does not know enough about a topic to do these things, comprehension will be impaired . . . young or less skilled readers can fail to comprehend what they read either because they simply have no knowledge of it or because they do not apply to their reading the facts that they do know" (p. 14).

Anderson, Spiro, and Anderson, (1978) predicted that students with well defined schema about a topic would have better recall about the topic than one not well defined. A food theme was used to get readers to activate different schemata for different passages. After choosing seventy-five undergraduates, the students read a passage about eating in a restaurant, than recalled, in order, foods that were mentioned. The same foods were used in a shopping-in-a-supermarket passage, with foods being introduced in the same order as in the restaurant passage. The researchers concluded that the students recalled more items in the restaurant passage and that the stronger the schema, the more likely the reader will learn and remember the text information.

The importance of schemata on comprehension of written material was studied by Steffensen, Joag-Dev, and Anderson (1979). The researchers chose twenty Indian adults (from India) enrolled in an India college and twenty American adults enrolled in an American college. Males and females were of equal number. Each subject was given two letters. One was of a typical Indian marriage and the other described an American marriage. The directions given were to read the passage and to record the time it took to read, then to write down the letter from memory in the same words and word order as closely as possible. The adults then answered five inference questions about the letter content and answered an autobiographical questionnaire. Subjects had a shorter reading time, recalled more information of the passage, had more culturally appropriate elaborations, and had fewer distortions of the information on the culturally familiar passage. The researchers concluded, “. . . the schemata embodying background knowledge about the content of a discourse exert a profound influence on how well the discourse will be comprehended, learned and remembered” (p. 19).

The effect of cultural background knowledge between subcultures living in the same country was studied by Reynolds, Taylor, Steffensen, Shirey and Anderson (1982). The researchers chose 105 eighth-grade students drawn from three different schools. Half the students were from a black working class area and the other half

were from a white agricultural area. Near equal numbers of girls and boys were represented. The subjects received a letter to read that could be interpreted as a fight or as an instance of a "sounding." In the black culture, sounding is a verbal activity, or ritual insult used for amusement or for males to achieve status in their peer group. The subjects were directed to read the letter, then to write down all they could recall. When subjects finished the subjects rated twenty-nine probe statements as to whether or not each statement was in the letter. A questionnaire on student attitude about the study, understanding of sounding and understanding of the letter was answered by the subjects. In review, the researchers stated interpretations of the letter were related to cultural background knowledge which strongly influenced reading comprehension. In summarizing this study, Lipson (1984) stated that "Prior knowledge, even among relatively fluent readers, can act to distort text, interfering with the author's message" (p. 761).

Culture differences have also played a major role in understanding text with young students (Lipson, 1983). Lipson used sixteen fourth, fifth and sixth grade Catholic subjects and sixteen fourth, fifth and sixth grade Jewish students to examine the role that cultural background played in understanding. Each student read three expository passages. The first passage was culturally neutral, the second was titled First Communion and the third titled Bar Mitzvah. The students read the passages and recorded the time it took them to read each passage. Subjects were then asked to fill in incomplete sentences about information explicitly stated in the text and then to free recall text information or to write down what was remembered from reading and the order in which it was read. Lipson reported that reading rate was faster on the culturally familiar passages for both groups. With partial sentences, students were more successful when the text was familiar and had a more difficult time retrieving information about the culturally unfamiliar passage. The subjects free recalled more text explicitly and inferred more on the familiar culturally specific passage. The

researcher also suggested that cultural background knowledge interfered with comprehension when generalizations were made from one cultural event to another. In retrospect, Lipson (1984) stated that "The findings are especially interesting since the children actually performed better, proportionately, on the completely unfamiliar neutral passage" (p. 762).

Pearson, Hansen, and Gordon, (1979) conducted a study to assess how well children would score on a comprehension test in relation to the level of background knowledge they had about a topic. Twenty children were chosen for the experiment. Ten children who scored high on background knowledge about spiders and ten children who had a low score on background knowledge about spiders made up two groups. A pretest of eight questions concerning spiders was given to all students. After one week, the students read a basal selection on spiders, then answered six explicit questions and six implicit questions over their reading. Researchers concluded the students with high prior knowledge about a given topic had better performance on answering passage questions than students with weakly developed schemata.

In a second study by the same researchers using the same groups of students, questions on the same topic were asked. The difficulty of the questions were varied from the first study. Five questions were textually explicit, or could be answered directly from the text and five were scriptually implicit, or needed the reader's prior knowledge to answer the questions. No prior knowledge test was given to compare the groups. The researchers concluded that students with well developed schemata on a topic were able to answer more questions about a passage than those with weakly developed schemata, especially on implicit questions where the reader is drawing upon existing background knowledge to integrate it with new information.

