Seven Cs of reading comprehension strategy/ graphic organizer

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SEVEN Cs OF READING COMPREHENSION
STRATEGY/GRAPHIC ORGANIZER

by

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1999

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A dissertation submitted in partial fulfillment
of the requirements for the

Doctor of Education Degree in Special Education
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SEVEN CS OF READING COMPREHENSION STRATEGY/GRAPHIC ORGANIZER

is approved in partial fulfillment of the requirements for the degree of

Doctor of Education in Special Education

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Examination Committee Member

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ABSTRACT

Seven Cs of Reading Comprehension
Strategy/Graphic Organizer

by

Michele Frances Farmer

Dr. Beatrice Babbitt, Examination Committee Chair
Professor, Department of Special Education
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The intervention was Seven Cs/graphic organizer, comprised of seven steps (connect, clarify, consider, collect, converse, conclude and cite) in a graphic organizer format. It is completed as the reader works through the reading process (pre, during, and after-reading) in a nonfiction reading selection. The purposes of this study were as follows: (a) to determine if the use of the Seven Cs strategy/graphic organizer increased nonfiction reading comprehension scores for middle school students with learning disabilities, (b) to determine if the use of the Seven Cs strategy/graphic organizer in other content areas increased reading comprehension for the participants when measured through scores on grade level probe assessments.

Six participants took part in the 11-week period, single subject reversal design, A-B-A-B, which included an instructional phase. Dependent measures included a pre-test and a post-test, daily reading comprehension quiz scores and, three grade level probes.
Participants were members of an inclusive seventh grade reading class in a large urban school in the western portion of the United States. Each day they completed a reading selection, a graphic organizer, and an associated quiz. The participants also completed three grade level probes, which were selections from a social studies seventh grade text. Results were analyzed individually. Data across participants was also analyzed as a means to determining whether there was a pattern of repeated improvement.

The results of this study demonstrated that from pre-test to post-test reading comprehension scores increased for each student. In the cases of three participants the use of the graphic organizer did not result in increased reading comprehension. In the cases of two other participants, there was an initial gain in daily reading comprehension but it was not maintained. In the case of one participant, his reading comprehension scores did improve with the use of the graphic organizer. At the end of the study there was not sufficient evidence to claim that the participants' use of the graphic organizer as an intervention, helped to increase reading comprehension.
# TABLE OF CONTENTS

LIST OF FIGURES ................................................................................................................viii

ACKNOWLEDGMENTS ..........................................................................................................ix

CHAPTER 1  INTRODUCTION: SEVEN CS OF READING COMPREHENSION/GRAPHIC ORGANIZER ..............................................................1

Historical Overview of Cognitive-Based Strategy Instruction .......................................4
   Early Development of Strategy Instruction 1950s-1970s .........................................4
   1980s Strategy Instruction Era ......................................................................................6
   1990s Strategy Instruction Era ......................................................................................7
Problem Statement ................................................................................................................8
Research Questions ..............................................................................................................9
Significance of the Study ......................................................................................................9
Limitations of the Study .....................................................................................................10
Summary ...............................................................................................................................10
Definitions ...........................................................................................................................11

CHAPTER 2  REVIEW OF LITERATURE..............................................................................15

Literature Review Procedures ............................................................................................16
   Selection Criteria Used ................................................................................................16
   Historical Review and Analysis of Studies ..................................................................17
Auditory/Language Dependent Strategies .......................................................................19
   Self-Monitoring/Self-Questioning Strategies ...........................................................19
Summarizing/Rewording Strategies .................................................................................23
Multi-Component Strategies ............................................................................................34
Summary of Research Related to Auditory/Language Dependent Strategies ...........40
Visual Dependent Strategies/Graphic Organizers ..........................................................40
Summary of Research Related to Visual Dependent Strategies/Graphic Organizers ....55
Dissertation Contribution ...............................................................................................  55
Literature Review Summary ..............................................................................................55

CHAPTER 3  METHODOLOGY ............................................................................................57

Purpose of Study .................................................................................................................57
Procedures ...........................................................................................................................57
Participants ..........................................................................................................................57
   Alba .............................................................................................................................58
   Boyd .........................................................................................................................59
LIST OF FIGURES

Figure 1  Percentage of correct responses for Alba........................................................... 84
Figure 2  Percentage of correct responses for Boyd.......................................................... 86
Figure 3  Percentage of correct responses for Conrad....................................................... 88
Figure 4  Percentage of correct responses for Daniel......................................................... 90
Figure 5  Percentage of correct responses for Edgar.......................................................... 93
Figure 6  Percentage of correct responses for Fernando.................................................... 95
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ix
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CHAPTER 1

INTRODUCTION: SEVEN CS OF READING

COMPREHENSION/GRAPHIC ORGANIZER

Middle school students with learning disabilities (LD) in the area of reading struggle to comprehend nonfiction materials such as content textbooks (Horton, Lovitt, & Bergerud, 1990). One reason they have difficulty is a failure to access prior knowledge of a topic, which can hinder their ability to create an appropriate visual image of the subject being studied (Zwaan & Radvansky, 1998). Another reason students with LD are considered poor readers is the fact that they do not rely on the use of effective strategies to aid comprehension. Rather, they often revert to instinctual evaluations that do not create a correct mental picture of the content being read (Schumaker & Deshler, 1984). Along with years of insufficient practice using reading strategies and below grade level reading ability, students with LD experience frustration trying to comprehend passages with extensive vocabulary and facts that are typical features of nonfiction selections. By using ineffective organizational techniques to process multiple facts and concepts, students with LD continue the cycle of poor reading comprehension (Horton et al.).

The ability to comprehend nonfiction reading materials is of extreme importance due to federal legislation such as No Child Left Behind Act (U.S. Department of
Education, 2002). This act mandates improvement of student achievement across the curriculum. Students with LD are expected to read proficiently or at their grade level by no later than the year 2014. The current climate of apparent accountability that prevails in K-12 public education has resulted in the identification of numerous measurement tools to assess academic achievement. In the state of Nevada, the Criterion Reference Test (CRT; Nevada Department of Education, 2006) is used to assess reading performance. Nonfiction passages are the predominant format used on the CRT (Nevada Department of Education). These passages are laden with facts and complex information. Students with LD often have difficulty identifying important facts without a solid basis of correct information (Shaywitz & Shaywitz, 2006). Erroneous conclusions contribute to lower reading comprehension (Ciborowski, 1992).

Additionally on the CRT, there is a reliance placed upon students' prior knowledge of the topic, which may be incomplete or completely void of applicable facts. This directly impacts their ability to create accurate mental pictures of reading passage content. Without the correct image, the result will be faulty conclusions, misconnections, and lower reading comprehension (Hirsch, 2006).

An organized method/strategy to assist students with LD when they are first accessing prior knowledge may lead to increased reading comprehension (Englert & Mariage, 1991). An effective intervention, such as a cognitive-based strategy in an organized format (graphic organizer), is likely to provide the support necessary for students with LD to become more accurate readers. The Seven Cs of Comprehension is a strategy that enables students to access prior knowledge and organize information found in nonfiction reading passages (Farmer & Soden, 2005). The strategy was
designed to assist students in clarifying misunderstood information as they use the steps of the reading process. The students use this strategy before reading, during reading, and after they have finished reading.

Additionally, the creation of a visual display using a specified format for students with LD facilitates greater organization and increased comprehension (Hughes & Schumaker, 1991). One effective format for ordering information is the graphic organizer (Boyle & Weishaar, 1997). Graphic organizers are diagrams that display information in a tiered, hierarchical fashion. Main ideas or essential elements are listed and details or facts are connected as subordinate branches (Horton et al., 1990). Graphic organizers provide a basis for student interaction with reading materials (Dunston, 1992). A distinguishing feature of graphic organizers is the arrangement of information. Words or phrases are connected graphically to form a diagram, which becomes a visual display (Moore & Readence, 1984).

The Seven Cs of Comprehension is also built upon the KWL strategy (Ogle, 1986) where students list what they know about a topic, their questions about the topic, and then what they have learned after reading about the topic. Within the KWL’s three steps, the provision to correct erroneous information is not directly addressed leaving students assuming that the beginning listed facts are correct. It is critical to build a foundation of correct information to help make bridges of greater understanding for students with LD (Graesser, Singer, & Trabasso, 1995; Hirsch, 2006).

Previous research has demonstrated that firm foundations of understanding are established through the use of cognitive-based strategy instruction (Hirsch, 2006; Mayer, 2001). The type of instruction was designed to encourage student motivation by
making the participant aware of how each step helped increased their ability to understand the topic. This type of instruction involved a purposeful step-by-step procedure designed to enhance student performance (Mayer). Furthermore, research indicated the use of cognitive-based strategies increased student self-esteem because they were more prepared to complete difficult assignments (Nolen, 1988).

Historical Overview of Cognitive-Based Strategy Instruction

*Early Development of Strategy Instruction 1950s-1970s*

Cognitive theorists in the late 1950s emphasized the role that inner thinking processes had on human intellect (Bruner, Goodnow, & Austin, 1956). Bruner et al. wrote that studying cognitive processes is fundamental to understanding how individuals retain information. Chomsky's writings in 1959, *A Dispute on Behaviorism*, also reinforced the idea that cognitive processes were more than just organized pieces of information. He referred to language as an example, where the construction of it is complex and infinitely recreated rather than just stored and reproduced (Chomsky, 1993). This approach to the acquisition of knowledge was a departure from the prominent behavioral theories that focused on addressing and modifying observable behavior (Bell-Gredler, 1986).

During the 1970s, cognitive theorists such as Meichbaum (1977) furthered the field regarding cognitive learning processes by defining stages of processing information. It was asserted that these stages included pre-perceptual, perceptual, recognition, integration, and executive, processing. During the pre-perceptual stage, learners are focused on the basic features/symbols associated with the concept under investigation.
Next, in the perceptual stage students are able to recognize information in relation to features and symbols while choosing which pieces of information will be stored in their long-term memories. Recognition processing includes attaching meaning to the recognized feature or symbol thus creating a body of information that is automatically retrieved. Finally, students are able to integrate new information with information held in their long-term memory thus creating expanded areas of information (Hresko & Reid). Each of these cognitive stages are interrelated and assist the individual in placing information in long-term memory.

As cognitive theory entered the field of education, it affected beliefs about the nature of student thinking (Pressley, 2003). When students are presented with a task/assignment, prior knowledge must be retrieved first. Next, the evaluation of the task must take place, followed by a set of procedural steps to complete the task or assignment. Each step then, is integral to the learning process (Kavale & Forness, 2006).

With the establishment of the United States Office of Special Education in 1977, research was delegated to several major universities to investigate cognitive-based instruction for students with learning disabilities. Columbia University researchers focused on the information-processing model, which applies characteristics of computer storage to that of human storage (Kavale & Forness, 2006). Researchers at the University of Virginia focused on cognitive-behavior modification techniques such as monitoring self-actions and self-regulation. Researchers at the University of Kansas investigated educational interventions for students with LD. Through these investigations and others it was hypothesized that how students learn, their ability to
perform, or lack of ability is the central concern rather than what a student is given to learn (Torgesen, 1977).

1980s Strategy Instruction Era

Research in the area of reading strategy instruction for adolescents was conducted at the Institute of Research in LD, University of Kansas (KU-IRLD) during the 1980s. A team of researchers (Lenz, Schumaker, Deshler, & Beals, 1984) developed a learning strategy curriculum. The curriculum included specific strategies designed to teach students the basics of how to learn. Several reading strategies were developed, validated and included in the curriculum. Some examples of these strategies are the **Word Identification Strategy**, the **Self-Questioning Strategy**, the **Visual Imagery Strategy**, and the **Paraphrasing Strategy** (KU Center for Research on Learning, 2007). The reading strategies assist student in decoding unknown words, creating relevant questions during reading, making mental images of a written story, and locating the main idea and details and restating them in their own words. Each of these strategies produced increased reading comprehension for its users (Sencibaugh, 2007).

Strategy instruction in the early 1980s focused on teaching student memorization of one strategy at a time. However, over the course of time later research focused on teaching a combination of strategies (Palincsar & Brown, 1988). One example of this is the POSSEE (predict, organize, search, summarize, evaluate) strategy. It incorporated four reading strategies, questioning, summarizing, clarifying and predicting textual information in a reciprocal teaching format. In this approach, students become the leaders of the instruction by working through each step of the strategy in a small group format and sharing their findings with the class as a whole (Englert & Mariage, 1991).
1990s Strategy Instruction Era

Cognitive strategy instruction of the 1990s was introduced to adolescents with LD to help them solve problems deciphering mathematical word problems. Cognitive and metacognitive processes were combined to help students solve one-step to multiple-step word problems. The cognitive portion included reading, paraphrasing, visualizing, hypothesizing, computing, and checking solutions for each word problem. Metacognition was included through the use of self-instruction, self-questioning and self-monitoring (Montague, 1992). The Cognitive and metacognitive components of this strategy combine application and self-regulation to create a strong bond between increased understanding and positive student self-esteem (Wong, 1994).

The incorporation of self-directed learning is also known as Strategic Content Learning (SCL; Butler, 1995). It uses the cognitive and metacognitive approach to strategy learning and defines the latest area of discovery in cognitive-based strategy research. The major emphasis of SCL is to assist students in constructing knowledge for success in a self-directed format that can be changed to meet the desired application. In other words, the strategy is used across multiple subject areas and is applied on a modified individual basis. The teacher guides students through the process of self-regulated task completion and assessment. The teacher serves as a facilitator instead of a disseminator of information.

While the aforementioned strategies do not begin to completely define the scope of the field of cognitive-based strategy instruction, they do provide a basis of historical movement in this field of research. The beginning goal was to assist students with LD to become strategic learners. This driving force grew to include the teaching and
acquisition of multiple strategies to meet desired academic goals. Along with the infusion of related strategies, the importance of student self-monitoring and evaluation was also discovered to be a vital link to students' academic success and strategic use of cognitive-based strategies.

Researchers have come to understand, that students with LD benefit from learning a variety of cognitive strategies. If students with LD fail to use the strategies, the result is a continuation of below grade level performance. However, students who are continuously immersed in strategy instruction across subject areas through teacher infusion with multiple opportunities for use are more likely to continue to use them in the future (Gaskins, Cunicelli, & Satlow, 1992). This fosters academic gains and increases positive students' self-perception of competence (Butler, Elaschuk, & Poole, 1998).

Problem Statement

The current state of literacy performance for middle school students with LD is problematic. Typically, students with LD are reading 2 to 3 years below grade level as their same age peers (Ciborowski, 1992). In many cases, students do not comprehend grade-level reading material even though they are able to decode the words included in the reading passage. One reason students struggle to understand concepts being presented in a reading passage is due to faulty prior knowledge (Sencibaugh, 2007). Researchers have found the failure to create an accurate mental image of a reading selection increases errors in student understanding (Biancarosa & Snow 2006). As students with LD progress through the reading process, rather than using accurate prior
knowledge as a support to better understand complex subjects, they make faulty or incomplete connections to prior knowledge. They often rely on information that is incorrect. In other words, they are building an incorrect mental picture of reading content. Consequently, poor reading comprehension is the result (Farmer, & Soden, 2005). Additional research is needed to identify strategies to assist students in building accurate mental pictures and subsequently improve their understanding of the content they read. The purpose of the study was to investigate the effectiveness of the Seven Cs Strategy/graphic organizer for improving the nonfiction reading comprehension of middle school students with LD. To address the problem, the following research questions will be answered.

Research Questions

1. Will the use of Seven Cs Strategy/graphic organizer increase reading comprehension scores in the area of nonfiction for middle school students with LD?

2. Will the use of the Seven Cs strategy/graphic organizer in other content areas increase reading comprehension for the participants in this study when measured through their scores on grade level probe assessments?

Significance of the Study

Many prior studies (Bimmel, 2001; Butler, 1995; Ciborowski, 1992; Meese, 2001; Shaywitz, & Shaywitz, 2006) concentrated on reading comprehension in the area of fiction, where determining the plot, sequence, and character analysis of a story were important factors of proficient reading. However, this study focused on nonfiction reading materials, which is an area of reading comprehension known to be problematic
for students with LD (Frey & Fisher, 2006; Gajria & Salvia, 1992; Hughes & Schumaker, 1991; Malone & Mastropieri, 1992). The potential benefits include helping students in several content areas such as science, social studies, and language/arts. Students who become more proficient in these content areas will be more apt to pass their courses and demonstrate proficiency on high stakes tests (i.e. Nevada State CRT). Student discipline problems may decrease as students become more engaged and successful in the learning process. An additional potential benefit will be more students will be able to graduate from high school. Moreover, continued academic success will increase their sense of positive self-worth throughout the remainder of their educational career and as lifelong learners.

Limitations of the Study

The dissertation was conducted in the fifth largest school district in the nation. However, the choice of participants were limited to one middle school within the researcher's geographical region. Thus, caution must be used when generalizing to other school districts and students in elementary or high school. However, the single-subject design A-B-A-B assisted the researcher in determining, on a case-by-case basis, if the strategy/graphic organizer was effective in increasing student reading comprehension of nonfiction content (Barlow & Hersen, 1984).

Summary

Middle school students with LD struggle with comprehension of nonfiction materials at a time in their school years where there is an increased demand to decipher content laden textual information. Typically, these students are reading below their
developmental grade level and need strategy assistance to grasp the main ideas and important details of what they read. Misconceptions, and or an erroneous knowledge base prevent the learner from creating the appropriate mental picture that is used for comprehension. The skill is especially important as it provides a foundation for understanding essential information needed to draw conclusions about the topic.

The intent of the study was to contribute information regarding the effectiveness of teaching a cognitive-based strategy, the Seven Cs of Comprehension, as an intervention to improve reading comprehension for middle school students with LD. Additionally, the configuration of the strategy in a graphic organizer format instructed the user in step-by-step procedures to connect, clarify, consider, collect, conclude and cite information without having to memorize specific strategy steps. The results of the study have practical implications for teachers of reading, language/arts, and content area subjects. Details related to this study are discussed in the following chapters. A review of literature applicable to the study is presented in Chapter 2. Methodology used for the execution of this study is discussed in Chapter 3. The results and discussion of the findings are reported in Chapters 4 and 5 respectively.

Definitions

The following terms and definitions were used in this study. They are presented in alphabetical order.

Cognitive-based Strategy Instruction is a purposeful step-by-step procedure designed to enhance student performance. It is designed to make the participant aware
of how each step is an integral part of increasing his/her ability to understand the topic of investigation (Mayer, 2001).

Direct Instruction is a systematic instructional methodology that may include scripted lessons administered by the teacher. The focus is on efficiently advancing students toward achieving mastery or 80% proficiency of a targeted concept (Becker, 2001).

Graphic organizers arrange concepts to be learned, connect concepts to prior knowledge, and provide a basis for student interaction with reading materials (Boyle & Weishaar, 1997; Darch & Eaves, 1986; Dunston, 1992).

Learning Disability as defined by I.D.E.A. Federal Regulations §300.7(c)(10)

. . . a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. (U.S. Department of Education, 2002)

Middle School Students average biological age is from 11 to 14 years. This is the time when males and females move from the physical setting of an elementary school to a middle school, which accommodates grades 6 through 8. Cognitive and biological changes, adjustments in size and an increase in hormonal levels are indicative for this age group (Harwell, 2001).

Paraphrasing is a restatement of a text, passage, or work giving the meaning in another form (Merriam-Webster, 2007). Typically, it is written in the author's own words.
Reading is the complex, purposeful, social, cognitive process where individuals use their knowledge of spoken and written language, their knowledge of topic and text, and their knowledge of culture to create meaning (National Council of Teachers of English [NCTE], 2006). It develops over time and continues to grow through practice with varied formats and for a multitude of purposes throughout a person’s life span.

Reading Process encompasses specific stages of student engagement in reading such as, the period of time before reading, during reading, and after reading. Students engage in relating new information to prior reading and or experience before reading. Students work toward understanding relationships between the text and his/her historical, social, and cultural context during their reading (Foertsch, 1998).

Self-Questioning is a reading strategy that assists students in understanding the authors’ message while they read the text. Students engage in mental self-talk to clarify the topic of the reading passage by internally asking questions while actively reading (Robinson & Smith, 2007).

Seven Cs of Comprehension is a cognitive-based strategy. It is comprised of seven steps connect, clarify, consider, collect, converse, conclude, and cite in a hierarchal format that moves the reader through the reading process of a nonfiction reading selection. Each step of the Seven Cs strategy aids in verifying and developing connections among correct information while the student is engaged in reading the selected material (Farmer & Soden, 2005).

Seven Cs of Comprehension/graphic organizer is a visual display that is used to organize information aligned with the steps of the Seven Cs Comprehension Strategy. It
assists students in constructing knowledge for success in a self-directed format that can be changed to meet the desired application (Butler, 1995).
CHAPTER 2

REVIEW OF LITERATURE

There are two purposes for the following literature review. The first is to summarize and analyze existing cognitive-based, auditory/language dependent reading comprehension strategies for middle school students with learning disabilities (LD) including self-monitoring/self-questioning strategies, summarizing/rewording strategies and training strategies packages. The second purpose is to summarize and analyze existing literature related to cognitive-based, visual dependent strategies in the area of nonfiction reading comprehension for middle school students with LD. Knowledge of these two literature bases will provide an understanding of their connections to increasing reading comprehension for middle school students with LD.

The chapter begins with the literature review procedures and selection criteria used for experimental studies related to cognitive-based nonfiction reading comprehension strategies, followed by a review and analysis of studies related to cognitive-based, auditory/language dependent, nonfiction reading comprehension strategies and a review and analysis of studies related to cognitive-based, visual dependent nonfiction strategies.

