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AUTHOR MacLean, Isabel
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ABSTRACT

This 5-month action research project examined effects of a short-term interactive vocabulary instruction on reading comprehension with four intermediate grade students identified as having learning disabilities in reading. Participants read a narrative text and an expository text without vocabulary instruction and then received vocabulary instruction before reading an additional narrative and expository text. Comprehension tests and fluency tests were given after reading each text. Participants showed gains in both comprehension tests and in their reading fluency during the intervention phase. There was some evidence of students trying out new words in conversation but no evidence that students' general reading comprehension improved, that they were able to glean the subtle meanings in text, or that they used the new vocabulary terms in their writing. Forms used in the study, sample comprehension tests, a project time line, and a student survey are appended. (Contains references.) (DB)

Effects of Interactive Vocabulary Instruction on Reading Comprehension of Students with Learning Disabilities

Isabel MacLean

Action Research Project

Western Washington University
Woodring College of Education

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Abstract

The effects between knowledge of word meanings and reading comprehension was examined in a short-term interactive vocabulary instruction case study. Three fifth-grade students and one fourth-grade student identified as having learning disabilities in reading participated for five months in this study. Participants read a narrative text and an expository text without vocabulary instruction and then they received vocabulary instruction before reading an additional narrative and expository text. Comprehension tests and fluency tests were given after reading each text. The scores before the intervention were compared to the scores during the intervention. The participants showed gains in both comprehension tests and in their reading fluency during the intervention phase. Participants showed evidence of increased comprehension and fluency during the instruction of vocabulary. The implications of these results for vocabulary instruction as a means of increasing reading comprehension for students with learning disabilities are discussed.

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Introduction

Skillful reading is a complex system of word recognition, recognizing the individual letters and the words they make; and comprehension, recognizing the lexical meaning of words as they exist in the context (Adams,1990). For example the sentence, "I like to read," is recognized for the words that make up the sentence and the meaning that the sentence holds. The word "read" changes its pronunciation and tense in the sentence, "I have read many books," again the words that make up this sentence are recognized and understood within the context of the sentence. Skillful readers recognize the spelling, sound and meaning of a familiar word almost automatically and simultaneously, leaving their active attention to reflect on and evaluate what they have read (Adams, 1990).

Beginning readers are taught phonemic awareness, letters and their sounds, and then the students learn to put the letters together to form words. The students recognize these words and know their meaning because the words are used in their vocabulary (Anderson & Freebody, 1981). It becomes more of a challenge for beginning readers to learn to read words that they are unfamiliar with, not being a part of their own vocabulary. A young child, who is familiar with cats, will learn the word "cat" readily because the child uses the word in his/her vocabulary. It would be more of a challenge for that child to learn the word "yaw" as

this is not a familiar word, nor is it commonly used by adults. Skilled comprehenders exhibit rapid word recognition, whereas less skilled comprehenders, even when accurate at word recognition, are significantly slower at comprehending the text (Beck, Perfetti, & McKeown, 1982). Reading is a complex system of processing of which vocabulary is a critical component.

Research has shown that for the "typical" grade level reader vocabulary knowledge is a strong indicator of reading comprehension, however, vocabulary instruction has been given very little attention over the last few years (Rupley, Logan, & Nichols, 1999). It is assumed that students will acquire vocabulary words incidentally through their own independent reading. Research demonstrates that vocabulary can be gained through reading (Zimmerman, 1997). For the typical student this technique of gaining vocabulary may be enough, but what about the student who has a learning disability?

O'Shaughnessy and Swanson (1998) present two constructs for understanding the memory performance of children with learning disabilities (LD). The *deficit model* assumes that LD children perform poorly on memory tasks because of skills that have not developed adequately. The *developmental lag model* suggests that LD children vary in the rate at which their cognitive skills develop and that over time these skills will emerge. The question asked is whether the differences of memory performance are proportionally greater in older children than

younger children and is memory performance greater under instructional rather than non instructional conditions. The authors present a synthesis that provides a quantitative review of the published research related to the immediate memory of students with learning disabilities in reading. The authors analyzed memory studies that included short-term memory (STM) tasks. This function of memory was isolated because it is the most investigated area of memory functioning. Two main hypotheses were tested. One based on the *developmental lag model*, suggests that LD children vary in the rate at which their memory processes develop, so that this skill will emerge eventually over time. The other based on the *deficit model,* suggests that memory problems are pervasive across age.

The overall results of this meta-analysis supports the *deficit model* construct, that memory deficits in LD students persist across age and that ability group differences are pervasive across most memory tasks. These differences do not change much over time. It was also determined by this analysis that LD readers show some benefits from strategy instruction, however LD readers did not spontaneously use the strategies on their own.

I have been working with LD students over the last three years and have noted that their vocabulary usage is significantly lower than their peers. The question still remains: Will vocabulary instruction make a difference for students with learning disabilities (LD)? Students with learning disabilities spend the majority of their instructional time on word identification and word recognition (Zimmerman, 1997). If more

instructional time is spent on vocabulary instruction, will LD students be able to improve their comprehension of the text? My area of interest is reading instruction for LD students. Reading instruction that focuses on vocabulary enhances children's abilities to infer meanings and to gain greater comprehension of what they read (Rupley, Logan, & Nicholas,1999). As their vocabulary grows their ability to comprehend what they read grows; furthermore, as their comprehension skills increase so do their abilities to learn new words from the context (Rupley, Logan, & Nichols, 1999). I want to investigate interactive instruction of vocabulary to examine its effectiveness in increasing the reading comprehension of LD students. This is an area that both general education and special education teachers need to know in order to promote reading comprehension in the classroom.

Context

There are three main components to a balanced reading program: word identification and recognition, vocabulary, and comprehension skills (Anderson and Freebody,1981; Rupley, Logan, & Nichols, 1999). There is sufficient evidence to support that skill in word identification and word recognition contribute to beginning reading skills and ultimately reading comprehension (Rupley & Willson, 1997). However, students with learning disabilities do not transfer knowledge as easily as children without a learning disability. Children with learning disabilities spend a majority of

their reading time decoding words (word identification). It is difficult for LD students to associate antonyms and synonyms with known words. Known words that have more than one lexical meaning are often not recognized by LD students as having more than one meaning or use. Many instructional activities that are utilized to decode words do not focus on the lexical aspects of words. The gains that LD students make in decoding skills do not always generalize to their comprehension of text (Lovett & Steinbach, 1997). They often are unable to retell the story or pull information from what they have read. They read the words, but do not always connect the concepts or ideas well enough to demonstrate full comprehension.

If reading for meaning is our paramount goal as educators, it is important that LD students learn more than word identification and recognition strategies. The words must be understood within the context they are written. Comprehension of a text occurs when the majority of the words in a given text are known to the reader. Processing can then focus on the overall meaning of a sentence or passage. If a text contains too many unknown words, comprehension of the text may be restricted (Beck, Perfetti, & McKeown, 1982).

Interactive instruction of vocabulary presents key words from the text to students in a variety of ways that require student participation (Rupley, Logan, & Nichols, 1999). Examples of interactive instruction include: discussion, word webbing, word clusters, analogies, antonyms and

synonyms, and dramatization. Vocabulary instruction that encourages children to discuss, elaborate, and demonstrate meanings of new words, and provides varied opportunities for them to use new words outside of their classroom has been shown to be effective (Beck, Perfietti, & McKeown,1982). Vocabulary instruction is done before the text is read. I want to investigate what impact interactive vocabulary instruction has on LD students' reading comprehension.

Purpose of the study

The purpose of this study is to describe the effectiveness of vocabulary instruction for improving reading comprehension for students with learning disabilities. Interactive instruction of vocabulary could improve reading comprehension for LD students by teaching them the vocabulary they need to gain meaning from various genres of text. Many of the students have limited vocabulary in their speech and in their writing. I believe that this limited vocabulary also affects their reading comprehension. In this study I investigated the effects that interactive vocabulary instruction had on students' reading comprehension. I anticipated that interactive vocabulary instruction would improve students' reading comprehension. I also anticipated that students would become more confident in their reading abilities as reading became more meaningful to them. I expected their efforts and motivation to increase. The gains that could be made would be important to educators who are

concerned about improving reading comprehension for students with learning disabilities.

Research Questions

Students with learning disabilities have difficulties understanding what they read. They often are unable to comprehend the more subtle meanings of text. Their vocabulary is often deficient compared to their peers. My question is: **Will interactive vocabulary instruction improve reading comprehension for students with learning disabilities?** The following auxiliary questions will also be examined:

(1) Will LD students' reading comprehension increase?

(2) Will students be able to glean the subtle meanings underlining the text?

(3) Will students use the new vocabulary words in their writing?

(4) Will students use the new vocabulary gained in their conversations?

Theoretical Perspective

Research has shown that an eclectic approach in which both interactive instruction of vocabulary and wide reading are means for fostering vocabulary development (Rupley, Logan, & Nichols,1999; Rupley &Willson,1997; Vanniarajan, 1997). Vocabulary knowledge has an impact

on reading comprehension where by students are able to understand what they read and gain contextual understanding of new words. When instruction is based on building connections, students are not just asked to supply words that fit the example, but rather to describe how words fit in the stories and informational text that they read (Rupley, Logan, & Nichols, 1999). Students should be given varied opportunities to practice and apply their word knowledge by way of exposure to wide reading and writing activities in both narrative and informational texts. As students gain a knowledge of words and the concepts they contain as well as the connections they have to other words; i.e., word webbing, synonyms, antonyms, grammatical conventions, and multiple meanings, text becomes meaningful.

An interactive model of vocabulary acquisition is based on the information-processing models in psychology; how we organize data and connect concepts together. The relationship between vocabulary knowledge and reading comprehension is a reflection of the reader's elaborate conceptual network of ideas, and the vocabulary words are the labels for these concepts (Lloyd,1996). The information is put into categories or schema dependent on the labels and attributes of the concept.

Constructivist theory also supports an interactive model of vocabulary acquisition (Goodman,1990; Fosnot,1989). Constructivist views of learning include the beliefs that all individuals are active

participants in seeking, transforming, and organizing their own knowledge; that learning often proceeds from whole to part to whole; that errors are critical to learning; and that the development of forms (e.g., conventions of written language) follows the emergence of function and meaning (Mefferd & Pettegrew, 1997). Children build their own knowledge base and construct meaning by connecting new information with what they already know. By enhancing student vocabulary, the teacher is providing scaffolding that will enable students to acquire a greater depth of meaning from the text.

> Vanniarajan (1997), quotes Beck and McKeown, 1991,
> "a coherent theory of vocabulary research cannot exist of itself, but must draw from theories that concern the full range of language comprehension and production. The theory, furthermore, must attempt to capture the mental processes involved in inferring the meanings of unknown words and establishing relationships between concepts, organization of concepts, and expansion and refinement of knowledge about individual words." (p. 790)

The theories that are specific to language development also contribute to reading acquisition and instruction. Anderson and Freebody (1981) discuss two possible reasons for the correlation between vocabulary knowledge and comprehension: the verbal aptitude hypothesis

and the knowledge hypothesis. The verbal aptitude hypothesis assumes that an individual's verbal aptitude leads to both vocabulary and comprehension achievement. The knowledge hypothesis assumes that knowledge in specific domains leads to both vocabulary and comprehension achievement. These two hypotheses are not mutually exclusive, but overlap in the cognitive processes.