Lipson (1982) investigated recall and remembrance of expository texts between average and poor readers. Students were rated on the Standard Achievement Test and on teacher judgment for reading ability. Seven average and seven below average third



grade students made up two groups. Equal numbers of male and females were in both groups. Students were assessed on prior knowledge of expository text items about Eskimos, Vikings, dinosaurs, insects, whales, Venus flytraps, and New Guinea. Approximately one week after the background assessment eight passages were handed out one at a time for the students to read. After each passage, the students selected the best answer for six different questions, two of which were explicit and four of which were inferential, then immediately recalled everything they could remember about the passage. In review, the experimenter stated that prior knowledge was a powerful factor in reading comprehension for both average and poor readers. If students scored correctly on pretest questions, they most likely scored correctly on posttest questions. For questions where students had no prior knowledge, scores were higher than for students who had inaccurate previous or partial knowledge. "Both groups were better at acquiring totally new information than at correcting old information that was inaccurate. Even when prior knowledge was contradicted by the text, subjects used it, rather than textual information, for item recognition. Only when they did not, or believed they did not, possess the necessary prior knowledge did they resort to text with a consequent improvement in recognition" (p. 243).

To learn if children who had background information could connect it to new information by drawing inferences Paris and Lindauer (as cited in Hansen, 1981) conducted a study with seven-year-olds. The children were provided implicit and explicit sentences to listen to. Two versions of a sentence were presented. An explicit version was presented to one half of the children and an implicit version of the sentence was presented to the other half of the children. After listening, the children were asked to recall the sentences. The children with the implicit version weren't able to recall the sentence when key words were given. When a follow-up study took place, the children were asked to act out the action in the sentence. The children understood both explicit and implicit sentences. After this study, the authors stated that young children

may have the background knowledge needed to draw inferences while reading, but may not always be able to connect the new information to their prior knowledge.

Teaching children to make connections between prior knowledge and the written text was the focus of a study by Hansen (1981). Hansen investigated the relationship between inference training practice and reading comprehension. Twenty-four second grade students were divided into three equal groups of eight. One of the groups was randomly assigned as the experimental group or the "Strategy Group." For this group the focus before reading would be on integrating prior knowledge and text information. The "Control Group" received the usual basal reader story introductions. The third group was the "Question Group" which answered inferential questions. An experimenter met with each group daily. Each story was taught over four days. Ten stories were taught during the study. On day one all groups received the same vocabulary instruction and on day four the same phonic skill instruction. On day two the "Strategy Group" received instruction on integrating text information and prior knowledge. The other groups received prereading activities from the basal reader. On day three the "Question Group" answered all inferential questions while the other two groups answered half literal and half inferential questions. Ten comprehension questions each, for each of the last five stories taught, followed the four day instruction. In analyzing the data, Hansen found that the "Strategy Group," which received instruction in how to integrate background knowledge with text information, was superior in comprehension to the "Control Group" which only received traditional basal reader procedures on inferential questions and also exceeded the "Question Group" which practiced answering inferential questions. The "Question Group" scored higher on making inferences from the stories than the "Control Group." Hansen concluded that with direct teaching of how to integrate background knowledge with new information and with practicing answering inferential questions, students seemed to remember more information when answering questions from stories.

Hansen and Pearson (1983) were interested in the effects of using the strategy of integrating prior knowledge with text information and also practicing answering inferential questions as Hansen had used in her 1981 study. After randomly selecting forty fourth grade students, reading levels were attained through comprehension scores on the Stanford Achievement Test and on teacher judgment. Students were then divided into four groups: an experimental group with poor readers, an experimental group with good readers, a control group with poor readers, and a control group with good readers. Both experimental groups discussed the importance of prereading activities like comparing the reader's life to the situations in the stories. The two control groups received the basal lesson's prereading strategy of the teacher pointing out main idea and setting of the stories. Postreading discussions centered on ten questions. The experimental groups answered questions by connecting information not in the text with text information. The control group answered both literal and inferential questions. After discussing each story, all students were given comprehension worksheets and answered the same ten questions, six of which were analyzed for comprehension results. Of these six, three questions were literal and three were inferential. All students read a transfer story, one without preteaching, at their reading level and then everyone read a story in common and answered questions after each. When the results of the study were examined, Hansen and Pearson concluded from their analysis of responses, that poor readers benefited from the experimental treatment on inferential questions, but not on literal questions and the good readers improved in literal comprehension from the control treatment. The effects for the transfer story on both groups of poor readers was that they benefited from the experimental treatment and outscored the good readers in both groups. Finally, for the common story, there was no difference in answering literal questions between the poor readers and the good readers.

In examining basal reading stories, the researchers Beck, Omanson, and McKeown (1982) decided teacher guides didn't follow concepts central (or noncentral) to the stories' key ideas when building and using background information. The researchers revised basal story lessons. These lessons were altered to activate prior knowledge, present background information central to key story concepts for prereading, focus attention on a story map to connect reading with prereading concepts during silent reading, and to redirect students to use the story map when answering questions after reading for understanding central concepts. Pictures were also redesigned to match central concepts. The researchers administered the Wide Range Achievement Test to urban third grade students to determine reading levels of skilled and less skilled readers. Forty-eight third grade students were chosen and divided into groups. The "Control Group," made up of twelve skilled and twelve less skilled students, received basal lessons directly from the teacher's manual. The "Revised Group," with twelve skilled and twelve less skilled students, received the altered basal reading lessons. After individually teaching the appropriate lesson for each story, the students recalled everything they could remember about the story, then answered thirty-five questions directed towards central content, noncentral content, and implied content about the story. In the conclusion of the study, researchers indicated that students in the revised group had better performance on all three types of questions and on recalling information. Beck and McKeown (1985) reviewed this study and stated, ". . . results again supported the idea that greater background knowledge enhances text comprehension" (p. 121).