Finally, a summary and synthesis of research related to auditory/language and visual dependent nonfiction cognitive-based reading comprehension strategies is provided.
Literature Review Procedures

Studies included in this review were located through a comprehensive search of studies from the following databases: Academic Search Premier, Elton B. Stephens Company (EBSCO), Educational Resources Information Center (ERIC), Psychological Abstracts (Psych info), and Dissertation Abstract International (Proquest dissertations).

The following descriptors were used to conduct the search: cognitive-based reading strategies; cognitive-based strategy instruction, metacognitive strategy instruction, graphic organizers, LD content reading comprehension middle school, struggling readers, graphic organizers reading secondary, graphic organizers resource room interventions, mental visual images, nonfiction text strategies, narrative text strategies, prior knowledge strategy instruction, and scaffolding strategies LD.


Selection Criteria Used

Studies were included in the review of literature if (a) the research was published between 1975-2006, (b) participants were enrolled in secondary (middle school) or upper elementary public school, (c) students were identified either as having learning disabilities or as having reading difficulties, (d) the study included multiple subjects,
and (e) the purpose of the study examined the effectiveness of an instructional intervention related to students’ nonfiction reading comprehension. Studies were excluded from this review if: (a) participants were enrolled in pre-school or early elementary education, (b) the strategies were applied to students without disabilities without including students with LD; (c) the intervention strategy was isolated to vocabulary, decoding, phonics, reciprocal teaching, English language learners, fluency, computer assisted, non-cognitive based, and or fictional reading comprehension.

Historical Review and Analysis of Studies

Students with LD have difficulty with reading comprehension (Sencibaugh, 2007). Specifically, they struggle in the areas of recall of specific facts, inference, and prediction, which are associated with cognitive skills. Nonfiction materials are especially difficult for students with LD (Horton et al., 1990) due in part to the multitude of facts included in the text passage.

In contrast, students who read proficiently innately activate appropriate cognitive behaviors during the reading comprehension process. They use self-questioning while they are reading, which helps them monitor their understanding. They also stop to review material that is complex such as nonfiction textual passages (Swanson & De La Paz, 1998), which increases their reading comprehension skills.

Historically, previous studies have supported the importance of self-monitoring. For instance, the SQ3R strategy (survey, question, read, recite, review) developed by Wooster (1954) helped students recall important facts. Later, Wong and Jones (1982) used a modified SQ3R model to investigate lack of metacognition as a possible cause of
reading comprehension difficulties for adolescents with LD. A sample of \((N=120)\) students from 8th and 9th grades, whose mean age was 14.1 years, and who received daily 30 to 40 minute remedial services in a clinical setting, were assigned to a treatment group or a control group. The treatment group was taught a self-questioning strategy that was designed to cultivate metacomprehension. The treatment group was given a booklet that assisted in learning how to convert the main idea of a short reading passage into relevant questions. Corrective feedback was also provided. The control group received the same pamphlets but was not instructed in its use. Findings showed that the treatment group increased their reading comprehension, and in addition, students in the treatment group learned the importance of formulating appropriate questions during reading. The study confirmed a tendency of students with LD to rely on faulty reasoning skills while reading textual information.

Numerous studies indicate the important role of metacognition in improving reading skills for students with LD. Cognitive instructional strategies can be classified as either "auditory/language dependent" or "visual dependent" (Sencibaugh, 2007). For the purposes of the dissertation, auditory/language dependent strategies focused on self-monitoring/self-questioning and/or summarizing/rewording. Multi-component reading comprehension interventions focused on inference, textual organization, and reciprocal teaching. Visual dependent strategies focused on the use graphic organizers as visual displays, semantic maps and/or illustrations (Bender, 2004).
Auditory/Language Dependent Strategies

Self-Monitoring/Self-Questioning Strategies

Graves' (1986) study focused on self-questioning training for students with LD. The study used a sample of \( N = 24 \) 5th to 8th grade students with an average age of 12.4 years, who were assigned to one of three groups. Group 1 received direct instruction along with self-questioning strategy training. Direct instruction consisted of lecture lesson format where the teacher prompted students to access prior knowledge of topic and vocabulary, then assigned silent reading and a 10 question multiple-choice quiz. Training included the use of a check sheet to self assess reading comprehension midway through a reading selection. Students were told to stop during reading and complete a check for comprehension by using the sheet to paraphrase the main idea of the story. Group 2 received direct instruction only. Group 3 (the control group) did not receive any training but were told to find the main ideas in reading passages. Group 1 outperformed the other groups on a 10 item post-test that required them to complete a reading comprehension quiz administered by the instructor. Group 2 also demonstrated an observable difference from the control group, Group 3. The study verified that self-questioning combined with paraphrasing was an effective strategy for increasing reading comprehension.

Chan (1991) conducted a study that followed a self-questioning/self-regulatory training approach that also included a "think aloud" component. The purpose of the study was to measure the effects of self-instruction procedures, such as self-questioning to determine the main idea of short reading passages. Students \( N = 60 \) enrolled in three different Australian public schools were selected as participants in the study. The first
group \((N = 20)\), enrolled in the 5th and 6th grades \((\text{mean age} = 13.5 \text{ years})\), was reading 2 years below grade level and identified as students with a learning disability. The second group \((N = 20)\), enrolled in the 3rd grade \((\text{mean age} = 10.5 \text{ years})\), was identified as average readers without disabilities. The group’s reading age was comparable to the reading age of the learning disability group. The third group \((N = 20)\) enrolled in the 5th and 6th grades \((\text{mean age} = 13.5 \text{ years})\), was identified as average readers without disabilities. Researchers in the study taught a self-questioning strategy. It included using self regulatory techniques to find the main idea of a story. All instruction was provided in a resource room setting. Students were randomly assigned to either the standard instruction of strategy training or to the strategy/self-regulated condition. Students learned how to look for answers to questions while reading a paragraph. Students receiving the standard strategy training were given a demonstration on how to find and remove unnecessary information, delete peripheral information, rate sentences according to importance, and identify stated and unstated main ideas. Then, they were given class time to practice the strategy independently.

The group that was given strategy/self-regulatory training was taught the steps of the strategy and was also instructed on how to use a “think aloud” method as a means of checking for understanding \((\text{Chan, 1991})\). Guidance of how to conduct a “think aloud” was first modeled by the teacher. It was then practiced by student participation and teacher guidance, practiced aloud, independently whispered; and then faded to silent practice of self-questioning.

Results indicated a positive effect of strategy instruction for students with learning disabilities \((\text{Chan, 1991})\). Scores during generalization testing were higher (pre-test
mean = 8.20; post-test mean = 9.20) by an average of 10 points in the area of comprehension. Students in the group who received the strategy/self-regulated training improved their scores in finding the main idea with prompting once they returned to their homeroom. Once prompting to use the strategy was removed, this group continued to choose the strategy more than the standard instruction group.

The study (Chan, 1991) verified the effectiveness of teaching self-regulating strategies to students with learning disabilities as means of improving reading comprehension. The participants transferred the use of the strategies to other subject areas. Furthermore, students continued to use the strategy after the study was completed.

Graham and Wong (1993) also investigated self-regulated strategy training. The purpose of their study was to compare a two-strategy model, didactic teaching with 3H (information that is Here, Hidden, and in my Head) strategy and 3H self-instruction training, to determine which model was more efficient in helping students, who were considered poor readers, to improve their comprehension. A group of 5th and 6th grade girls and boys from four Canadian public schools ($N = 90$) were divided into two groups, poor readers ($N = 45$) and average readers ($N = 45$). Poor readers and average readers were designated as such by teacher observation and results of a standardized reading test. Schools considered to be of a lower socioeconomic status were the locations where above identified students attended daily instruction.

Random assignment was used to assign placement in the control group (no training), treatment-1 group ( instructional training in 3H strategy only), or the treatment-2 group (3H strategy training and self-instructional training). Each group
spent 3 weeks working on reading comprehension skills (Graham & Wong, 1993). All students were given the same reading materials to use during the study. The control group read through assigned reading selections and took quizzes after each reading. Strategy instruction was not included but the teacher helped students understand difficult vocabulary. Students in treatment-1 group learned the 3H strategy that included instruction on how to find information that is explicit (here), implicit (hidden), and implied (in my head), by using a question and answer format. Throughout the study participants in the treatment 1 group were required to transcribe their answers to the 3Hs. The treatment-2 group received self-instructional training in addition to 3H strategy training. They were given three questions that directed them to think about responding, investigating, and verifying their answers to questions on the quiz.

Data were collected and analyzed using a 2x3 analysis of variance total comprehension scores by group (Graham & Wong, 1993). The results indicated that training had a significant effect for both groups trained in didactic instruction \([F (1, 84) = 38.97; p < 0.01]\). Results for the self-instructional and strategy training group showed that the training significantly improved reading comprehension for both poor and average readers \([F (1, 56) = 5.32; p = 0.02]\). However, there was a lack of interaction effect for the two experimental conditions. Maintenance tests indicated a significant effect for both treatment groups but the treatment-2 group was higher than the control or the treatment-1 group \([F = 12.30; p < 0.05]\).

Results indicated that the 3H strategy training was effective in improving reading comprehension (Graham & Wong, 1993). Additionally, the study verified the use of self-instructional strategy as a means of increasing reading comprehension.
In summary, it appeared that students with LD can be trained to use self-monitoring/self-questioning/self-regulatory training strategies, including the “think aloud” component; and the 3H self-instructional and strategy training to increase reading comprehension (Chan, 1991; Graham & Wong, 1993; Graves, 1986). When students are effectively trained to use the self-monitoring strategy they experience success and have demonstrated that they transfer the use of the strategy to other subject areas. These students also exhibited behaviors related to proficient readers such as looking back while reading, which helps to build a framework of continued understanding.

Summarizing/Rewording Strategies

Strategies that use summary have been successful in improving reading comprehension for students with learning disabilities. An example is the *Paraphrasing Strategy* (Schumaker, Denton, & Deshler, 1984). The strategy required students to reword essential information in a reading selection. The basis of the strategy involved a regulated instructional delivery along with a step-by-step procedural plan to assist students in uncovering important facts in a textual passage. Students who engaged in using this strategy improved their grade level reading comprehension scores by as much as 35 points (Schumaker et al., 1984). The average pre-test score on a reading comprehension quiz was 48% correct compared to 84% correct after mastering and using the rewording strategy.

During the decade of field testing the Paraphrasing Strategy, repeated replications of the study with numerous students has demonstrated there is a high rate of success in
improving reading comprehension for secondary students with LD who learn and continue to use it. When students are able to find the main idea and supporting details of a story and then restate/summarize them in their own words, a mental connection is created in long-term memory that leads to increased reading comprehension (Bimmel, 2001). Rinehart, Stahl, and Erickson (1986) focused their study on the effects of training $N = 70$ 6th grade students identified as struggling/poor readers to use a summary strategy on their reading comprehension and studying behavior. Students were ranked in the 58th and 63rd percentile based on their score from the Gates/MacGinitie standardized reading comprehension assessment tool. They were randomly assigned to the experimental group or the control group. The treatment took 5 days of regularly scheduled class time for each group.

During the training period for the experimental group, the teacher instructed the students on the first day how to identify important information and supporting facts while eliminating unimportant and repeated information to create a summary (Rinehart et al., 1986). The teacher also modeled how to construct a summary by creating an outline while taking notes. On the second day, students used the teacher guide, created from day one, to assist in creating summaries of each paragraph in an assigned social studies reading passage. Students practiced summarizing groups of paragraphs into a one-paragraph summary on the third day. Day 4 consisted of summarizing a group of paragraphs without individually summarizing each paragraph. Day 5 students were given a test on their ability to summarize without the visual aid previously provided by the instructor. The assessment required students to summarize a reading passage by first creating notes/outline and next writing a summary inclusive of the main idea and at
least three supporting details. Students were graded according to the accuracy of the content in their notes/outline and the correct identification of the main idea and related details included in their completed summary. The control group followed their usual grade level reading and worksheet schedule during the same period.

Data were analyzed through an analysis of covariance using the Gates/MacGinitie score as the covariate (Rinehart et al., 1986). The treatment, summary strategy, had a significant effect \( [F (1, 62) = 5.28; p < 0.025] \) on the day five summary test without the use of a visual aid. There was also a significant effect on the quality of notes created by students in the experimental group \([F (1, 62) = 56.17, p < 0.001]\). Additionally, there was a correlation between the treatment and the improvement of student's recall of major information.

A second analysis of covariance test analyzed paragraph summaries using the 2(treatment) x 5(paragraph) as the covariate and the treatment as the repeated measure (Rinehart et al., 1986). The results demonstrated a significant main effect for both treatment \([F (1, 67) = 7.26, p < 0.01] \) and paragraph \([F (4, 268) = 23.98, p < 0.01] \), and the interaction between treatment and paragraph was statistically significant \([F (4, 268) = 3.77, p < 0.01] \). Results indicated that the treatment group wrote better summaries than the control group. Summary training also had a significant effect on the recall of major information.

A five-point summarization strategy for expository writing was the intervention introduced by Gajria and Salvia (1992). The purpose of their study was to assess the effects of summarizing instruction on comprehension for expository materials for \((N = 30)\) students with learning disabilities in the 6th to 9th grades. Students who participated
were identified with reading comprehension skills two grade levels below their peers, and were recipients of special education services. A group of average readers was also included in the study.

The study was conducted in two phases (Gajria & Salvia, 1992). The first phase involved dividing students into three groups: (a) treatment group students with LD, (b) no training provided students with LD, (c) average readers. Students were placed in small groups throughout the study. The length of the study encompassed 11 hours of regularly scheduled class instruction over a 4 week period. During this phase, the treatment group learned the steps of the summarization strategy. They were taught a replication of the summarization strategy conducted by Rinehart et. al (1986). Students in the control group and average reader group were not instructed in the strategy. The second phase of the study included an assessment for maintenance and transference. It was conducted 4 weeks post training.

Results of the study demonstrated an observable improvement in reading comprehension for the treatment group (Gajria & Salvia, 1992). This group also displayed improvement after the 4 week interval from training to post test. The assessment used in the study was also a replication of the Reinhart et al. study (1986). Where the Reinhart et al. study focused on struggling readers, the Gajria and Salvia (1992) study focused on students with LD. Interestingly, the outcome in both studies was improved reading comprehension for both groups. This evidence suggests that summarization is an effective strategy for struggling readers and students with LD.

Malone and Mastropieri (1992) studied the effects of summarization and self-monitoring on reading comprehension for \(N = 45\) students with a learning disability in
grades 6 through 8. One of their areas of interest was the impact of time on outcomes of student performance. Another area of interest was a comparison of performance between the trained group and the control group. The last area of interest was the role of metacognition as previously examined in the Graves (1986) research.

Participants in this study were identified as students with LD (Malone & Mastropieri, 1992). They were enrolled in special education for approximately 3.5 years and spent 40% of their day in special education classes. They were randomly assigned to one of three groups: (a) summarization training, (b) summarization/self-monitoring training, and (c) traditional instruction. All students were given an 8 item questionnaire about strategy use before and after the second day of training.

Students in the summarization group were taught how to summarize with dialog scripts by the teachers (Malone & Mastropieri, 1992). They were told to look for who the paragraph was about and what happened to them. From this information students were told how to create a summary sentence. After each paragraph there were blank lines to write a summary sentence based on facts they had retrieved from the paragraph. They finished the assignment by answering 12 recall questions. On day two, a review of the previous day was provided. Students re-read a previous paragraph from day one aloud and voiced their thoughts (in a classroom setting) to the instructor. Day three was the testing period. Students were given a post-test of the training, a near-transfer test, a far-transfer test, followed by a post-intervention strategy interview.

Students in the summarization/self-monitoring training followed the same regiment as the summarization group but were also given monitoring cards on day one and taught how to use them (Malone & Mastropieri, 1992). Each step of the summarization process
was written on the card so students could refer to it during the summarizing process. Students who received traditional instruction read stories from the same text as the treatment groups but did not receive any training. Additional stories were assigned to comply with the allotted time used in summarization training for the other two groups.

Results on the post-test, near-transfer, and far-transfer tests were analyzed using analysis of variance tests (Malone & Mastropieri, 1992). Students in summarization training recalled 63%, students in summarization/self-monitoring recalled 69% and the traditional group recalled 32% across question type. There was a significant main effect for treatment condition \[ F(2, 42) = 28.63; p < 0.000 \]. There was also a significant interaction for treatment condition and question type \[ F(2, 42) = 3.66, p < 0.034 \]. Simple effects analysis indicated the summarization group performed at a higher level on non-summary items. The monitoring group performed at a comparable level for summary and non-summary items. The traditional group performed at a higher level on the summary-related items. However, the traditional group excelled because they entered the study as proficient readers.

Results of the near-transfer test were: summarization/self-monitoring group recalled 65%, summarization group recalled 64% and the traditional group recalled 45% (Malone & Mastropieri, 1992). Far-transfer results were: summarization/self-monitoring group recalled 68%, summarization group recalled 56%, and traditional group recalled 38%. Pre-intervention and post-intervention data analyses were conducted using analysis of variance tests. Results indicated significant main effects for treatment condition \[ F(2, 42) = 3.45; p < 0.05 \] and testing time \[ F(1, 42) = 28.62; p < 0.001 \] and for time of testing by condition interaction \[ F(2, 42) = 4.58; p < 0.05 \].
Analysis indicated that both summarization groups increased significantly from pre-intervention questionnaires to post-intervention questionnaires.

Results demonstrated that summary training/self-monitoring statistically outperformed the traditional group (Malone & Mastropieri, 1992). Students' scores in this group demonstrated a significant increase in strategic knowledge from pre-training to post-training, whereas the traditional group did not show a difference. The research supported the use of summarization reading comprehension strategy instruction for students with LD. Furthermore, students in the summarizing/self-monitoring group performed better on the far-transfer test than the other two groups. The results validated metacognition as a critical factor of strategy instruction for secondary students with LD.

Jitendra, Hoppes, and Ping Xin (2000) examined the effectiveness of a summarization and self-monitoring strategy on reading comprehension for \((N = 33)\) students with learning disabilities enrolled in the 6th to 8th grades. Their study replicated and extended previous studies (Chan 1991; Graves, 1986; Malone & Masterpieri, 1992) by using the same steps of summarization. The steps included locating main idea, eliminating unimportant information, and rephrasing individual paragraphs along with the use of a self-monitoring card.

Training for the treatment group (students taught the summarizing strategy and use of the self-monitoring card) were conducted in the school cafeteria (Jitendra et al., 2000). Students in this group were first taught how to use the strategy then moved to independently work through a social studies reading selection to find the main idea and create a summary statement. Self-monitoring cards listed a four-step procedure that required the user to place a check mark next to each completed task. Students were
encouraged to fade card usage once they were familiar with the list. The control group were taught in the regular classroom setting, assigned the same reading selections but was not trained in strategy usage.

Overall scores were analyzed using a 2 (group: treatment and control) x 3 (time of testing: pre-test, post-test, delayed post-test) analysis of variance test with repeated measures on time of setting (Jitendra et al., 2000). Significant main effects were found for group \[ F(1, 31) = 16.57; p < 0.001 \] and time of testing \[ F(2, 62) = 7.49; p < 0.01 \]. A significant interaction effect was found for group by time of testing \[ F(2, 62) = 20.31, p < 0.001 \]. The treatment groups’ scores increased significantly from pre-test (Mean = 10.06) to post-test (Mean = 16.94). Results from the training measure showed significant main effects for group \[ F(1, 31) = 25.78; p < 0.001 \]; response type \[ F(1, 62) = 56.03; p < 0.001 \] and time of testing \[ F(1, 62) = 6.65, p < 0.01 \]. Scores for the treatment group (Mean = 3.33) were markedly higher than the control group (Mean = 1.72) on response scores. Transfer measures both near and far favored the treatment group.

Students in the treatment group outscored the control group on post training items and improved their performance on the delayed test according to the researchers involved in the study. The findings supported previous results of similar studies. Additionally, students maintained and increased their post-test performance 6 weeks later on the far transfer test. Jitendra’s et al. (2000) findings indicated that explicit instruction of main idea comprehension strategy skills and self-monitoring techniques are beneficial for students with a learning disability.
Esser (2001) was interested in determining the effects of attitudinal training along with a summary strategy approach as a means of improving reading comprehension for students with LD. Although Esser’s focus was on a specific population, the study added an important aspect which involved students’ beliefs about personal success after learning the strategy. Esser enumerated several purposes of the study. The first purpose was to determine if African American students with LD embodied a pattern of academic achievement that differs from students without disabilities. The second purpose was to determine if the treatment interventions would affect metacognitive awareness for the specified group of African American students with LD. The third purpose was to determine if treatment interventions would impact the participants’ beliefs that success or failure may be linked to personal ability or applied effort. The last purpose of the study was to determine if the treatment interventions improve reading comprehension for the participants.

Of the students ($N = 110$) from African American middle schools enrolled in an urban public school in the Midwest involved in Esser’s (2001) study, 30 were average readers and 80 were identified as having LD. The total sample consisted of 66 boys and 44 girls randomly assigned to one of three treatment interventions or part of the control group. Students with LD were chosen by using a multi-disciplinary team approach, excluding any participants whose scores were due to an emotional disturbance or inadequate curricular instruction. Students who participated in the average reader group were identified through IQ tests, and scores on the Wechsler Individual Achievement Test rating them as proficient or above grade level in reading comprehension. All students were in the general education classroom setting throughout the 2 year study.
Procedures included replicating three treatment conditions four times during the course of 2 years. The three treatments were (a) metacognitive strategy training only (MST), (b) attribution retraining only (AR), and (c) combined metacognitive strategy and attribution retraining (MST+AR). Students were randomly assigned to the MST, AR, MST+AR or the control group. The control group received no training. Twenty students were enrolled in each of the three treatment groups and half ($N = 10$) were identified as LD. In the control group ($N = 30$), 10 were identified as having a learning disability. Pre-tests were administered to determine the participants’ understanding of metacognitive strategies, attributions for academic achievement, and their reading comprehension grade level. Students in the MST group received 3 weeks of strategy instruction on how to preview a text, use prior knowledge and summarize a reading passage. Students in the AR group received training in positive self-talk and attitudes of school success/failure over a 2 week period. The MST+AT group received a combination of strategy and attitudinal training together during their 50 minute class period. The control group read non-fiction passages and answered multiple-choice questions without any training.