Definition of Terms

Interactive instruction: students are involved in more than one media and use as many senses as possible in learning the content presented. (Rupley, Logan, & Nichols, 1999)

Interactive vocabulary instruction: presents key words from the text to students in a variety of ways that require student participation. Examples of interactive instruction include: discussion, word webbing, analogies, antonyms and synonyms, and dramatization. (Rupley, Logan, & Nichols, 1999)

Lexical comprehension: understanding of word meaning as contrasted to understanding grammar or syntax. (Harris & Hodges, 1995)

Semantics: the study of meaning in language, as the analysis of the meanings of words, phrases, sentences, discourse, and whole texts; linguistic semantics. (Harris & Hodges, 1995)

Vocabulary: **1.** a list of words, as in a dictionary or glossary; lexicon. **2.** those words known or used by a person or group. **3.** all the words of a language. (Harris & Hodges, 1995)

Vocabulary control: the practice of limiting the rate of introduction of new words. (Harris & Hodges, 1995)

Vocabulary development: **1.** the growth of a person's stock of known words and meanings. **2.** the teaching learning principles and practices that lead to such growth, as comparing and classifying word meanings, using context, analyzing word roots and affixes, etc. (Harris & Hodges, 1995)

Vocabulary diversity: the extent to which different words are used in writing or speaking; lexical variety. (Harris & Hodges, 1995)

Vocabulary test: any test of word knowledge, active or passive, oral or silent. (Harris & Hodges, 1995)

Word bank: a file of words mastered or being studied by a student. (Harris & Hodges, 1995)

Word identification: refers to the use of one or more strategies to identify unknown words. (McCormick & Becker, 1996)

Word recognition: recognizing words without resorting to any apparent use of strategies, knowing the word by sight, also known as *sight word vocabulary*. (McCormick & Becker, 1996)

Delimitations and Limitations of the Study

The focus of this study is on interactive vocabulary instruction and its effect on reading comprehension of LD students. I will be referring to the research that pertains to vocabulary instruction as it relates to reading comprehension. I have reviewed the literature that addresses word identification and word recognition as they relate to reading comprehension. The research supports both of these components of reading as critical to reading comprehension. This study is focused on just the lexical aspects of vocabulary and reading.

My proposed study is limited to the groups of students that I serve in the resource room. I will not be able to randomly assign these students. I will be looking at gains made in reading comprehension during the instructional intervention. This study may not be generalizable to other students with learning disabilities because of the small sample size. However, the information gleaned from this study will be useful to others who wish to continue researching in this area.

Significance of the Study

This study has significance for practical applications in working with LD students to increase their vocabulary and their reading comprehension. I am examining the benefit of interactive vocabulary instruction that initially teaches word meaning by application in narrative and expository text. Vocabulary instruction that is geared to the active process of learning and connecting new information to students' background knowledge provides a means for students to make the connection between learned vocabulary and text (Rupley, Logan, & Nichols, 1999). As their vocabulary increases so should their reading comprehension. I believe that interactive vocabulary instruction will increase reading comprehension for LD students and that it will put vocabulary instruction in a prominent place in teachers' reading programs.

Research has consistently shown that comprehension has a high correlation with vocabulary knowledge, more than any other factor including syntax (Klein,1988). In recent years, there has been considerably fewer studies in vocabulary acquisition (Rupley, Logan, & Nichols, 1999; Zimmerman,1997). There is a gap in the research that examines vocabulary knowledge in regards to learning disabled students. This study will add to the current research in this area.

Review of the Literature

Vocabulary Instruction

Rupley, Logan, and Nichols (1999) present an argument for vocabulary instruction to take a more prominent role in a balanced reading program. Their article explores the role of vocabulary in reading development and current instructional approaches for nurturing vocabulary development and interest in students. As a child's vocabulary grows, their ability to comprehend what they read grows as well. Rupley, Logan, and Nichols recommend an eclectic approach in which both direct instruction and wide reading are used as a means for fostering vocabulary development. Instruction that is based on connecting new concepts and words to the student's background knowledge provides a scaffold for the student to build upon. Rupley, Logan, and Nichols suggest an interactive model of vocabulary instruction that encourages children to discuss, elaborate, and demonstrate meanings of new words, and provides varied opportunities for them to use new words outside of the text to be effective in vocabulary development. Examples are given of several strategies such as a concept wheel, semantic word map, word webbing, and semantic feature analysis. Each strategy encourages active participation of the students to enable them to process meaning and gain

their own understanding. In conclusion the authors claim that successful vocabulary instruction builds upon students' background knowledge and makes explicit the connections between new words and what they already know.

Vanniarajan (1997) also supports an interactive model of vocabulary acquisition for both first language (L1) and English as a second language (L2) students. He states that research has consistently shown that comprehension difficulty has the highest correlation with vocabulary difficulty than with any other factor in reading. Yet there have been considerably fewer research studies in vocabulary acquisition in both L1 and L2 than in syntax or phonology acquisition. He proposes an interactive model of vocabulary acquisition that draws background knowledge and theory from the information-processing models in psychology. The article is divided into three sections: (1) description of what it means to know a word, (2) overall view of the proposed model of vocabulary acquisition, and (3) implications of the model for vocabulary instruction.

In the first section Vanniarajan identifies three levels of word knowledge: unknown, acquainted, and established. These levels of word knowledge have implications for students in light of their "receptive" and "productive" use of vocabulary. The extended mapping of vocabulary words is a long process that starts with the unknown word that eventually gets to be established by way of instruction and use. In the second section, Vanniarajan defines "interactive" as the interaction between learner

external (contextual) and learner internal (cognitive) factors. From this definition he builds a framework for vocabulary acquisition being cognizant of the role of "working memory." The factors that affect both external and internal processing of the learner are discussed. These factors (e.g., context, prior knowledge, higher order thinking skills, motivation) interact with each other simultaneously, however the most important variable to be considered is working memory since it is the place where the nature and the quality of processing is determined. The learner's interactive process can be complete or incomplete depending on the strength of the factors involved.

The pedagogical implications for efficient vocabulary instruction consist of: (1) patience, it takes time for new words to get firmly established, (2) awareness, there are different levels of vocabulary knowledge, (3) simulate, both incidental and intentional learning conditions in the classroom, (4) links, prior knowledge is the connection, (5) repetition, multiple encounters with the new word, (6) authenticity, contextual support and association games, (7) context, teaching and identifying contextual clues, (8) assessment, both process and product oriented, (9) instruction, introduce new words within reading tasks, (10) strategy, teach dictionary and thesaurus skills.

Vanniarajan has attempted to create a model of vocabulary acquisition that captures how vocabulary is represented in the human mind, how items are interconnected, and how we acquire new vocabulary

within the confines of our cognitive and situational constraints. This article is an in-depth synthesis of research and theory. It is suggested that more research in the area of interactive vocabulary instruction is needed.

Zimmerman (1997) asks the question, "does vocabulary instruction make a difference?" in her pilot study of the combined effects of independent reading and interactive vocabulary instruction for U.S. post secondary English as a second language students (L2) preparing for university entrance exams. She states that word knowledge includes the ability to recall meaning, infer meaning, comprehend a text, and communicate orally. Zimmerman reports that no single approach can address all of these skills but require a complex variety of activities such as repetitive exposure and time to achieve success in word knowledge. Her concern is that a limited amount of classroom-based research has looked at an actual classroom vocabulary-learning environment for English as a first language students (L1). Zimmerman states in her article that "Many teachers give little or no classroom attention to vocabulary, assuming students will learn words incidentally" (p.121).

Zimmerman's 10-week classroom-based study tested the hypothesis that L2 students exposed to a combination of regular periods of reading and interactive vocabulary instruction will show significant increases in their knowledge of the nontechnical terms that are used widely across academic fields. L2 students attending English programs were divided into

two groups. The control group was asked to read assigned texts and read independently. Vocabulary instruction was only given as questions and confusions arose. The experimental group was asked to read assigned texts, read independently, and received 3 hours a week of interactive vocabulary instruction. The results of this study suggest that interactive vocabulary instruction accompanied by moderate amounts of self-selected and course related reading led to gains in vocabulary knowledge. The findings suggest that the group that received interactive vocabulary instruction preferred the vocabulary instruction over the independent reading. Both groups placed more value on vocabulary activities and independent reading than on the non-contextualized study skill methods proposed on the questionnaire that both groups were given.

The implications of this study point to combining reading and interactive vocabulary instruction to develop vocabulary knowledge which leads to greater comprehension in reading. Teachers need to recognize that less attention is paid to vocabulary than to other language skills and that vocabulary instruction is a viable aide to students in gaining word knowledge which can contribute to reading comprehension. Zimmerman states that more research is needed in the area of vocabulary instruction that uses contextualized exposure to language and communicative techniques.

Lloyd (1996) examined four categories of reading comprehension and how teachers instruct in those areas. Her article responded to an

assumption made by the Federal Government that teachers were not employing research-based strategies in their instruction of reading comprehension. This study is an initial step in investigating reading comprehension practices teachers were utilizing. Lloyd set out to provide a qualitative description of those practices so that connection between practice and research could be explored. Four categories of instructional practice are presented through frequencies of practice and anecdotal descriptions. These four categories are: background knowledge, vocabulary, alignment, and imagery.

Thirty-eight intermediate grade teachers from six schools in two school districts in the Southwest participated in the study. The teachers were observed during times they designated as teaching reading. Students represented a range of socioeconomic and ethnic backgrounds, as well as achievement levels.

Each of the four categories were presented in a table that broke down the practice into instructional strategies that are supported by theory and research. Frequency of how often a teacher used a particular strategy was scored and the amount and percentage of teachers using the strategy was documented in the table. The results demonstrated that, for this group of teachers, reading comprehension practices were theoretically eclectic, with most emanating from bottom-up or part to whole models. The practices that they chose to implement may indicate that their understandings of the efficacy of practices related to these

theories was meager, or that they chose not to implement effective strategies. Background knowledge was addressed during instruction, yet the means of implementation did not reflect the theory and research supporting this practice. Vocabulary instruction was mainly decontextualized which is not supported by research. Imagery and alignment practices were rarely observed in this study.

The study is limited in the observation time per teacher. Lloyd made only two observations per teacher. The observations often took place in the middle of a lesson or a lesson that was carried over from the previous day. The sample size of 38 teachers provided 76 observations. In conclusion, Lloyd felt that the total number of observations across so many teachers provided a reasonable representation of teachers' behavior. This study has some strong implications for educational training centers and on-going teacher training. Teachers need to be educated on how to align their practice with research and theory. It also suggests that teachers need time to be more reflective in their practice.