Prince and Mancus (1987) studied the effect of enrichment activities, which involved students in bringing out and building concept background before reading, on comprehension test scores. The researchers chose forty-five first through fifth grade students as their subjects. Students were split into two groups, the "Altered Group" of 23 students and the "Traditional Group" of 22 students. Enrichment activities, which

usually came at the end of a reading lesson, were presented to only the altered group before the reading lesson. The enrichment activities built and elicited prior knowledge to a greater depth than the usual brief background building lessons before a story in the basal. Both groups then received the traditional format of the basal lesson by activating prior knowledge through introducing some vocabulary and making a few statements before students read the story. All students answered literal and inferential comprehension questions at the end of each story. The group that was provided enrichment activities before reading, showed a statistically significant increase in scores on comprehension questions. The researchers concluded that in their studies when background knowledge was activated and built upon using publisher-provided enrichment activities before reading story selections, reading comprehension improved.

Integrating prior knowledge with new concepts may lead to inaccurate information (Cote, Goldman, Gjellstad, Keeton, and Millican, 1995). In a study using expository texts sixth grade students were asked to think aloud as they read and then to recall information. In analysis of the statements made by students and the recall information researchers stated that students actively interacted with the text mostly by bringing in prior knowledge or personal experience and integrating this with the text information. Because some of the students' prior knowledge on science concepts was inaccurate, recall of the integration of science concepts was not always factual. The researchers concluded that children bring their perceptions of the world into the situation whether accurate or not. Misunderstandings may be more a measure of the reader's prior beliefs than a measure of reading ability.

Text interpretation was studied in its relation to a reader's interest by Anderson, Reynolds, Schallert, and Goetz (1977). The researchers chose thirty female music majors from an educational psychology course and thirty males from weight-lifting classes. Each student read two passages then answered questions about the stories. One passage was written as a prison escape but could be interpreted as a wrestling

match. The other passage was designed with four friends playing cards but could be understood as friends playing music together. After reading the passages, students completed a vocabulary test, multiple choice test, gave free recall of each passage, and completed a debriefing questionnaire and autobiographical inventory. From the results the researchers determined that the readers in the weight-lifting class interpreted the passage as one of a wrestling match, whereas students from an education class thought it was about a prison escape. Music majors interpreted the card playing passage as one of friends playing music together. Researchers indicated “results support unequivocally the claim that high-level schemata provide the interpretive framework for comprehending discourse. (And) . . . that people’s personal history, knowledge, and belief influence the interpretations that they will give to prose passages” (p. 377).

To find out how good readers and poor readers comprehended ambiguous passages when interest was not a factor, Anderson and Acker (1984) replicated the above study. Thirty education majors taking part in reading improvement classes were chosen based on reading test scores on the Iowa Silent Reading Test. Eight good readers and twenty-two poor readers read two separate passages that could be interpreted as a wrestling match or prison escape and a passage that could be interpreted as playing music or playing cards. After reading each passage, the students took a vocabulary test, wrote free recall of the passage, and answered questions on a multiple-choice test. To find out students’ prior knowledge level of the passage topics a debriefing questionnaire and an autobiographic inventory were completed after all passages and testing were completed. Both groups of subjects in this study had limited background knowledge of the passage topics wrestling, prison, music and cards. The researchers of this study indicated that good readers and poor readers with limited background knowledge, perform similarly on reading comprehension.

How a shift in perspective after reading affects comprehension was investigated by Anderson and Pichert (1978). In the first study thirty-nine students from an

educational psychology class were given the same passages. Instructions to read the passage differed, with some students taking the perspective of a homebuyer while the other students read taking the perspective of a burglar. Given blank pages the subjects were asked to recall everything they could remember as close to the original words as possible. Next, half the subjects were asked to recall the same passage from the other perspective. After students read the passage with a perspective as either a burglar or homebuyer, all subjects switched perspectives before recalling information. In conclusion, the researchers stated that information recalled from a passage increased when a shift in perspective was taken after reading. Subjects remembered information significant to the new perspective that was not significant to the first perspective taken. Anderson and Pearson (1984) summarized the effects of this study “. . . the reader’s perspective strongly influences which information will be recalled” (p. 275). The next section will review teaching reading comprehension with background knowledge applied.

#### Schema and Reading Comprehension Instruction

The movement toward researching reading comprehension was followed by a burst of research in comprehension instruction between the 1980’s and 1990’s. Pearson (1993) summarized the instructional applications of schema theory. His recommendations were: first, for teachers to focus on text structure and the content of text to be read: second, for teachers and students to connect their background knowledge with the text content so students could improve in drawing inferences: and third, for readers to monitor their reading to make sure understanding has taken place.