Data were analyzed using a one-way repeated measures analysis of variance to test differences among groups (Esser, 2001). IQ scores were used as covariates. Dependent variables were student scores on the metacomprehension strategy test and attribution for academic achievement test. These measures were administered pre and post-training. Results of the study revealed a significant treatment effect for the combined MST+AT group [$F(2, 17) = 3.965; p < 0.03$]. The expected outcome confirmed treatment interventions did affect metacognitive awareness for the specified group of African-American students.
American students with LD. Pair wise comparisons demonstrated significant differences between the LD groups. However, there was no significant difference between the groups. The information ruled out the hypothesis that there was a link between beliefs of personal performance and academic ability. The outcome between treatment groups and the control group, indicated treatment interventions were successful in improving reading comprehension for the participants. Mean average scores for students in the treatment groups were 1.40 points higher on the post-test, whereas the control group’s scores decreased by 1 point from pre-test to post-test.

Metacognitive training along with attitudinal training resulted in positive outcomes for African American students with LD (Esser, 2001). Teaching students with LD to plan, monitor and evaluate their performance on a given task resulted in improved reading comprehension performance for all treatment groups but most significantly for MST+AT group. The study confirmed that reading comprehension improved for the participants after learning and using the strategies.

In summary, research involving summarization strategy training resulted in improved reading comprehension for students with LD. Specific instructions aligned with clear teacher directives yielded positive outcomes (Gajria, & Salvia, 1992; Jitendra et al., 2000; Malone, & Mastropieri, 1992; Rinehart et al., 1986; Schumaker et al., 1984) such as cue card prompts to find the main idea and supporting facts. When students engaged in rewording, whether written or spoken, results demonstrated improvement in reading comprehension scores (Malone & Mastropieri; Schumaker et al.). Notably, when students were taught to monitor their use of the strategy, transference was maintained for a prolonged period of time past post-testing. These
findings validate the use of summary strategies to improve reading comprehension for students with learning disabilities. Also, when paired with self-management, it is a strategy that students continue to use during the maintenance and post-maintenance phase.

Multi-Component Strategies

The purpose of Philips' (1988) study was to explore inference strategies used by middle school readers of varying reading comprehension proficiency and varying background knowledge. She was interested in determining if struggling readers employed the same inferential strategies as proficient readers and how prior knowledge would dictate strategy usage. The researcher used 10 strategies with the participants: (a) Rebinding, (b) Questioning inaccurate interpretation, (c) Shifting of focus, (d) Analyzing alternatives, (e) Assigning an alternate case, (f) Confirming an immediate prior interpretation, (g) Confirming a non-immediate prior assumption, (h) Assuming a default interpretation and transforming information, (i) Withholding or reiterating information, and (j) Empathizing with experience of others.

Of the \(N = 80\) 6th grade students participating in this study, 40 were high-proficient readers and 40 were low-proficient readers from two Canadian cities (Philips, 1988). Determination of proficiency was based upon percentile ranking derived from the Canadian Test of Basic Skills with high-proficiency students being ranked above the 85th percentile and low-proficiency students being ranked below the 50th percentile. The low-proficiency readers exhibited similar characteristics of students identified as LD. Their reading comprehension skills were considered to be equivalent to a 3rd or 4th
grade reading comprehension level. Students were randomly assigned to read either three passages where they were familiar with the topic, or three unfamiliar passages. Procedures of the study included the use of a set of six passages and quizzes based on inference and clarification. Oral “think-alouds” (verbally expressing thoughts/ideas after reading) were required, where students expressed inferences as they read each passage.

Data were analyzed using a 2-way multivariate analysis of variance test that demonstrated a significant interaction between background knowledge and proficiency level, making the main effects unreadable (Philips, 1988). The result indicated that strategy use is a function of both prior knowledge and reading comprehension acumen. Interaction effects were analyzed using four possible levels of prior knowledge and reading comprehension proficiency. The results suggested that strategy 10 (the reader personally identifies with narrative and projects personal attitudes of response to circumstances in the reading passage) contributed more to understanding the text than any other strategy by proficient readers. However, all readers used strategies 4 (the reader questions possible outcome and provides alternative endings until more information is made available) and 6 (the reader confirms interpretation on information that immediately follows) most often. High-proficiency readers engaged in strategies 3 (most recent information acquired from reading passage does not align with previous interpretation, reader adjusts questions to resolve misconnection); 6 and 10 more often than the low-proficiency reader group. When the material was unfamiliar, both groups used strategies 5 (the reader has no prior knowledge and following information does not
provide needed clarification) and 9 (the reader rephrases previous interpretation of the reading passage without adding additional insights, or does not offer any interpretation).

The study confirmed the importance of prior knowledge as a critical link creating a basis of understanding for all students (Philips, 1988). It also verified that strategies that include the use of prior knowledge help students with LD improve reading comprehension ability.

The purpose of the Englert and Mariage (1991) study was to determine the effectiveness of an instructional procedure known as POSSE (Predict, Organize, Search, Summarize, and Evaluate), which was based on a reciprocal teaching approach with at risk students. A sample of (N = 28) 4th through 6th grade students with LD were assigned to 1 of 2 groups, the intervention group or the control group. All testing was conducted in a resource room setting over a 2 month period.

The beginning phase of the study involved the teacher reading a short nonfiction passage about animals to the participants (Englert & Mariage, 1991). Next, the students were asked to recall the story. Researchers assigned scores for recalls based on the total number of ideas recalled from the story. Students were also tested on strategy knowledge by asking them to predict what kind of information they would find in a story. After reading two paragraphs, students were required to generate a main idea statement and make a predication of what the author might write next. Finally, students were asked to identify appropriate reading comprehension strategies to use through each step of the reading process.

After the pre-test phase, the teacher taught students in the intervention group the POSSE strategy (Englert & Mariage, 1991). The teacher formed small groups; and
strategy cards were used to help the leader of each group maintain the focus. When leaders felt that they could make important decisions about monitoring and establishing learning procedures, the cards were faded. Students in the control group engaged in their regular reading routine without working in small groups.

Analyses of data included procedures for scoring recall information from 0-3 based upon the quantity of accurate information remembered by the student (Englert & Mariage, 1991). Additionally, there was a 0-2 point score for strategy knowledge that involved students’ ability to accurately predict associated information from the reading selection. A 0-2 point score was applied to student-generated main ideas, questions and predications.

A multivariate analysis of covariance was performed. Results revealed a significant main effect for instructional condition \( F(3, 18) = 6.77; p < 0.01 \). The intervention group recalled significantly more ideas and created better organized written recalls than the control group. Englert and Mariage (1991) believed the POSSE intervention assisted students during reading and helped them understand story structure. Students who were trained to use the strategy made significant gains in their ability to recall portions of a nonfiction passage. The inclusion of group work allowed students to collaborate with peers and practice the strategy. The results of this study validated group work along with specified procedural steps as a means to increase reading comprehension for this population of students.

Bakken, Mastropieri, and Scruggs (1997) designed a training package that included strategies to help students with LD identify three different types of organizational structure found in a textbook, as well as be able to identify the main idea of a nonfiction
reading selection within the text. Eighth grade students \((N = 54)\) with LD participated in the study. The researchers taught participants how to apply specific text structure strategies to aid comprehension.

Students were randomly assigned to 1 of 3 groups which were: (a) text-structure-based strategy (TSBS), (b) paragraph restatement strategy (PRS), or (c) traditional instruction strategy (TIS; Bakken et al., 1997). Materials used for the study, across all conditions, included teacher scripts, instructional passages from a grade level science text, and student assessment booklets. The test booklets included one immediate test and one transfer test.

On the first day of the study, the TSBS group was taught concepts of book organization (Bakken et al., 1997). They also learned how to find the main idea. The next day they were taught how to effectively list general topics of each passage. On day three, the TSBS group learned how to locate general information. They were also taught how to compare similarities and differences of the strategies they learned on days one-three. The PRS group learned how to create a summary on day one. They continued to practice this strategy for the duration of the study. The TIS group learned how to read a specific passage and answer associated questions. They continued this procedure throughout the duration of the study. All groups were tested on day four and day five. The test on day five was a social studies passage to determine if transference would occur.

Results from the analysis of variance test with repeated measures for type of idea unit indicated a significant main effect \([F(3, 51) = 81.92; p < 0.001]\) and a significant interaction for type of idea unit \([F(3, 51) = 5.59, p = 0.006]\) (Bakken et al., 1997). The
PRS group outperformed students in the TIS group. Additionally, TSBS group outperformed the TIS group on recall of the material.

Results of the study verified that middle-school students with LD could learn to identify types of expository text and apply appropriate strategies to aid comprehension (Bakken et al., 1997). Tests on transference of strategy use demonstrated that students in both strategy groups out-performed the traditional group. Furthermore, this study validated that when students are taught how to identify differences in text structure and taught appropriate strategies to facilitate understanding the material, reading comprehension increases in the area of recall.

In summary, multi-component reading comprehension interventions provided options for students struggling to understand nonfiction text by promoting a continuum of instruction from simple to complex strategy use. The outcome has provided students with LD a means of support that can be gradually faded when no longer necessary. For instance, cue cards that led small group instruction were eventually discarded once the designated leader was familiar and comfortable with leading group discussion (Englert & Mariage, 1991). The small group method can then be modified to a paired activity or used individually. The goal is to infuse the nonproficient reader with a skill set that is easily adapted to multiple situations. When students used these comprehension promoting strategy packages, the result was improved reading comprehension for the targeted group. Finally, students with LD involved in these studies demonstrated their ability to acquire and continue to effectively use the strategy across other settings (Bakken et al., 1997; Englert & Mariage, 1991; Mastropieri & Scruggs, 1997; Phillips, 1988).
Summary of Research Related to Auditory/Language Dependent Strategies

Based on the review of literature, it appears that auditory/language dependent strategies are effective means of augmenting reading comprehension for students with LD (Beals, 1984; Biancarosa & Snow, 2006; Englert & Mariage, 1991; Esser, 2001; Graham & Wong, 1993; Graves, 1986; Phillips, 1988; Wong & Jones, 1982). It also appears that these strategies are most effective when students are taught the importance of self-questioning/monitoring behaviors during the reading process. Furthermore, students' self-perception tends to change in a positive direction when students receive specific, direct instruction (Esser).

Since students with LD often lack the skills or inner language to create an organized plan for understanding facts, details, and interpreting information of a written text, these auditory/language dependent strategies provide specific steps to fill in these gaps. Research on auditory/language dependent strategies have demonstrated that significant gains in reading comprehension are attainable for students with LD. Researchers should continue to explore factors related to auditory/language dependent strategy instruction that will create transference beyond a limited 6 week time frame.

Visual Dependent Strategies/Graphic Organizers

Graphic organizers arrange concepts to be learned, connect new concepts to prior knowledge, and provide a basis for student interaction with reading materials (Boyle & Weishaar, 1997; Darch & Eaves, 1986, DiCecco & Gleason, 2002; Dunston, 1992; Gersten, Fuchs, Williams, & Baker, 2001; Kim, Vaughn, Wanzek, & Wei, 2004). Graphic organizers take many forms such as Venn diagrams, timelines, webs,
hierarchical charts. Strategies that incorporate graphic organizers assist students in creating connections between factual information and conceptual understanding (Wang, 2006). Graphic organizers also offer a concrete representation of textual information that is organized in a logical sequence. They help to reinforce mental images needed for future recall (DiCecco & Gleason; Prawat, 1989). Students with LD often have difficulty learning from expository text due to an inability to select, organize and integrate critical information (Armbruster, Anderson, & Meyer, 1991). Research related to graphic organizers has demonstrated that measurable gains in reading comprehension can result for secondary students with LD.

Sinatra, Stahl-Gemake, and Berg (1984) found graphic organizers to be an effective technique to increase reading comprehension for students with LD. The research group studied \( N = 27 \) students ranging in grade from 2nd through 8th were enrolled in the researcher's university remedial reading comprehension program. All students had demonstrated difficulty in reading comprehension through the pre-test assessment. Six students were enrolled in special education services during the school year. This study encompassed 4 months and was conducted at the researcher's clinic.

During the study, all students were taught to use a verbal readiness approach and an associated graphic organizer approach (Sinatra et al., 1984). The verbal readiness approach followed a traditional directed lesson format. Three different types of graphic organizers were taught, which included vocabulary mapping, thematic elements webs (details of person, places, and things connected to central theme), and classification displays. After students reached proficiency using each graphic organizer, they were
assigned a reading passage and encouraged to choose a graphic organizer. After completing the assignment, students took a 10 question multiple-choice quiz.

The researchers used an analysis of variance and their experimental design to evaluate the data. When Sinatra et al. (1984) compared the results of the scores between verbal readiness and graphic organizer; they determined that 70% of the participants scored higher on the multiple-choice quizzes when a graphic organizer was used during reading. The difference was significant as indicated by the $t$-test conducted [$t (25) = 2.41; p < 0.05$]. Students who used the graphic organizer as a support for recalling information demonstrated improved scores, which demonstrated the graphic organizer’s potential benefits for students who struggle with reading comprehension. The results confirmed that the visual/spatial configuration of a graphic organizer helped struggling readers organize information during the reading process.

The purpose of the Darch and Eaves’ study (1986) was to investigate the effectiveness of visual spatial displays (graphic organizers) on reading comprehension for ($N = 22$) students with LD enrolled in secondary education. Participants were randomly assigned to either the treatment group, which received instruction on visual displays or the control group, which received traditional text instruction. The study included 12 days of classroom instruction in a resource room setting. Reading passages were nonfiction texts. Materials used as the dependent measures were a 5 item unit test administered daily, a 10 item post test administered the last day, a 10 item maintenance test administered 10 days after completion of the instructional units, and a 5 item transfer test (treatment group only) on unrelated content and correct use of a visual display.
Procedures of the study included training and practice using the visual display for the treatment group (Darch & Eaves, 1986). Following the training these students were placed in small groups and engaged in a game-like activity where they filled in a blank visual display with information from the text. The control group also worked on the same reading assignment but followed a direct instructional format.

When the study was complete, data were analyzed from the three unit tests with a 2x3 analysis of variance with repeated measures (Darch & Eaves, 1986). The between group-factor was type of instruction (i.e., treatment versus control) and the within-subjects factor was time of the test. The analysis indicated a significant main effect for type of instruction \( F (1, 20) = 9.14; p < 0.01 \) that favored the treatment group. The results of the post-test transfer test and maintenance test were analyzed through \( t \)-tests for independent samples. The visual display group had a mean score of 83% correct; the text group had a mean score of 57% correct. The difference was significant \( t (20) = 3.19; p < 0.01 \).

The study verified that the treatment using visual displays was an effective intervention for the participants (Darch & Eaves, 1986). Students in the treatment group remembered more information as evidenced through post-test scores. Additionally, specific strategy instruction coupled with the use of a graphic organizer helped students with LD retain information for a longer period of time. By linking strategy instruction with the use of graphic organizers at the secondary level for students with LD reading comprehension increased.

Idol and Croll (1987) conducted a single subject study using the A-B-A design with \( N = 5 \) students ranging in age from 10 years to 12.9 years. The purpose of their
research was to determine possible effects of story mapping on student reading comprehension. They were also interested in finding out if the use of a story map would increase standardized test scores, listening comprehension, and reading comprehension for the participants. Four of the 5 students were identified as having a learning disability and receiving special education services. During the study individual instruction was administered by four master's level students enrolled in the Resource/Consulting Teacher program in the Department of Special Education at the University of Illinois.

Procedures of the study included a pre-assessment to determine decoding, fluency, and grade-level reading ability to align reading materials to the highest level possible for each student (Idol & Croll, 1987). Students were randomly assigned to 4, 7, 8, 10 and 17 days of baseline. During baseline, students read a short passage while the teacher corrected oral reading errors. Students then taped their own retelling of the story. They completed this phase by answering concrete comprehension questions that could be found in the text. During the intervention phase the instructor taught students how to use the story map, filling in relevant sections as the story was read. Next, students independently completed a story map while reading. After reading, each student reviewed the map and answered comprehension questions. Once 80% accuracy of the strategy was attained per student, the intervention was ended. Baseline procedures were followed to determine the intervention effectiveness.

Results of the study were analyzed by conducting an analysis of variance with repeated measures across students who completed all phases (Idol & Croll, 1987). The effect of phases was significant \[ F(2, 219) = 58; p < 0.001 \]. This indicated that improved reading comprehension was maintained after removal of the intervention. An
analysis of variance with repeated measures \[ F(1, 223) = 109; p < 0.001 \] demonstrated a significant difference between baseline and intervention changes for all the participants. The study validated the use of graphic organizers to attain improved reading comprehension for the participants.

Bos, Anders, Fillip, and Jaffe (1990) used a graphic organizer termed semantic feature analysis (SFA) to determine its effectiveness on vocabulary instruction for \( N = 50 \) high school students identified as having LD. Resource room English and social studies classes made up the population of participants of which half \( N = 25 \) were randomly assigned to the experimental group (SFA), and half \( N = 25 \) were randomly assigned to the control group (dictionary method). The study was conducted during a 4 week period that included a pre-test and a post-test assessment. Six months later, a 20 item test was administered.

The SFA group learned how to create a relationship chart of vocabulary and definitions (Bos et al., 1990). Each relationship was rated (a) positive, (b) negative, or (c) not known ideas. Once the chart was completed, students read a social studies passage to confirm or to clarify unknown relationships listed in the chart.

The dictionary method group entered into a discussion of topic of the reading passage. The teacher went over a vocabulary list and students verbally repeated each word. The list was placed on the board for student reference. Students were instructed to use the dictionary to write the definition and a sentence that related to the Fourth Amendment. At the end of the dictionary activity, students were assigned a reading selection and required to create a written definition of assigned vocabulary.
Data were analyzed to determine the short and long-term learning effects of the two instructional practices on reading comprehension of the participants in the study (Bos et al., 1990). A 2x2 multivariate analysis of covariance was used. “Type of Instruction” served as the between factor, and “Time of Testing” (beginning and follow up) served as the within factor. The dependent variable was the test. The test included vocabulary and conceptual questions. Students in the SFA group performed significantly better on vocabulary and concept understanding items. Results of the multivariate analysis of covariance showed a significant main effect for type of instruction \[ F (2, 46) = 24.10; p < 0.001 \]. Results of the second multivariate analysis of covariance indicated that prior knowledge made a significant difference on the test \[ F (2, 46) = 5.92; p < 0.05 \]. Results from the study verify the use of a semantic feature analysis for students with a learning disability in secondary education.

Horton et al. (1990) simultaneously conducted three experiments regarding the use of graphic organizers as an intervention for students with LD. The first study involved an investigation of the effect of teacher directed graphic organizers in comparison to a self-study condition. The participants were 3 classes of \( N = 68 \) science middle school students, of which 5 were students with LD; and 3 classes of \( N = 36 \) social studies high school students, of which 3 were students with LD. Classes were randomly assigned to either the treatment group (teacher directed) or the control group (self-directed) through the use of random assignment. Materials included in the study were two reading passages from their content textbook.

The control group was instructed to use a graphic organizer and read, and then re-read an assigned passage for 15 minutes (Horton et al., 1990). Next, they completed the
graphic organizer. There was no formal training in the use of graphic organizers. Students were required to work independently to complete the assigned and follow-up test.

The treatment groups also read and re-read the passage for 15 minutes (Horton et al., 1990). Then the teacher directed students on how to fill in the graphic organizer. They completed a reading assignment and filled in the graphic organizer during reading. Before taking the follow-up test they were allowed to review information listed in the graphic organizers for no more than 5 minutes.

Analyses of data were conducted using an analysis of variance 2 (class) x 2 (treatment) with repeated measure on the last factor (Horton et al., 1990). Results indicated a significant treatment effect for students in the treatment groups: middle school \( F(1, 40) = 45.22; p < 0.01 \) and high school \( F(1, 46) = 15.81; p < 0.01 \). Middle school students in the treatment group averaged 86% correct compared to self-directed group at 57% correct on unit tests. The researchers also conducted a \( t \)-test \( t(7) = 4.39; p < 0.01 \) on students with LD. Students with LD in the treatment group averaged 73% correct whereas their counterparts in the control group averaged 30% correct on the post-test.

Horton et al. (1990) noted the lowest score in the teacher directed group was higher than the best score in the self-study group. This experiment substantiated the effectiveness of graphic organizers over self-study methods of learning for middle school students with LD.

Horton et al. (1990) was interested in determining if students could replicate the effects of the prior experiment with student-directed graphic organizers in the second
experiment. The graphic organizer contained reference cues but required students to work independently. Participants in this study were the same students enrolled in the first study.

Students in the treatment group were given a reference sheet that included instructions on "how" and "where" to locate answers from the text (Horton et al., 1990). They also received instructions on how to use the reference sheet but were required to work alone. The control group was not provided any assistance and told to use self-study techniques to help them remember important facts. Self-study was the comparison measure used.