Simpson (1997) emphasizes the importance of teaching vocabulary in content areas in such a way that the at-risk readers can develop strategies that help the reader to see word relationships. Her essay was prompted by the need for reading instructors to adapt to new methods in the classroom that teach students strategies that can be used across the curriculum. She focused on student prior knowledge and word relationships through the direct instruction of analogies, word groupings,

and mnemonigraph cards. Simpson explains each strategy and why you would use them. These strategies are also mentioned in other studies regarding interactive instruction of vocabulary. Because her article is an essay, there is little research cited to back up her premise that these strategies are effective for at-risk students.

Beck, Perfetti, and McKeown (1982) examined the relationship between knowledge of word meanings and semantic processes in a long-term vocabulary instruction experiment. Twenty-seven fourth grade students were taught 104 words over a five month period. The students performed tasks designed to require semantic processes ranging from single word semantic decisions to story recall. The authors identify three components to semantic processes involved in reading comprehension: accuracy (knowing word meanings), fluency (speed of lexical access), and richness (semantic network connections). It is proposed that attempts to improve reading comprehension by improving vocabulary may be influencing one, two, or three of these processing components. The purpose of their study was to arrange conditions that would allow them to observe some of the effects of vocabulary knowledge on lexical access and reading comprehension. A variety of both laboratory and real-world tasks were used to measure outcomes that fall along a continuum of comprehension complexity from simple accuracy of word knowledge to speeded lexical access to text comprehension. The students were paired up with students in a control group to compare between group achievement.

The instruction was designed to promote a deep and fluent level of word knowledge seen as necessary to enhance semantic processing.

The students were tested on semantic decisions, sentence verification, and story recall. The Iowa Test of Basic Skills (ITBS) vocabulary and reading subtest were also used to gage the students' word knowledge and comprehension skills before and after instruction. The results of the vocabulary instruction indicate significant gains made by the experimental group in all tasks, ranging from single-word semantic decision through text recall and even apparent transfer to standardized test of vocabulary and comprehension. The instructed students were able to respond more accurately and more quickly to instructed words in simple semantic tasks and also to understand and produce them in the more complex tasks of story understanding and recall than the non-instructed students. The instructed students did not make significant gains on words that were not part of the instruction, but were part of the testing. The experimental group and the control group had comparable scores in this section.

Beck, Perfetti, and McKeown concluded that acquiring word meaning to a high level is not an easy task, even with intensive instruction. This has implications for vocabulary training that provide for shorter and less intensive instruction. They suggest that speed of processing is an important goal of instruction, after accuracy. The authors state that considerable work is needed to develop a theory of vocabulary instruction

that would suggest decisions about content and procedures.

Anderson and Freebody (1981) discuss what is known about the role of vocabulary knowledge in reading comprehension. There is an extremely high correlation between the number of meanings a reader knows to the individual's ability to comprehend text. Measures of vocabulary knowledge are also strong predictors of a variety of indices of linguistic ability. There are three main factors that influence comprehension: vocabulary knowledge, ability to draw inferences from a paragraph, and the ability to grasp the main idea of a paragraph. The strong relationship between vocabulary tests and comprehension has been found to hold across a wide range of language groups. The authors cite a study done by Thorndike (1973) who concluded that the results indicate "how completely reading performance is determined by word knowledge at different levels and in different countries" (p. 62).

Anderson and Freebody go on to explain why vocabulary knowledge is a major factor in linguistic ability by examining three distinct views: instrumentalist, aptitude, and knowledge. The most fully developed position is that vocabulary knowledge reflects verbal aptitude which is an indicator of ability to comprehend text.

Anderson and Freebody have summarized and synthesized a tremendous amount of research in their 1981 article. They state that "the deeper reasons why word knowledge correlates with comprehension cannot be determined satisfactorily without improved methods of

estimating the size of people's vocabularies" (p.77). More research is needed to answer questions such as what is a word, what does it mean to know the meaning of a word, and what is the most efficient way of estimating vocabulary size from an individual's performance on a sample of words.

Word Identification and Recognition

Rupley & Willson (1997) explored word recognition and structural features of words as determinants of reading comprehension drawing upon research in word recognition and comprehension relationships, and developmental models of reading. There is sufficient evidence that demonstrates that word recognition contributes significantly to the comprehension of readers. Developmental changes in word recognition and comprehension occur as children acquire reading skills, which leads to automaticity or capacity-free processing of word recognition. This enables the reader to spend more attention on construction of meaning. Considering this construct, Rupley and Willson chose to explore the relationship of comprehension to word recognition skills based on the prediction and anticipation of letter strings. They wanted to investigate whether specific word recognition capabilities contribute to reading comprehension at varying levels of reading development. The major finding of their study is that the relationship between word recognition and comprehension remains high for students ages 6 through 12 years old. The

results support a model that teaches younger children word recognition and suggests a developmental model of reading. The developmental model would include emphasis on word recognition during the beginning stages of reading and then moving on to the more complex task of reading comprehension. In conclusion Rupley and Willson affirm that gaining automaticity in the word recognition is necessary prior to success in reading comprehension.

An experimental study investigated by Lovett & Steinbach, (1997) looked at two remedial programs with a special focus on the question of whether there exists a developmental window in the early school years to remediate students with learning disabilities. In this study Lovett and Steinbach based their research on the construct that the presence of a disability in reading does not indicate that reading achievement cannot be attained, but that appropriate intervention can and does make a difference. They randomly assigned 122 disabled students, ranging from 7 to 12 years old, in three groups. Treatment group 1 used Phonological Analysis and Blending/Direct Instruction Program (PHAB/DI) to remediate reading deficits. Treatment group 2 used Word Identification Strategy Training program (WIST), and the third group was the control group. Their study concluded that there is no apparent window of time in which a child must receive remediation. Students of all ages made significant gains in both remedial programs with the WIST training producing broader transfer for words of both regular and irregular orthography.

A case study by Mefford & Pettegrew (1997) based their research on Constructivist theory (students build their own understanding from a desire of function and meaning) and whether or not LD students would benefit from such an approach. Their questions were: (1) would students gain in basic sight word vocabulary?, (2) would students make gains in instructional reading levels?, (3) would fluency increase?, and (4) would students show more efficient use of graphophonic, semantic, and syntactic cues following the instructional intervention? Three LD students were immersed in literature using techniques such as repeated readings, reading aloud, shared reading, vocabulary study, independent reading, and decoding skills. The results indicated that students improved in basic reading skills by developing new skills and extending on existing skills. This case study has limited generalizability due to the many confounding variables and the limited sample size.

Levy, Abello, and Lysynchuk (1997) reported on two studies that examined the relationship between word identification speed and story reading fluency, as indicated by speed and accuracy as well as comprehension. Their study was based on previous research that links reading fluency and reading comprehension to theories of developmental deficits. Content words were given to students to practice speed of identification, and stories with and without content words were read. Comprehension questions were asked at the end of each reading. The results indicated that the stories with trained content words were read

more accurately than the untrained stories. However, the comprehension question analysis did not indicate an increased benefit. In the second treatment they required students to identify the content words in less than one second per word, combined with longer and easier passages to be read. In the analysis of this second treatment, both fluency and comprehension improved significantly.

A review of investigations conducted by McCormick and Becker (1996) related to word identification and its effect on reading achievement for LD students. Their investigation furnished evidence that direct word study leads to reading improvement for learning disabled students, specifically word knowledge instruction promotes word learning and comprehension. Their investigation was prompted by their desire to assist the instructional efforts of both general education teachers and special education teachers in finding strategies that foster word learning and reading comprehension for LD students. The articles they examined came from reputable journals in the field of education and focused on successful strategies that were used to instruct LD students in word recognition and word identification.

Summary

Overall, the conclusions of the research favor instructional approaches that teach students contextualized vocabulary, word identification/word recognition, and fluency to gain and enhance readers'

comprehension. These factors all have a significant impact on reading comprehension. Vocabulary knowledge has a strong correlation to reading comprehension and this holds true across languages and cultures. There are two camps on how to teach vocabulary; directly or as part of a schema-oriented approach to reading instruction (Klein, 1988). An interactive approach finds a balance between these two camps in that vocabulary is taught directly using authentic approaches and high involvement of the students. Teachers need to consider the research on reading comprehension and adapt their in-class practices to strategies that are considered effective by the prominent research supporting it.

Lovett & Steinbach's (1997) experimental study indicates that there is no developmental window beyond which phonological deficits cannot be effectively remediated with intensive phonological training.

Levy, Abello, and Lysynchuk (1997) add strength to the premise of word recognition leading to reading comprehension improvement. Their results indicate that word identification training led to increased reading fluency which ultimately leads to reading comprehension. They concluded that children should not be asked to read text that have a high proportion of unfamiliar words, because they are unable to focus attention on meaning processing.

In the case study conducted by Mefferd and Pettegrew (1997) they took a different approach in that they wanted to see if LD students could make gains in reading by being immersed in literature and "real" reading

as opposed to skill-based instruction. With this approach they also included vocabulary recognition. Their conclusion to this preliminary study is that students who struggle with reading need a developmentally appropriate and meaningful approach to reading; from whole to part to whole rather than part to whole.

In the review of literature by McCormick and Becker (1996) found that the value of explicit phonics instruction apparently spans a wide age range. They discussed many strategies that have been found successful for students with learning disabilities. All of which include word identification and word recognition training. A word-emphasis approach coupled with a comprehension-emphasis approach aided LD students more effectively than the two approaches done separately or not at all. They conclude that the ability to read words, quickly, accurately, and effortlessly, is critical to skillful reading comprehension.

In conclusion, the research that I have explored indicates that interventions for LD students should include word identification and word recognition strategies, vocabulary instruction, as well as comprehension strategies that train students to gain meaning from the text. Students should be given instructional text where at least 90% of the words are familiar in order for them to gain meaning. The speed at which words are identified is crucial to reading fluency and comprehension.

The studies generally favor the phonological deficit model to

understanding students with learning disabilities over the developmentally delayed model. The theory that there is a developmental window of time where intervention is effective has not been found.

Further research is needed in the area of interactive vocabulary instruction in relation to reading comprehension. The theoretical connection between access to word meanings and understanding texts has not been empirically established (Beck, Perfetti, & McKeown, 1982). I intend to investigate the question: Will interactive vocabulary instruction improve reading comprehension for students with learning disabilities? Will this approach allow LD students to gain meaning from various genres of text? Reading comprehension is a complex process and every element of the process is important, however vocabulary instruction has been ignored or decontextualized in recent years. If comprehension is partly dependent on access to word meanings, then vocabulary instruction should affect reading comprehension (Beck, Perfetti, & McKeown, 1982). The research is suggesting that teachers put into practice vocabulary instruction that is supported by theory and research in order to be effective in promoting vocabulary development and knowledge.

Methods

In this study I examined the effects of interactive vocabulary instruction on reading comprehension of students who were identified with a learning disability in reading. The students were first instructed in reading strategies and phonetic skills and were then asked to read a narrative and an expository text. Students then received interactive vocabulary instruction before reading a narrative and an expository text. Comprehension and fluency tests were given after each reading of the texts. This study compares student comprehension and fluency scores before and after the instructional treatment. Observations of the students' use of instructed vocabulary words are also included in this study.