Text structure knowledge helps students make inferences, construct meanings and recall the text (Mulcahy & Samuels, 1987). “Children’s schemata for story structure (or text structure) greatly influence their memory of what they read” (McNeil, 1992). One strategy for teaching reading comprehension is to develop and use the

structure of narratives (story grammar) or expository (informational) texts (Pearson and Fielding, 1991). Developing a story sense by reading to children and having them read a lot is one strategy. Having students skim expository texts to become familiar with text layout and design is another strategy.

One instructional method to build background knowledge recommended by Fielding and Pearson (1994) is letting students just read. Reading is acquiring new knowledge which helps build a base of concepts for connecting to more new knowledge. Building background can also be achieved when the teacher directly teaches concepts related to knowledge concepts specifically stated in texts. (Graves, Watts & Graves, 1994).

To determine if students have the appropriate schema for reading, teachers can activate students' prior knowledge by asking them what they know about a topic. Teachers can then assess whether their students have the needed background for reading. If necessary, teachers can build the specific background, help students activate or select an appropriate schema for text interpretation, or let students read because their background is ready for reading. If teachers find students with inaccurate background knowledge they can correct it by using discussions and questioning or by giving examples of accurate content (Ruetzel & Cooter, 1996).

"New information is learned and remembered best when it is integrated with relevant prior knowledge" (Pearson, Roehler, Dole, & Duffy, 1992, p. 154). Students need to understand why drawing relationships with the text and their prior knowledge is important for reading comprehension. Discussions about central themes or concepts that are of importance to the teacher or reader become the basis for readers to relate reading to their lives and to talk about their experiences with the ideas. This activated knowledge is used during reading to connect to text information, to predict what might happen in the story and to elaborate on the story ideas (McNeil, 1992). Students' experiences are used to make inferences or to fill in information that is not directly



stated in the text as students read to find out what happens (Graves, Watts, & Graves, 1994). Another strategy for drawing inferences is setting a purpose for reading or determining what is important to the story. This may be student generated or accomplished through teacher guidance.

“While a good deal of research supports the usefulness of determining importance probably even more work confirms the usefulness of summarizing as a comprehension and studying strategy” (Pearson, Dole, Roehler, & Duffy, 1992, p. 163). Summarizing gets students to focus on the structure of the piece, to pull out important information and to accurately write it in an understandable way. Summarizing a story in the students’ own words gets them to infer and elaborate in their interpretations by using their background and text information (Graves, Watts, & Graves, 1994).

Generating teacher and student questions about the text activates prior knowledge and lends itself to focus the readers’ attention while reading. The readers actively try to answer these questions while they read (Dole, Duffy, Roehler, & Pearson, 1991).

Monitoring comprehension has been termed, metacognition. “Metacognition may be loosely defined as conscious awareness and control of one’s own cognitive processes. This involves knowing when one does or does not understand something and knowing how to go about achieving a cognitive goal, such as successful comprehension or long term recall” (Irwin, 1991).

To use metacognition, students need to expect that reading should make sense. While reading, students should stop and ask themselves if they understand what is being read. If reading is not making sense, readers should decide why and choose a strategy to repair the breakdown in their understanding. Students need to also know when to use specific strategies. Teacher think-alouds and modeling the strategies is one way for students to gain this skill (Reutzel & Cooter, 1996).

### Summary of the Literature Review

Researchers' views of reading comprehension have changed over past years with the combination of cognitive psychology research and reading research (Pearson & Dolc, 1987). Background knowledge has been shown to have an impact on reading comprehension. Readers use background knowledge in understanding new information, recalling information, elaborating on the authors' ideas and interpreting texts (Anderson & Acker, 1984; Anderson & Pearson, 1984; Anderson, Spiro, & Anderson, 1978; Anderson & Pichert, 1978; Beck, 1986; Beck, Omanson, & McKeown, 1982; Bransford & Johnson, 1972; Hansen, 1981; Hansen & Pearson, 1983; Paris & Lindauer, 1981; Lipson, 1982 & 1983; Pearson, Hansen, & Gordon, 1979; Reynolds, Taylor, Steffenson, Shirey, & Anderson, 1982; Steffensen, Joag-Dev, & Anderson, 1979).

Having background knowledge isn't always enough for comprehension to take place. Sometimes readers have the needed background knowledge, however, it must be activated before reading for students to make connections to and inferences about the author's meanings (Bransford & Johnson, 1972; Beck, 1986).

The amount of knowledge readers have about a topic determines the level of comprehension they have. The more defined and higher level of schemata readers have, the better their reading comprehension will be (Anderson, Spiro, & Anderson, 1978) and the shorter the reading rate (Lipson, 1981; Steffensen, Joag-Dev, & Anderson, 1979). Good readers and poor readers have similar performances on recall when their schemata is limited (Anderson & Acker, 1984).