Results from t-test \( t (7) = 7.40; p < 0.01 \) showed that students with LD in the treatment group performed better than their peers in the self-directed group (Horton et al., 1990). Middle school students with LD in the treatment group scored 71% of items correctly compared to their self-study peers' score of 19% correct on the post-test. High school students with LD also outperformed their peers with an 89% average versus a 56% average for their counterparts in the control group. Results from this experiment confirmed the beneficial use of graphic organizers across age groups, content course and varying populations of students.

The objective of the third experiment by Horton et al. (1990) was to determine the effectiveness of a variation of a student-directed graphic organizer. Participants involved in the study included students enrolled in three middle school science classes \( (N = 69) \), three middle school social studies classes \( (N = 79) \) and three high school health classes \( (N = 75) \) of which four were students with LD. Classes were randomly assigned to the treatment group (graphic organizer and clues list) or the control group
(self-study techniques). Even though the population of students with LD was small the results experienced by their group is significant when related to the results of their same age peers who were also included in the study.

Procedures of this study included the use of content area text for all students (Horton et al., 1990). Graphic organizers and list of clues were provided for treatment groups. Both groups were assigned reading selections from the text. The treatment group was encouraged to use the clues to help complete the graphic organizer. The control group was instructed to engage in self-study skills to find the answers to unit questions. The post-test included the accurate completion of a graphic organizer in addition to the completion of a comprehension test on the assigned reading of the science or social studies text. All students were required to complete this unit test.

Post-test results were analyzed in a 2 (class) x 2 (treatment) analysis of variance test that revealed significant treatment effect for middle school science \[ F (1, 4) = 79.73; p < 0.01 \], and middle school social studies \[ F (1, 52) = 56.87; p < 0.01 \] (Horton et al., 1990). Average post-test scores for treatment groups were 82% compared with same age control groups at 50% correct. High school students' post-test scores average was 89% compared to their control group's score of 61%. The results verified that the use of graphic organizers produced positive results for a heterogeneous group of participants. All three studies demonstrated the advantages of using graphic organizers in the classroom.

Kuehne's dissertation (1997) focused on the use of graphic organizers as a science reading comprehension method for \( N = 37 \) 5th grade students with learning disabilities selected randomly from three Louisiana public schools. Three different types of
instruction were used to create two experimental and one control group. The groups included: student constructed (SC) graphic organizers; teacher created graphic (TC) organizers; and traditional instruction (TI). The entire study took 3 weeks to complete. Participants in the study were classified as LD based on multi-disciplinary evaluations consistent with the state of Louisiana Department of Education requirements.

Materials used were three chapters from the assigned science text for 5th grade (Kuehne, 1997). Teacher constructed graphic organizers included one generic and four specific graphic organizers that were aligned by chapter in the text. Index cards with essential concepts written on computer generated pictures of associated concepts were used by both SC and TC groups. The researcher constructed a 25 item pre-test and post-test covering the three chapters. Student created graphic organizers were scored based on (a) the effective use of categorization, (b) demonstration of relationship correspondence, and (c) overall construction of the graphic organizer.

During the first week, all groups received traditional instruction (Kuehne, 1997). Beginning with week two, the SC group learned how to make graphic organizers. Then, in week three all groups received instruction according the confines of their group assignment. Post-tests were performed week three during the last day.

An analysis of covariance was used to control for initial differences in students that may have been present (Kuehne, 1997). Results indicated knowledge between groups was not significantly different. Pair wise comparisons were conducted on the dependent variable, science achievement, and the independent variables, the SC; TC or TI groups. A significant difference was found between SC and TC group $[F (2, 32) = 10.23; p <$
There was also a significant difference between SC and TI group \( [F (2, 31) = 6.64; p < 0.05] \).

Kuehne (1997) suggested the difference between the SC and the other two groups was due in part to the metacognitive portion of organizing information in a hierarchal format. This caused the SC group to think about how concepts fit together while creating a visual image. Although the TC group performed better than the control group (TI), the self-constructed graphic organizer seemed to provide a basis for student retention of the material. The post-test mean score for the SC group was 13.5 out of a total of 25 with the TC group's mean score being 11.2. The study was conducted over a short period of time, which impacted the final results. However, within the short time frame students who used the graphic organizer improved reading comprehension scores. The study confirmed that the use of graphic organizers helped to improve nonfiction reading comprehension.

DiCecco and Gleason (2002) were interested in determining the effect graphic organizers had on recall and retention of information found in social studies text material for students with LD. They chose \( (N = 24) \) middle school students from two public schools in Oregon as participants. Students were enrolled in a special education program, and they had an active Individual Education Plan (IEP). Students were randomly assigned to the treatment group (received graphic organizer instruction) or the control group (no graphic organizer instruction). The study was completed over 20 days during a regularly scheduled 40 minute period in resource rooms of the two middle schools.
Materials used for the study included eight selected passages from grade-level social studies text used previously in the resource room, and teacher/student created graphic organizers were also used (DiCecco & Gleason, 2002). Testing instruments included: multiple choice pre- and post-tests; and lesson specific quizzes. Students also wrote pre- and post-test lesson specific essays to determine content knowledge.

Once pre-tests were completed, each lesson followed the same format; students read aloud the assigned passage followed by 20 minutes of direct instruction. During this period, students in the graphic organizer (GO) group were guided by teacher modeling to fill in the blank cells. Students in the control group (NO GO) were involved in class discussion and teacher directed note-taking. Post-tests were administered at the end of the study.

DiCecco and Gleason (2002) used a 2-way analysis of variance with repeated measures on pre-test/post-test scores. They found a main effect for time of test \[ F (1, 22) = 184.783; p < 0.0001 \]. Follow up analyses showed both groups had higher post-test scores. However, the GO group had slightly higher scores (pre-test mean = 6.08; post-test mean = 13.42) than the NOGO group (pre-test mean = 4.25; post-test mean = 12.58). Results from quiz scores demonstrated a main effect for time of test \[ F (7, 22) = 3.801; p < 0.0008 \].

Results of DiCecco and Gleason's (2002) study verified that graphic organizers acted as a visual cue for the retrieval of information. Additionally, this investigation demonstrated middle school students with LD benefited from the combination of graphic organizers, direct intensive instruction and the use of summary writing, which increased their reading comprehension scores.
Wang's (2006) purpose was to conduct a comparison between graphic organizers and linear outlining in nonfiction reading comprehension for students with LD in Taiwan. Additionally, Wang was interested in furthering previous research in determining if graphic organizers were more, equal or less effective than the traditional linear outlining technique, and if the participants would generalize the format of the graphic organizer after the study was completed.

The (N = 4) participants included in the study were enrolled in the 9th grade and had been classified as LD according to guidelines of identification criteria by the Ministry of Education Department, Taiwan (Wang, 2006). All were attending a middle-sized metropolitan junior high school in Taiwan. The setting for this study was the resource room.

The research design used was an alternating treatments design for single subjects (Wang, 2006). The completed study encompassed 12 separate sessions during the regularly scheduled school day. Materials used were taken from 7th and 8th grade Science textbooks used in general education curriculum. The textbooks served as the baseline condition. The intervention consisted of presenting graphic organizers/mind maps and outlines as treatment strategies. Students were exposed to both treatment variables equally. Data were gathered in three separate areas, free oral retells (i.e., recall of information), production-response tests (short answer tests), and choice-response tests i.e., multiple choice tests).

During baseline, students were given a passage to read and then told to self-review important information (Wang, 2006). Free oral retells and post-tests followed. Data collected provided the baseline information. During the intervention, random
assignment for the use of the outline or graphic organizer was used. Each of the treatment conditions encompassed four sessions. The instructor directed student use of each intervention prior to independent student use. Students were given time to review information in the outline or graphic organizer. Oral retells and post-tests were administered mirroring the baseline phase. A pre-test was conducted after the baseline phase and a post-test was administered at the end of the treatment phases. During the pre-test and the post-test, students were given a blank paper and pen and told to use this paper to construct notes, of any style, on the assigned reading passage.

Results of the study (Wang, 2006) indicated that free oral retells during intervention did not display an observable difference from baseline. One of the four participants’ scores indicated a better performance in the graphic organizer condition on choice-response tests compared to outline and baseline conditions. Two other students showed better scores for both interventions, but they did not show a clear difference between conditions. Three out of the 4 students demonstrated improved performance on choice-response during the both treatment conditions. During post-test, students did not generalize the use of the graphic organizer. However, 2 of the 4 did create original hybrids of the graphic organizer and the linear outline, while two used a sentence structure for creating reference notes. While the study did not validate the use of graphic organizers over the use of linear outlining, it did confirm that organizing strategies helped increase reading comprehension for the participants.
Summary of Research Related to Visual Dependent Strategies/Graphic Organizers

Based on this review of literature, it appears that the use of graphic organizers as visual aids has potential to increase the reading comprehension achievement of middle school students with LD (Bos et al., 1990; Darch & Eaves, 1986; DiCecco & Gleason, 2002; Horton et al., 1990; Idol & Croll, 1987; Kuehne, 1997; Sinatra et al, 1984; Wang, 2006). It appears that most of the studies related to graphic organizer strategy instruction have been conducted in resource room settings. Therefore, there is a need for research that explores factors related to students' success in reading comprehension when instruction is provided in a general education setting.

Dissertation Contribution

The research in this dissertation study will contribute to the field of cognitive-based strategy instruction. Specifically, the Seven Cs of Comprehension/graphic organizer will be used as an intervention to improve reading comprehension for middle school students with LD. The configuration of this strategy in a graphic organizer format will assist the user in step-by-step procedures without memorizing the strategy. The results of this study have practical implications for teachers of reading and language/arts. Through an understanding of visually dependent strategies in a graphic organizer design, general and special education teachers will be better prepared to serve the needs of this increasing group of students.

Literature Review Summary

The review of literature included a summary and analysis of existing professional literature related to cognitive-based, auditory/language dependent reading...
comprehension strategies for middle school students with learning disabilities (LD) with extensive discussions of self-monitoring strategies and summarizing strategies. Secondly, the review included a summary and analysis of existing literature related to cognitive-based, visual dependent strategies in the area of nonfiction reading comprehension for middle school students with LD.

From the review of literature, six of the seven components of the Seven C's/Graphic Organizer strategy have been validated. However, the combination of validated components is constructed in a unique way and an additional component has been added which involves creating a citation of the reading material. The researcher will attempt to validate this distinctive combination of cognitive strategies to improve reading comprehension of nonfiction content by middle school students.
CHAPTER 3

METHODOLOGY

Purpose of Study

The purpose of the study was to determine if using the Seven Cs strategy/graphic organizer helped students increase reading comprehension scores in the area of nonfiction for middle school students with learning disabilities. The following research questions were addressed.

1. Will the Seven Cs Strategy/graphic organizer increase reading comprehension scores in the area of nonfiction for middle school students with LD?

2. Will the use of the Seven Cs strategy/graphic organizer, in other content areas, increase reading comprehension for the participants in the study, when measured by their scores on a grade level probe assessment?

Procedures

Participants

The participants in the study were 6, 7th grade middle school children with a learning disability in the area of reading and were enrolled in general education classrooms. Participant selection was based on several criteria. First, students were identified as having a learning disability by Nevada special education eligibility standards of average intellectual functioning and significant skill deficits. Second, these
students experienced difficulty with reading comprehension as determined through standardized reading achievement tests such as Wechsler Individual Achievement Test (WAIT) and the Kaufman Test of Educational Achievement (KTEA) with grade equivalent scores 2 to 3 years below their current 7th grade level. These students were also identified by teacher observation as continuing to struggle with reading comprehension in the 7th grade reading class during fall semester 2006. The above listed criteria helped to eliminate students who demonstrated adequate reading comprehension skills despite low achievement test scores. Each of the six students involved in the study was given a pseudonym for the ease of identification for the reader.

**Alba**

Alba was 12 years 7 months of age when the study was conducted. His primary language was English. He was a respectful child who was a pleasure to have in class according to written comments included in his IEP. He also was a very quiet student who did not like to ask questions in class, based upon his reading teacher's observations. Alba had difficulty making predictions about the resolution of a reading comprehension passage. He also struggled with the identification of related details to the main idea of a story as indicated on his IEP. A goal listed on Alba's IEP stated that he needed to make measurable progress or 80% correct identification of inference within a reading comprehension passage.

Assessments of Alba's reading comprehension indicated that he had a deficit in reading comprehension. His standard score on the KTEA II was 96, which was representative of 6.1 grade level. Also, on the SRI standardized test he scored 749,
which was equivalent to 5th grade reading comprehension. On the Nevada State Criterion Reference (CRT) for reading Alba's score was 196, where 100 was the lowest possible score and 500 was the highest. This CRT score indicated Alba correctly answered 39% of the questions posed in the area of reading comprehension.

Furthermore, Alba's special education eligibility status was categorized as having a specific learning disability in the area of reading comprehension (see Table 1).

Boyd

Boyd was 12 years 3 months of age when the study was conducted. His primary language was English. He was a respectful child who always gives 100% according to written comments included in his IEP. He came to class prepared, worked at following directions and did not hesitate to ask for help when unsure of a new concept, based upon his reading teacher's observations. Boyd had difficulty answering non-literal or interpretative questions of a reading comprehension passage. He also struggled with the identification of the main idea and related details of a story as indicated on his IEP. A goal listed on Boyd's IEP stated that he needed to make measurable progress or 80% correct identification for the following: main idea, fact and opinion, cause and effect, summary, and drawing conclusions within a reading comprehension passage.

Assessments of Boyd's reading comprehension indicated a severe discrepancy between predicted and actual achievement, which deemed him eligible for special education services. His standard score on the KTEA II was 89, which was one standard deviation below average. Also, on the SRI standardized test he scored 459, which was equivalent to 2nd grade reading comprehension. On the Nevada State Criterion Reference (CRT) for reading was Boyd's score was 223. This CRT score indicated he
correctly answered approximately 45% of the questions posed in the area of reading comprehension. Furthermore, Boyd’s special education eligibility status was categorized as a specific learning disability in the area of reading comprehension (see Table 1).

Conrad

Conrad was 12 years 8 months of age when the study was conducted. His primary language was English. He demonstrated an ability to work hard in class according to written comments included in his IEP. He acted mature for his age and tries to apply the newly learned information to class assignments, based upon his reading teacher’s observations. Conrad had difficulty drawing conclusion or making generalizations of a reading comprehension passage. He also struggled with the identification of supporting details of a story as indicated on his IEP. A goal listed on Conrad’s IEP stated that he needed to make measurable progress or 80% correct identification in drawing conclusions or making inferences within a reading comprehension passage.

Assessments of Conrad’s reading comprehension indicated that he had a deficit in reading comprehension. Conrad’s standard score on the KTEA II was 79, which was two standard deviations below average score. On the SRI standardized test he scored 784, which was equivalent to 5th grade reading comprehension. On the Nevada State Criterion Reference (CRT) for reading was Conrad’s score was 254. This CRT score indicated he correctly answered approximately 51% of the questions posed in the area of reading comprehension. Conrad’s special education eligibility status was categorized as having a specific learning disability in the area of reading comprehension (see Table 1).
Daniel

Daniel was 12 years 2 months of age when the study was conducted. His primary language was English. He lacked organizational skills and had a history of poor attendance according to written comments included in his IEP. He was easily distracted by other students' actions in class, which resulted in him rushing through class assignments, based upon his reading teacher's observations. Daniel had difficulty with the syntax of a reading comprehension passage. He also struggled with the identification of related details to the main idea of a story as indicated on his IEP. Goals listed on Daniel's IEP stated that he needed to make measurable progress or 80% correct identification of supporting details as well as the use of context clues to determine the meaning of words within a reading comprehension passage.

Assessments of Daniel's reading comprehension indicated that he had a deficit in reading comprehension. Daniel's standard score on the KTEA II was 96, which was representative of 6.1, grade level. Also, on the SRI standardized test he scored 673, which was equivalent to 4th grade reading comprehension. On the Nevada State Criterion Reference (CRT) for reading was Daniel's score was 237, which indicated he correctly answered 47% of the questions posed in the area of reading comprehension. Daniel's special education eligibility status was categorized as having a specific learning disability in the area of reading comprehension (see Table 1).

Edgar

Edgar was 13 years 9 months of age when the study was conducted. His primary language was English. He had a difficult time taking constructive criticism and at times refused to make any changes, stating he liked it that way, according to written
comments included in his IEP. He had difficulty organizing his materials and had a tendency to become upset when redirected, based upon his reading teacher’s observations. Edgar had difficulty making inferences of a reading comprehension passage. A goal listed on his IEP stated that he needed to make measurable progress or 80% correct identification of inference within a reading comprehension passage.

Assessments of Edgar’s reading comprehension indicated that he had a deficit in reading comprehension. Edgar’s standard score on the KTEA II was 99, which was representative of 6.4, grade level. Also, on the SRI standardized test he scored 834, which was equivalent to 6th grade reading comprehension. On the Nevada State Criterion Reference (CRT) for reading was Edgar’s score was 315, which indicated he correctly answered 63% of the questions posed in the area of reading comprehension. Edgar’s special education eligibility status was categorized as having a specific learning disability in the area of reading comprehension (see Table 1).

**Fernando**

Fernando was 13 years 8 months of age when the study was conducted. His primary language was English. He was a pleasant student who had taken on an “I don’t care attitude” and refused to complete his homework assignments according to written comments included in his IEP. He was quiet in class but also easily distracted by his peers in class, based upon his reading teacher’s observations. Fernando had difficulty identifying the main idea and supporting facts of a reading comprehension passage. He also struggled with fluency while reading a story as indicated on his IEP.

Assessments of Fernando’s reading comprehension indicated that he had a deficit in reading comprehension. Fernando’s standard score on the KTEA II was 94, which was
below his current 7th grade equivalent. Also, on the SRI standardized test Fernando scored 646, which was equivalent to 4th grade reading comprehension. On the Nevada State Criterion Reference (CRT) for reading was his score was 288, which indicated he correctly answered 58% of the questions posed in the area of reading comprehension. Fernando's special education eligibility status was categorized as having a specific learning disability in the area of basic reading comprehension (see Table 1).

Table 1. Student Demographic and Standardized Assessment Information

<table>
<thead>
<tr>
<th>Student</th>
<th>Age&lt;sup&gt;a&lt;/sup&gt;</th>
<th>KTEAI&lt;sup&gt;b&lt;/sup&gt;</th>
<th>SRI&lt;sup&gt;c&lt;/sup&gt;</th>
<th>NV CRT&lt;sup&gt;d&lt;/sup&gt;</th>
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</thead>
<tbody>
<tr>
<td>Alba</td>
<td>12.7</td>
<td>96</td>
<td>749</td>
<td>196</td>
</tr>
<tr>
<td>Boyd</td>
<td>12.8</td>
<td>89</td>
<td>549</td>
<td>223</td>
</tr>
<tr>
<td>Conrad</td>
<td>12.2</td>
<td>79</td>
<td>784</td>
<td>254</td>
</tr>
<tr>
<td>Daniel</td>
<td>12.2</td>
<td>96</td>
<td>673</td>
<td>237</td>
</tr>
<tr>
<td>Edgar</td>
<td>13.9</td>
<td>99</td>
<td>834</td>
<td>315</td>
</tr>
<tr>
<td>Fernando</td>
<td>13.8</td>
<td>94</td>
<td>646</td>
<td>288</td>
</tr>
</tbody>
</table>

<sup>a</sup>Students' age in years and months at the beginning of the study.
<sup>b</sup>Kaufman Test of Educational Achievement (KTEAI)<sup>II</sup>
<sup>c</sup>Scholastic Reading Inventory (SRI)
<sup>d</sup>Nevada Criterion Reference Test (NV CRT)

Researcher and Teacher

The researcher and teacher administering the instruction throughout the study, met with parents and students, individually and outlined the goals, benefits and possible negative results that may result from student participation in the study. During the discussion, an overview of procedures, involvement of time and setting were provided. A sample of the Seven Cs strategy/ graphic organizer and basal reader was shown to
each parent. Students were given a tour of the classroom at the end their 6th grade class term and prior to enrollment in 7th grade reading. Both the researcher and teacher asked for comments and questions regarding the information and format of the study before the meeting ended. Some comments from parents were: Will students in the class know my child is part of your study? Does my child have to do additional reading to prepare for the study? How will I know the results of the study? Answers assured parents that student participation was confidential, extra reading was not required, and student performance results would be shared with the parents. Students were most concerned with the possibility of extra assigned work. The research team assured them that no additional work was required. Parents and students were given a consent form, which each signed prior to participation (see Appendix A & B).

Setting

The setting for the intervention was the general education classroom in a public middle school in large urban area. The participants were placed together in the same section of a regularly scheduled reading class. Participants' seating arrangements did not change due to enrollment in the study. Direct instruction was delivered by the instructor, in the same setting for all students (N = 30) in the room. During baseline and intervention phases, non-participants in the study were engaged in the same lesson as the participants.
Materials

Instrumentation

Scholastic Reading Inventory Test (SRI)

In determining the appropriate grade level basal for each participant to use during baseline and intervention phases a Scholastic Reading Inventory (SRI) computer software program was used. The Scholastic Reading Inventory Program tests students' comprehension skills and assigns a Lexile number (or grade equivalent) to their score (Scholastic, 2006; see Appendix C). The software program measures adaptive reading comprehension or individual reading ability of difficult text. Students read a short reading passage on the computer screen and then answer subsequent questions pertaining to the passage. The teacher chose a grade level or starting point for the first reading selection, which was the current grade level of the participant. If the student responds correctly to the question/s following the passage, the text increases in difficulty, if incorrect the text decreases in difficulty. The computer assessment was completed in 30 minutes and the participant received a score, which was their Lexile number. This number was translated to a specific reading grade equivalent.

