THE EFFECTS OF ACTIVATING PRIOR KNOWLEDGE BEFORE READING ON
STUDENTS WITH AND WITHOUT LEARNING DISABILITIES

A Thesis by

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ABSTRACT

Students with learning disabilities use prior knowledge differently than students without learning disabilities. This paper examines what happens to reading fluency, words per minute, and reading comprehension when prior knowledge is activated.

By using two reading passages at the fourth grade level, students read one passage without prior knowledge activation and another with prior knowledge activation. The students were timed for words per minute. The reading errors were noted for fluency, and questions were asked to measure comprehension.

While students’ individual scores both increased and decreased in all areas when prior knowledge was activated, students with learning disabilities did increase their reading comprehension on average.
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CHAPTER I
INTRODUCTION

Some educators would espouse the opinion that as long as students understand what they read, reading fluency should not matter. While understanding what is read is the final outcome for reading, fluency cannot be ignored. Slow reading, a major cause for concern, requires some readers to spend a considerably greater amount of time in the reading task than it does for others who are reading at a rate appropriate for their grade level (Rasinski, 2000). Sometimes one of the most difficult tasks for students with learning disabilities is the ability to read fluently at their grade level. According to Rasinski, slow reading equals poor comprehension, and poor comprehension leads to less reading; this leads to slower progress in reading. The foundation of learning is language; the second tier is skills, followed by strategies, subject matter, and last, higher order thinking. One must possess the strategies to activate prior knowledge before they can grasp the subject matter (Deshler, 2005). Thus, students with learning disabilities may continuously fall further and further behind unless they learn to activate prior knowledge to assist in reading comprehension. The purpose of this study is to compare the impact (or effects) of the activation of prior knowledge in students with learning disabilities and students without learning disabilities.

Where does prior knowledge come from? Knuth and James (1991) described prior knowledge as some life experience, either real or vicarious; previous works read; and experience with language. Strangman and Hill (2005) contended that prior knowledge is a term for more specific knowledge dimensions such as metacognition, subject matter,
strategy, personal, self-knowledge, and conceptual knowledge. These words typically describe the same basic concept of knowledge that is obtained before reading.

The definition of fluency offered by the National Reading Panel (2000) takes into consideration automatic word recognition. According to the Panel, fluency is “the ability to read a text quickly, accurately, and with proper expression” (p. 3-1). When fluent readers read silently, they recognize words automatically. They group words quickly in ways that help them gain meaning. Fluent readers read aloud effortlessly and with expression. Their reading sounds natural as if they are speaking (p. 22).

Reading comprehension is a process of constructing meaning from written text based on a complex coordination of a number of interrelated sources of information. Research that has focused on the reading and listening comprehension of students with learning disabilities has demonstrated an inactive learner characteristic by being passive learners (Wong, 1979). Students with learning disabilities were found to be deficient in generating inferences and determining the main idea in narrative text when compared to good readers (Wong, 1979). Bos and Anders (1990) found that minimal practice and cueing prompted successful comprehension monitoring. The collected findings seemed to suggest that direct instruction toward activating comprehension monitoring and adjusting schemata for reading should have positive effects on the reading comprehension of students with learning disabilities. Students with learning disabilities need to be given tools to aid in reading fluency and reading comprehension.

This research examined how prior knowledge affects reading fluency and comprehension of students with learning disabilities as well as how activating prior knowledge affects reading fluency and comprehension. It also examined whether
students with learning disabilities use prior knowledge as effectively as their non-disabled peers at the same reading level.
CHAPTER II
LITERATURE REVIEW

How does prior knowledge affect reading fluency and comprehension of students with learning disabilities? This study analyzed how activating prior knowledge affects reading fluency and comprehension. The use of prior knowledge by students with learning disabilities was compared to that of their non-disabled peers at the same reading level. In order to comprehend, one must have all attention focused on the meaning.

If you’re reading slowly and struggling with individual words, sounding them out, even if you’re sounding them out correctly, all of your mental attention is wrapped up in the actual decoding. So you’re not paying attention to the point of reading, which is obviously the meaning. We find that fluency and automaticity are a very big deal. (Feldman, 2002, p. 1)

This review will examine literature on: (a) prior knowledge, (b) learning disabilities and prior knowledge, (c) the impact of incorrect prior knowledge, (d) the impact of prior knowledge on comprehension, (e) the impact of prior knowledge on reading fluency, and (f) activation of prior knowledge.

Prior Knowledge

A person with more prior knowledge is able to comprehend better than a person with less (Johnston, 1984). Shapiro (2004) found that prior knowledge is more important than reading ability in determining learning outcomes. Even among experts on a given subject, topic knowledge varies, and it will influence learning outcomes. Shapiro indicated that, even among novices, topic knowledge varies, and it influences learning outcomes. Lipson (1982) explained that authors expect readers to connect information in predictable ways. The only way the new information is understood is with reference to
information already there. At the time of recall, students use what they know the information (p. 244). In order to connect, readers must use prior knowledge along with the data given and information inferred from within the text. A reader who brings adequate prior knowledge can make the inferences required to construct meaning from the text with less effort than a reader with a weak prior knowledge base.

People with learning disabilities usually have adequate long term memories. What they may have more difficulty with is working memory. It may take ten to fifteen repetitions throughout several days to retain what the “average” person retains after three to five repetitions on one occasion (Boon, 2006).