Reading comprehension increases when background knowledge is taught or built upon before reading (Pearson, Hansen, & Gordon, 1979; Prince & Mancus, 1987; Beck, Omanson, & McKeown, 1982) and when students understand the

importance of using background knowledge while they read (Hansen & Pearson, 1983). Students can be taught to integrate and use background knowledge and the text to make inferences (Hansen, 1981; Hansen & Pearson, 1983). Students can be guided to use the content central to the text and to follow a story map to understand key ideas (Beck, Omanson, & McKeown, 1982). Comprehension improves when a focus, theme or perspective is determined before reading (Bransford & Johnson, 1972; Beck, 1986; Anderson & Pichert, 1978) and when students summarized after reading (Pearson, Roehler, Dole, & Duffy, 1992). Questions asked by the teacher or students before, during and after reading helps students activate prior knowledge and to make connections between the author and the text (Hansen, 1983; Beck, Omanson, & McKeown, 1982). Learning how to answer implicit questions improves comprehension of implicit questions (Beck, Omanson, & McKeown, 1982) especially for poor readers (Hansen & Pearson, 1983).

Text interpretation depends upon the reader's background. Interests, perspectives, beliefs, personal history and cultural knowledge can benefit or limit comprehension (Anderson & Pichert, 1978; Steffensen, Joag-Dev, & Anderson, 1979; Lipson, 1983; Reynolds, Taylor, Steffensen, Shirey, & Anderson, 1982). Previous knowledge, if inaccurate, could lead to misunderstandings of new information (Reynolds, Taylor, Steffensen, Shirey, & Anderson, 1982; Lipson, 1983). It is harder to learn new information when old background knowledge is not corrected (Lipson, 1982).

When reading, students' comprehension improves when they monitor their comprehension to determine if understanding is taking place. If needed, students select strategies to aid in the repair of their comprehension (Ruetzel & Cooter, 1996).

In review of the literature it seems imperative that teachers give students, coming to class with varied schema, a common base of knowledge by activating and building schemata before introducing new information. By eliciting and building

background knowledge, students will have a schema to attach and integrate the new information to thereby increasing comprehension. By teaching students to use their background knowledge, to monitor their comprehension while reading, and to use strategies to repair comprehension breakdowns, students will improve their reading comprehension.

---

The findings in this literature review support the need for this project. By having third grade students develop background and literary elements for selected literature books, it was felt that students were learning how to develop and activate prior knowledge in reading. Additionally, the interactive multimedia presentations developed for the CD will be available for other children who may elect to read these books, thereby building and activating their background knowledge before reading.

## CHAPTER III

### PROCEDURES

The purpose of this study was to help third grade students develop multimedia presentations using current technology to improve the related background knowledge and literary awareness of students for six different literature books. A second purpose was to use the authoring system, HyperStudio, to develop an interactive compact disk which future students could access before reading specific literature books to enhance reading comprehension.

Chapter III contains information describing Project Background, Population, Equipment and Software, Technology Preparation, Reading Preparation, Design Preparation, and The Project.

#### Project Background

As a result of participation in Share 105, a grant for teachers to gain technology skills and to share these skills with students, linking technology with reading seemed one possible way to improve student preparation for reading various materials. Recognizing the importance of experiential background to successful comprehension of reading materials, and of using technology to motivate and provide interactive opportunities to learn, a multimedia approach was selected as the vehicle to create the project. This multimedia approach consisted of the blending of audio, graphics, text, and video through computer technology.

#### Population

The population of this project was a classroom of 26 third grade students and one teacher. A college reading practicum student helped the teacher work with student literature groups. While students used the computer to create the project, one parent volunteer assisted children as needed. The media teacher and an aide supported students in the media

center with HyperStudio, a multimedia authoring program designed for students in grades 3 - 12, and Kid Pix, a multimedia authoring tool designed for young children.

#### Equipment and Software

Multimedia equipment available in the classroom consisted of two Power Mac 5200/100's, one Apple LC 575, an Apple scanner, Kodak DC 40 digital camera, and a zip drive. Software included HyperStudio, Kid Pix, Microsoft Word, Apple Color One Scanner, Photo Enhancer, and Avid Video Shop. In the media center two Power Macs, one Apple LC 575, a video camera, and lighting equipment were available along with the software HyperStudio, Kid Pix, and Microsoft Word.

#### Technology Preparation

The author's technology training through Share 105 consisted of the use of multimedia in the classroom. How to use a Power Mac 5200/100 and lessons on integrating writing and technology were taught.

For third grade students to become familiar with HyperStudio, a multimedia authoring program, a research project about the seven continents was planned. By using AverKey, a software program designed to transmit the computer screen onto a television screen, the teacher modeled the use of HyperStudio by presenting the program to the whole class. Students were partnered and designed cards, or screens that appear in HyperStudio. These appear as white 4 x 5 index cards in which pictures, graphics, text, video, sound, and buttons could be imported onto or embedded into the cards. Tasks for this project consisted of selecting a new card, using tools for drawing freehand with a paintbrush, pencil or spray can, applying background with the Paint Bucket Fill Tool, typing titles with the Paint Text, changing text or illustration color, using an eraser or selector tools for editing, adding text boxes to type text in, and adding buttons with voices to read text. A stack, or series of cards, became the finished project.

Students were taught to use and became acquainted with Kid Pix in October by composing a character slide show. They used draw, color and edit tools similar to HyperStudio's, and stamp tools to create an imaginary character's face, then typed character traits for these. Voice was added. Transitions, a visual effect between cards, were selected to connect each card.

To prepare for puppet videos, the students dressed applehead puppets as Pilgrims during November. A brief puppet show was presented about the problems Pilgrims encountered.