Research design

This study is a case study investigating the effect of interactive vocabulary instruction on reading comprehension of students who have a learning disability in reading. Comparisons are made by looking at the reading comprehension scores and fluency scores during instructional intervention and comparing them with the non-instructional comprehension and fluency scores. I also looked at the effect interactive vocabulary instruction had on the students' writing and verbal use.

In this study I gathered both quantitative and qualitative information to create a holistic picture of the students and the effect interactive vocabulary instruction had on their reading comprehension scores and their fluency scores. When multiple methods are used to collect information a more accurate and complete picture of students and their progress is attained. Data triangulation is recognized in both authentic assessment and qualitative research as an essential element of collecting data (Hurst & Wilson, 1997). I have interviewed students via a student survey to ascertain how the students view themselves as readers. I have recorded the gains made by the students in their comprehension scores and their fluency scores before and during the intervention. I have also observed the students' use of the new vocabulary words in their writing and in their conversations.

Variables

The intervention in this study is the interactive vocabulary instruction that the students have received before the reading of an expository text and a narrative text. Vocabulary words that are critical to understanding the texts were chosen by the teacher. The words used during instruction were determined by oral testing, selecting out the words that students were familiar with, and using the ones that they were unfamiliar with for instruction. The words found to be unfamiliar to the students in the first text were: exclaimed, appetizer, reluctance, and schemed. In the

second text the students were unfamiliar with: hollow, advances, ridge, and Arctic. These words were used in the interactive vocabulary instruction and are described in the procedures section.

Interactive vocabulary instruction took place before reading each text. This type of instruction involves the students in discussions and vocabulary activities such as word webbing, identifying antonyms and synonyms, word forms, comparing and contrasting, and role playing. Visual aids and dictionary activities were also used. The key to interactive vocabulary instruction is involving the students in a variety of activities to learn the lexical meaning and form of an unknown word.

The dependent variables are the comprehension and fluency test scores, which were gathered after each of the texts were read. The comprehension tests were measured using a taxonomy for evaluating the answers. The questions on the tests were designed at three different levels of understanding: surface level, mid-level, and subtle level. The tests were scored giving a value to the level of responses and achievement attained. The three achievement levels are partial, clear, and detailed. (See table 1, p.44).

The intervening variables in this study are the individual students' reading level, fluency rate, background knowledge, the nature and complexity of their disability, classroom and home support in reading, and their attendance. Each of these variables are known to affect students'

motivation and reading comprehension (Levy, Abello, & Lysynchuk,1997; Lloyd,1996). Another intervening variable is that of time. Students make improvement over time and this is not accounted for in this study.

Participants

The students selected for this study attend an elementary school in the Northwest region of Washington state. They have been identified by state standards as having a learning disability in reading and writing. These students have Individual Education Plans (IEP's) that describe the students' present level of performance in reading and writing and the goals and objectives that will aid the students' progress in these two areas. The students selected were two or more years behind their grade level and participated in small group reading and writing instruction in a Resource Room for 45 minutes a day, Monday through Friday.

For the purposes of this study, the students were selected by the teacher, which is a single-stage sampling procedure. Selection was based on grade level and present level of performance in reading. Students' age range was not a factor in student selection. The students' age range are between 10 and 12 years old. This age range is similar to that of their peers in the same grade level. These students have not been retained due to their below grade level performance.

There were four students participating in this study. They consisted of three fifth graders and one fourth grader with a mean reading level of

2.6 grade equivalent. The participants were all males. The ethnicity of the boys were three Native Americans and one Caucasian. All the participating students come from low socioeconomic backgrounds. Permission was granted from each of the student's parents to participate in the study. (See Appendix A).

Setting

The students were in a Special education pull-out program for reading and writing. They came from their general education classroom to the Resource room from 11:15 to 12:00 for a 45 minute block of instruction in reading and writing. This group of students met Monday through Friday.

The Resource room was set up in four sections for instruction. Free standing walls or dividers separated each of the sections to define areas and limit distractions. Tables and chairs occupied each section for student and teacher use. Three of the sections had white boards. In addition, an independent reading area was located at the back of the room along with a computer area. Students were allowed to use these areas at break times and upon request.

The Resource room was very busy with four groups in process at the same time. The morning hours had the greatest amount of students present in the room at one time. There were usually 15 to 20 students working in the room during the study. The dividers helped limit the distractions, but not entirely.

The students participating in this study came in the room at 11:10 and used the computer area or the reading area until the group before them left. At 11:15 they came to the table in their section. Before instruction started, I checked in with each one of them, asking how they were. Homework was collected and returned. Then I identified what they would be working on during that time period.

Materials

Four instructional texts were used from the Literature Works reading program (Silver Burdett Ginn, Education Group,1997). I chose two narrative and two expository texts. A narrative and an expository text were used during the non-instructional phase (Phase I) and then a narrative and an expository text were used during the instructional phase (Phase II). The texts were new to the students and had never been read before. The texts are leveled at approximately 2.5-3.0 grade equivalent.

Draft books were used to record the students' work during the instructional intervention and record their writings after the texts were read.

Procedures

Students were given a self-evaluation survey that I designed before the intervention took place in order to attain the students' perceptions of their own reading performance. The survey used a Likert scale of one to five; one being strongly disagree and five being strongly agree. The statements used were:

1. Reading is important to me.
2. I am a good reader.
3. I understand what I read when I read with a group.
4. I understand what I read when I read by myself.
5. Reading is a fun way to learn.

Before the reading of each text I identified key vocabulary words in the text. I chose ten words from each text and tested students individually to determine the familiarity of the words with each of them. The students' word knowledge was tested orally. I determined whether students were knowledgeable of the vocabulary words by asking them to read the word, define the word, and then put it in a sentence. Their word knowledge was recorded by a plus or a minus; plus indicating they know the word, minus indicating they do not know the word. I then noted the words that were unfamiliar to most of the students in the group.

In Phase I of this study, students were taught reading strategies (e.g. what makes sense, does it look right, reread). Emphasis was placed on

decoding words that are unfamiliar in the text. The students were asked to read aloud a narrative and an expository text. As students together read aloud in their group, the text was discussed. After reading each text students were asked to answer comprehension questions for that given text. Comprehension scores were determined by how many points were achieved out of a total of sixteen. Students' reading fluency of the text was then assessed by a timed reading of a passage in the text. Fluency scores were recorded as words correct per minute.

In Phase II of this study students were taught key vocabulary words in an interactive format (e.g., word webbing, analogies, visual displays, demonstrations, etc.) before reading a narrative and an expository text. The key vocabulary words taught were determined by oral testing of words chosen from the text in the same manner as before. The students were then asked to read aloud together in a group and the text was discussed as they read. A comprehension test for each of the texts was given. Comprehension scores were determined by how many points were achieved out of a total of sixteen. Students' reading fluency of the text was then assessed by a timed reading of a passage in the text. Fluency scores were recorded as words correct per minute.

Vocabulary Strategies

The instructional strategies used were dependent on the type of key words chosen for the interactive vocabulary instruction. More than one strategy may be employed per word to provide an interactive model of instruction. The following is a list of strategies used in interactive vocabulary instruction.

Analogies

Antonyms and Synonyms

Concept wheel

Discussion

Feature analysis

Semantic word map

Word forms

Word webbing

Visual aids

In phase II of this study, the first text used was a narrative titled Ma'ii and Cousin Horned Toad which is a Navajo folk tale by Shonto Begay. The words that were unfamiliar to the students in this text were: appetizer, reluctance, schemed, and exclaimed. A word web was used to teach "appetizer." The word was discussed and then the students wrote a word web identifying the different types of foods that could be used as an

appetizer. For the word "reluctance" a T-graph was used with synonyms on one side and antonyms on the other. Students looked up words in the dictionary that could be synonyms or antonyms for the word reluctance. For the word "schemed", word forms were used for instruction, connecting the word schemed with the word planned. For the word "exclaimed" role playing was used and then the students had to compare and contrast the word "exclaimed" with the word "explained" because of their noticeable confusion between the two words. The students recorded their work in their draft books.

The second book was an expository text titled Polar Bear Cubs by Downs Matthews with photographs by Dan Guravich. The words that were unfamiliar to the students were: hollow, advances, ridge, and Arctic. The students worked with analogies and examples by comparing and contrasting to learn the word "hollow." Word forms was used to learn the word "advances" along with looking it up in the dictionary. Visual aids in the way of pictures and maps were used to teach the words "ridge" and "Arctic." The students recorded their work in their draft books.

Assessment

Instrumentation

Three points of data were used to evaluate the students' reading skills and reading comprehension. The three critical components in reading assessed were: fluency, vocabulary, and reading comprehension. This triangulation of information was recorded on tracking sheets, one for each student.

Fluency is defined as how many words a student reads correctly in a minute. This measurement displays a child's capacity for word recognition. Students were asked to read a passage from the text aloud. A timer was set for one minute and a running record was taken, noting the words the student read fluently and the words that the student had difficulty with, left out, or substituted another word for a word in the text. I measured student's fluency rate for each text read in words correct per minute (e.g. 30/1). A fluency score was assessed per text, in both phase I and phase II of this study. Fluency scores were taken after the students had read the text one time.

The vocabulary assessment is taken to determine the student's lexical understanding of key vocabulary words in the text. This was done by asking students individually to read key vocabulary words that I chose from each text. They had to define each word and use it in a sentence.

Vocabulary scores were noted as words understood out of a total of ten selected (e.g., 8/10).

Comprehension questions were asked after reading each of the texts to determine the student's level of understanding. Reading comprehension was recorded in how many points achieved out of a total of 16 points available (e.g., 8/16).

The comprehension tests were composed of six questions. I developed the questions by using the Reading Comprehension Taxonomy (See table 1, p. 44). The questions represent three different levels of understanding: surface level, middle level, and subtle level. At the surface level the questions could be found in the book and had a literal meaning. For example in the expository text the question "Where do Polar bears live?" is a surface level question. The middle level questions requires the student to make connections and predictions. An example of a middle level question is "Would you like to live where Polar bears live? Why or why not." It asks the student to use what they have read and make connections to their lives or other circumstances. Subtle level questions ask the student to evaluate, judge, and analyze what they have read. An example of a subtle question is "How does a mother Polar bear teach her cubs?" Examples are given in the text of how a mother Polar bear teaches her cubs, but it is not stated explicitly. Surface level question were given a total of two points, middle level questions were given a total of three

points as were the subtle level questions. Each comprehension test consisted of two questions at each level for a total of 16 points.

Development of Taxonomy

Reading comprehension is a complex task that involves many levels of proficiency. Nessel (1987) identifies three levels of comprehension: the literal level (recalling the explicit), the interpretive level (grasping the implicit), and the evaluative level (making judgments). I have adapted these three levels, defined them more clearly and given each level three categories of achievement. The three levels of comprehension in the taxonomy are (1) **surface level**: the text is taken literally and the concrete components can be identified, (2) **middle level:** connections can be made from what is read to what might happen next (predictions) with what came before, and the text can be related to personal experiences, (3) **subtle level:** readers are able to glean the more subtle meanings in the text and the implications they hold for the reader and the content or subject matter. The three categories of achievement are necessary to measure the level of attainment that the student has reached within the three levels of comprehension. These achievement levels are: partial, clear, and detailed. These categories are defined at each level of comprehension. I developed the reading comprehension taxonomy in order to evaluate students' reading comprehension objectively.