“Those in the realist position view cognition as a process by which learners eventually construct mental schemata that corresponds to the environment” (Scheepers, 2000,p.5). Constructivist learning should be meaningful and related to real life situations. To introduce new concepts and to instruct on what the students already know as a foundation, teachers need to discuss first some related ideas that are already familiar to the students. This practice helps students with learning disabilities because of low self-esteem and repeated failures. If they have a chance to start with something familiar, new learning is not so overwhelming (Steele, 2005).

Realizing that prior knowledge should be activated is only part of the issue. Another part is to establish levels of prior knowledge for students, to verify a baseline for what needs to be taught or what would be considered review.

**Determining Levels of Prior Knowledge**

Determining students’ levels of prior knowledge may be as informal and simple as brainstorming and discussion or may be as formal as a written pretest. According to
Farrell (2004), testing for prior knowledge may involve looking for some, or all, of the following: life experiences (vicariously or real), previous works read, previous concepts taught, previous experiences with the language, and the first reading of the materials. Students lost in the text on the first reading may be frustrated but engaged and thinking. By the second reading they are actively studying and have acquired prior knowledge from the first reading.

One example of measuring prior knowledge, from Coiro (2006) includes the Qualitative Reading Inventory (QRI2). This includes asking students, “What do you think of when you hear the words _____?” and “What do the words _____ mean to you?” The purpose for these questions is to help predict students’ comprehension level on the related passages and gives the examiner an idea of how familiar or unfamiliar concepts in the passage are to the student. Coiro (2006) explained that a lack of knowledge of the concepts or different knowledge may explain difficulty in comprehension. Another example of measuring prior knowledge is by simply listening. According to Roschelle (1997), “understanding prior knowledge is 90% perspiration and 10% method (p. 12).”

Measuring prior knowledge among students may be complex, but determining prior knowledge levels among students with learning disabilities may be especially complicated due to processing difficulties.

**Prior Knowledge and Learning Disabilities**

Learning disabilities may be viewed as a result of the interplay between a poorly elaborated knowledge base, the biologically determined efficiency of various micro level processes such as encoding, and the physical and social meaning attached to performance (Carr, 1996). Carr observed that the differences between the task performance of students
with learning disabilities and those without learning disabilities may be related to differences in previously acquired knowledge as well as differences in processing. Children with learning disabilities actively use strategies, but they are inefficient in their strategic behavior.

Reading disabilities are not a distinct syndrome, but rather a continuum with other cases of poor reading. Reading disabilities always involve an interaction between children’s intrinsic cognitive characteristics and environmental influences. Children may be born with biological vulnerability to a reading disability; the reading disability only develops in interaction within the environment (Spear, 1995). How does poor reading ability affect prior knowledge? Poor readers may be different from good readers in their ability to answer comprehension questions because they have less information stored; they fail to relate their prior knowledge to the questions; or they may not use strategies to answer questions even though they may have equal prior knowledge to that of a good reader (Holmes, 1983). Text implicit questions may be difficult for poor readers because they must go beyond sentence boundaries and/or they must reason at a deeper level by relating two separate items of information. Stahl, Jacobson, Davis, and Davis (1989) suggested that readers do not use one higher-level knowledge source, like prior knowledge, to make up for difficulty in another higher-level knowledge source, such as vocabulary. Stahl et al. hypothesized that a reader who knew few of the word meanings in a text but who had a good knowledge of the topic might be able to use that knowledge to comprehend the text.

Less knowledgeable readers may be employing different strategies to comprehend expository materials. Skilled readers make inferences during and after reading, and
inferences improve comprehension (Lipson, 1982). Students with low prior knowledge appeared able to recall as many facts as those with high prior knowledge; the subjects with higher levels of prior knowledge were better able to infer an organization to those facts. Readers high in domain knowledge, but low in vocabulary knowledge may use their domain knowledge to compensate for their lack of word knowledge (Stahl, Hare, Sinatra, & Gregory, 1991).

According to Boon (2006) our minds scan and pick up information using the senses. We are not usually overwhelmed because the information is held for a second or two in buffers where working memory decides if the information is useful. If it is, it goes into working memory. If not, it will just disappear. If it didn’t, the mind would be overwhelmed with more information that it can handle. This lack of filtering is what causes problems for individuals with learning disabilities. This lack of filtering may even lead to picking up incorrect prior knowledge, which can damage comprehension of facts.

**Incorrect Prior Knowledge**

Some students have prior knowledge that is incorrect; this can also affect reading comprehension and reading fluency. According to Alvermann, Smith, and Readence (1985), activating prior knowledge can actually interfere with comprehension if prior knowledge is incompatible with the information in the text.

Some believe that it is a threat to one’s self-concept to discover faulty information (Holmes, 1983). Poor readers may have gotten their knowledge through films, first-hand experiences, and conversations with other people. They were less likely to allow text to influence their beliefs. Some people tend to hold on more tightly to preconceived judgments. This may be especially true of poor readers with more prior knowledge.
Holmes also noted that poor readers lacked the metacognitive awareness of what is old and new information. 

Readers are thought to organize their prior knowledge into a framework which provides slots for adding new information. Poor readers, as compared to good readers, may fail to use their existing knowledge as a framework to learn new information from the text and to correct misinformation in their knowledge store. (p. 2)

Being able to differentiate between old and new textual information and to identify misinformation in their existing knowledge leads not only to better assimilation of new material, but also to a restructuring of old knowledge.

Lipson (1982) found that when prior knowledge was contradicted by the text, subjects used their prior knowledge, rather than the textual information. She also found that subjects were more likely to get an item correct when they did not know the information at pretesting than if they had been wrong at pretesting. Another explanation may be that poor readers with more prior knowledge may have thought that they knew the information in the passage so they skimmed it (Holmes, 1983).