Microsoft Word, a word processing program, was introduced as a writing tool in November. Students learned word processing, how to use spell-check and to insert clip art, or pre-designed graphics, for pen pal letters. They also used Microsoft Word to draft, edit, then copy and paste a season's greeting into Eudora Lite, a program for electronic mail, to E-mail their pen pals in December.

In January, to review and learn new HyperStudio techniques, students used a teacher-made template to compose a slide show about Japan. The students learned to copy and paste a card, and to frame pictures. They used a scanner, a machine that captures a flat image changing it into a digital image on the computer. Students scanned self-made pictures. Images were adjusted with the software, Apple ColorOne Scanner, for brightness, and contrast by the students. The scanned artwork was copied and pasted into HyperStudio as clip art. Text was typed in text boxes, brought into Microsoft Word, spell-checked and copied and pasted back into HyperStudio. Lastly, children selected buttons and chose ready-made transitions to connect cards.

### Reading Preparation

Throughout the school year students' background knowledge was related with stories through whole class read-alouds. Discussions of story elements and experiential knowledge took place. Story elements included explanations of setting, character,

problem, outcome and resolution. Students described story elements from their points of view. Students were encouraged to ask questions when words or concepts weren't explained or were unclear in the text. Teacher and students gave definitions using story clues and their background information. This background information, or prior knowledge was referred to as background knowledge.

In September, how to choose an appropriate book for individual reading level was discussed. Students used a five finger rule developed in Reader's Workshop. A "Too Easy" book had 0-1 unknown words to the reader on a page; a "Just Right" book had 2-4 unknown words on a page; and a "Too Hard" book was one with 5 or more unknown words on a page. Students were encouraged to choose a "Just Right" book. Genre was learned through categorizing student's library books and classroom library books by common characteristics of book type. Using the Reader's Workshop idea of two apple trees, one labeled fiction and one labeled nonfiction, students wrote book titles and genre on apples, pasting them on the appropriate trees. Through-out the month, definitions and examples of different genres were discussed including realistic fiction, historical fiction, biography, autobiography, humor, animals, reference, fantasy, legends, informational, and poetry.

In October, the students gained understanding of story structure by reading legends. They chose one story, isolated setting, problem and outcome by using a story map. Another story map was used to develop awareness of the sequence of events in the legend. The students memorized the story, and presented their legend through storytelling.

By November, students wrote their own legends using setting, character traits, problem, and outcome, with audience in mind. These were read to first grade reading buddies.

Reader's Theater, a reading activity for partners to read text conversation out-loud and with expression, took place in January. Cooperative behavior among partners was observed, and used as a determiner for literature groups later in February.



### Design Preparation

To help students with illustrations, art lessons on line, color, and drawing were taught. Art prints were analyzed for use of line, color, and perspective. Before designing cards for the project, the seven continents stacks and Japan slideshow created earlier were discussed for effective use of color, and text font.

### The Project

By February, students were prepared to begin the project. Six literature books were selected on teacher perception of students' interests, and on appropriate reading levels. After a brief introduction of each book by the teacher, students rated these books on their interests and perceived reading level. The teacher placed students into groups of four or five, keeping in mind students' interest ratings, reading levels, and a cooperative mix for productive behavior.

Students read assigned books. Setting, character traits, and problem were determined by each literature group for their selected story. Genre was identified. Authors' background were researched in the library, through the internet, and the Scholastic Book Club. Students scoured book jackets for more author information. Other books written by the same authors were located in the school media center.

To start the multimedia part of the project in March, each literature group split into partners to choose three of six topics: title page, author, character, genre, problem and setting. Partners decided on media to be used on cards. Choices were to illustrate using HyperStudio or Kid Pix, scanning self-made pictures, taking a digital picture, or making a brief video recording to add as a movie. Students created rough drafts of text, and sketches of pictures for topic areas on four by five paper. Multimedia stacks were made on the computer using HyperStudio from these drafts. Each pair of students received a 3.5 disk to save work on, which was then saved to a zip disk by the teacher.

All pairs of students chose to use a video on one card. Puppets were cut out of material by the teacher. Life Skills students (students identified for least restrictive environment) dyed, sewed and ironed them. Third grade students brought materials from home to decorate their puppets. Each group practiced dialogue and actions. Lights and background were set up in the media center, and puppet plays were video taped by the teacher. Each video segment was edited using Avid VideoShop, a software program for creating and editing digital movies from a video recording. The edited movies were saved on project disks. The students imported movies into HyperStudio by adding a button with movie playing capability.

A few groups chose to use digital camera photos. The camera captures an image which is sent, or downloaded, into the computer and changed to a digital picture. The students took pictures, downloaded and edited the images by using the software, Photo Enhancer, with the teacher's help. The pictures were saved to project disks, then brought into HyperStudio as clip art.

All literature groups used the HyperStudio capability storyboard to rearrange their cards in order of the way the students wanted the audience to view them. Transitions were chosen to connect cards.

In April, students compared their personal experiences with those experiences of the main characters. The children chose experiences, and wrote their point of view as experiential knowledge. To complete this piece, another HyperStudio stack was created with animation and voice added. Hypertext links were connected. A hypertext link is a word or phrase than can be clicked upon to change from the current card to a related card.