Basal Readers

The reading grade equivalent was used to select a basal reader from Project Achievement Reading (Spache & Spache, 1987) 4th, 5th, 6th, and 7th grade. In the basal, each selection was nonfiction, approximately four to five paragraphs in length, followed by six questions (see Appendix D). Random selection was used in assigning specific basal selections. The participants used different levels of basal readers during the study.
Seven Cs Graphic Organizer

A graphic organizer was used as an organizational tool that assisted students in accessing prior knowledge, confirming knowledge and expanding knowledge. The structure of the Seven Cs/graphic organizer was comprised of seven steps (connect, clarify, consider, collect, converse, conclude and cite) in a hierarchal format that moves the reader through the reading process (pre, during, and after-reading) of a nonfiction reading selection (see Appendix E).

Basal Reader Quiz

A quiz comprised of six questions (see Appendix D). Main idea/detail questions and inferential questions are typical components of each quiz. Questions about the main idea indicate a student’s ability to find the topic of a paragraph or of the entire reading passage. Questions about details focus on finding word-for-word information from the text to verify the main idea. Inferential questions require the student to interpret the information and make an evaluation of what was implied in the reading selection. The quiz at the end of each reading selection was the dependent measure of the study.

Grade Level Performance Probe

A grade level social studies text, Creating America: A History of the United States, (Garcia, Ogle, Risinger, Stevos, & Jordan, 2002) was chosen for the pre-intervention grade level performance probe as well as probes for subsequent phases. The teacher and researcher created a six-question quiz for each of the chosen reading selections. The quiz reflected a similar formatting structure as the basal quiz (see Appendix F). Random selection of each grade level performance probe determined order of use.
Fry's Readability test was performed to determine the grade level of the text (Fry, 1977; see Appendix G). The test established consistency between the chosen text and the student's grade level. It was used to determine the difficulty of an article or a book. Consequently, the history text was rated at a 7th grade reading level. The text adopted by the school district and used in most 7th grade general education classrooms.

**Procedures**

Once the students were chosen and consent forms were signed the study began in their general education reading classroom. Each student participated 5 days per week (Monday through Friday) during a 50 minute regularly scheduled class period. During each class period 30 to 40 minutes was designated for the study. The entire study encompassed a 10 week period from baseline to generalization for the students involved.

**Teacher/Observer Responsibilities**

The middle school teacher administering the instruction was an educator with 20 years experience in teaching reading to this specific age group of learners. Additionally, she was the co-author of the Seven Cs Strategy/graphic organizer. This teacher had used the strategy for 2 years in previous reading classes. Responsibilities of the instructor included, administration of instruction, recording correct usage of the graphic organizer and recording quiz scores of each participant.

The observer was the researcher in the study. The observer’s responsibilities included recording correct usage of the graphic organizer, recording strategy instruction per checklist, and recording quiz scores of each participant (see Appendix H). Quizzes
are located in *Project Achievement* (Spache & Spache, 1986) basal reader. Each quiz includes six questions that follow a short reading selection. The dependent measure of the study consisted of each student’s percentage of correct responses to multiple-choice questions included in the basal reading series. The level of difficulty for each quiz was aligned with the grade level of the basal and determined by the publisher of the series.

Confidentiality

To ensure confidentiality all student identifiers were omitted. A number was assigned to each participant that identified the user rather than using individual names as an identifier. This ensured student confidentiality during the study and in the future. Individual file folders were created for each student and locked in a secured area when not in use. All printed materials, such as Seven Cs/graphic organizers and quiz answers were added to each student’s individual folder and kept in the same secured area.

Data Collection

Quiz answers were collected and graded according to the teacher instructional test guide supplied as a resource for use with *Project Achievement* basal reader (Spache & Spache, 1987). Measurement was based on the number of correct responses over the total of possible correct responses or six, for each story read, not to exceed one story per day. The observer and an outside third scorer also scored each quiz using the provided resource answer guide. Each student’s quiz results were graphed in a student performance chart (see Figures 1-6 in chapter 4).

Quiz answers for each grade level performance probe were collected and graded according to teacher/observer created test answers (see Appendix F). The instructor, researcher and an outside instructor scored the grade level performance probe. The
results of three grade level performance probes were graphed for each student (see Figures 1-6 in chapter 4).

Rewards

Students can become bored with the routine and lose interest in completing the task. Therefore tangible rewards were chosen to create interest from baseline through intervention phases. All students received a ticket (upon demonstrated completion of each daily assignment from baseline through the last intervention phase). Students wrote their name on the back of the ticket and dropped it in the “Participation Jar” winners were randomly selected at the end of each week by pulling a ticket from the jar. The selected student was given a choice of available rewards located in the prize box. Rewards included such items as “how-to-do-it projects” and fiction/nonfiction novels (at his reading level) from the teacher.

Experimental Design

The study used a single subject reversal design A-B, A-B (Barlow & Hersen, 1984). Baseline data (A) were gathered then the treatment (B) was introduced to the participants. Next there was a return to the (A) phase followed by a return to the (B) phase. The single subject research design was chosen to assess the effects of using the Seven Cs/graphic organizer on reading achievement in the area of nonfiction.

Experimental conditions included the administration of a pre-test using Scholastic Reading Inventory (SRI) software program was administered. It was followed with the administration of a pre-intervention grade level performance probe, a baseline (A1) phase (3 days), which included reading a selection from a basal reader, which was
aligned with each student's grade level as determined by the SRI assessment results. An instructional phase (4 days) included teaching students how to use the graphic organizer. The intervention (B1; 10 days) was the next phase, which included reading a selection from the basal and using the Seven Cs/graphic organizer as the treatment intervention. After the (B1) phase there was a removal of intervention. This completed the first A-B phase. The (B1) phase was followed by, administering a parallel grade level performance probe (1 day). A review of how to use the graphic organizer was completed prior to the (B2) phase. A return to baseline (A2) was the next phase. The reintroduction of the intervention was the (B2) phase (10 days). A post-test using SRI reading software was conducted following the last day of intervention (1 day). A final grade level performance probe was taken 2 weeks after the last intervention phase (1 day).

Multiple participants were used in the study as a means of direct replication within the study. Results from multiple participants who have similar characteristics in reading ability increased the reliability of the findings of the study and allowed generalization to a similar population of students (Barlow & Hersen, 1984).

**Baseline Procedures**

The teacher instructed students to read one nonfiction story at their determined reading level and take the six question multiple-choice quiz that follows. Each quiz was comprised of the following: comprehension questions that include main idea, facts, vocabulary questions and inferential questions. An example of a comprehension question was: What is the main purpose of this article? Multiple choice responses to the question included the following: (a) to describe features of the article to the reader, (b)
to persuade the reader, (c) to present details to the reader d) to encourage the reader. Students were required to identify the main idea of the article. An example of an inferential question was: what is the author's main purpose of the story? Multiple choice responses to the question include the following: (a) to persuade the reader, (b) to entertain the reader, (c) to inform the reader, and (d) to describe events to the reader. Students were required to evaluate and or make a judgment regarding the author's purpose in writing the chosen passage. No short answer or essay type answers were included the quizzes.

After each student completed the quiz, (during baseline) he turned in his answers to be graded by the instructor and later verified by the researcher and outside third scorer. Each score was logged, (after verification) on a progress graph created for each participant and labeled as a baseline score. This continued for three probes, which established a baseline of data. During this phase students were required to read at their reading level and attempt each quiz without any assistance from the teacher. This describes the baseline or (A) phases. Scores were displayed in a performance chart (see Figures 1-6 in chapter 4).

Instructional Phase

Instructional Procedures

The Seven Cs/graphic organizer intervention was taught to participants using direct instruction, modeling and team practice before trying it independently. This was the instructional phase, which encompassed 4 days of regular 40 minute class instruction. A copy of the reading passage and a blank graphic organizer were provided for students to
fill in as the teacher progressed through each step of the strategy. During this phase, students were taught how to use the graphic organizer (by the teacher) modeling how to fill in each step of the graphic organizer for one class session. The teacher used the overhead with the graphic organizer and verbally asked self-directed questions completing each step, to demonstrate how to effectively use the strategy/graphic organizer. Students were encouraged to contribute information to help the teacher finish filling in each step of the Seven Cs graphic organizer. During modeling, the instructor explained each step of the Seven Cs/graphic organizer. Students copied the information from the teacher's overhead example on their blank graphic organizer. She started by explaining the agenda of the day. The teacher told her students that they were going to learn how to use a new strategy/graphic organizer. She explained the objective of using this graphic organizer was to help them increase their reading comprehension skills.

On the first day of the instructional phase (prior to (B1) intervention phase), the teacher provided the topic. The first step of the Seven Cs strategy guides students to connect what they know about the topic. The teacher read the prompt under step one, “Type this (topic) into your brain; pull up my file” to prepare students to activate their prior knowledge of the topic. The instructor gave examples of how to brainstorm ideas, by writing associated words and phrases, not complete sentences on the list provided in this section of the graphic organizer. While brainstorming, the teacher checked students' understanding of the terminology to ensure they were writing facts related to the subject of the story and not listing random ideas. The teacher used a nonfiction passage about sharks, and wrote her brainstormed ideas, which included sharp teeth, dorsal fin, black eyes, and scary appearance. She explained that this step should only
include facts about the topic. The instructor explained to her students how important it was to only use their own prior knowledge and not rely on the reading materials. Consequently, the book was not opened at this time. After each entry for step one the instructor asked if there were questions as students copied the information on their example graphic organizer.

The second step of the strategy, clarify/confirm, provided the opportunity for students to begin to verify or challenge their prior knowledge. At this point the teacher used the book as a resource but only for scanning purposes. She continued with the shark passage and looked for key terms such as dorsal or teeth or eye color to prove her brainstormed facts. The teacher demonstrated how to find key terms by looking for bold print, or using her index finger line by line to find the words or phrases she listed in step one. When the word or phrase was found, the information was listed again in step two. However, when brainstormed information was incorrect, (e.g. the teacher listed that sharks walk on land), then the misunderstood information was revised and added to the list stating sharks inhabit the oceans, are creatures of the sea and do not walk on land.

By using obtained factual information students were able to the find the main idea of story (subject) and supporting details (facts). Students compared, contrasted and disregarded any incorrect facts while the teacher encouraged them to concentrate on relevant pieces of information.

The third step, consider, included creating a list of additional questions that relate to the topic. This step was taught by the teacher, which included modeling the creation of the list of additional questions. An example the teacher included in her list for this step was “Where do Hammerhead sharks live most of the time?” The teacher explained to
the students that the importance of this step was to further their understanding of the topic. While students were reading they added questions that they believed would help them comprehend the topic.

During the fourth step, collect, the teacher demonstrated how to find the answers to questions posed in the previous step and also the importance of including other pieces of information. She stressed their first priority was to read the assigned passage. The teacher read the passage aloud and as she encountered important facts she included them in this step of the graphic organizer. Once the reading selection was finished, she demonstrated the value of using artifacts, such as other informational books and the Internet to find more information. She told her class that the use of multiple sources of information was an effective way to confirm their list of facts.

The importance of this step was to help students build mental images of factual information that can be recalled. Images found on the Internet, pictures in other books and encyclopedias provided a concrete example of sharks that may become part of the student’s mental picture for future reference.

Converse, the fifth step, was a paired activity. It required one person listening and transcribing the oral summary of their partner and then reading back the written summary to the speaker. The speaker listened and was able to mentally confirm or revise their summary during the read-back portion. The teacher demonstrated by using a volunteer from the class as her partner. She retold the story by summarizing all the information written on the graphic organizer. While talking about the topic she pointed to each written fact to show students how to refresh their memory of newly acquired facts. By pointing out the sentence where she wrote that sharks live in water near the
Australian continent and indicating she wanted to include it in her summary helped students remember when that particular piece of information was found and verify along with her the accuracy of including the statement. The teacher’s partner wrote the summary on the instructor’s graphic organizer. Once the summary was completed, her partner read aloud the spoken story of sharks. The process of orally retelling the story was completed for both members before the team activity was ended. The retelling step assisted students in connecting all the pieces of information while using their own words. This part of the strategy was designed to create ownership of the newly learned material. It required students to synthesize the information, which may increase their ability to recall the information.

During the sixth step, conclude, the teacher modeled how to use information that she confirmed, clarified or collected, along with her partner’s transcription of the oral summary and wrote a paragraph about the topic. She used this opportunity to fix any errors encountered through transcription or misinterpretation of the oral summary. Examples include grammatical problems and incorrect facts. This was the editing phase of paragraph writing. Students observed while the teacher checked not only the information, but also the structure of her summary. She modeled an appropriate structure for a paragraph. The teacher explained that each paragraph should include a topic sentence a conclusion sentence and at least 1-2 sentences with supporting facts. By rewriting the topic sentence, clarifying a conclusion sentence and including 1-2 sentences with supporting facts she demonstrated the value of editing written work. Students were encouraged to fix any factual errors a last time before they complete the reading comprehension quiz on the selected passage.
The final or seventh step, cite, involved a demonstration of how to reference the basal, materials and other sources of information. During this step, the instructor completed the last section of the graphic organizer. Students copied, on their example graphic organizer, the bibliographic format expected by the teacher. The teacher explained the importance of taking time to recognize where the information was found in that established the importance of accurately and responsibly using other author’s data. This step was designed to create ethical research methods that may be used in future research.

Once the graphic organizer was completely finished the teacher instructed her students to label their copy in capitol letters EXAMPLE. Each student was encouraged to refer to the example graphic organizer until he felt comfortable completing one independently. Examples were placed in student file folders for daily reference. The observer and teacher worked in collaboration to check student folders and make sure examples were accurate.

The next step was a review of the first day to ensure understanding of the purpose of the graphic organizer. Students received a blank graphic organizer and a basal reader. The instructor led students through completing one Seven Cs/graphic organizer by modeling the process again. Next, she created pairs and provided the last 20 minutes of class for teamed practice. Students were assigned one reading passage and one graphic organizer to complete as a pair. Their goal was to complete the graphic organizer, read the passage, turn in the completed organizer and jointly take the associated quiz. Students did not finish the team assignment on the second day and they were allotted time on the third day to complete it. The teacher graded team’s scores, and a discussed
correct and incorrect usage of the strategy/graphic organizer as well as the team's quiz results with them. Correct usage included written information for each of the seven steps in conjunction with relevant responses (e.g. responses must demonstrate understanding of the selected passage). Incorrect usage consisted of drawings instead or written words and irrelevant passages choices (e.g. the main idea had not been identified and associated information was not aligned with the reading selection). The teamed activity ended on the third day but paired teams remained intact for student participation in step five, converse.

The fourth day of the instructional phase was used as an independent practice day for students to use the graphic organizer before beginning the intervention phase. The teacher observed students using the graphic organizer and redirected student answers when needed.

Intervention Procedures

Intervention Phase

During the (B1) intervention phase, students were expected to complete one reading selection, graphic organizer and quiz each day. Comprehension test results were graphed in a student performance chart (see Figures 1-6 in chapter 4) during this period. Students were given a ticket to enter into a weekly reward contest each day he completed the graphic organizer. The intervention was completed at the end of the tenth day.

Upon conclusion of the (B1) phase the intervention was ended. There was a return to the (A2) phase, which included reading from their reading level basal, taking an
associated basal quiz, without using the Seven Cs/graphic organizer. Prior to the second (B1) phase, a 1-day review of how to use the graphic organizer was provided. The second (B2) phase involved the provision of the graphic organizer for student use. Data from quiz results for each phase (A1) (B2) and (A2) (B2) were graphed in a student performance chart (see Figures 1-6 in chapter 4).

*Grade Level Performance Probe*

Reading passages from the history text *Creating America: A History of the United States* (Garcia et al., 2002) were randomly assigned and administered before each baseline phase (A1), (A2). The final grade level probe was the generalization activity.

*Generalization Assessment Procedures*

A generalization activity was designed to determine if participants would use the Seven Cs strategy/graphic organizer in other subject areas and also determine if the strategy helped increase comprehension in another content area. A final grade level performance probe was completed 2 weeks after the end of the last (B2) phase. The test was conducted during regular school hours, in the participant’s general education reading classroom. History textbooks at 7th grade level *Creating America: A History of the United States*, (Garcia et al., 2002) were used along with a Seven Cs/graphic organizer. The probe consisted of reading a selected passage from the text and answering a six-question quiz. The reading instructor was the administrator of the assessment. The teacher, researcher and third scorer verified student quiz scores. Student scores were graphed on a student performance chart (see Figures 1-6 in chapter 4).
Inter-Scorer Reliability

The Seven Cs Comprehension Strategy/Graphic Organizer Usage Checklist (see Appendix H) was used to determine scoring reliability related to the student use of the graphic organizer with each reading assignment. Each day the teacher collected the graphic organizer and read each step of the graphic organizer to determine if the student was applying the strategy correctly. A plus (+) symbol for complete usage (e.g. completed each step in the graphic organizer), or zero symbol (0) for partial usage, or minus symbol (-) indicating did not use, was affixed to each student’s graphic organizer. Daily, the observer reviewed each student’s graphic organizer following the same process as the teacher to determine if the graphic organizer was correctly used and added the information to her data collection form. These data forms were the basis for inter-scorer reliability. Calculations were conducted to determine the difference of agreements and disagreements between the teacher and the observer. All agreements were added to create a total, which became the numerator. Next, all the disagreements and agreements were added together to create a total, which became the denominator. The total used to create the numerator was divided by the total created for the denominator and multiplied by 100 to determine a percentage score for inter-scorer reliability. The final inter-score reliability percentage was 85%.

During the instructional phase, the Strategy Instruction Checklist Instructional Phase (see Appendix I) was used by the researcher to determine if the instruction was delivered by the teacher as designed. Scoring included total of steps needed to be included during instruction. This number was the denominator. Completed instructional steps were added to create a total number; this number became the numerator. The total
used to create the numerator was divided by the total created for the denominator and multiplied by 100 to determine a percentage score for effective teacher instruction of the strategy/graphic organizer. The final percentage score for effective teacher instruction of the strategy/graphic organizer was 100%.

Treatment of Data

All quizzes in baseline, intervention, grade level performance probes and generalization were scored by the teacher, researcher and outside third scorer prior to plotting data on a graph. Baseline and treatment data were plotted on a graph for each of the participants. The expectation was to see an increasing trend of student reading comprehension aligned with the use of the Seven Cs/graphic organizer. Expectations of participants' scores when using the A-B, A-B reversal design would most likely include a flat or small increase in quiz scores during (A1) phase. However, during the (B1) there most likely would be an increase in reading comprehension scores due to the introduction of the treatment, which was the Seven Cs/graphic organizer. Once this intervention phase ended and students entered (A2) phase, which eliminated the use of the graphic organizer, scores were expected to drop. In the (B2) phase there was an expectation that students' scores would quickly rise to previous levels of performance identified in the (B1) phase. The results section of this study defines the effects of the intervention. Analysis of data across participants was also included as a means of determining whether there was a pattern of repeated improvement. Comparisons of plotted pre-, mid-, and post-performance probes were used to interpret a trend.
CHAPTER 4

RESULTS

The purpose of this study was to demonstrate if using the Seven Cs strategy/graphic organizer would help students increase reading comprehension scores in the area of nonfiction for middle school students with learning disabilities. A total of two questions were answered in this study. This chapter is organized according to these questions. After a restatement of each question, the data analysis procedures that were used to answer the question as well as the results obtained are reported for each participant involved in this study.

The study was completed over an 11 week period, which included baseline, an instructional phase, an intervention phase, a return to baseline, and a second intervention phase. A pre-test and a post-test were administered. Three grade level probes (GLP) were also conducted, the first was conducted prior to beginning baseline or day one, the second was completed following the last day of the second baseline, and the third was administered 2 weeks after the last day of the study. During the 11 week time frame, there was a departure from the study as follows: 2 days teacher absence, 2 days student assembly, 2 days school-wide standardized testing (interim data measurement), 2 days holiday observance, and 1 day library checkout for students. Also, it took more time than the original 4 days of instruction to teach students how to use the graphic organizer. The instructional phase took a total of 7 days at which time
the teacher indicated students were able to fill in each step of the Seven Cs strategy/graphic organizer. Due to these departures from the original 10 week schedule, an extra week was added.

There was a modification in the reversal design of this study. It was intended to follow the A-B-A-B model (Barlow & Hersen, 1984) but was altered to A1-B1-B2-A1-B2-B1 (Tawny & Gast, 1984) design. (See chapter 5 for discussion of this modification). The intervention was the Seven Cs strategy/graphic organizer. The dependent variable consisted of a daily reading comprehension quiz score (see chapter 3 for detailed description). Grade level probes were used to measure students’ reading improvement and as an indicator of generalization in another content area. A standardized pre-test and post-test were conducted to measure each participant’s reading comprehension ability and equate it with a reading proficiency grade level in school years.

Research Question 1

Will the Seven Cs Strategy/graphic organizer increase reading comprehension scores in the area of nonfiction for middle school students with LD?

Introduction

An analysis of each student’s results is discussed from baseline to the last intervention phase. Each student’s daily reading comprehension quiz scores and each grade level probe is displayed in a graph that follows individual narrative results. Pre-test and post-test scores are discussed, and individual student scores are provided in Table 2.
Table 2. SRI (Scholastic Reading Inventory) Scores

<table>
<thead>
<tr>
<th>Student</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Lexile^</th>
<th>Grade level^b</th>
</tr>
</thead>
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<td>Alba</td>
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<td>802</td>
<td>53</td>
<td>1</td>
</tr>
<tr>
<td>Boyd</td>
<td>549</td>
<td>605</td>
<td>146</td>
<td>2</td>
</tr>
<tr>
<td>Conrad</td>
<td>784</td>
<td>852</td>
<td>68</td>
<td>1</td>
</tr>
<tr>
<td>Daniel</td>
<td>673</td>
<td>453</td>
<td>80</td>
<td>1</td>
</tr>
<tr>
<td>Edgar</td>
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</tr>
<tr>
<td>Fernando</td>
<td>646</td>
<td>991</td>
<td>265</td>
<td>4</td>
</tr>
</tbody>
</table>

Note: Student scores are based on results from SRI standardized reading comprehension test.