**Prior Knowledge and Comprehension**

While incorrect prior knowledge affects comprehension negatively, correct prior knowledge can enhance comprehension. Reading comprehension has been defined as a process of constructing meaning from written texts, based on a complex coordination of a number of interrelated sources of information. Such difficulties can be particularly difficult for students with learning disabilities because reading comprehension requirements increase as students progress through school (Mastropieri & Scruggs, 1997). Students with learning disabilities typically exhibit deficits in reading
comprehension, including problems not only in remembering the facts and details of texts, but also in making inferences. Reading disabilities are viewed as language based disabilities involving several types of linguistic deficits. Students may have difficulties in phonological skills, semantic skills, and syntactic skills. Sometimes they also have difficulties in inferring and in meta-cognitive monitoring (Montgomery, 2006). Students with learning disabilities may have deficits involved in inferencing and text integration, meta-cognitive skills related to comprehension, and working memory. In contrast, phonological skills, short term memory, and verbatim recall of text are typically not deficient (Fletcher, Lyon, Barnes, Stuebing, Francis, Olson, Shaywitz, and Shyawitz 2006).

Anderson and Pearson (1984) explained that prior knowledge affects comprehension in three ways. First, it helps students make inferences about their reading. Second, it directs attention to information that is important in a knowledge domain. Last, prior knowledge provides a plan for recall. Students who lack prior knowledge are going to have a difficult time through their school careers. Students with high prior knowledge will recall information in a more coherent manner, will make more knowledge-based inferences, and will have an idea of which ideas in the text are important and which are not (Stahl et al, 1991). Taft and Leslie (1985) stressed that “children should not be expected to comprehend materials where the major concepts contained therein are unknown, even when the concepts are explicitly defined in the text” (p. 177). It would be beneficial for teachers to know student levels of prior knowledge to prepare the students for lessons or units in the future. When students lack prior knowledge of a topic the information may seem arbitrary and difficult to understand and remember (Carr, 1996).
Pearson (1997) felt that increasing children’s conceptual knowledge may do more to increase reading comprehension than any skills training. Just reminding students to activate prior knowledge is beneficial especially in application level thinking (Spires, Hiller, & Donley, 1998).

Pearson, Hansen, and Gordon (1979) found that “average readers with high prior knowledge have been found to score significantly better than readers with low prior knowledge on implicit questions, but not explicit questions” (p. 207). Carr (1996) found the same information, and she felt that comprehension of textually explicit (right there) information is easier than comprehension of implicit (implied) information requiring the reader to mix information from the text with prior knowledge. Furthermore, Carr found that students with learning disabilities were able to answer more inferential comprehension questions about familiar topics and fewer inferential comprehension questions about unfamiliar topics. So, background information may have increased the readers’ ability to process the more difficult types of questions. Spires et al, (1998) noted that “prior knowledge activation was stimulated not simply by domain-specific knowledge but by the combination of personal and domain-specific knowledge” (p. 257). Personal domain knowledge is the informal knowledge that is picked up along the way. Specific domain knowledge is knowledge that is specific to the topic and usually received formally. Even with adequate comprehension based on prior knowledge, fluency may turn any school or recreational reading assignment into a marathon of frustration for nearly any student.
Prior Knowledge and Reading Fluency

Allinder, Dunse, and Brunken (2001) defined reading fluency as the ability to read orally in a smooth and effortless manner. Disfluent readers lack sensitivity to meaningful phrasing and syntax that encourage comprehension (Rasinski, 2000). According to the National Assessment of Educational Progress (NAEP), if a person reads at 74 words per minute or slower, it is difficult to keep track of ideas as they are developing within the sentence and across the page (1992). Slow readers are using resources for word recognition rather than comprehension. Rasinski believed that fluency and reading volume (amount) are cause and consequence of one another. When students do not read well they will only read the minimum amount required of them. When reading is not practiced, fluency does not improve.

Several studies have been done on reading fluency and prior knowledge. Zabaluk, Samuels, and Taylor (1986) found that large differences in reading times were reported depending upon whether the topics were familiar or not. Taft and Leslie (1985) found that children with prior knowledge of a science passage read with 25% fewer miscues than children with lower prior knowledge of the topic. They also found that the low prior knowledge group relied on graphic cues regardless of the level of accuracy, and that prior knowledge had a significant effect on the proportion of miscues resulting in loss of meaning. Finally, Taft and Leslie found that students with low prior knowledge made significantly more miscues which resulted in loss of meaning than did students with higher prior knowledge. Rousch (1972) found that a higher prior knowledge group made more miscues that were syntactically and semantically acceptable and corrected those miscues that changed meaning more often than did a low prior knowledge group. The
average reading time on an informative passage on an unknown topic was longer than on any other passage of equivalent readability.

Fluency is believed to be the result of automatic decoding. Initial stages of reading are marked by word-for-word decoding. During this phase, cognitive function is focused on decoding. As fluency increases, individuals are able to devote more cognitive resources to comprehension. Learning to read involves increasing automaticity in processing word units into recognizable words and connecting the words while reading a passage. So, improvement in the processing of units, words, and connected text cognitively releases the reader to think about the meaning of the text (Chard, Vaughn, and Tyler, 2002).

Fluency is a critical but neglected part of reading programs. Effective interventions for improving fluency are not widely known. It is a mystery as to why word recognition proficiency may not always produce fluent readers (National Reading Panel, 2000). According to the National Research Council’s Committee for the Prevention of Reading Failure, the ability to obtain meaning from print depends so strongly on the development of word recognition accuracy and reading fluency that both should be regularly assessed in the classroom, permitting timely and effective instructional response when difficulty or delay is apparent (Snow, Burns, & Griffen, 1998).