Table 1: Levels of Comprehension

Reading Comprehension Taxonomy			
Levels of comprehension	**Partial (1)**	**Clear (2)**	**In Detail (3)**
Surface Level: The text is taken literally and the concrete components are identified. e.g. plot, characters, setting, conflict, resolution, and information learned from expository text.	Student mentions some of the components of the text, but does not describe any one in detail.	Student describes some components of narrative text; characters, setting, plot, etc.. Student gains some information from expository text.	Student describes in detail components of text. Events are in sequence, characters' roles are evident. Conflict and resolution is clear.
Middle Level: Connections are made from what is read to what might happen next, what came before, and the text can be related to personal experience.	Student makes partial prediction Student shows difficulty linking events together. Student does not link text to personal experience.	Student make predictions that make sense. Students link events together. Students link text to personal experience.	Student makes realistic prediction Student links events giving cause and effect relationships. Student links text to personal experience.
Subtle Level: The more subtle meanings in the text are identified, implications to the reader and about the subject matter are made, evaluation and synthesis is evident.	Student describes partial implications and makes simple evaluations of the meaning of the text.	Student describes implications of text to self. Student makes an evaluation of text that demonstrates thoughtfulness.	Student describes implication of text to self and to the subject matter in detail. Student evaluates text in detail and relates to other reading and to experience.

Data Analysis

Findings

My data analysis includes comparisons of fluency scores and reading comprehension scores between Phase I and Phase II of this study. I have used a descriptive statistical format for evaluating the data. Individual scores were charted and progress levels were compared between the instructional intervention and non-instructional reading of the texts. I have given the four students in my study pseudo names in order to protect their identity. They will be called Peter, Derek, Harold, and Andrew.

In the beginning of this study each student was tested using the Woodcock-Johnson Revised (1990) standardized test to evaluate how the students compared in reading to their peer group. Peter is in the 5th grade and he had a broad reading score of 3.4 grade equivalent (g.e.). His word attack skills were at a 3.8 g.e., his reading vocabulary score was 2.6 g.e., and his reading comprehension score at a 3.2 g.e.. Peter demonstrated skills in decoding unfamiliar words as he read by identifying the beginning, middle, and ending sounds. He put his voice and intonation into his reading. His comprehension skills were fair, identifying some components of the text, but he does not describe any one in detail.

In the student survey that was given to each of the boys in the

beginning of the study, Peter states that he thinks reading is a fun way to learn and that he is a good reader. He thinks it is important to read and that he understands what he reads whether he is reading in a group or reading alone. Peter does not get any support at home for any of his academic work.

Derek is a 5th grader who scored 2.8 g.e. in broad reading, a 2.6 g.e. in word attack skills, a 2.6 g.e. in reading vocabulary, and a 2.7 in reading comprehension. He reads without any intonation or voice. He demonstrated fairly good decoding skills by reading longer phases and slowing down for problem solving of unfamiliar words. His comprehension of the text was fair, identifying some components of the text, but he does not describe any one in detail. He seemed to get more from the discussions. Derek enjoyed participating in the discussions of the texts.

In the student survey, Derek thinks it is important to read and that he is a good reader. He also thinks that reading is a fun way to learn. Derek states that he does not comprehend well when reading by himself and that he has partial comprehension when he reads in the group. Derek has some home support in his academic work.

Harold is also in the 5th grade. He scored a 2.5 g.e. in his broad reading skills. His word attack skills were low, scoring a 1.5 g.e.. His reading vocabulary was at a 2.4 g.e. and his reading comprehension skills were at a 2.6 g.e. He reads a mixture of word-for-word and in fluent phrases. He does not exhibit many problem solving skills nor intonation. He

does not have much home support in his academic work.

In the student survey, Harold does not think it is important to read. He thinks he is a moderate reader. He says that reading is a fun way to learn and that he likes to read. He states that he comprehends well when reading by himself and in the group. Harold has some home support in his academic work.

Andrew is a 4th grade student. He scored a 2.7 g.e. in his broad reading skills. His word attack skills were at a 2.2 g.e., his reading vocabulary was at a 2.5 g.e., and his reading comprehension score was at a 2.7 g.e. Andrew reads with voice and exhibits fluency with few word by word slow downs for problem solving.

In Andrew's student survey he states that he thinks it is important to read and that he is a good reader. He thinks reading is a fun way to learn and that he comprehends well when he is reading alone or in the group. He has no support at home for his academic work.

Reading comprehension tests were given after each of the four texts were read. The comprehension tests had a total of 16 points possible for each test. The scores were determined by how many correct out of 16 possible points. Fluency scores were taken for each text in words correct per minute.

Peter's comprehension scores before the intervention were 6/16 for the narrative text and 5/16 for the expository text. During the intervention phase he scored 10/16 for the narrative text and 11/16 for

the expository text. This is an improvement over the scores achieved without the intervention. Peter's fluency scores showed steady improvement from text to text. He started out at 40 correct words per minute (40/1) and steadily increased with each text; 55/1, 85/1, and 105/1. See graphs of Peter's scores in figures 1 & 2 on page 49.

Peter's Graphs

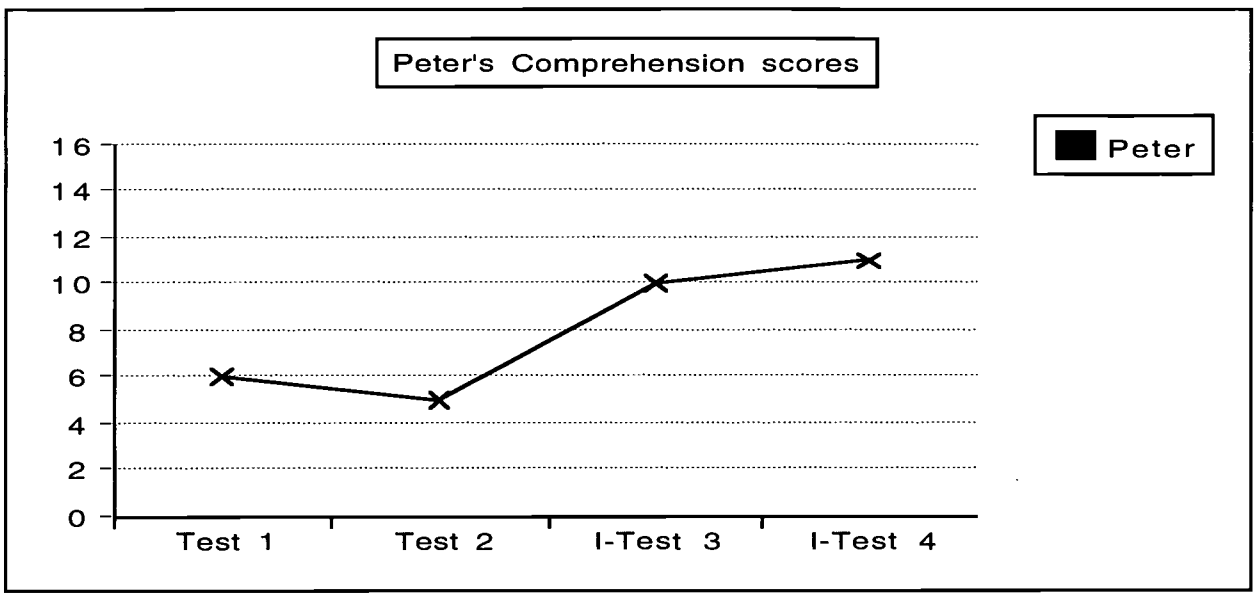

Figure 1. Peter's comprehension scores for the non-instructed and instructed texts.

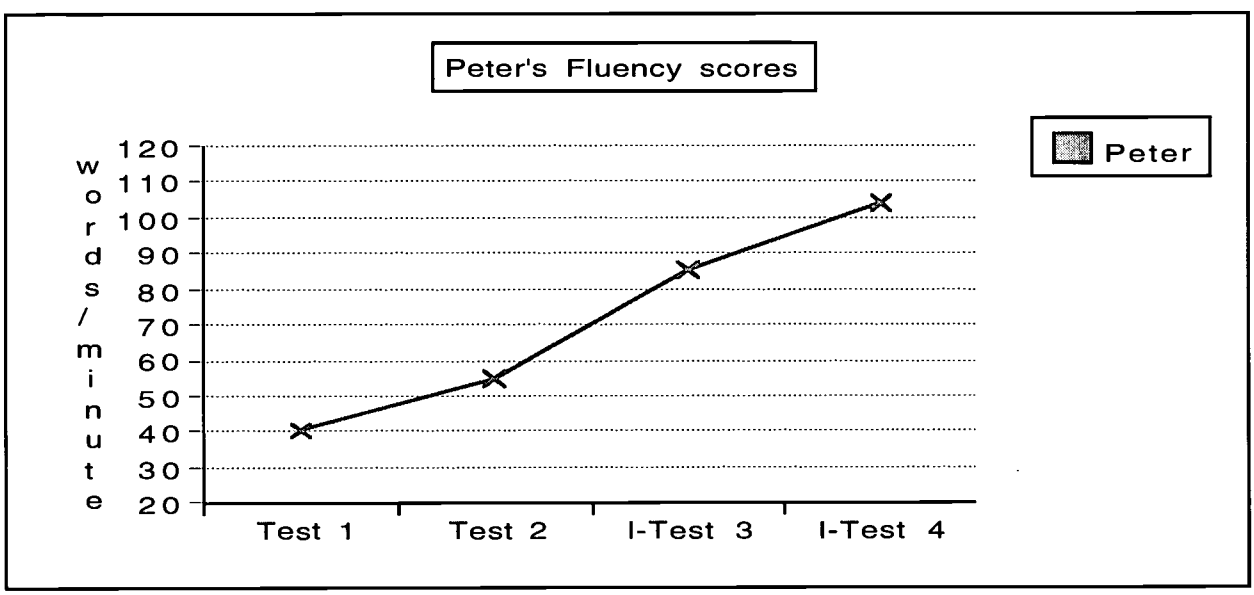

Figure 2. Peter's Fluency scores for the non-instructed and instructed texts.

Derek's comprehension scores before the intervention were 6/16 for the narrative text and 7/16 for the expository text. During the intervention phase he scored 6/16 for the narrative text and 10/16 for the expository text. These scores show an inconsistent improvement of the last test score over the scores achieved previously. Derek's fluency scores were also difficult to explain as the first and last text are equivalent and the scores in between are lower. He started out at 80 correct words per minute (80/1) for the narrative text and then he went down to 65/1 for the expository text. During the intervention phase he read 68/1 for the narrative text and then went up to 80/1 for the expository text. See graphs of Derek's scores in figures 3 & 4 on page 51.