As each literature group finished in April, reflections on final stacks took place. Students looked at eye appeal of graphics and text, to see if topic area concepts were clear to the audience, and if enough background information was given so future students would better understand the story, without too much plot revealed. Editing and revision by students of the programs for each book was completed in April and May. When book

backgrounds were finished, stacks were linked, a tour guide created, and the project pressed to a CD in the media center by the teacher and media specialist.

## CHAPTER IV

Chapter IV contains the CD, "Great Books to Read," which holds student authored multimedia presentations for six literature books. Background concepts for setting, character, problem, genre, author and related background information for each story is presented. A tour guide on how to move through the stacks is also included.

The CD could be kept in individual classrooms, or in the school media center. The framework could be used as a pattern to create other multimedia CDs for literature books.

## CHAPTER V

### SUMMARY, CONCLUSIONS, RECOMMENDATIONS

#### Summary

The purpose of the study was to help third grade students develop multimedia presentations using current technology to improve the related background knowledge and literary awareness of students for six different literature books. A second purpose was to use the authoring system, Hyperstudio, to develop an interactive compact disc which future students could access before reading specific literature books to enhance reading comprehension. A summary of research and project findings is presented in the next paragraphs.

Based on the literature review background knowledge was found to be a determining factor affecting reading comprehension (Pearson & Dole, 1987). Students who have an activated, well developed background knowledge before reading are likely to have an enhanced reading comprehension. Activating, building or correcting prior knowledge may be needed. Using text structures, inference training, monitoring of understanding and strategies to repair comprehension may also benefit reading comprehension.

The project was developed to enhance readers' comprehension and to make available one more tool for teachers to use with their students in developing background for literature books. The multimedia presentations include background information related in a framework of story grammar identifying setting, character, problem, and genre. The authors' background was also contained in the presentation. A tour guide explaining how to move through the stacks and story grammar topics was included. Conclusions of the research findings and project are listed below with recommendations based on the conclusions following.

### Conclusions

As a result of the review of literature and this project the following was concluded:

1. Students who actively use background knowledge for reading will likely improve reading comprehension.
2. Students come to the classroom with varying schemata that may or may not enable them to comprehend the materials they are asked to read.
3. Having third grade students develop multimedia presentations with background knowledge takes much preparation.
4. Third grade students seem to understand the importance of bringing background knowledge to their reading when they have been taught why it is necessary, and have been actively involved in preparing presentations for other students.
5. Teachers must be well-trained in multimedia development before attempting a whole class project.

### Recommendations

In review of the conclusions, recommendations are as follows:

1. Educators need to be aware of the effects background knowledge has on reading comprehension.
2. Teachers should assess background knowledge of students before reading to be able to provide necessary information for successful comprehension.
3. Teachers should teach the importance of using background knowledge for reading purposes, how to integrate prior knowledge with the text, and how to monitor and fix reading comprehension.
4. It is recommended that the CD be tried out with students before reading the books to determine the effectiveness of this approach.

## REFERENCES

- Agnew, P. W., Kellerman, A. S., & Meyer, J. (1996). *Multimedia in the classroom*. Needham Heights, MA: Allyn and Bacon.
- Anderson, R. C. (1984). Role of the reader's schema in comprehension, learning, and memory. In Anderson, R. C., Osborn, J., & Tierney, R. J. Learning to read in American schools (pp. 243-257). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Anderson, O. S., & Acker, R. L. (1984). An investigation of the effects of prior knowledge on comprehension of discourse by good and poor comprehenders. Reading World, 24(2), 87-95.
- Anderson, R. C., & Pearson, P. D. (1984). A schema-theoretic view of basic processes in reading comprehension. In Pearson, P. D. Handbook of reading research (pp. 255-292). New York: Longman, Inc.
- Anderson, R. C., & Pichert, J. W. (1978). Recall of previously unrecallable information following a shift in perspective. Verbal Learning and Verbal Behavior, 17, 1-12.
- Anderson, R. C., Spiro, R. J., & Anderson, M. C. (1978). Schemata as scaffolding for the representation of information in connected discourse. American Educational Research Journal, 15, 433-440.
- Beck, I. L. (1986). Using research on reading. Educational Leadership, 43(7), 13-15.
- Beck, I. L., & Mckeown, M. G. (1985). Instructional research in reading: A retrospective. In Oransu, J. Reading comprehension from research to practice (pp. 113-164). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Beck, I. L., Omanson, R. C., & Mckeown, M. G. (1982). An instructional redesign of reading lessons: Effects on comprehension. Reading Research Quarterly, 17, 462-481.

Bransford, J. D., & Johnson, M. K. (1972). Contextual prerequisites for understanding: Some investigations of comprehension and recall. Journal of Verbal Learning and Verbal Behavior, 11, 716-726.

Cote, N., Goldman, S. R., Gjellstad, L., Keeton, J., & Millican, C. (1995). Children's use of prior knowledge and experience in making sense of informational text. San Francisco, CA: American Educational Research Association. (ERIC Document Service No. ED385395)

Dole, J. A., Duffy, G. G., Roehler, L. R., & Pearson, P. D. (1991). Moving from the old to the new: Research on reading comprehension instruction. Review of Education Research, 61(2), 239-264.