Fluency is important for students with significant reading problems because they have labored reading with many pauses which results in slow and disconnected oral reading. This laborious reading is a problem because it focuses reading at the decoding and word level which makes comprehension impossible (Chard et al., 2002). Students with learning or reading disabilities struggle in the area of fluency. The common core
problem is the ability to read sight words, decode words, and read phrases and sentences automatically and rapidly. Reading fluency is an essential skill for all students; however, students with reading disabilities are most at risk for presenting difficulties in fluency (Chard et al., 2002).

Readers may have a difficult time comprehending a text on a subject with which they are unfamiliar even if the person understands the meaning of the individual words in the passage (Widmayer, 2005) because information that does not fit into schema may not be comprehended or could be comprehended incorrectly. Activation of prior knowledge may be important to increasing reading fluency. Implementation of strategies to increase and stimulate prior knowledge would be beneficial to many students with and without learning disabilities.

**Activating Prior Knowledge**

Activating that prior knowledge is just as important. Zakaluk and cohorts (1986) found that for poor readers it is important to activate background knowledge before reading to make students aware of what they know and don’t know and to help them realize the importance of comprehending what they already know compared to the new information. Stevens (1980) believed that

> knowledge and the relationships among pieces of knowledge, must be nurtured in school children if reading with understanding is to result. . . More attention must be devoted to the development of the prior knowledge bases upon which sound reading depends.” (p. 153)

In order for learners to effectively process information, their existing information related to the new content need to be activated (Widmayer, 2005). Holmes (1983) agreed that activating the background knowledge of poor readers may be beneficial in helping them
become more aware of what they know and don’t know so that they are attentive to contradictory and new information in the expository material they read.

Teaching learners metacognitive strategies designed to activate one’s prior knowledge before reading can assist students in reading for comprehension. These strategies include reading headings, titles, visuals, and making predictions (Widmayer, 2005). Strangeman (2004) suggested activating prior knowledge through reflection and recording, interactive discussion, answering questions, KWL (What I Know, What I Want to Know, and What I Learned), CONTACT-2 computer-assisted activation, or interpretation of topic-related pictures.

Several conclusions can be drawn about activating prior knowledge for all students. First, fluency and vocabulary building are necessary, but they are not sufficient components for increased reading comprehension. Second, aids to encourage prior knowledge activation increase comprehension. Third, students who use teacher questioning and self-questioning (by actively questioning the purposes and structure of text) activate prior knowledge, identify main ideas, and question their comprehension as they read are likely to improve reading comprehension (Mastropieri & Scruggs, 1997).

Summary

Activating prior knowledge and correcting incorrect prior knowledge may be the greatest help to students with or without disabilities when preparing to read texts. While prior knowledge is important, students with learning disabilities usually have difficulty activating what they know. Poor readers may not answer comprehension questions as well as good readers because they have less information stored; they fail to relate prior knowledge to the questions, or they may not use strategies to answer questions. Some
readers may lack the metacognitive awareness of what is old and new information. When students lack prior knowledge of a topic the information may seem arbitrary, but increasing children’s conceptual knowledge may do more to increase reading comprehension than any skills training. Teacher questioning and self-questioning in which learners actively question the purposes and structure of text, activate prior knowledge, identify main ideas and self-monitor their comprehension as they read, are likely to improve reading comprehension, if students have pre-skills and the text is readable.

Students with low prior knowledge may make a significant number of miscues which result in loss of meaning. If a person reads at 74 words per minute or slower, it is difficult to keep track of ideas as they are developing within the passage. The slow readers are using resources for word recognition rather than comprehension.

Thus, this study addressed how prior knowledge affects reading fluency and comprehension of students with learning disabilities and the relationship of activating prior knowledge to reading fluency and comprehension. It will also examine if students with learning disabilities use prior knowledge as effectively as their non-disabled peers at the same reading level.
CHAPTER III

METHODS

This research examined how prior knowledge affects reading fluency and comprehension of students with learning disabilities. The research was conducted with eleven fourth grade students from a general education language arts class and ten students reading at the fourth grade level who have identified learning disabilities in the area of reading. This study analyzed how activating prior knowledge affects reading fluency and comprehension and whether students with learning disabilities used prior knowledge as effectively as their non-disabled peers at the same reading level. This chapter details the methods used to obtain the data relevant to these questions. Specifically, it includes descriptions of the participants and the procedures used in the study.

Participants

Twenty one students who read and comprehend at the fourth grade level participated in this study. Group 1 consisted of eleven students (S1-S11) in one fourth grade regular education language arts class. The average age of the students in Group 1 was 10 years 3 months. Three of the students were female and eight of the students were male. The average score on the Iowa Tests of Basic Skills for the Reading subtest was fourth grade first month. Four of the students receive free lunch as provided by the state of Kansas through the Child Nutrition Program Benefits. Group 2 consisted of ten students (S12- S21) in a special education language arts class. The average age of the students in Group 2 was 12 years 6 months. Five of the students were female and five were male. The average score for the Iowa Tests of Basic Skills Reading subtest was
fourth grade second month. Four of the students received free lunch; two received reduced cost lunches.

The procedures for this study were described to the students and their parents by a letter and a phone call. Parental consent as well as student consent to participate in the study was obtained (see Appendices A and B). If the letter was not returned signed within two days, I called the parents to make sure they understood the letter. If the letters were not returned before the research was started, the student was not used for the study.