Derek's Graphs

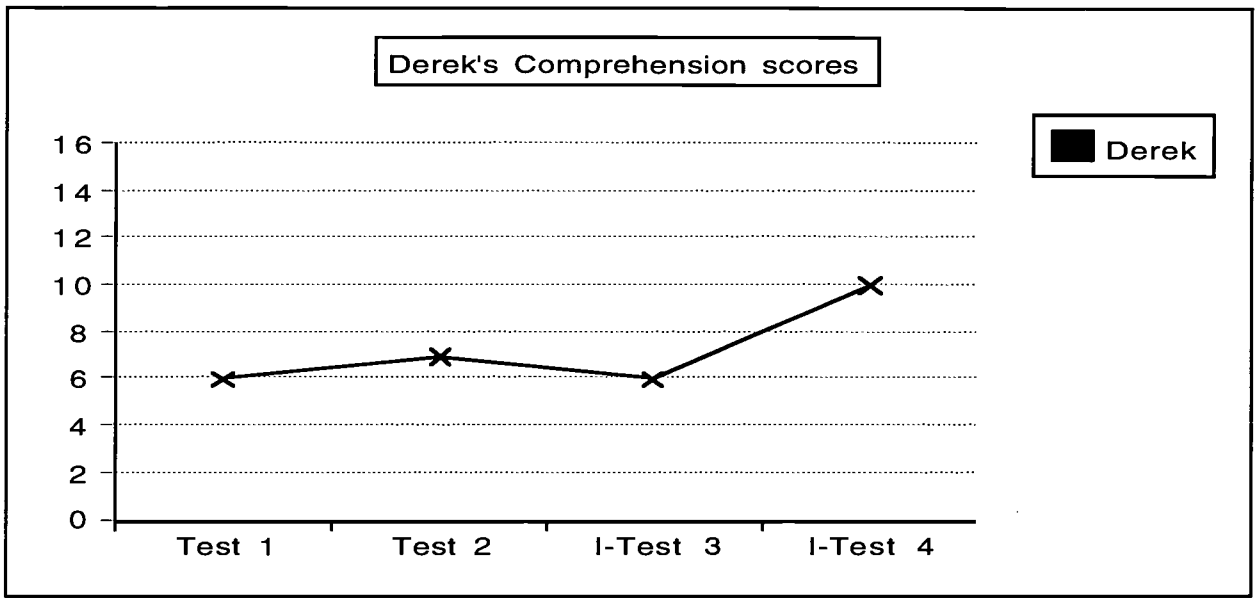

Figure 3. Derek's comprehension scores for the non-instructed and instructed texts.

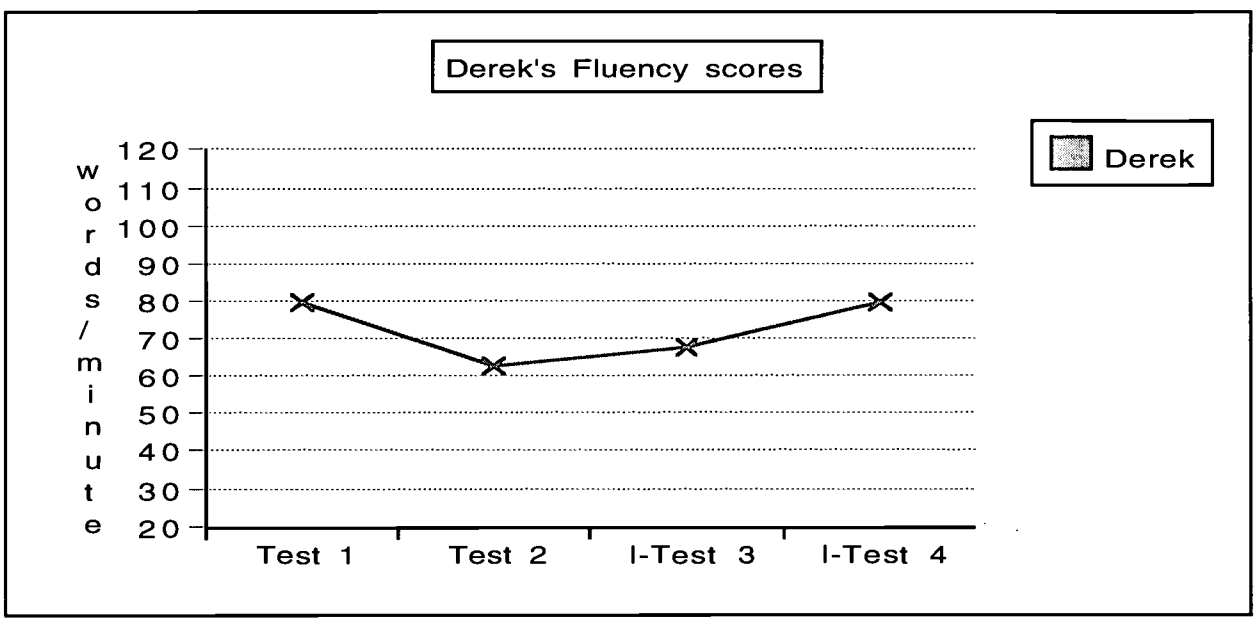

Figure 4. Derek's fluency scores for non-instructed and instructed texts.

Harold's comprehension scores before the intervention were 6/16 for the narrative text and 9/16 for the expository text. During the intervention phase he scored 13/16 for the narrative text and 8/16 for the expository text. These scores show an increased improvement during the intervention phase with the exception of the last score which appears to be a deviant score. Harold's fluency scores showed improvement during the intervention phase over the first phase with no intervention. He started out at 30/1 for the narrative text and then he went down to 29/1 for the expository text. During the intervention phase he read 59/1 for the narrative text and then went up to 63/1 for the expository text. See graphs of Harold's scores in figure 5 & 6 on page 53.

Harold's Graphs

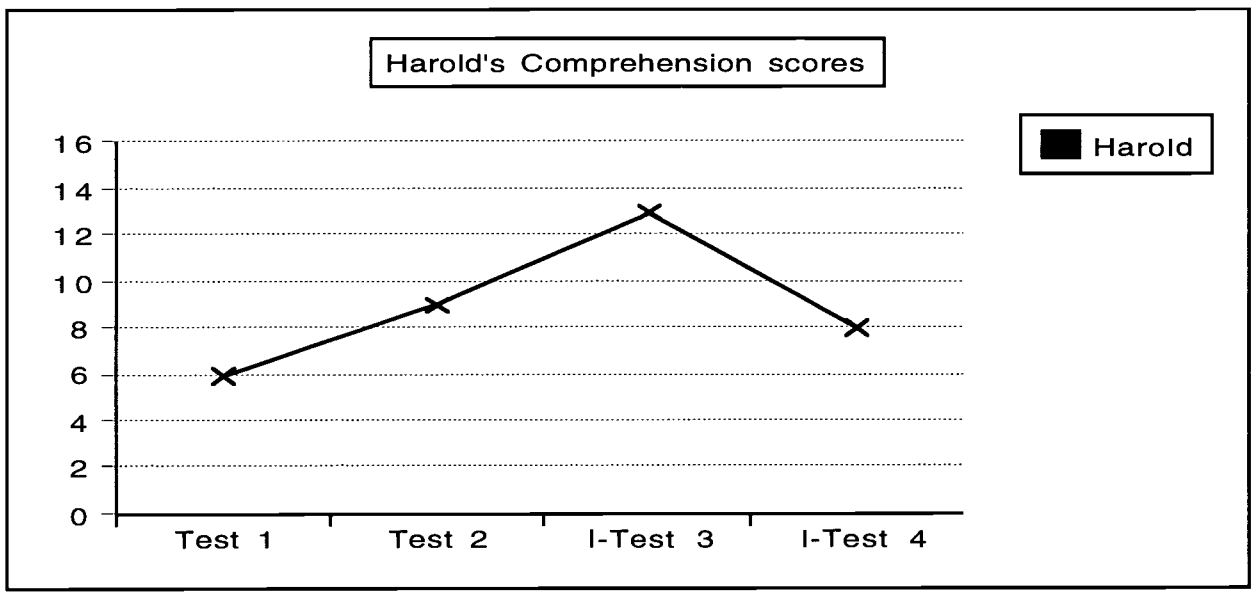

Figure 5. Harold's comprehension scores of non-instructed and instructed text.

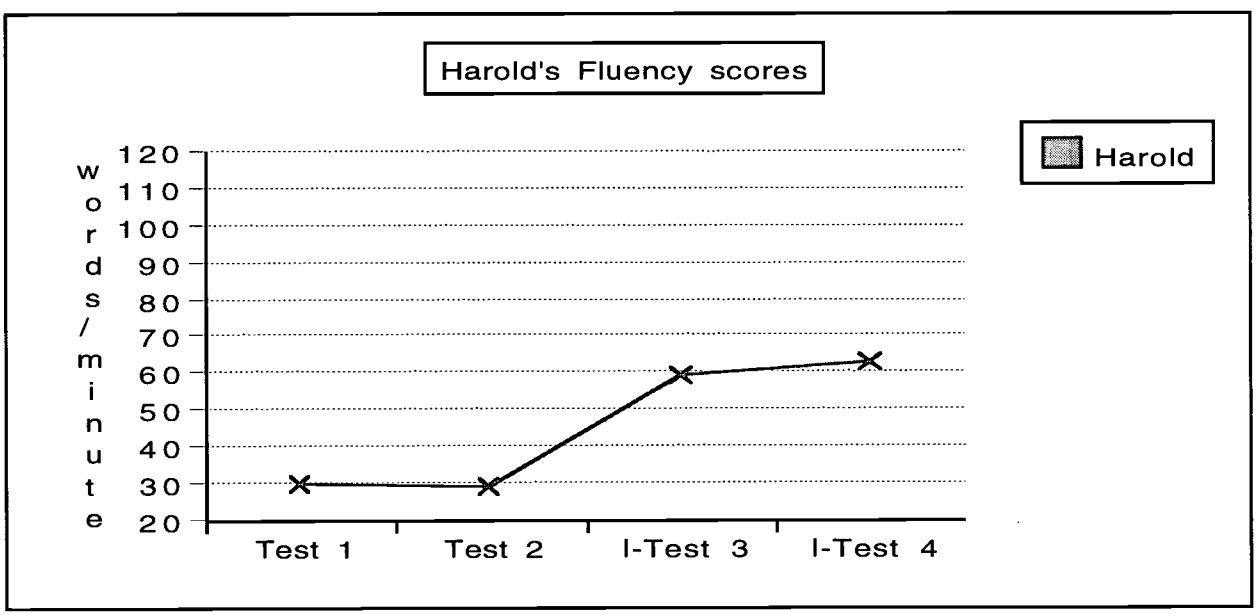

Figure 5. Harold's fluency scores of non-instructed and instructed text.

Andrew's comprehension scores before the intervention were 7/16 for the narrative text and 7/16 for the expository text. During the intervention phase he scored 8/16 for the narrative text and 11/16 for the expository text. These scores show an increase of the intervention scores over the non-intervention scores, but not by a large amount. Andrew's fluency scores showed improvement during the intervention phase over the non-intervention phase. He started out at 49/1 for the narrative text and then he went down to 41/1 for the expository text. During the intervention phase he read 80/1 for the narrative text and then went up to 104/1 for the expository text. See graphs of Andrew's scores in figures 7 & 8 on page 55.