^SRI scores expressed in Lexile number indicate increase from pre-test to post-test.

^bGrade level indicates increase from pre-test to post-test.

Alba

A student performance graph for Alba shows the results of his reading comprehension quiz scores for all phases of the study (see Figure 1). During baseline (A1), Alba initially scored 83% correct on the reading comprehension quiz from the basal reader that was aligned to his current reading level (5th grade). His subsequent scores during baseline were lower each day (71%, 60%). His baseline average score on reading comprehension quizzes was 71.33% correct.

After the 7-day instructional phase was completed, the intervention was introduced at the beginning of the B1 phase. Alba was instructed to use the Seven Cs strategy/graphic organizer before, during, and after the reading process and complete all seven steps before he attempted the assigned reading comprehension quiz. His average score on reading comprehension during the B1 phase was 69.33%. This first intervention condition was intended to encompass 10 days; however, it was ended after the sixth day.
A consensus of opinion by students in the classroom resulted in the omission of the fifth step of the strategy. This step required paired students to discuss and transcribe one another's summary of the reading comprehension passage. This unusual event resulted in ending the first intervention condition and the beginning of an altered intervention phase, B2, where the fifth step was omitted. This condition encompassed 4 days. Alba's average reading comprehension scores for this period was 69.75%. After the fourth day, the altered condition (B2) was ended and there was a return to baseline.

As the second phase of baseline progressed, Alba continued to read passages from the same basal aligned to his current reading level. His average reading comprehension quiz score for this phase of A1 was 85.66%.
The altered intervention condition B2, followed the end of the second baseline phase and continued through 4 days. Alba’s average reading comprehension quiz score for this period was 79.00%. During this condition, Alba’s last daily quiz score represented a large drop from his previous scores.

Conditions were changed on the fifth day, when the teacher initiated a return to the original intervention. This ended the B2 altered condition. Alba’s average reading comprehension quiz score for this period was 74.83%.

Alba’s reading comprehension scores increased from 71.33% at baseline to 74.83% during the final intervention phase. There was wide variation in his daily performance throughout the study.

Pre-test and post-test scores for Alba were based on the SRI standardized reading assessment. His pre-test score was 749, which is equivalent to a 5th grade reading level. Alba’s post-test score was 802, which is equivalent to a 6th grade reading level (see Table 2). Across these assessments, Alba’s reading comprehension score increased one grade level.

Boyd

A student performance graph for Boyd shows the results of his reading comprehension quiz scores for all phases of the study (see Figure 2). During baseline (A1) Boyd initially scored 83% correct on the reading comprehension quiz from the basal reader that was aligned to his current reading level (5th grade). His subsequent score was 83% for the second day. Then, there was a marked decrease on the final day (33%). Boyd’s baseline average score on reading comprehension quizzes was 66.33% correct.
After the 7-day instructional phase was completed, the intervention was introduced in condition B1. Boyd was instructed to use the Seven Cs strategy/graphic organizer, before, during, and after the reading process and complete all seven steps before he attempted the assigned reading comprehension quiz. His average total score of correct reading comprehension responses during B1 phase was 88.33%. The first intervention condition was intended to encompass 10 days; however, it was ended after the sixth day. Across this condition, Boyd’s total reading comprehension quiz scores increased.

Boyd also voted to omit step five. This resulted in ending the first intervention condition and the beginning of the B2 altered intervention phase where the fifth step was omitted. This condition encompassed 4 days. His average reading comprehension score during this period was 75.00%. This was a decrease from the first intervention
phase of 88%. After the third day the altered condition (B2) was ended and there was a return to baseline.

As the second phase of baseline progressed, Boyd continued to read passages from the same basal aligned to his current reading level. His average reading quiz score for this phase of A1 was 39.00%. This was a visible decrease from the first baseline average reading comprehension score.

The altered intervention condition B2, followed the end of the second baseline phase and continued through 4 days. Boyd’s average reading comprehension quiz score for this period was 75.00%.

Conditions were changed on the fifth day, when the teacher initiated a return to the original intervention. This ended the B2 altered condition and the return to the B1 condition. Boyd’s average reading comprehension quiz score for this period was 74.83%.

Boyd’s reading comprehension scores increased from 66.33% at baseline to 74.83% during the final intervention phase. There was growth aligned with his use of the graphic organizer in his daily performance throughout the study.

Pre-test and post-test scores for Boyd were based on the SRI standardized reading assessment. His pre-test score was 459, which is equivalent to a 2nd grade reading level. Boyd’s post-test score was 605, which is equivalent to a 4th grade reading level (see Table 2). Boyd’s reading comprehension score increased two grade levels.

Conrad

A student performance graph for Conrad shows the results of his reading comprehension quiz scores for all phases of the study (see Figure 3). During baseline
(A1) Conrad scored 60% correct on the reading comprehension quiz from the basal reader that was aligned to his current reading level (5th grade). His baseline average score on reading comprehension quizzes was 63.60%.

![Figure 3](image_url)

Figure 3. Percentage of correct responses for Conrad.

After the 7-day instructional phase was completed, the intervention was introduced in condition B1. Conrad was instructed to use the Seven Cs strategy/graphic organizer, before, during, and after the reading process and complete all seven steps before he attempted the assigned reading comprehension quiz. His average total score of correct reading comprehension responses during B1 phase was 36.00%. The first intervention condition was intended to encompass 10 days; however, it was ended after the sixth day.
Despite Conrad’s demonstrated eagerness to discuss his readings with a partner, he also indicated the desire to eliminate step five of the strategy. This resulted in ending the first intervention condition and the beginning of the B2 altered intervention with the omission of the fifth step. His average reading comprehension score during this period was 68.00%. This was an increase from the first intervention phase of 36.00%. After the fourth day, the altered condition was ended and there was a return to baseline.

As the second phase of baseline (A1) progressed, Conrad continued to read passages from the same basal aligned to his current reading level. His average score of correct reading comprehension responses was 73.60%.

The altered intervention condition B2, followed the end of the second baseline phase and continued through 4 days. Conrad’s average reading comprehension quiz score for this period was 71.00%. His average score during this period represented a slight increase from the first B1 altered intervention phase.

Conditions were changed on the fifth day, when the teacher initiated a return to the original intervention. This ended the B2 altered condition and a return to the original intervention where students were required to complete all seven steps. Conrad’s average reading comprehension quiz score for this period was 72.10%.

Conrad’s reading comprehension scores increased from 63.60% at baseline to 72.10% during the final intervention phase. There was wide variation in his daily performance throughout the study.

Pre-test and post-test scores for Conrad were based on the SRI standardized reading assessment. His pre-test score was 784, which is equivalent to a 5th grade reading level. Conrad’s post-test score was 852, which is equivalent to a 6th grade reading level (see...
Table 2). Across these assessments Conrad’s reading comprehension score increased one grade level.

Daniel

A student performance graph for Daniel shows the results of his reading comprehension quiz scores for all phases of the study (see Figure 4). During baseline (A1) Daniel initially scored 67% correct on the reading comprehension quiz from the basal reader that was aligned to his current reading level (4th grade). His subsequent scores during baseline were mixed (83%, 33%). His baseline average score on reading comprehension quizzes was 61.00% correct.

Figure 4. Percentage of correct responses for Daniel.
After the 7-day instructional phase was completed, the intervention was introduced at the beginning of the B1 phase. Daniel was instructed to use the Seven Cs strategy/graphic organizer before, during, and after the reading process and complete all seven steps before he attempted the assigned reading comprehension quiz. His average score on reading comprehension during the B1 phase was 56.00%. The first intervention condition was intended to encompass 10 days; however, it was ended after the sixth day.

Daniel also agreed to drop step five. This resulted in ending the first intervention condition and the beginning of an altered intervention (B2) condition where the fifth step was omitted. This condition encompassed 4 days. Daniel’s average reading comprehension score for this period was 66.75%. After the fourth day, the altered condition (B2) was ended and there was a return to baseline.

As the second phase of baseline progressed, Daniel continued to read passages from the same basal aligned to his current reading level. His average reading comprehension quiz score for this phase of A1 was 72.3%.

The altered intervention condition B2, followed the end of the second baseline phase and continued through 4 days. Daniel’s average reading comprehension quiz score for this period was 83.25%.

Conditions were changed on the fifth day, when the teacher initiated a return to the original intervention. This ended the B2 altered condition. Daniel’s average reading comprehension quiz score for this period was 83.33%.
Daniel’s reading comprehension scores increased from 61.00% at baseline to 83.33% during the final intervention phase. There was wide variation in his daily performance throughout the study.

Pre-test and post-test scores for Daniel were based on the SRI standardized reading assessment. His pre-test score was 673, which is equivalent to a 4th grade reading level. Daniel’s post-test score was 753, which is equivalent to a 5th grade reading level (see Table 2). Across these assessments Daniel’s reading comprehension score increased one grade level.

*Edgar*

A student performance graph for Edgar shows the results of his reading comprehension quiz scores for all phases of the study (see Figure 5). During baseline (A1) Edgar initially scored 83% correct on the reading comprehension quiz from the basal reader that was aligned to his current reading level (6th grade). His subsequent scores during baseline were 83%, 33%. His baseline average score on reading comprehension quizzes was 66.33% correct.

After the 7-day instructional phase was completed, the intervention was introduced at the beginning of the B1 phase. Edgar was instructed to use the Seven Cs strategy/graphic organizer before, during, and after the reading process and complete all seven steps before he attempted the assigned reading comprehension quiz. His average score on reading comprehension during the B1 phase was 79.33%. This first intervention condition was intended to encompass 10 days; however, it was ended after the sixth day.
Edgar reluctantly agreed to end step five. This resulted in ending the first intervention condition and the beginning of an altered intervention (B2) condition where the fifth step was omitted. This condition encompassed 4 days. Edgar’s average reading comprehension score for this period was 87.50%. After the fourth day, the altered condition (B2) ended and there was a return to baseline.

Edgar continued to read passages from the same basal aligned to his current reading level during the second baseline phase. His average reading comprehension quiz score for this phase of A1 was 94.33%.

The altered intervention condition B2, followed the end of the second baseline phase and continued through 4 days. Edgar’s average reading comprehension quiz score for this period was 91.50%. During this condition, Edgar’s average quiz score rose slightly from his previous average quiz score (87.50%) during B2.
Conditions were changed on the fifth day, when the teacher initiated a return to the original intervention. This ended the B2 altered condition. Edgar’s average reading comprehension quiz score for this period was 69.10%.

Edgar’s reading comprehension scores demonstrated a wide variation in his daily performance. Large fluctuations in daily reading scores during the last B1 phase are evidence of the visual variability.

Pre-test and post-test scores for Edgar were based on the SRI standardized reading assessment. His pre-test score was 834, which is equivalent to a 6th grade reading level. Edgar’s post-test score was 990, which is equivalent to an 8th grade reading level (see Table 2). Across these assessments Edgar’s reading comprehension score increased two grade levels.

**Fernando**

A student performance graph for Fernando shows the results of his reading comprehension quiz scores for all phases of the study (see Figure 6). During baseline (A1) Fernando initially scored 100% correct on the reading comprehension quiz from the basal reader that was aligned to his current reading level (4th grade).

His subsequent scores during baseline were 83%, 0%. His baseline average score on reading comprehension quizzes was 61.00% correct.

After the 7-day instructional phase was completed, the intervention was introduced at the beginning of the B1 phase. Fernando was instructed to use the Seven Cs strategy/graphic organizer before, during, and after the reading process and complete all seven steps before he attempted the assigned reading comprehension quiz. His average score on reading comprehension during the B1 phase was 86.10%. This first
intervention condition was intended to encompass 10 days; however, it was ended after the sixth day.

![Graph showing percentage of correct responses for Fernando.](image)

Figure 6. Percentage of correct responses for Fernando.

Fernando did not participate in the vote to eliminate step five but also did not attempt to complete it either. This resulted in ending the first intervention condition and the beginning of an altered intervention (B2) condition where the fifth step was omitted. This condition encompassed 4 days. Fernando’s average reading comprehension score for this period was 70.75%. After the fourth day, the altered condition (B2) ended there was a return to baseline.

As the second phase of baseline progressed, Fernando continued to read passages from the same basal aligned to his current reading level. His average reading comprehension quiz score for this phase of A1 was 79.00%.
The altered intervention condition B2, followed the end of the second baseline phase and continued through 4 days. Fernando’s average reading comprehension quiz score for this period was 70.75%.

Conditions were changed on the fifth day, when the teacher initiated a return to the original intervention. This ended the B2 altered condition and a return to the original intervention where all seven steps were completed by the students. Fernando’s average reading comprehension quiz score for this period was 69%.

Fernando’s reading comprehension scores increased from 61.00% at baseline to 69.10% during the final intervention phase. There was wide variation in his daily performance throughout the study.

Pre-test and post-test scores for Fernando were based on the SRI standardized reading assessment. His pre-test score was 646, which is equivalent to a 4th grade reading level. Fernando’s post-test score was 911, which is equivalent to an 8th grade reading level (see Table 2). Fernando’s reading comprehension score increased four grade levels.

Research Question 1 Summary

Results of this study regarding the use of the Seven C’s strategy graphic organizer as a means of increasing reading comprehension indicate that for all but one student there was no clear evidence that the strategy improved reading comprehension scores with daily use. However, data from Boyd’s scores do suggest that his reading comprehension improved by using the strategy/graphic organizer.

His scores during each intervention condition (B1, B2) ranged from 88.33% to 75.00% correct whereas scores during each baseline phase were 66.33% and 39.00%.
Boyd’s average score dropped during the first altered condition and it remained the same through the second phase of the B2 altered condition. Boyd’s average score improved slightly during the last phase of the B1.

Results from the standardized pre-test and post-test assessment indicated the Seven Cs strategy/graphic organizer did contribute to an increase in reading comprehension for each of the participants in the study. Reading grade level equivalents increased by a minimum of one grade level. In the case of Fernando, it increased four grade levels. This test is not conclusive evidence that the strategy contributed to each student’s ability to comprehend nonfiction material but it is a positive indicator that these students were retaining information that facilitated an increase in reading acumen.

Research Question 2

Will the use of the Seven Cs strategy/graphic organizer, in another content area, such as Social Studies, increase reading comprehension for students involved in this study, when measured by their scores on a grade level probe assessment.

Introduction

Grade level probes (GLP) were administered three times: before, during and 2 weeks after the study, following the same guidelines as reading comprehension quizzes. Each probe included a reading passage from their student social studies text that was equal in length to the basal reading texts. The associated quizzes were of similar construction to the basal quiz. Each GLP quiz consisted of six questions that included queries about the main idea, supporting details and inference. Random selection was used to determine when each passage was to be used as the GLP. Each student was
given the opportunity to use the Seven Cs strategy/graphic organizer on the second and third probe. Students did not use the graphic organizer during the first probe since they had not yet received instruction on how to effectively use it. Refer to Table 3 for individual student scores for each grade level probe. Additionally, results on the grade level probe are discussed individually. Finally, a conclusion completes this section.

Table 3. GLP (Grade Level Probe) Scores

<table>
<thead>
<tr>
<th>Student</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
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<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Boyd</td>
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<td>83</td>
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<td>Conrad</td>
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<td>50</td>
<td>83</td>
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<td>33</td>
</tr>
<tr>
<td>Fernando</td>
<td>50</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

*Note: Each score expressed as a percentage of correct responses.*

*Alba*

Alba's overall average score for the three tests was 50% (see Figure 1 and Table 3). The consistent response pattern indicated he did not generalize the use of the strategy to another content area. He did choose to use the graphic organizer each time it was provided but did not complete all the steps. He eliminated step three (consider), step five (converse), and step seven (cite). When asked by the teacher why he did not use these steps he indicated his reluctance to speak aloud during a testing atmosphere. Additionally, Alba believed that it took too much time to consider other questions when his priority was completing the test.
Boyd

Results from Boyd’s three GLPs indicated steady improvement. His first reading comprehension score was 17%, the second 50% and the final 83% correct (see Figure 2 and Table 3). Boyd used the graphic organizer each time it was provided and also chose to skip step five. However, he did complete all the other steps including citing the title of the passage as a reference since the text was not available. He indicated that by using the graphic organizer he believed he could keep his ideas organized and not worry about forgetting the details of the passage. Boyd’s attention to completing the graphic organizer impeded his progress, which caused him to be the last person to complete the assignment. This bothered him (as observed by the researcher). When the noise level in the room increased, he attempted to write faster. However, Boyd’s reading comprehension score at the end of the intervention demonstrated that he increased his reading comprehension in another content area.

Conrad

Conrad’s score for each GLP test was 33%, 50%, and 83% (see Figure 3 and Table 3). He did not choose to use the graphic organizer each time it was provided but did use it for the last probe. He completed each step including step five by writing his own summary and then rewriting it in step six (conclude). When asked by the teacher why he did not use the graphic organizer during the second probe he indicated he thought it was a test and he was supposed to remember the information without any help. Conrad verbally complained about all the writing necessary to complete the graphic organizer. His GLP scores indicated he increased his reading comprehension in another content area.
Daniel

Results from Daniel’s three GLPs indicated mixed improvement. His first reading comprehension score was 50%, the second 33% and the final 100% correct (see Figure 4 and Table 3). Daniel did not choose to use the graphic organizer each time it was provided but did use it for the last probe. He did complete all the steps of the graphic organizer and only wrote 1-2 words for steps one through four. He skipped steps five and seven but did write a 2-sentence summary for step six. He told the researcher the only reason he chose to use the graphic organizer during the final probe was due in part to everyone else’s choice in using it. After he witnessed others getting up from their desk to get the graphic organizer he decided he should too. The results of Daniel’s mixed progress do not diminish the positive outcome of his final score, which was 100% correct. His GLP scores indicated he increased his reading comprehension in another content area.

Edgar

Edgar’s score for the first and second GLP was 50%, the third dropped to 33% (see Figure 5 and Table 3). This response pattern indicated he did not generalize the use of the strategy to another content area. He did not choose to use the graphic organizer each time it was provided. When asked by the teacher why he did not use the graphic organizer, he indicated that he did not like having to do extra work and felt it did not help him remember information. Additionally, Edgar believed that it took too much time to think through each step and it confused him. He believed his reading skills were adequate and the graphic organizer did not help him understand the reading passage.
Fernando

Results from Fernando’s 3 GLPs indicated steady improvement. His first reading comprehension score was 50%, the second 67% and the final 100% correct (see Figure 6 and Table 3). Fernando used the graphic organizer each time it was provided and also chose to skip step five like other students in the class. However, he did complete all the other steps of the graphic organizer. He indicated his choice to use the graphic organizer was based upon his own observations of other students in the class. Because they were using it, he thought it was a required part of the assignment. In several steps, his writing consisted of a few illegible words as observed by the researcher of this study. Fernando’s GLP scores indicated he increased his reading comprehension in another content area.

Research Question 2 Summary

Four of the 6 participants included in the study demonstrated an increase in reading comprehension to another content area. The test results indicated that these students were improved their understanding of nonfiction reading that was written at a 7th grade level. Additional testing following the last grade level probe in another content area would help to establish the validity of these findings. However, it was not possible to include an additional probe at the time the study.
CHAPTER 5

DISCUSSION

The purposes of this study as stated in the introduction were as follows: (a) to determine if the use of the Seven Cs strategy/graphic organizer increased nonfiction reading comprehension scores for middle school students with learning disabilities, (b) to determine if the use of the Seven Cs strategy/graphic organizer in other content areas increased reading comprehension for the participants when measured through scores on grade level probe assessments. Findings related to each research question in the study are discussed in the following sections of the chapter. Next, conclusions drawn from findings are shared. Finally, practical implications of the study for future research are provided.

Research Question 1

Will the Seven Cs Strategy/graphic organizer increase reading comprehension scores in the area of nonfiction for middle school students with LD?

*Alba*

Problematic events that may have negatively impacted the results of this study included the death of one Alba’s family members. Alba expressed his disinterest in completing the assignment on the day four of the B1 intervention. When questioned further, he explained that his uncle had died the night before and everyone in his family
was very upset. Also, he stayed up late and was unable to get enough sleep. According to the researcher’s observations, after this Alba required repeated prompts to complete the graphic organizer. Except during the second baseline, when he worked without being prompted to complete his daily assignment. Alba’s scores indicated the use of the graphic organizer did not improve his daily reading comprehension scores.

Alba needed behavioral assistance on how to manage grief so it would not negatively influence his academic routine. Esser’s study (2001) included attitudinal training for students, where students were instructed on how to plan, monitor and evaluate their attitudes. This may have been beneficial additional training for this particular student but was not included due to several factors, (a) lack of expertise in the area of grief counseling by the teacher and researcher, and (b) time constraints of the study impeded the process of coordinating with other school personnel equipped to assist in the area of grief counseling.

A comparison of pre-test and post-test SRI scores for Alba indicated growth in reading proficiency occurred during the course of this study, but daily scores did not support this result. He started at a 5th grade reading level and completed the study at a 6th grade reading level. Although he did not reach grade level reading proficiency on daily assignments, Alba’s reading comprehension scores increased a grade level during the 11-week study. This progress indicated that Alba experienced improvement although it cannot be directly attributed to the use of the graphic organizer.