**Procedures**

In this section, the procedures used to obtain the data for this study are outlined.

**Instruments.** The students read two passages from the *Basic Reading Inventory* (Johns, 2001) to test reading fluency and comprehension. Each passage was 100 words in length and written at the fourth grade level. The first passage was “Fire and Animals;” the second passage was “The Detectives.”

**Setting.** All students met with me on an individual basis for all phases of the research. The students from the general education fourth grade class (Group 1) met with me in the resource room. Each student identified as having a learning disability (Group 2) met with me in the resource room during reading class.

**Steps of procedure.** To determine which reading passage would be chosen for prior knowledge activation the students’ names were listed in alphabetical order and numbered; the passages were then alternated. The odd numbered students received prior knowledge activation for the first passage read. The even numbered students received prior knowledge activation for the second passage. Each student read the “Fire and Animals” passage first. Prior knowledge was activated before the reading if the student
had an odd number. The prior knowledge activation procedure is explained later. The students read from the Jerry Johns’ book. I tape recorded each session so that no miscues would be noted during the reading, but miscues could be scored later to obtain a fluency score. Following reading of the passage, students completed an oral 10-item comprehension test. The comprehension questions included six factual questions, one topic knowledge question, one inference question, one evaluation question, and one vocabulary question.

Following the reading of the first passage, the student was allowed to take a five minute break. Then s/he read Passage 2 in the same manner as Passage 1.

**Prior knowledge activation.** To determine the students’ prior knowledge, the students in both Group 1 and Group 2 were asked to complete two open-ended questions about the specific topic for the passage targeted for prior knowledge activation. The questions were read to the student by the researcher, and each student answered the questions orally. This exchange was tape recorded so the researcher could document all of the key words that the students used. The researcher then compared the words that the students used to the key words (and their synonyms) from the passages to determine low, medium, or high prior knowledge of the topic. The key words were nouns and verbs used in the passage to describe the activities within the passage. Level of prior knowledge was determined to be high, medium, or low after the key words given by the student were compared to the key words. A student with 3 or fewer key words was considered to have low prior knowledge. A student with 4 to 6 tallies was considered to have medium prior knowledge, and students than 7 or more tallies are considered to have high prior
knowledge. The questions used and the prior knowledge word lists are included as Appendix C.

Data Collection Procedures

Words read per minute. As each student read, I kept time on a stop watch to record number of words read per minute. The dividend for the passages was determined by multiplying the number of words per selection (100) by sixty seconds. I recorded the divisor for the formula as the time (in seconds) the student took to read the passage. The resulting numeral is the student’s rate in words per minute (Johns, 2001). If a student read 100 words in 92 seconds, the procedure would be 100 times 60, which equals 6000. Then divide 6000 by 92, which equals 65.217, which would round to 65 words per minute.

Reading fluency. Miscues were also calculated as part of reading fluency. Miscues are “an oral response that differs from the expected response to the written text” (Harris & Hodges, 1981, p. 199). Since the sessions were tape recorded, few notations were made during the initial readings. Miscues were recorded and counted later in the following manner. Substitutions, insertions, omissions, and reversals were marked as miscues. Repetitions and self corrections were not counted as errors. The score for fluency was a percentage of the number of words pronounced correctly divided by 100.

Comprehension. To measure comprehension, the ten questions accompanying the passages were used. The answer key supplied by the author was used for scoring. The questions were scored, and the number correct was divided by the number possible resulting in a percentage ranging from 0% to 100%.
CHAPTER IV
RESULTS

This study was undertaken to answer these research questions: (a) how does prior knowledge influence fluency and comprehension of students with learning disabilities? (b) How does activating prior knowledge affect percentage of words read correctly and comprehension? And (c) do students with learning disabilities use prior knowledge as successfully as their non-disabled peers at the same reading level? The students were divided into two groups. One group included students without learning disabilities who are in fourth grade and who were reading at a fourth grade level. The second group included students with learning disabilities who read at the fourth grade level. All students read two passages at the fourth grade level, one with no prior knowledge activation and one with prior knowledge activation. This chapter presents the results of the study related to each research question. First, the effects of prior knowledge on the percentage of words read correctly by students without learning disabilities and students with learning disabilities is presented. Second, the result of prior knowledge on words read per minute is presented. Third, the effects of prior knowledge on comprehension are included.

The Effects of Prior Knowledge on Percentage of Words Read Correctly

Students without learning disabilities (Group 1). The number of words read correctly increased from 97% to 97.3% correct when prior knowledge was activated. The range of scores for no prior knowledge activation was 93% to 100% words read correctly. The range of scores for prior knowledge activation was 91% to 100% or words read correctly. Six of the eleven students increased the percentage of words read correctly with
activation of prior knowledge. Three remained the same and two decreased their percentage of words read correctly. While 97% is the mean score of words read correctly with no prior knowledge activation, the standard deviation was ±2.04. The mean for the scores with prior knowledge activation was 97.3%. The standard deviation was ±2.86. See Table 1.

Students with learning disabilities (Group 2). The percentage of words read correctly for students with learning disabilities decreased from 94.2% to 94.1%. Group 2 displayed a decrease in percentage of words read correctly by .1%. The ranges of scores for no prior knowledge activation were 80% to 100%. The range of scores for prior knowledge activation was 78% to 100% correct. Four of the ten students increased their percentage of words read correctly when prior knowledge was activated. One student stayed the same. Five students decreased their percentage of words read correctly when prior knowledge was activated. The mean for no prior knowledge activation was 94.2%; the standard deviation was ±5.56. The mean for the group after prior knowledge was activated was 94.1%. The standard deviation was ±6.39. See Table 1.