Andrew's Graphs

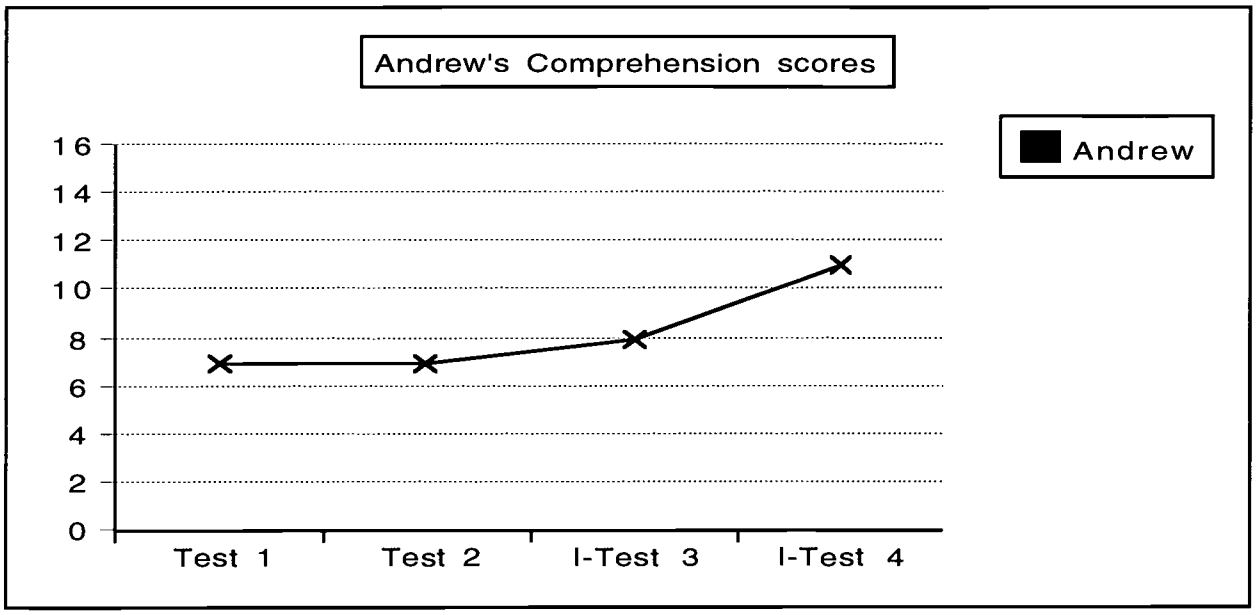

Figure 7. Andrew's comprehension scores for the non-instructed and instructed text.

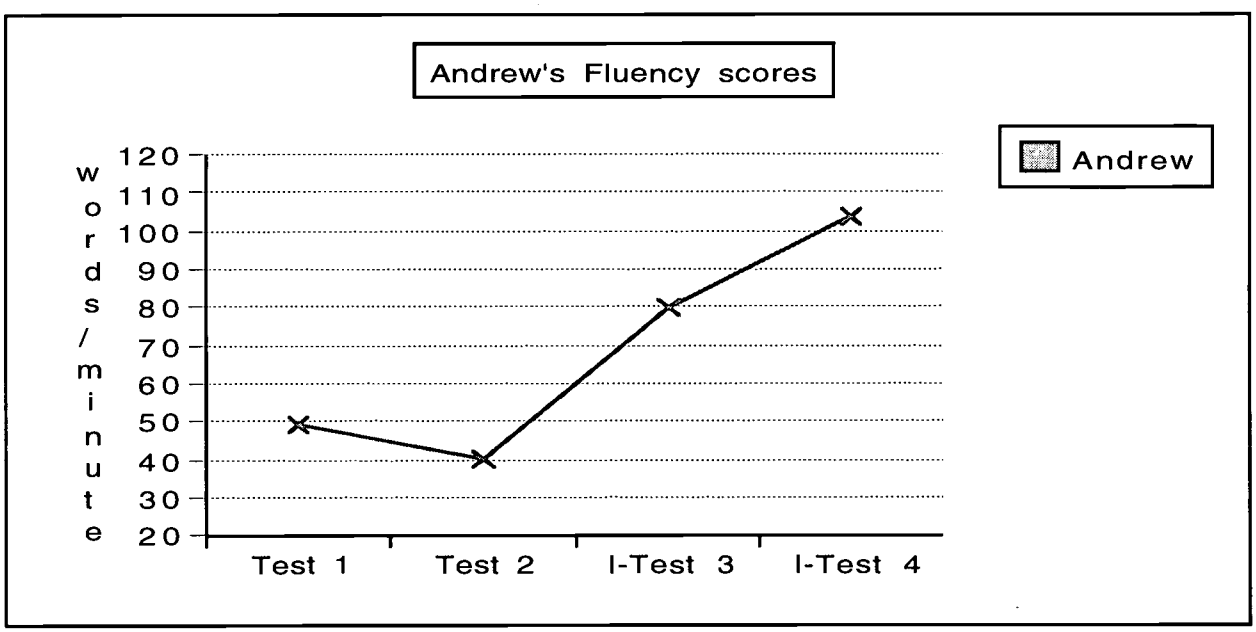

Figure 8. Andrew's fluency scores for the non-instructed and instructed text.

Comparing the students' scores, Peter, Andrew, and Harold all made gains during the intervention in both comprehension and fluency scores. I have determined that they benefited from the interactive vocabulary instruction. Harold had one deviant score in comprehension during the intervention phase. If more points of data were taken during the intervention phase, I speculate that Harold's scores would show a steady increase. Derek made some gain during the intervention phase in reading comprehension, but his fluency scores did not show any significant change. See graphs of comparing students' scores in figures 9 & 10 on page 57.

Field notes were taken as students exhibited use of new vocabulary words in their conversations and in their writing. I read through the students' writing during this study and observed that the students did not use the new vocabulary words in their independent writing. I am speculating that the students had not become familiar enough with the words to use them. The difficulty of spelling the new words could also have prevented them from using the words in the independent writing. However, students were observed using some of the vocabulary words in their conversations during instructional time. Harold exclaimed at one point, "We are scheming!" during a math lesson that required him to plan a survey. Two other students recalled the words appetizer and hollow during a discussion of the stories we read together.

Comparing Student Scores

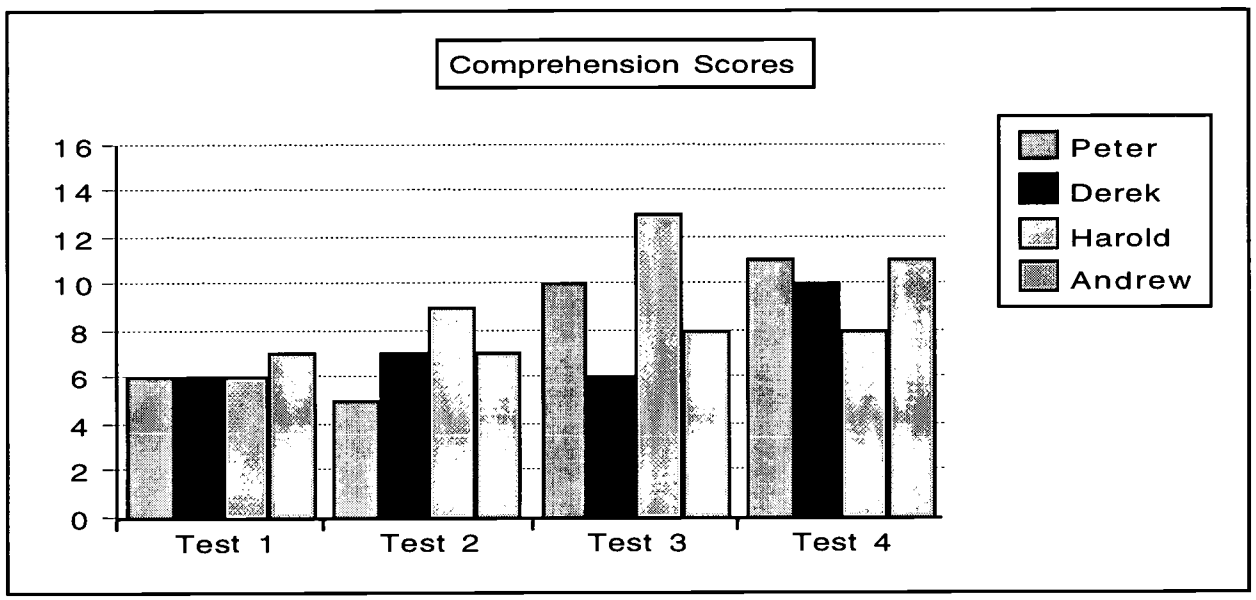

Figure 9. Comprehension scores of the four students for the non-instructed and instructed texts.

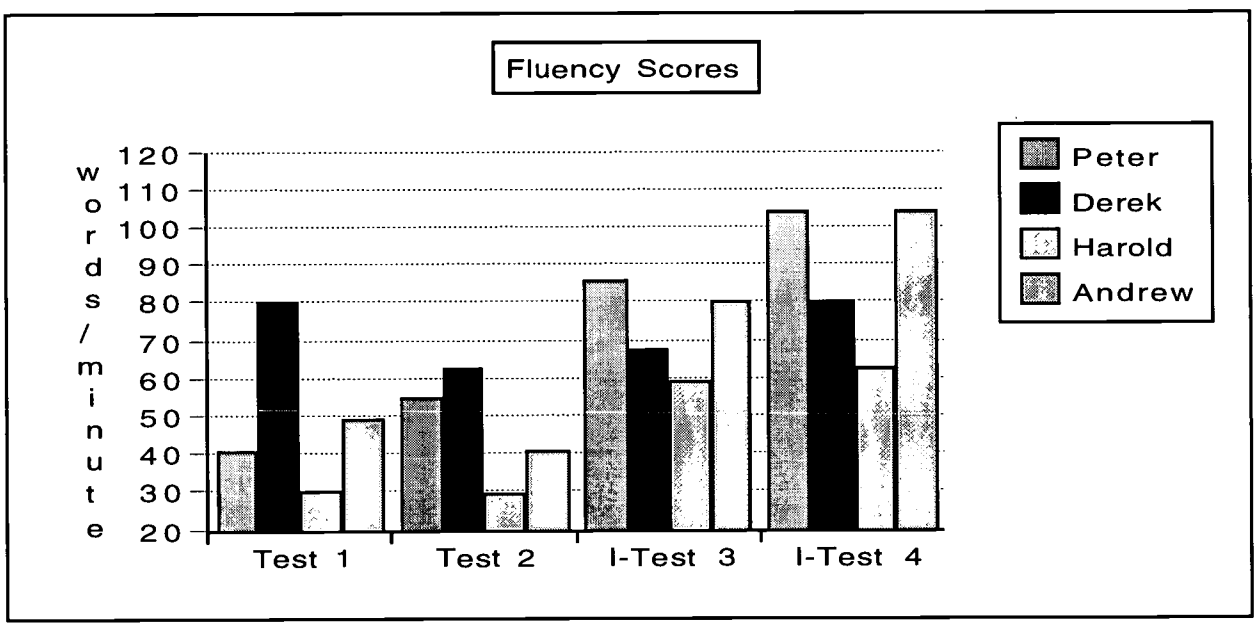

Figure 10. Fluency scores of the four students for the non-instructed and instructed texts.