*Boyd*

Boyd’s scores during the study best demonstrated that the use of the Seven Cs strategy/graphic organizer helped to increase reading comprehension. Boyd’s effective
use of the graphic organizer supports the findings of Horton et al. (1990) in that the structure of the strategy provided a basis for plotting the multitude of facts included in a text passage, which resulted in an increase in reading comprehension scores. Improved scores resulted following the instruction and implementation of the Seven Cs strategy/graphic organizer. As Boyd used the graphic organizer during the intervention phase, his reading comprehension scores increased. Familiarity with the structure of the text helped him understand how to find keys pieces of information in the reading passage and the graphic organizer provided a visual format to keep his ideas organized. This supports previous findings (Bakken et al., 1997 Darch & Eaves, 1986) where the use of a graphic organizer as a visual aid helped students improve their nonfiction reading comprehension scores.

Boyd’s previous difficulties (as defined in his IEP) were answering non-literal or interpretative questions, and the identification of the main idea and related details of a story. Results of this study indicated his reading comprehension scores improved in two areas: (a) correctly identifying details, and (b) correctly determining inference (a conclusion drawn from evidence) in nonfiction passages when he utilized all steps of the strategy/graphic organizer. Boyd’s scores demonstrated the particular importance of step five of the strategy in that, when step five, converse, was eliminated from the intervention, his scores in the area of details decreased. His overall reading comprehension scores were higher when all steps were used as the as the intervention compared to the two intervention phases when the altered intervention was in place. The implication, in this particular case, supports Englert and Mariage (1991) findings that collaboration with peers and practice with specified procedural steps of the strategy
helped increase reading comprehension for this participant. When the collaboration step was removed, it negatively impacted Boyd’s daily reading comprehension scores.

Boyd’s summary writings, recorded on the graphic organizer throughout the intervention, adhered to the directions given by the instructor. He consistently completed each of the seven steps of the graphic organizer. Additionally, he demonstrated an understanding in the editing process, in that he used information from step five (converse) to create a final summary, which was required in step six (conclude). Boyd used his oral statement and rephrased it to become a coherent paragraph with a topic sentence, a supporting fact sentence, and a conclusion sentence.

After step five (converse) was eliminated, Boyd continued to use this step but modified it. His modified step five became a rough draft for step six (conclude). Boyd consistently completed the graphic organizer and initiated his own adaptation rather than completely eliminating step five as did other participants in the study.

According to the researcher’s observation, Boyd’s attention to completing each step often made him the last to finish his class work but did not seem have an impact on his progress. The improvement in reading comprehension Boyd made supports previous findings that when students engage in rewording, whether written or spoken, their reading comprehension improved (Malone & Mastropieri 1992; Schumaker et al., 1984).

A comparison of pre-test and post-test SRI scores for Boyd indicated growth in reading proficiency occurred during the course of this study. He started at a 2nd grade reading level and completed the study at a 4th grade reading level. Although he did not reach grade level reading proficiency, Boyd’s reading comprehension scores did
increase two grade levels during the 11-week study. This supports Phillips' (1988) findings that options provided through training packages, like the Seven Cs of Reading Comprehension, for students struggling to understand nonfiction text, support learning starting with simple and moving on to complex strategy use.

Conrad

Conrad’s goal listed on his IEP stated that he needed to make measurable progress in drawing conclusions or making inferences within a reading comprehension passage. During the first baseline phase, he demonstrated difficulty in this area. He continued to perform poorly on inference questions even when all steps of the strategy were in use. Conrad followed each step of the organizer but left step five blank during the altered intervention phases. Conrad’s correct responses during the final intervention phase mirrored his initial poor baseline performance.

Pre-test and post-test SRI scores for Conrad indicate growth in reading proficiency occurred during the course of this study. He started at a 5th grade reading level and completed the study at a 7th grade reading level. Conrad’s reading comprehension scores did increase two grade levels during the study. The intervention did not help him improve his reading comprehension as evidenced in his daily quiz scores but he did show overall improvement in reading proficiency.

Daniel

Daniel’s IEP goal stated that he needed to make measurable progress or 80% correct identification of supporting details, as well as in the use of context clues to determine the meaning of words within a reading comprehension passage. Daniel’s mixed results in the area of details indicated the graphic organizer did not help to
improve his daily reading comprehension. He did experience a slight improvement during the first altered intervention phase, B2, but was not able to maintain the increase. Daniel’s scores decreased from the first baseline where he correctly answered 8/11 detail questions as compared to 8/13 correct responses for detail during the last intervention period.

Daniel demonstrated several difficulties in implementing the Seven Cs strategy. He did not follow the teacher’s instruction regarding step six (conclude). He copied the oral summary without editing his work. When step five (converse) was eliminated, his summaries were incomplete phrases in an illegible writing style. Summary writing briefly improved during the second altered intervention with the use of a complete paragraph format but by the end of the study his writing reverted to the phrases and illegible penmanship.

The researcher noted Daniel was easily influenced by other student’s actions in class, which impacted his daily performance. An example of this was a note written in the margin of a corrected graphic organizer, by the teacher, that he did not take time to read the passage but tried to complete the graphic organizer and quiz to finish before other class members. When questioned about this method of work, Daniel indicated he was pretty sure he knew what the passage was about by skimming through it during step two (consider/confirm) and reading the “whole thing” was not needed. His IEP stated that distractions were problematic for Daniel and this was evidenced in his hurried responses to complete the daily assignment. There is not enough evidence to link this behavior characteristic to the results of this study, but it appears that the use of the graphic organizer did not improve his daily reading comprehension scores. The use of
self-monitoring cards (Jitendra et al., 2000) as a reminder of key elements that needed to be included may have provided the additional prompt necessary to help control his behavior and keep him focused on completing each step of the assignment.

Pre-test and post-test SRI scores for Daniel indicate growth in reading proficiency occurred during the course of this study. He started at a 4th grade reading level and completed the study at a 5th grade reading level. Daniel’s reading comprehension scores did increase one grade level during the study. The intervention did not help him improve his reading comprehension as evidenced in his daily quiz scores but his overall reading proficiency improved within the 11-week period.

**Edgar**

Edgar’s goal listed on his IEP stated that he needed to make measurable progress or 80% correctly answering inference type questions of a reading comprehension passage. At the end of the first intervention B1, he correctly answered 3/4 inference questions. Edgar continued to improve during the B2 intervention phase, when step five (converse) was eliminated and ended this phase by correctly answering 10/12 inference questions correctly. Edgar’s daily quiz scores for inference dropped slightly during the last B1 phase to correctly answering 13/16 questions. During the last intervention phase, Edgar’s daily quizzes had the greatest number of inferential questions, when factored into a percentage there was a slight decrease in correct answer responses. These results indicate that the use of the graphic organizer did help him improve in the area of inference.

Edgar experienced an initial gain in daily reading comprehension scores during the first intervention. After the second baseline, his daily reading comprehension scores
steadily declined. Several outside influences may have played a role in creating these mixed daily quiz scores following the first intervention phase.

Problems Edgar encountered during the study were in relation to his difficulty accepting constructive criticism and his refusal to make revisions in his work. He did not follow the teacher's instructions regarding how to effectively fill in each step of the graphic organizer. Sometimes he would add minimal information in each step and other times he would write a few words that were not in sentence form or skip this step. Throughout all intervention phases, Edgar wrote illegibly which made deciphering difficult for the teacher and the researcher. When encouraged to write neater, Edgar made it clear he was not going to change his style of writing.

Additionally, during the course of the study, Edgar became verbally upset with the teacher's classroom management, which resulted in parent/teacher conferences with the parent in an adversarial role. After this event, he sought out the researcher as his primary instructor regardless of repeated reminders that she was not the teacher of the class. During one discussion with the researcher, Edgar explained his overall plan in completing the daily graphic organizer and reading assignment. He indicated that if the title or first couple of sentences did not seem interesting to him, he would write down anything that he thought might be in the passage, skip the reading, take the quiz and be done. He said that he could not force himself to read anything that was boring. The school's special education facilitator suggested self-regulatory training since he had an established pattern of a negative response in conjunction with criticism of his work. Previous research findings supporting successful self-monitoring techniques included the "think-aloud" approach where the student verbalized each step, cognitively
checking his/her own progress (Beals, 1984; Chan, 1991; Graves, 1986). This approach was not attempted, since Edgar indicated he would not participate in another strategy that might force him to do more work.

Despite the problems described above, pre-test and post-test SRI scores for Edgar indicated growth in reading proficiency occurred during the course of this study. He started at a 6th grade reading level and completed the study at a 9th grade reading level. Edgar’s reading comprehension scores did increase three grade levels during the study. The intervention did not help him improve his reading comprehension as evidenced in his daily quiz scores and observational evidence recorded by the researcher. However, he managed the second largest increase in reading proficiency for this time period. At the end of the study, Edgar was reading above the 7th grade level.

**Fernando**

Fernando’s goal during this study was to make measurable progress in the following areas: distinguishing the main idea and supporting details, creating a summary, and correctly answering inference type questions related to a reading comprehension passage. Fernando’s results throughout the study were mixed. During the first intervention period he experienced his highest scores. After that initial phase, his scores never reached the same percentages.

Fernando’s “I don’t care attitude,” as listed in his IEP, was evidenced in his summary writing. As in the case of Daniel, Fernando did not follow the teacher’s instruction regarding step six, conclude. He copied the oral summary without editing his work until the step five was eliminated. At that point, he drew a big X mark in the space and hurriedly scribbled words to complete the summary section. There were several
instances when he only wrote one or two words for his summary. When the converse step was added again to the intervention he reverted to copying the oral summary without editing his work. Numerous promptings by the teacher to take more time to complete the graphic organizer and edit his work went unheeded by Fernando.

The researcher noted the similarity between Daniel and Fernando in that both were easily distracted by other student’s actions in class. Fernando most often finished his assignment quickly without completely reading the assigned basal passage. He was more interested in other team’s discussions, and in interjecting his opinion of their oral summary. Fernando seemed to pace himself based upon students in close proximity; if they were almost finished with their assignment he would write faster to finish during the same time period. There was not enough evidence to link his distracted behavior to the results of this study but it appears that the graphic organizer did not improve his daily reading comprehension scores. As with Daniel, these findings suggest the use of self-monitoring cards might have been a helpful tool for Fernando as a behavioral reminder to pace himself, and ignore the actions of other students in the class.

Despite the problems described above, pre-test and post-test SRI scores for Fernando’s results from the pre-test and post-test reading comprehension SRI quiz scores indicate growth in reading proficiency occurred during the course of this study. He started at a 4th grade reading level and completed the study at an 8th grade reading level. Fernando’s last SRI score demonstrated an increase of four grade levels in reading comprehension skills. He demonstrated the greatest growth in reading proficiency among study participants within the 11-week period. It is unclear what was
the cause of the growth, but it cannot be directly attributed to the use of the graphic organizer.

Research Question 1 Summary

In conclusion, the Seven Cs strategy/graphic organizer as an intervention did increase reading comprehension for 1 student in the study as evidenced through pre-test/post-test scores, and daily quiz scores. However, this result was not replicated through the daily quiz scores of the other participants in this study. Pre-test and post-test results from the SRI computerized standardized test demonstrated that each student’s reading comprehension increased during the 11-week time period.

Research Question 2

Will the use of the Seven Cs strategy/graphic organizer, in other content areas, increase reading comprehension for the participants in this study, when measured by their scores on a grade level probe assessment?

Each grade level probe was an excerpt from the student 7th grade social studies text and mirrored basal reading texts in passage length and type of questions (see Appendix F). Students completed the first probe without the use of the Seven Cs strategy/graphic organizer since they had not yet received instruction on its use. During the second and third probe assessment, students were given the opportunity to use the graphic organizer but its use was not a requirement. Five of the 6 students in the study chose to use the graphic organizer when they were available. However, Alba only partially completed it and indicated his reticence to talk to others while testing. Edgar’s refusal to use the
graphic organizer was in response to his continued belief that it was not necessary to help him remember the important parts of the reading passage.

Research Question 2 Summary

Results indicated that four of the 6 participants generalized the use of the Seven Cs strategy/graphic organizer to another content area. Boyd, Conrad, Daniel, and Fernando all demonstrated steady improvement with each administration of the grade level probe. Furthermore, these 4 students achieved their highest score on the last probe conducted 2 weeks after the final intervention phase. These results support the previous findings that the use of a graphic organizer helped increase reading comprehension during testing in another content area (Bos et al., 1990; DiCecco & Gleason, 2002; Idol and Croll, 1987; Wang, 2006).

Boyd and Conrad were both able to complete step six (summary) by effectively creating a complete paragraph. They were both able to identify and include the main idea of the reading passage in their topic sentence. Boyd and Conrad also followed the teacher's initial instruction of including two sentences with details that supported the main idea. Although their paragraphs did not exceed four sentences they did have a beginning sentence, and a concluding sentence. There was also evidence that these students edited their oral summary. For example, the topic sentence in the oral summary was different from the topic sentence in their written summary. This additional benefit of effective summary writing is consistent with other research that demonstrated increased reading comprehension resulted when students were taught summary writing skills (DiCecco & Gleason, 2002; Gajria and Salvia, 1992; Rinehart et al., 1986).
Two students, Albert and Edgar, did not demonstrate an increase in reading comprehension through grade level probe tests. Alba’s score for each test was unchanged from the first probe to the third probe. Edgar’s scores for the first two probes had the same results, half of the questions answered correctly. On the last probe, Edgar’s scores declined. Negative motivation may be the mediating variable.

Overall Summary

Results of this study demonstrated improved reading comprehension in a related content area for middle school students with learning disabilities following strategy use. The grade level probe test results indicated that 4 of the participants, following extended practice using the strategy/graphic organizer, were able to use the strategy/graphic organizer in a new content area that was written at a 7th grade level. The findings in this study concur with those of Wong and Jones (1982) that the use of effective strategies increased reading comprehension for students with LD.

Problems/Limitations

Setting and Population

An inclusive middle school classroom setting was used for the intervention. Instruction was delivered by a 7th grade reading teacher, for the participants \(N = 6\) of the study, and their class members \(N = 24\). During baseline and intervention phases, non-participants in the study were engaged in the same lesson as the participants. There are several distinctive features of this classroom that should be noted. The class was an all-male reading class. Several students not included in the study were receiving special education services under the category of behavior \(N = 3\), and some other students were
receiving services under the category of Autism Spectrum Disorder ($N = 2$).
Additionally, several students ($N = 2$) without IEPs demonstrated chronic absenteeism
due to school rule violations that resulted in multiple-day suspensions. This
combination of students often created a disruptive classroom environment. Numerous
attempts at re-direction were used to quell the noise. During the first week of the fall
semester, the volume of noise stopped instruction from moving forward while the
teacher worked to reinforce acceptable classroom behavior.

The attempt to use an inclusive classroom to conduct the study was generated from
previous research with the same agenda (to increase reading comprehension for students
with LD) that predominately took place in a resource room or clinical setting. It hoped
that this study would add to the existing body of research demonstrating positive results
of strategy use (Meese, 2001; Mueller, 2001; Sencibaugh, 2007) in general education
settings. The distractions in the classroom were especially problematic for Daniel and
Fernando who tended to change their behavior based upon other students in the room,
as observed by the researcher. Finally, the omission of girls in the room eliminated the
possibility of female participants limiting implications of the results to one gender.

*Duration of Study and Motivation*

This study was completed over an 11-week period. There were brief departures
inclusive of teacher absences, student assembly, standardized testing, holidays, and a
visit to the library but, from the first day of the fall semester until completion of the
study, all students were engaged in learning how to use the Seven Cs strategy/graphic
organizer or actively completing one daily. Early in the study, there were problems
keeping students focused on the instruction. This resulted in an additional week of
teacher-directed instruction to ensure the correct usage of the graphic organizer. The researcher observed comments made by students, both participants and non-participants, halfway through the first intervention phase stating “oh no, not this again” and “when are we ever going to do something different.” These statements indicated that a saturation point had been reached and students were not interested in continuing with the use of the graphic organizer. This was an anticipated outcome; therefore tangible rewards were used to create interest from baseline through intervention phases. However, conflicting rules for earning a reward ticket confused students and did not help with daily motivation. Originally, students were told they would be given a ticket to enter the weekly drawing upon completion of the graphic organizer. Additionally, the ticket would go back in the prize jar for future weekly drawings even if it had been previously picked. Hence, students quit working to complete the organizer once they received a ticket surmising they were already in the weekly drawing and didn’t need additional entries. This attitude quickly spread throughout the class. The teacher discussed this problem with the researcher and was reminded that the ticket was a reward for completing the daily reading assignment, which included completing the graphic organizer. Furthermore, all tickets were to be discarded after each drawing so students would have to re-earn tickets for the following week. The teacher informed the class of the amended reward system. The class responded to the new rules and did work to complete the graphic organizer but the original purpose as a motivational tool was diminished.

The original 10-week study period was determined based upon the limitations of previous studies that encompassed a shorter period of time and attained mixed results as
in the Wang (2006) study where the treatment was over a 12-day period with some students not experiencing an increase in reading comprehension. It was surmised that a longer time period would help increase student familiarity with the reading format and the use of the graphic organizer which aligns with Englert and Mariage's (1991) findings that the 2 month time frame produced an increase in reading comprehension.

**Altered Intervention**

During the first intervention phase (day seven), students in the classroom indicated they did not want to share their findings with their assigned partner, which is a requirement of step five (converse). One student expressed his displeasure to the teacher that waiting for his partner to finish left him with nothing to do. Other students agreed with his statement and the teacher enacted a vote by a “show of hands” to determine the amount of students in agreement and those student who were not in agreement. More students voted to eliminate the converse step than those who wanted to retain it so she told the class they did not have to complete that portion. The researcher questioned the instructor and was told that the students were refusing to continue in the study so as a means to create motivation the intervention was changed to A1-B1-B2-A1-B2-B1 as a variation of the A-B-A-B reversal design proposed in the methodology section. This alteration is aligned with Tawny and Gast’s (1984) description of the characteristics of single subject research in that it is “dynamic and can be rapidly changing,” and the reversal design allows for flexibility while still demonstrating experimental control.

After the second phase of the intervention (B2) ended its fourth day, there was a discussion between the teacher and researcher to return to the original intervention design where all students would be required to complete each step, including the
converse step, in the graphic organizer. Data results from daily quiz scores did not indicate that omitting step five helped students increase their reading comprehension. Additionally, the attitude of students in the class had not improved. There were daily complaints centered on the lack of originality of the lesson plans and questions about how much longer they would be “stuck” doing this work. The teacher explained that they would be required to do this same lesson as long as they demonstrated a need for it, as observed by the researcher.

Teacher Instructional Style

The teacher was the co-author of the Seven Cs Strategy/graphic organizer and used the strategy for 2 years in previous reading classes. She followed each step of the strategy instructional checklist (see Appendix I) throughout the instructional phase with 100% compliance as observed by the researcher. She took additional time to ensure students’ understanding of how to correctly complete the graphic organizer.

The instructor, as well as the researcher, used the strategy/organizer checklist, in checking each participant’s daily progress. Calculations were conducted to determine the percent of agreement and disagreement between the teacher and the observer. The final inter-rater reliability was 85%. As the teacher became more engaged in managing classroom behavior some differences occurred. For example, the researcher did not agree that the graphic organizer was complete if the student only wrote phrases for step five, whereas the teacher checked that it was completed. The instructor recorded all daily scores, as well as the researcher, and an outside third party verified each score by using a teacher’s guide-book of correct answers (Spache & Spache, 1987) for daily quiz scores. After each person had graded the daily quiz and initialed the student’s score of
correct responses, it was recorded in each participant’s confidential records. When there was a discrepancy, the scoring team, as named above, gathered together and reviewed each disputed answer. The final result was 100% total agreement.

In the researcher’s opinion, problems encountered by the instructor were due in part to the configuration of the class. This was the first time she had almost half of her class eligible and receiving special education services. In addition, it was the first time she had been an integral part of a controlled study. Previously, the teacher had participated in action research and was familiar with those parameters but was not as confident under the atmosphere of a controlled study. Coupled with this was the condition of her physical health in which she contracted a cold virus that lasted almost the entire length of the study.

After the first week of disruptive behavior in the classroom, the teacher instituted strict classroom rules. When students entered the room she would state in a loud voice her orders for the day such as, “step one, you will need a pencil; step two, you will need a graphic organizer, step three, you will place all binders on the left side of your desk on the floor, and no talking.” Then she would wait for total compliance and loudly express her displeasure at students who took too long to get prepared. When the researcher explained the possible negative impact of this type of control, the instructor was determined it was her only option and would not entertain other methods.

Every participant’s daily reading comprehension score visibly dropped on the day three of the beginning baseline phase. The classroom environment on this day was not conducive to learning. The noise level at times in the classroom was very loud which prompted the teacher to enforce strict rules for student behavior. The observer noted
that the participants in the study displayed gestures associated with intimidation. Additionally, they were hesitant to speak with their partner during the oral summary portion of the assignment.

As the study entered the second intervention phase B2, the teacher decided it would be a good idea to have students complete two graphic organizers to get the study completed faster. Before this was implemented, the researcher reminded the teacher that this action would create a deviation that could have negative results for the students involved. The teacher stated that the students were tired of doing the study but did agree to follow the original plan of one reading passage and one graphic organizer per day. As the study entered its final days of the last intervention, both the teacher and the researcher agreed that motivation had not increased with the elimination of step five. She reinstituted step five but was hesitant to do so because it would increase the noise volume in the class. Upon completion of the study, the teacher stated that she was not prepared to teach the same lesson for such an extended period of time and that in the future she would not use all the steps of the strategy because they seemed too tedious for students with LD.