For a visual comparison of average words per minute of both groups, see Figure 3.

The Effects of Prior Knowledge on Words per Minute

Students without learning disabilities. In Group 1, the students without learning disabilities, words per minute decreased from 105 to 104.8 words per minute when prior knowledge was activated. The range of words per minute without prior knowledge activation was 54 to 158 words per minute. The range with prior knowledge activation was 50 to 158 words per minute. Five students in Group 1 increased their words per
minute when prior knowledge was activated. Six students’ words per minute decreased. While the words per minute mean score was 105 words, the standard deviation was ±31.78. With prior knowledge activation the mean score was 104.8 words per minute. The standard deviation was ±33.32. See Table 1.

Students with learning disabilities. In Group 2, the students with learning disabilities, words per minute decreased from 87 words to 82 words per minute when prior knowledge was activated. The range of words per minute without prior knowledge activation was 32 to 158. The range of words per minute with prior knowledge activation was 26 words per minute to 158 words per minute. Group 2’s words per minute decreased by 5 words. Five students with learning disabilities increased their words per minute when prior knowledge was activated. Five students read at a slower pace with prior knowledge activation. The mean for this group without prior knowledge activation was 87 words per minute; the standard deviation was ±38.52. The mean with prior knowledge activation was 82 words per minute; the standard deviation was ±35.65. See Table 1.

For a visual comparison of average words per minute for both groups, see Figure 3.

The Effects of Prior Knowledge on Comprehension

Students without learning disabilities. In this study, the comprehension of students without learning disabilities increased by 3.6%. The mean of the comprehension scores increased from 80.9% to 84.5% correct. Percentages for comprehension ranged from 65% to 100% without prior knowledge activation. With prior knowledge activation the scores ranged from 60% to 100%. Seven of the students from Group 1 increased their
comprehension scores when prior knowledge was activated. Four students decreased their comprehension when prior knowledge was activated. The mean score without prior knowledge activation was 80.9%; the standard deviation was ± 12.75%. The mean score with prior knowledge activation was 84.5%; the standard deviation was ±11.37. See Table 1.

*Students with learning disabilities.* Comprehension increased from 75.5% to 77%. Comprehension increased by 1.5%. The range of comprehension scores ranged from 55% to 100% without prior knowledge activation. The range with prior knowledge activation was 55% to 90%. Four students from Group 2 increased reading comprehension when using prior knowledge while six students decreased their reading comprehension when using prior knowledge. The comprehension mean was 76% without prior knowledge activation. The standard deviation was ±15.56. The comprehension mean was 77% with prior knowledge activation; the standard deviation was ±12.48. See Table 1.

For a visual comparison of average comprehension scores of both groups, see Figure 3.

*Comparison of Prior Knowledge Usage with Students With and Without Learning Disabilities*

Students without learning disabilities increased the number of words read correctly as did students with learning disabilities. Both students with and without learning disabilities decreased words read per minute. Both students with and without learning disabilities increased their comprehension scores. See Figure 1.
Of the four students without learning disabilities who had high prior knowledge, two increased their words read correctly. Words per minute increased for one student. Comprehension increased for one student when prior knowledge was activated.

Five students without learning disabilities had high prior knowledge. Words read correctly increase for three students and two student’s scores stayed the same. Words per minute increased for two students, Comprehension increased for four students out of five.

Of the two students with low prior knowledge, words read correctly increased for one student; one student’s scores stayed the same. Both increased their words per minute, and both increased comprehension when prior knowledge was activated.

Of the four students with learning disabilities who had high levels of prior knowledge, three of the four increased words read correctly and words per minute while two of the four students increase comprehension.

Four of the students with learning disabilities had medium levels of prior knowledge. Words read correctly increased for one student. Words per minute increased for one student, decreased for three students and stayed the same for one student.

For two students with learning disabilities, words read correctly decreased for both. Words per minute increased for one and decreased for the other student. Comprehension decreased for both students with low prior knowledge.
Table 1. Mean Scores and Standard Deviations for Group 1 and Group 2

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<td>With activation</td>
<td>Without activation</td>
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<td>M  (SD)</td>
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<td>94% 6.39</td>
<td>87 38.52</td>
<td>83 35.65</td>
<td>76% 15.56</td>
<td>77% 12.48</td>
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*All percentage rounded
Figure 1. Comparison of scores of students without learning disabilities.
Figure 2. Differences of scores of students with learning disabilities
Figure 3. Group Comparison of Averages
CHAPTER V

CONCLUSION

Discussion of Results

The purposes of this study were to determine how prior knowledge affects reading fluency and comprehension of students with learning disabilities. This study analyzed how activating prior knowledge affected reading fluency and comprehension. It also examined if students with learning disabilities use prior knowledge as effectively as their non-disabled peers at the same reading level.

In Group 1 the number of words read correctly increased from 97% to 97.3% correct when prior knowledge was activated. The percentage of words read correctly for students with learning disabilities decreased from 94.2% to 94.1%. Although the differences where small, why did the students without learning disabilities words read correctly increase while the students with learning disabilities nearly stayed the same? As noted in the literature review, the common core problem is the ability to read sight words, decode words, and read phrases and sentences quickly. Fluency practice is important for students with significant reading problems because they have many pauses which results in slow and disconnected oral reading. This laborious reading is a problem because it focuses reading at the decoding and word level (Chard, 2002).