Conclusion

Discussion of Results

The purpose of this study was to determine the effectiveness of interactive vocabulary instruction for improving reading comprehension for students with learning disabilities. I anticipated that this vocabulary instruction would improve the students' comprehension of the texts read. I had not anticipated that it would also affect their fluency in reading. It stands to reason, however, that the fluency did increase because fluency has been directly correlated with reading comprehension (Rupley & Wilson,1997).

My initial question was, *will interactive vocabulary instruction improve reading comprehension for students with learning disabilities?* Overall, students did make gains in their comprehension scores during the vocabulary instruction phase. This increase in scores indicates that the vocabulary instruction did improve the students reading comprehension. The students also made gains in their fluency scores. This increase in comprehension scores and fluency scores demonstrates that the students were able to recognize the words that they read more quickly and they were able to understand the concepts and ideas that the texts presented. The vocabulary instruction provided the students a scaffold from which they could build understanding. The students' fluency increased

demonstrating that they had to spend less time decoding the unfamiliar words, thus allowing them more cognitive processing time to understand the text.

The students enjoyed learning the new vocabulary words in this interactive format of instruction that included a variety of activities. They were engaged during the vocabulary instruction and demonstrated stronger motivation to read the text. They were eager to read the text and they became excited when they identified a vocabulary word in the text. They made statements such as "there's that word," then they read the word and discussed what it meant within the context of the passage.

I had also asked, *will LD students' reading comprehension increase?* This was a general question that I was hoping to answer in this study. However, instruction did not occur over the entire school year and I am not able to determine if the short term vocabulary instruction effected students broad reading comprehension. I would expect instruction would have to take place over a long period of time to determine the overall effects on reading comprehension of LD students.

I also wanted to know if *students would be able to glean the subtle meanings underlining the text.* I had hoped that the students would gain understanding of the subtle meanings of the texts, however this was not demonstrated on the comprehension tests nor in the discussions. These students still had difficulties with connecting concepts and ideas to other areas of interest and the implications that the concepts and ideas could

have. They scored full points on a majority of the surface level questions, with decreasing scores for the middle and subtle level questions. Evaluation, synthesis, and judgment that denote understanding at the subtle level were not observed.

I also asked, *will students use the new vocabulary words in their writing?* I found that students did not use the new vocabulary words in their writing. I attribute this to their lack of familiarity with the words. These words were presented in the instruction one time and were referred to about two times after the instruction. This is not enough exposure for students to become familiar with a word where they would be able to use it in their writing. The students also had difficulty in spelling. I suggest that students were inhibited from using the words in their writing for these two reasons. The students write the way the speak and they did not have enough time to actually master the words and assimilate them into their conversational vocabulary. Therefore the students did not use the words in their writing.

The first time I heard a student "trying out" one of the vocabulary words was during a math lesson two days after the word had been taught. I had asked, *will students use the new vocabulary gained in their conversations?* My students were planning a survey that they were going to carry out in other classrooms. Harold exclaimed, "Hey, we are scheming!" He was referring to our planning of the survey. During the interactive vocabulary lesson we had connected the word "scheming" with

the word "planning", but made the distinction that scheming was usually referring to sneaky behavior. I heard Harold "try on" the word "scheme" two more times after that in reference to our math survey. As a group the students brought up two more words on their own during a discussion of one of the stories. The words they used were "hollow" and "appetizer." They seemed excited to be able to use these newly learned words on their own. The excitement showed in their voices and on their facial expressions.

I propose that if the vocabulary words continue to be addressed and posted in the room the students would start using them in their verbal communications more frequently. They showed evidence of trying to use them in the short time that they were exposed to the words during instruction. It has been suggested by Jenkins et al,1978 that the "increased task demands involved in comprehending connected discourse require greater vocabulary facility than that produced in the instructional procedures employed in the present study" (p.29). This statement is true also for my study. I estimate that given more time and practice with the new vocabulary words students would be more inclined to use them in their writing and verbal discourse. The processing inefficiencies that characterize my students, the less skilled readers, the implication of the verbal efficiency theory is that facility in verbal coding, including semantic codes, makes a critical contribution to comprehension (Beck, Perfetti, & McKeown, 1982). The ideal situation for comprehension of a

text occurs when virtually all of the words in a given text are known to the reader. The reader's cognitive processing can be directed toward the overall meaning of a sentence or passage. If a text contains too many unknown words to the reader, comprehension becomes restricted and the student may not be able to construct meaning.

I will continue to use interactive vocabulary instruction with my students, who demonstrate low reading ability, in order to allow them greater access to the text they are going to read. The results of the higher comprehension scores and fluency scores shows me that interactive vocabulary instruction is a beneficial instructional strategy that engages students in "word play" and allows them to learn unknown words before they encounter them in the text.

Implications for Education

For non-readers or low readers, interactive vocabulary instruction is a viable means to help students increase their vocabulary. These are the students who do not read many books on their own and so are not learning vocabulary at the rate of their more fluent peers. As educators we need to give these students a boost in learning vocabulary that they can master. Reading instruction must be geared toward the students' reading level with the intent of building their reading skills and expanding and deepening their comprehension. Interactive vocabulary instruction increased the students' reading comprehension scores and their fluency

scores during the intervention phase of this study. It appears that the vocabulary instruction helped to scaffold students in the reading of the text.

Reading is a complex process that requires multi-level processing skills. I suggest that three critical components should be part of reading instruction. They are fluency (word identification and recognition), vocabulary (understanding the grammatical use and lexical meaning of the words), and comprehension (understanding the concepts and subtle meanings of the written text). Students with low reading abilities showed evidence of increased fluency and comprehension during the intervention. They also appeared to have greater motivation for reading the text. This is important to Special Education teachers and General Education teachers who are working with diverse ability populations.

Suggestions for Further Research

Further research is needed in the area of vocabulary instruction and its affect on reading comprehension for LD students. This study was a preliminary look at interactive vocabulary instruction and its affect on reading comprehension. Due to the context of the study only four male subjects were considered in the evaluation and analysis. In addition this study was limited in the points of assessment taken and in the amount of time spent on Phase II, the vocabulary intervention.

Further research should involve random sampling of a diverse population that would select more students to participate in the

intervention. A control group should also be selected. A longitudinal study would provide results regarding the long term effects of the intervention.

Additional studies on interactive vocabulary instruction could also include participants other than LD students. General education, English as a second language (ESL), and adult students could benefit from such instruction. There is limited research in this area regarding vocabulary instruction and its affect on reading comprehension. The results of this study indicate that it would be worthwhile to continue investigating this line of research.

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Appendix A

I. Parent letter/permission slips

II. Time Line

III. Student Survey

IV. Comprehension Tests

Isabel MacLean
Support Services
Eagleridge Elementary School

September 20,1999

Dear Parents/Guardians,

Welcome to another school year at Eagleridge Elementary School. I will be providing support services for your children in the areas designated by their Individual Education Plan (IEP). At this time your child/children are being served by In-class support and pull-out services. I am looking forward to an exciting year of growth and development for all our students. This year our school focus is on READING. This is also my focus as I continue to take classes at Western Washington University. I am interested in how to help students improve their reading comprehension.

In your child's reading group, I will be examining vocabulary instruction and its effect on reading comprehension as a study conducted in the Resource Room. Parent/guardian permission is required as part of this study. Please mark one of the boxes below, sign at the bottom, and returned it to me by September 25th. If you have any questions regarding the study or the type of instruction your child will receive please feel free to call me. I will be happy to answer any questions you might have.

November conferences are right around the corner. At that time I will meet with you to discuss your child's IEP and set them up for a successful school year. If you would like to meet with me before November, or if you have any questions, or if you would just like to touch base with me, please give me a call me at 383-9738

Sincerely,

Child's name _____ Return to Ms. MacLean

_____ Yes, my child may participate in the vocabulary study.

_____ No, please do not include my child in the vocabulary study.

Parent Signature: _____

Time Line

October15:

Sent home parent/guardian permission letter

October 20:

Permission slips were returned

November 5-10:

Identify subjects

November 8-17:

Pre testing: Running records, fluency, comprehension, and vocabulary

December 1-19:

the group is exposed to no vocabulary intervention, 1st text

January 5-15:

the group is exposed to no vocabulary intervention, 2nd text

January 18-February 4:

the group is exposed to instructional intervention, 1st text

February 9-20:

the group is exposed to the instructional intervention, 2nd text

March 7:

Begin Analysis & write up

Reading Survey

1. I think it is important to read.
   Strongly Disagree 1 2 3 4 5 Strongly Agree

2. I am a good reader.
   Strongly Disagree 1 2 3 4 5 Strongly Agree

3. I understand what I'm reading when we read together.
   Strongly Disagree 1 2 3 4 5 Strongly Agree

4. I like to read.
   Strongly Disagree 1 2 3 4 5 Strongly Agree

5. I understand almost everything I read, when I read by myself.
   Strongly Disagree 1 2 3 4 5 Strongly Agree

6. Reading is a fun way of learning.
   Strongly Disagree 1 2 3 4 5 Strongly Agree

The Singing Snake
by
Stefan Czernecki and Timothy Rhodes

I.

1. Who decided to have a singing contest?

2. Who really had the most beautiful voice?

II.

3. Why did the old man call for a singing contest?

4. How did the story end?

III.

5. Why did the animals cry when they heard snake sing?

6. Why did snake never speak again?

Our Statue of Liberty
by
Thelma Nason

I.

1. What country did the Statue of Liberty come from?

2. Where is the Statue of Liberty now?

II.

3. Who paid for the Statue of Liberty and how?

4. Will the Statue of Liberty need repair in the future? If so, why?

III.

5. Why is the Statue of Liberty so important to Americans?

6. How does the Statue of Liberty represent democracy?

Ma'ii and Cousin Horned Toad

A traditional Navajo story
retold by Shonto Begay

I.

1. Why did Ma'ii want to visit his cousin Horned Toad?

2. What did Horned Toad do for his cousin Ma'ii when he first got there?

II.

3. Why did Ma'ii trick his cousin Horned Toad?

4. Do you really think Horned Toad could live in Ma'ii stomach? why or why not?

III.

5. What should Ma'ii have done instead of tricking his cousin?

6. Where do you think Ma'ii ran off to in the end?

Polar Bear Cubs
by
Downs Matthews

I.

1. Where do Polar bears live?

2. How do Polar bears normally travel?

II.

3. What other animals live where Polar bears live?

4. Would you like to live where Polar bears live? Why or why not?

III.

5. How does the mother bear teach her cubs?

6. Why do you think the mother bear keeps male Polar bears away from the cubs?

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Printed Name/Position/Title: Isabel MacLean, Special Ed. Teacher

Organization/Address: Western Washington University, Bellingham, WA 98225

Telephone: 647-2893

FAX:

E-Mail Address: imaclean@ferndale.wednet.edu

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