Limitations Summary

Several factors affecting the results of this study include the setting, limited population, length of study, lack of motivation, change of intervention, and teacher instructional style. The beginning disruptive environment of the classroom negatively impacted all areas listed above. Almost half of the all-boys class was receiving special education services and included in the other half were several with behavioral problems. This combination of students created an unruly atmosphere in which the teacher’s
response was to institute strict rules to maintain control. Her inability to adjust and or relax the rules was due in part to the reaction of the students the first week when the noise level stopped her from being able to continue with her instruction.

Consequently, student behavior did improve but the controlled atmosphere impacted the use of the strategy, as noted by students quiz scores on the day three of the study. Students in the classroom were uncomfortable verbally sharing their summaries (a requirement of step five) for fear they would be warned they were not following class rules. Once students voted to remove step five, the researcher observed students more visibly relaxed while working through each step. When step five was reinstated students were more familiar with class rules and the use of the graphic organizer so they were able to complete this step without the teacher prompting them to get finished.

As the study continued, student motivation subsided. The use of rewards was not sufficient to create enthusiasm for continuing the same daily assignment. Also, the inclusive setting did not help motivation. Though all students were completing the same assignment those not participating in the study would finish before the study participants, which prompted the teacher to offer fictional reading materials to those finished before the end of the class period. This choice resulted in a negative impact on student motivation. Those students offered the fictional book wanted to abandon the Seven Cs lessons and the movement and noise that accompanied the transition to another lesson distracted those students participating in the study. The participating students in the study hurried through so they could be included with the group reading fictional stories. Motivation proved to be difficult to achieve regardless of the teacher’s revisions to improve it.
Overall, the results of the Seven Cs strategy/graphic organizer study showed that from pre-test to post-test reading comprehension scores increased for each student. In the cases of Alba, Conrad and Daniel the use of the graphic organizer did not result in increased reading comprehension. In the cases of Edgar and Fernando, there was an initial gain in daily reading comprehension but it was not maintained. In the case of Boyd, his reading comprehension scores did improve with the use of the graphic organizer. At the end of the study there was not sufficient evidence to claim that the participants’ use of the graphic organizer as an intervention, helped to increase reading comprehension which is in opposition to previous research findings (Idol & Croll, 1987) where using a fill-in-type graphic organizer created a significant difference between reading performance during intervention for the participants.

The type of reading material, nonfiction text has been especially problematic for students with learning disabilities (Horton et al., 1990) due in part to the multitude of facts included in the text passage. The results of this study must be viewed within the context of the choice of the reading material used, especially when the participants complained that it was not interesting and 1 student refused to read some of the passages because it was “boring” to him. Only 1 student’s daily reading comprehension scores can be attributed to the use of the graphic organizer.

Results from the SRI pre-test and post-test suggest each student’s reading comprehension increased during the course of the study but this cannot be attributed to the use of the graphic organizer. Furthermore, the results obtained by the SRI scores must be viewed cautiously in that one measurement is not substantial evidence of student performance growth.
Practical Implications

This study did not provide sufficient evidence to support the use of the Seven Cs strategy/graphic organizer as a means to increasing reading comprehension for students with learning disabilities but it cannot be ruled either. The strategy helped 1 student's reading comprehension but this result was not replicated among the other 5 participants. Limiting factors that impacted the study cannot be discounted in producing the final results. Thus, several words of caution are appropriate for teachers, teacher educators and parents interested in using this or a similar strategy. First, preparation is an integral part of any unit or lesson plan. When even the smallest step is missed, the result can be the difference between success and failure. Thus a dialog for teachers to follow along with daily teacher instructions would ensure fidelity was maintained. Other researchers have demonstrated the benefit of teacher directed dialog as an effective model of strategy instruction (KU Center for Research on Learning, 2007).

Second, creating choice in a lesson allows students the freedom to rely on personal strengths and creates feelings of ownership of the completed work. This study provided one style of graphic organizer dependent upon a student's writing skills. The format was cumbersome for some, tedious for others, and the details needed to complete it may have been an interference for others. While the steps of the graphic organizer in this study were required, the method of delivery could be modified to meet individual student strengths. A survey of student learning styles before instruction would assist the teacher in creating several different formats of the graphic organizer, such as a fill in the blank, draw picture, or create your own design using the seven steps to demonstrate understanding of the reading selection. There is previous research that supports the use
of student-generated graphic organizers. Kuehene’s (1997) use of student-created graphic organizers led to improved factual retention and reading comprehension by the participants.

Third, the setting must be a conducive place for learning. When choosing an inclusive setting, the proportion of students with an IEP should not exceed an average ratio of 15 general education students to 10 students with special needs (McSorley, 2001). This ratio ensures that all students are receiving the instructional supports necessary to increase learning. When this ratio is exceeded the teacher may become overwhelmed, especially when professional training has not preceded the placement. It is essential that professionals provide training prior to creating an inclusive classroom, and offer continued support to general education teachers by special education professionals on staff (Friend & Hurley, 2008).

Fourth, varying instructional delivery is essential in providing quality instruction. Eleven weeks of non-variance in instruction resulted in student apathy, or outward dislike of the lesson. An alternative could include a structured break between interventions where students are engaged in activities that are a complete departure from the previous intervention lessons. A break also creates a valuable rest period before the next baseline and reduces the possibility of carrying over recently learned information creating a possible ceiling effect for the second baseline scores. It also helps to sustain student motivation in that the rest period could be an opportunity for student-teacher conferences regarding current progress and a time for future goal setting. Finally, a brief hiatus from the study would allow the teacher time to reflect on areas that did not work well and areas that were successful. In this way the teacher has
time to modify his/her instructional style to better meet his/her students' current levels of performance.

This study contributed to literature on the effects of strategy use in the area of literacy for students with learning disabilities. This information can be incorporated in current literacy methods courses for pre-service general and special education teachers so they may become discerning consumers of research-based intervention strategies when they are choosing strategies for students in their classroom.

Suggestions for Further Research

This study used a combination of validated strategy components, constructed in a unique way in an attempt to improve reading comprehension of nonfiction content by middle school students. The evidence does not strongly support its benefit for increasing reading comprehension but cannot be ruled out either. One student did improve by using it. It then becomes necessary to determine the components that were effective and those that could be discarded to further the investigation and to continue to create strategies that are validated through research. Next steps to further the investigation of this strategy/graphic organizer could be inclusive of the following: (a) a retesting of the strategy in a more positive environment, (b) a redesign of the graphic organizer format, (c) scrutiny of each strategy included in the Seven Cs of Reading Comprehension, and (d) a study using the Seven Cs’ strategy/graphic organizer in a comparative model of analysis between students with and without L.D.

As stated in the section “implications for teachers,” there is a need to create several versions of the graphic organizer and test this to determine how different formats
impact the learning process for students with learning disabilities. The original format required students to complete each step in writing. In the opinion of the researcher, this had a negative affect on the outcome as evidenced by the mixed results of individual student performance. Several different versions of the graphic organizer would provide the option of choice, which could facilitate student engagement in using the graphic organizer. However, several versions of the graphic organizer would necessitate the beginning of a series of studies in which each version is investigated to determine its effectiveness as an intervention to help students increase reading comprehension.

Further research should also be conducted on the combination of strategies chosen to comprise the Seven Cs. Recently, similar strategies have been described but not as yet validated, such as Super 6 Comprehension Strategies (Oczkus, 2004) for fiction that included all but step seven. In addition, there should be replicated research testing the hypotheses of this study for it to be considered a validated intervention.

Finally, a comparative study using the Seven Cs of reading comprehension strategy between students with and without disabilities would provide additional information concerning similarities and differences in learning strategies of the two groups. It would also allow the researcher to conduct a quantitative analysis of student performance for both groups. Lastly, a comparative analysis with positive results as the outcome would provide additional evidence that students with and without disabilities are able to benefit from strategy use.
Appendix A

INFORMED PARENTAL/GUARDIAN CONSENT
Department of Special Education

Purpose of the Study
Your child is invited to participate in a research study. The purpose of this study is to determine if using the Seven Cs strategy/graphic organizer will help students increase their reading comprehension of nonfiction informational materials. The information gathered from regular classroom activity will be used with your child's name excluded from any materials he/she may complete during daily classroom activities.

Participants
Your child is being asked to participate in the study because he/she has been identified by teacher observation as continuing to struggle with reading comprehension in the seventh grade reading class during fall semester 2006.

Procedures
Your child will be using a handout that has a reading strategy, the Seven Cs' of Comprehension included on the form, along with all the other students in the class. He/she will use the form to help them find information related to their assigned reading activity. All members of the class will be taught how to use the handout and will be given time to practice using it as a daily reading activity. Once all students in the class understand how to complete the handout they will read a short informational story alone and use it to help them recall important pieces of information.

Benefits of Participation
The anticipated benefit of your child being a part of this study include improved reading comprehension of informational reading materials.

Risks of Participation
There are risks involved in all research studies. This study may include only minimal risks. Your child may experience difficulty answering questions during the beginning class activity when he/she is learning how to use the Seven C's of Comprehension form.

Cost/Compensation
There will not be financial cost for your child to participate in this study. The study will be included during your child's regular daily school schedule. There will be no additional requests of your time to complete this study. You will not be compensated for
your child’s time. The University of Nevada, Las Vegas will not provide compensation or free medical care for an unanticipated injury sustained as a result of participating in this research study.

Contact Information
If you have any questions or concerns about the study, you may contact Dr. Beatrice Babbitt Principle investigator at _________ or Michele Farmer student investigator at _________ or Jackie Soden co-investigator at _______. For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact the UNLV Office for the Protection of Research Subjects at 702-895-2794.

Voluntary Participation
Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with the university. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Confidentiality
All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link your child to this study. All records will be stored in a locked facility at UNLV for at least 3 years after completion of the study. After the storage time the information gathered will be shredded before disposal.

Parent/Guardian of Participant Consent:
I have read the above information and agree to allow my child to participate in this study. I am at least 18 years of age. A copy of this form has been given to me.

_________________________________________  _____________________
Signature of Parent/Guardian of participant Date

_________________________________________
Parent/Guardian of participant Name (Please Print)

Note: Please do not sign this document if the Approval Stamp is missing or is expired.
APPENDIX B

STUDENT CONSENT LETTER
Assent to Participate in Research
Seven Cs of Comprehensive/Graphic Organizer: Reading Intervention

1. Our names are Dr. Beatrice Babbitt, Michele Farmer, and Jackie Soden.
2. We are asking you to take part in our study on reading comprehension. We are interested in finding out if the Seven Cs of Comprehension handout will help you remember pieces of the story when taking a reading quiz.
3. If you agree to be in this study, you will be using a handout that has a reading strategy, the Seven Cs of Comprehension. Everyone in the class will be taught how to use the handout and will be given time to practice using it as a daily reading activity. Once everyone in the class understands how to use the handout, they will read a short story alone and use the Seven Cs of Comprehension handout to help them remember important pieces of the story. Then you will take a quiz about the short story.
4. Possible benefits of being involved in the study include higher reading scores on quizzes after using the Seven Cs of Comprehension handout.
5. Possible risks of being a part of the study are very small. However, you may have difficulty answering quiz questions for the reading assignment at the beginning of the study. Also, you may feel frustrated learning how to use the Seven Cs of Comprehension handout.
6. Please talk this over with your parents before you decide whether or not to be part of this study. We will also ask your parents to give their permission for you to take part in the study. But even if you parents say “yes,” you can still decide not to do this.
7. If you don’t want to be in this study, that is okay, too. Remember, being in this study is up to you, and no one will be upset if you say “no” or even if you change your mind later and want to stop.
8. You can ask any questions that you have about the study. If you have a question later that you didn’t think of now, you can call Michele Farmer at xxx-xxx-xxxx.
9. Signing your name at the bottom means that you agree to be in this study. You and your parents will be given a copy of this form after you have signed it.

Print your name ___________________________ Date ___________________________

Sign your name ___________________________
APPENDIX C

THE LEXILE FRAMEWORK FOR READING MAP (Scholastic, 2006)

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Lexile Level</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lowest Range</td>
<td>Highest range</td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>200</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Second</td>
<td>300</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Third</td>
<td>500</td>
<td>700</td>
<td></td>
</tr>
<tr>
<td>Fourth</td>
<td>600</td>
<td>800</td>
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<tr>
<td>Fifth</td>
<td>700</td>
<td>900</td>
<td></td>
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<tr>
<td>Sixth</td>
<td>800</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>Seventh</td>
<td>850</td>
<td>1100</td>
<td></td>
</tr>
<tr>
<td>Eighth</td>
<td>900</td>
<td>1150</td>
<td></td>
</tr>
<tr>
<td>Ninth</td>
<td>1000</td>
<td>1200</td>
<td></td>
</tr>
<tr>
<td>Tenth</td>
<td>1025</td>
<td>1205</td>
<td></td>
</tr>
<tr>
<td>Eleventh</td>
<td>1050</td>
<td>1210</td>
<td></td>
</tr>
<tr>
<td>Twelfth</td>
<td>1070</td>
<td>1225</td>
<td></td>
</tr>
</tbody>
</table>

Note: Scores derived from Scholastic Reading Inventory are used as an approximate grade level indicator.
APPENDIX D

EXCERPT FROM BASAL READER, PROJECT ACHIEVEMENT 'E'
(Spache & Spache, 1984, pp. 64-65)

Nearly everyone is shy in some ways. If shyness is making you uncomfortable, it may be time for a few lessons in self-confidence. You can build your confidence by following some suggestions from doctors and psychologists.

Make a decision not to hold back in conversation. What you have to say is just as important as what other people say. And don't turn down a party invitation just because of your shyness.

Prepare yourself for being with others in groups. Make a list of the graphic organizer qualities you have. Then make a list of ideas, experiences, and skills you would like to share with other people. Think about what you would like to say in advance. Then say it.

If you start feeling self-conscious in a group, take a deep breath and focus your attention on other people. Remember, you are not alone. Other people are concerned about the impression they are making, too.

No one ever gets over being shy completely, but most people do learn how to live with their shyness. Even entertainers admit that they often feel shy. They work at fighting their shy feelings so they can face the cameras and public.

Just making the effort to control shyness can have many rewards. But, perhaps the best reason to fight shyness is to give other people a chance to know more about you.

Choose the best answer for each question.

1. Where would this article probably appear?
   a. in a popular magazine
   b. on the front page of a newspaper
   c. in a science textbook
   d. in an encyclopedia
2. The main purpose of the article is to_____.
   a. explain how shyness develops
   b. recommend ways of dealing with shyness
   c. persuade readers that shyness is natural
   d. prove that shyness can be overcome

3. According to the author, the key to fighting shyness is_____.
   a. speaking up at parties
   b. winning fame
   c. making a list of graphic organizer qualities
   d. developing self-confidence

4. Which of these can you conclude for reading the article?
   a. Shy people never have fun.
   b. Entertainers choose their work to fight shyness
   c. The attempt to overcome shyness is always successful.
   d. The attempt to overcome shyness is always worthwhile.

5. What is the source of the suggestions for fighting shyness?
   a. the author of the article
   b. shy men and women
   c. doctors and psychologists popular entertainers

6. In this reading selection the word self-conscious means
   a. unaware of your surroundings
   b. unable to discuss current events
   c. acutely aware of your actions
   d. actively seeking approval
APPENDIX E

SEVEN Cs OF COMPREHENSION/GRAPHIC ORGANIZER

Directions: Follow each step of the Graphic organizer to help you investigate your nonfiction reading passage.

Step 1: CONNECT
"Type this topic into my brain; pull up my file." What do I THINK I know about this topic? I realize all of these facts may NOT be correct.
1.
2.
3.
4.

Step 2: CLARIFY / CONFIRM
As I am scanning (NOT READING YET) the nonfiction passage I will clear up anything that I misunderstood in Step 1 and rewrite it correctly, or I will confirm that "Yes, I was right" in Step 1 and write the correct statement again. All facts in this step will be correct.
1.
2.
3.
4.

Step 3: CONSIDER
What other questions do I have about this topic?
1.
2.
3.
4.

Step 4: COLLECT
Now I am reading the text. I will try and answer my questions from Step 3. I will also write down interesting new facts I find while reading about this topic.
1.
2.
3.
4.
Step 5: CONVERSE
I will give my paper to my partner and summarize what I know about today’s topic. My partner will write down what I say on MY paper.

Step 6: CONCLUDE
I will use the information that I CONFIRMED, CLARIFIED, or COLLECTED to write a paragraph about today’s topic.

Step 7: CITE
I received this information from:
1.
2.
3.
APPENDIX F

GRADE LEVEL PERFORMANCE PROBE (EXAMPLE)

Excerpt taken from history text, Creating America: A History of the United States (Garcia, Ogle, Risinger, Stevos, & Jordan, 2002)

Tribes of the Great Plains

The Great Plains area stretches from the Mississippi River to the Rocky Mountains. Here lived the Plains Indians. These people lived in tepees made from buffalo hide. Buffalo gave them their food, their clothing, and other things they needed to live.

Many tribes lived on the Great Plains. The Mandans and Pawnees lived in settled villages where women grew crops while men hunted buffalo. Further west were tribes that did not live in settled villages and did not farm. The Dakotas, Crows, and Cheyenne followed the buffalo herds all year long.

Life for the Plains Indians changed greatly when the Europeans arrived. The Spanish brought horses with them to Mexico. Some of these horses escaped and created wild herds in the Great Plains. The Plains Indians captured these wild animals and learned to be expert riders. Horses made it much easier for them to hunt buffalo.

The Plains Indians got something else from the Europeans: guns. With horses and guns, the Indians of the Great Plains were able to fight to protect their lands for many years. Only when the buffalo herds were wiped out in the late 1800s were they forced to give up and move to special areas called reservations.

Choose the best answer for each question.

1. The Plain Indians lived mostly in what part of the United States?
   a. Eastern territory
   b. Western territory
   c. Southern territory
   d. All of the above

2. Life for the Plains Indians changed with the arrival of which group?
   a. English
   b. French
   c. Asian
3. In the sentence, "The Mandans and Pawnees lived in settled villages where women grew crops while men hunted buffalo." The word crops refers to:
   a. food from plants
   b. portions of the buffalo
   c. grass for the herds
   d. palms for housing

4. According to the passage, an important change in the life of the Plains Indians was the introduction of the horse because it,
   a. provided an additional food supply
   b. helped farmers plow fields
   c. made it easier to hunt buffalo
   d. let women visit neighboring forts

5. Which of these can you conclude from reading this story?
   a. The Plains Indians downfall was the introduction of the gun.
   b. The Plains Indians relied on the buffalo for food, clothing and other things needed to live.
   c. The Plains Indians did not speak to European settlers.
   d. The Cheyenne tribe was the leader of all the Plains Indians.

6. Another title for this passage could be,
   a. Gun and Horses in the Past
   b. Growing up a Mandan
   c. Lifestyles of the Plains Indians
   d. Buffalo: Gone but not Forgotten

Grade Level Performance Probe Answer Guide

1. b  2. d  3. a  4. c  5. b  6. C
APPENDIX G

FRY GRAPH FOR ESTIMATING READING AGES

Fry Graph for estimating Reading Ages (in years)

Note: Graph for Estimating Readability by Grade Level (Fry, 1977).

Directions for use: Measures the meaning and grammar factors of reading. Measuring the meaning of a passage determines word difficulty by evaluating the word length. This factor is measured by the average number of syllables per 100-words. Choose a sample inclusive of 100 words, count the number of syllables contained in the sample. Repeat this process of randomly choosing a 100-word passage for a total of 3 times. Use the results to calculate the average number of syllables found in the 3 passages, the result will be used as an input for the graph above.
Measurement for grammar is evaluated by taking the average number of words in a sentence. The same 100 word sample used in measuring the meaning may be used for this assessment. Simply count the number of words per sentence then calculate the average, the result will be used as an input for the graph above.

Take the two inputs, (1) the average number of syllables in three 100-word samples and (2) the average number of sentences per 100 words, then enter these into the graph, this will provide an estimated grade level of readability.
APPENDIX H

SEVEN CS COMPREHENSION STRATEGY/GRAPHIC ORGANIZER USAGE CHECKLIST

Student Identification ___________________________ Observer ___________________________

<table>
<thead>
<tr>
<th>Date</th>
<th>Complete Use of Graphic Organizer +</th>
<th>Partial Usage of Graphic Organizer 0</th>
<th>No Usage of Graphic Organizer ___</th>
<th>Comments/Quiz Score</th>
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</thead>
<tbody>
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</tbody>
</table>

139
## STRATEGY INSTRUCTION CHECKLIST INSTRUCTIONAL PHASE

<table>
<thead>
<tr>
<th>Procedure:</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
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</thead>
<tbody>
<tr>
<td>1. Introduction: prompts students to objective of daily lesson: provides book and blank graphic organizer</td>
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<td>2. Direct Instruction: provides directions to complete daily assignment</td>
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<td>3. Models:</td>
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<tr>
<td>a) Demonstrates how to progress through each of the 7 steps included in the graphic organizer.</td>
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<td>b) Guides students in finding additional information.</td>
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<td>c) Uses overhead as a visual display of the graphic organizer.</td>
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<td>d) Demonstrates how to work with a partner to create a summary.</td>
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<td>e) Demonstrates how to use textbooks and the computer to find more information.</td>
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<td>f) Demonstrates how to complete a basal quiz.</td>
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<td>4. Practice: includes time for student practice using graphic organizer</td>
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<td>5. Support: includes time to answer student question</td>
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<td>6. Feedback:</td>
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<tr>
<td>a) Redirects student work while students are practicing using the graphic organizer.</td>
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<tr>
<td>b) Conferences with teams on completed graphic organizer</td>
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</tbody>
</table>

**Total**

0 = Not implemented  1 = Partially implemented  2 = Appropriately implemented
REFERENCES


VITA

Graduate College
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Michele Frances Farmer

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  Bachelor of Science, Education, 1999
  Oklahoma State University, Stillwater

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