Both groups’ average words per minute decrease slightly. This could have been caused by the students slowing down to comprehend better since comprehension in both groups increased slightly. The students may have taken time to think about what they were reading to insure that it paralleled with their prior knowledge. As Anderson and Pearson (1994) stated, prior knowledge affects comprehension in three ways. It
encourages inferencing, it directs attention to important information and it provides a plan for recall.

According to Holmes (1983), poor readers may be different from good readers in their ability to answer comprehension questions because they have less information stored; they fail to relate their prior knowledge to the questions; or they may not use strategies to answer questions even though they may have equal prior knowledge to that of a good reader. While 40% of the students with learning disabilities increased their comprehension when prior knowledge was activated, 64% of the students without disabilities increased their comprehension scores. While comparable numbers of the students in each group had prior knowledge in the high range, the medium range, and the low range. This study shows that students with learning disabilities failed to relate their prior knowledge to the questions.

The unique aspects of this study were that: (a) the research was done involving students from three fourth grade classrooms and students with learning disabilities from the same school district, (b) all of the students read at the fourth grade reading level according to the Iowa Tests of Basic Skills Reading Comprehension Subtest, and (c) all students were asked the same questions to activate prior knowledge.

Based on this study, students without learning disabilities read more words correctly when prior knowledge was activated. Students without learning disabilities increased their reading comprehension when prior knowledge was activated. All students, with and without learning disabilities, on average, read slower when prior knowledge was activated. This decrease in words per minute could be attributed to the fact that they were reading more carefully and paying attention more closely.
Students with learning disabilities increased their comprehension when prior knowledge was activated. While correct word usage and words per minute decreased. When prior knowledge was activated, the average words per minute of students with learning disabilities dropped closer to the critical score of 74 words per minute. At 74 words per minute, it becomes more difficult for readers to comprehend what they were reading (National Reading Council). Thus, perhaps, accounting for the very small increase in comprehension of students with learning disability.

Student attitudes towards engaging prior knowledge were mostly positive. Students were willing and excited to share what they knew with a researcher. A few students were intimidated by speaking to a stranger, one on one, who was using a script. They may have been afraid to talk as much about the subjects.

**Limitations**

There are several limitations in this research. The special education teacher, who was also the researcher, could have influenced the students to improve test scores. I could have been partial in the evaluation of the students with learning disabilities since they were more familiar with me than the general education group. This familiarity with me as their teacher may have put increased pressure on them to perform.

Students may have known more about the one passage rather than the passage that prior knowledge had been activated for. One student may have known much about forest fires, but prior knowledge may have been activated for the passage about lost objects.

Passage One can be seen as a warm-up passage since they read it first. Passage Two may have been read better since it was read second. I insured that students always
read Passage One first and Passage Two second whether prior knowledge was activated on the first passage or second passage.

When prior knowledge was being activated the researcher followed a basic script of two questions which did not allow for true discussion and limited some deeper activation. All of the students were told that they would be given a number and that their names would not be used in the study. All of the students were told that the study would not affect their grades.

All students were told that they were chosen for their reading ability. Students without learning disabilities could have seen this as a positive statement. Students with learning disabilities could have seen this as a negative statement.

The differences, severity, and scope of learning disabilities among the students may be another influence on the research. The severity of the disabilities varied considerably from one student another, although all of the students were receiving special education services for reading. While some students may have a disability in decoding, others may struggle with comprehending. This could be seen when looking at the deviations of scores.

One observation made during this study was the students’ excitement to share knowledge with others. They wanted to show their knowledge and share experiences of the given topic. The scores may have been increased if the students could activate prior knowledge in groups to encourage discussion and to share what they knew.

In this study the research was done in the Resource Room. Students without disabilities who usually do not attend class in the Resource Room may have felt negatively. In the future, I could conduct the research in a neutral, totally private area.
Implications for Future Research

A study that could be done later would include prior knowledge activation that could include discussions within a group. The prior knowledge activation could be less scripted to allow me to interact more with the students.

In summary, in this study, students with learning disabilities did benefit from activating prior knowledge; it resulted in small increases in comprehension. Students without learning disabilities increased their fluency and comprehension with prior knowledge activation. While students with learning disabilities did not increase as much as students without learning disabilities, they did increase. While words per minute decreased for both groups, the students may have been reading more carefully to comprehend better. Simply by activating students’ prior knowledge, a teacher could perhaps increase a student’s reading fluency and comprehension.
REFERENCES
List of References


CONSENT FORM

Your child is invited to participate in a study of prior knowledge and reading. I hope to learn how to help students read better. Your child was selected as a possible participant in this study because he/she is a student at Halstead Middle School.

If your child decides to participate, he/she will be asked to complete some questions about a topic. He/she will then read out loud to an adult about the topic. The student will then answer comprehension questions based on the same topic. He/she will be asked to do this two times over the course of one month. The students’ responses will be tape recorded for accuracy. The students will be asked to miss some class time to complete the activities, about ten minutes on two different days, but they will not be required to make up any missed work. All of the tapes and paper documentation will be kept in locked cabinet.

At the end of this project I will be able to share with other teachers how to help students with reading. Any information obtained in this study in which your child can be identified will remain confidential and will be disclosed only with your permission. Each student will be given a number and that number will be used throughout the study. The students will not know their own numbers.

Participation in this study is entirely voluntary. Your decision whether or not to participate will not affect your future relations with Wichita State University and/or Halstead Middle School. If you agree to participate in this study, you are free to withdraw from the study at any time without penalty.

If you have any questions about this research, you can contact Amber Warznak at 835-2694, Halstead Middle School or Dr. Fran Clark at 978-6877, Wichita State University. If you have questions pertaining to your rights as a research subject, or about research-related injury, you can contact the Office of Research Administration at Wichita State University, Wichita, KS 67260-0007, telephone (316) 978-3285.