Fielding, L. G., & Pearson, P. D. (1994). Reading Comprehension: What works. Educational Leadership, 51(5), 62-68.

Graves, M. F., Watts, S., & Graves, B. (1994) Essentials of classroom teaching elementary reading. Needham Heights, MA: Allyn and Bacon.

Hansen, J. (1981). The effects of inference training and practice on young children's reading comprehension. Reading Research Quarterly, 16, 391-417.

Hansen, J., & Pearson, P. D. (1983). An instructional study: Improving the inferential comprehension of good and poor fourth-grade readers. Journal of Educational Psychology, 75, 821-829.

HyperStudio, (1994). El Cajon, CA: Roger Wagner Publishing Inc.

HyperStudio Software for a Mediacentric World, (1997). El Cajon, CA: Roger Wagner Publishing, Inc.

Lipson, M. Y. (1982). Learning new information from text: The role of prior knowledge and reading ability. Journal of Reading Behavior, 14(3), 243-261.

Lipson, M. Y. (1983). The influence of religious affiliation on children's memory for text information. Reading Research Quarterly, 18(4), 448-457.



Lipson, M. Y. (1984). Some unexpected issues in prior knowledge and comprehension. Reading Teacher, 37(8), 760-64.

Mathews, M. M. (1986). Teaching to read. Toronto: The University of Chicago Press.

McNeil, J. D. (1992). Reading comprehension: New directions for classroom practice (3rd ed.). New York: Harper Collins.

Mulcahy, P. I., & Samuels, S. J. (1987). Problem-solving schemata for text types: A comparison of narrative and expository text structures. Reading Psychology, 8(4), 247-256.

Multimedia Learning Tools, (1996) Cupertino, CA: Apple Computer, Inc.

Orasanu, J. (1985). Reading comprehension: From research to practice. Hillsdale, NJ: Lawrence Erlbaum Associates.

Pearson, P. D. (1993). Focus on research teaching and learning reading: A research perspective. Language Arts, 70, 502-511.

Pearson, P. D., & Dole, J. A. (1987, November). Explicit comprehension instruction: A review of research and a new conceptualization of instruction. Elementary School Journal, 88(2), 151-165.

Pearson, P. D., & Fielding, L. (1991). Comprehension instruction. In Barr, R., Kamil, M., Mosenthal, P., Pearson, P. Handbook of Reading Research (Vol. II)(pp. 815-860). White Plains, NY: Longman Publishing Group.

Pearson, P. D., Hansen, J., & Gordon, C. (1979). The effect of background knowledge on young children's comprehension of explicit and implicit information. Journal of Reading Behavior, 11(3), 201-209.

Pearson, P. D., Roehler, L. R., Dole, J. A., & Duffy, G. G. (1992). Developing expertise in reading comprehension. In Samuels, S. J., & Farstrup, A. E. What research has to say about reading instruction (2nd ed.)(pp. 145-199). International Reading Association.

Pearson, P. D., & Stephens, D. (1994). Learning about literacy: A 30-year journey. In Ruddell, B., Ruddell, M., & Singer, H. (Eds.) Theoretical models and processes of reading (4th ed.)(pp. 22-42). International Reading Association.

Prince, A. T., & Mancus, D. S. (1987). Enriching comprehension: A schema altered basal reading lesson. Reading Research and Instruction, 27(1), 45-53.

Reynolds, R. E., Taylor, M., Steffensen, M. S., Shirey, L. L., & Anderson, R. C. (1982). Cultural schemata and reading comprehension. Reading Research Quarterly, 3, 353-366.

Robeck, M. C., & Wallace, R. R. (1990). The psychology of reading: An interdisciplinary approach (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Reutzel, D. R., & Cooter, R. B. (1996). Teaching children to read: From basals to books. Englewood Cliffs, NJ: Prentice Hall, Inc.

Smith, N. B. (1965). American Reading Instruction. Newark: International Reading Association.

Steffensen, M. S., Joag-Dev, C., & Anderson, R. C. (1979). A cross-cultural perspective on reading comprehension. Reading Research Quarterly, 15, 10-29.

Venesky, R. L. (1984). The history of reading research. In Pearson, P. D. Handbook of Reading Research (pp. 3-38). New York: Longman, Inc.

Ward, A. W. (1994). Multimedia and learning: A school leader's guide. Alexandria, VA: National School Boards Association.

## APPENDIX

Bulla, Clyde R. (1987). The Chalk Box Kid. New York: Random House, Inc.

Bunting, Eve. (1994). Nasty, Stinky Sneakers. New York: Harper Collins.

Cleary, Beverly (1979). Ramona Forever. New York: Dell Publishing.

Giff, Patricia Reilly (1988). Watch Out! Man-eating Snake. New York: Bantam

Doubleday Books for Young Readers.

Hurwitz, Johanna (1979). Aldo Applesauce. New York: Puffin Books.

Peterson, John (1988). The Secret Hide-Out. New York: Scholastic, Inc.