You are under no obligation to participate in this study. Your signature indicates that you have read the information provided above and have voluntarily decided to participate.

You will be given a copy of this consent form to keep.

Signature of Parent or Legal Guardian ___________________________ Date ________________

Witness Signature ___________________________ Date ________________

Signature of Researcher ___________________________ Date ________________

Signature of Researcher ___________________________ Date ________________

Form A
Appendix B. Student Consent Form

WICHITA STATE UNIVERSITY
Department of Curriculum and Instruction

CHILD ASSENT FORM

I agree to read with Mrs. Warsnak for this project. I have been told that my parents have said it's okay for me to participate in a project about how well I read and how well I answer questions.

I know that I can stop at any time. It will be okay if I want to stop.

Name ___________________________ Date ___________________________
Appendix C. Passage 1

Student Copy is on page 135.

A 5414 (Grade 4) Activating Background: Read the title to yourself; then tell me what you think will happen.

Background: Low ——— High

Fire and Animals

The summer was a dry one, unusual

for this area. Trees and bushes in the forest

wilted and died. One afternoon a storm

came to the forest. Thunder was heard and

lightning was seen. Then it began to

rain. A spark touched the leaves and a

fire began. The fire spread quickly. The

animals warned each other as they hurried

to escape the flames. As the fire came

closer, trees fell to the ground. Their

branches were yellow, orange, and red.

The smoke was so thick that the animals

could hardly breathe. Many couldn’t

escape the danger of the flames.

TOTAL

Word Recognition Scoring Guide

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Total Miscues [ ] Significant Miscues [ ]

WPM [ ] 6000
Appendix D. Passage 1 Questions

A 5414 (Grade 4)
Comprehension Questions

T 1. ____ What is this story about?
   (a forest fire)

F 2. ____ What did the animals try to do?
   (escape; warn each other)

F 3. ____ What was unusual about this summer?
   (it had been a dry one)

F 4. ____ What was heard and seen in the woods before the fire began?
   (thunder and lightning)

F 5. ____ What started the fire?
   (a spark; lightning)

F 6. ____ What colors were the trees in this story?
   (yellow, orange, and red [any 2?])

F 7. ____ Why was it difficult for the animals to breathe?
   (smoke filled the air; the fire)

I 8. ____ Why do you think the fire spread quickly?
   (any logical response; it had been a dry summer)

E 9. ____ What problems do you think the animals that survived the fire might have?
   (any logical response)

V 10. ____ What does "escape" mean?
   (get away; any logical response)

Questions Missed

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Retelling Notes

Retelling
Excellent
Satisfactory
Unsatisfactory

162
Appendix F. Passage 2

Student Copy is on page 185.

**B 5414** (Grade 4) Activating Background: Read the title to yourself; then tell me what you think will happen.

Background: Low | High

The Detectives

It had been raining. Kate and her brother

Michael were looking for something

entertaining to do. Aunt Sue came into the

living room and announced, "I can't find my

purse."

The children looked for the missing

purse in various parts of the house. Michael

looked in the den where his aunt wrote

checks, but no purse. Kate searched the

bedroom carefully because the purse was

last seen there. It wasn't there, but Kate

recalled that her aunt had been shopping

earlier that day. She ran outside. Just as she

arrived, Michael was opening the trunk and

Kate saw the purse.

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**TOTAL**

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WPM 36000

211
Appendix G. Passage 2 Questions

B 5414 (Grade 4)
Comprehension Questions

T 1. ___ What is this story about?
   (looking for Aunt Sue’s purse)

F 2. ___ What were Kate and Michael doing
   at the beginning of the story?
   (thinking of something entertaining
to do)

F 3. ___ Why were Kate and Michael inside?
   (it had been raining)

F 4. ___ Where did Kate and Michael look
   for the purse?
   (den; bedroom; trunk [any 2])

F 5. ___ Why did Michael go into the den to
   look for the purse?
   (that is where his aunt wrote checks)

F 6. ___ Besides the house, where had Aunt
   Sue been that day?
   (shopping)

F 7. ___ Where was the purse found?
   (in Aunt Sue’s trunk)

I 8. ___ Why do you think this story is called
   “The Detectives”?
   (any logical response)

E 9. ___ What qualities made Kate and
   Michael good detectives? Why?
   (any logical response)

V 10. ___ What does “various” mean?
    (several; different; many)

Questions
Missed

Comprehension Scoring Guide

Retelling

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<th>Retelling</th>
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<td>5 +</td>
<td>Frustration</td>
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Excellent
Satisfactory
Unsatisfactory

212
Appendix H. Permission to use Basic Reading Inventory Eighth Edition

To Amber Warsnak

I am requesting permission to use the Jerry L. Johns Basic Reading Inventory Eighth Edition in my Masters Thesis. I will be using the fourth grade reading passages to determine if activating prior knowledge aids in reading comprehension.

I would like to put pages 161, 162, 211, and 212 within the appendix.

I would also be using those pages to do the research.

The Masters Thesis will be copied for the college library (Wichita State University in Wichita, Kansas), one copy to me, and one copy to my college professor.

This paper will not be written or used for profit.

If you have any questions you may reach me at my home phone: 316)830-2808 or at my office phone 316) 835-2694 or at my email.

Thank you,

Amber Warsnak

Permission granted per request.

Please send me 1 copy of your thesis. Use the credit line that is throughout the book.

Good luck!

Georgia Kotafole
Kendall Hunt Publ. Co
11-28-05

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