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The Effects of Graphic Organizers and Explicit Instruction on the Informational Text Learning and Comprehension of Fourth- and Fifth-Grade Students with Learning Disabilities

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by

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DEDICATION

This dissertation is dedicated to my parents, for their unwavering love and support, and to students with learning disabilities.

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**The Effects of Graphic Organizers and Explicit Instruction on the Informational
Text Learning and Comprehension of Fourth and Fifth Grade Students with
Learning Disabilities**

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This single-case study compared the effects of a typical practice baseline phase to those of a treatment phase. Seven students with learning disabilities (LD) in Grades 4 and 5 participated in the two-school-site study. Each student had basic word-reading proficiency and a distinct deficit in comprehension. Baseline lessons consisted of text reading with corrective feedback, a text-based summary with corrective feedback, and a daily quiz. In treatment, students read text with corrective feedback, used a graphic organizer to study and teach the content to the instructor, and completed a daily quiz. The baseline and treatment lessons were influenced by direct, systematic, and explicit instruction.

Analysis indicates that an experimental effect was present for all students when the daily quiz results for baseline and treatment phases are compared. Percentage of non-overlapping data (PND) results were 100% for five students, which is characterized as a highly effective treatment according to single-case standards. Two students had minimal overlap between baseline and treatment, but their scores indicate that the treatment was effective at improving informational text learning. On a cumulative pre/post social

studies test, students at School A improved from 26% to 56%, and at School B, students scored 28% on pretest and 81% on posttest. Results indicate that treatment components that were previously effective for students with LD in secondary school are promising for enhancing informational text learning for students in upper elementary school. A social validity questionnaire indicated that students perceived graphic organizers as an efficacious practice for improving learning potential.

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CHAPTER 1: INTRODUCTION

Students With LD in Grades 4 and 5: Difficulties With Reading for Understanding

Statement of the Problem

As students in the primary grades (K-3) learn to read, they acquire proficiency in the alphabetic principle, which enables them to decode words and read accurately. Then, beginning in upper elementary school, the focus of instruction shifts to an emphasis on reading text to learn (Wanzek, Wexler, Vaughn, & Ciullo, 2010). A fundamental requirement for older students is to read increasing amounts of text for various purposes, including reading to acquire content area information for later application (Gajria, Jitendra, Sood, & Sacks, 2007).

Reading for understanding can be a challenging endeavor for students with learning disabilities (LD) in Grades 4 and 5. The National Joint Committee for Learning Disabilities (2008) identified some characteristics that numerous students with LD in reading possess. Prevalent areas of difficulty for students with LD include recalling facts, summarization, locating details in text that reflect main ideas, sequencing, and generating inferences (National Joint Committee for Learning Disabilities, 2008). These specific reading problems that students with LD often possess interfere with their ability to acquire information and use the new information to demonstrate comprehension through a variety of activities, such as academic discussion and writing.

Students with LD experience additional learning challenges that impede their ability to effectively comprehend. During reading, these students frequently concentrate

on details that are not directly associated with the main idea or topic being presented (Bulgren, Deshler, & Lenz, 2007). Deficits in comparing and contrasting, organizing pertinent concepts, relating novel information to prior knowledge, and thinking critically subsequent to reading prevent students with LD from meeting expectations in Grades 5 through 12 (Bulgren et al., 2007). Additional problematic areas that can hinder learning include confusion about differences in text structure for narrative and expository text, insufficient vocabulary development, failure to appropriately integrate background knowledge, and weak strategic processing skills (Gersten, Fuchs, Williams, & Baker, 2001).

Significance of the Problem

Two significant problems exist for students with LD in upper elementary grades that experience difficulty with reading comprehension. First, despite years of research, there is still much to learn about successful instructional practices and interventions for upper elementary students with LD. A recent synthesis encompassing 20 years of research on students with LD and struggling readers in Grades 4 and 5 yielded only nine studies since 1990 that have used a treatment to improve reading comprehension (Wanzek et al., 2010). In this synthesis, five experimental and quasi-experimental studies since 1990 were located that focused on comprehension-skills development and strategies, and only four single-case (single subject) studies were identified (Wanzek et al., 2010). Although promising results were identified for treatments using researcher-developed measures of performance for main idea and summarization, fewer than half of the studies used standardized comprehension measures. Additional research is needed

that uses standardized measures to test the effectiveness of comprehension strategies in order for researchers and practitioners to gain increased confidence regarding what works best for students with LD in Grades 4 and 5 (Wanzek et al., 2010).

A second profound issue for upper elementary students with LD is that when reading deficits are not remediated in upper elementary school, students with LD are placed at a considerable disadvantage in secondary school compared to their nondisabled peers. Swanson and Hoskyn (2001) emphasized, “the challenges faced by adolescents with LD increase as they face the curriculum and learning demands of middle and high school” (p. 109). There are troubling statistics to support Swanson and Hoskyn’s claim. More than 20% of high school students with LD are at least five grades below their nondisabled peers in reading (National Joint Committee for Learning Disabilities, 2008). In summary, the majority of students with LD are unprepared to meet the academic challenges of secondary school (Swanson & Deshler, 2003).

The fourth and fifth grades, therefore, provide a brief window of opportunity for educators to provide quality instruction and treatment for students with LD who struggle with acquiring information from text and struggle with comprehension. Quality upper elementary instruction is vital because academic assignments requiring proficiency in reading, such as in science or social studies, increase in complexity in middle school (DiCecco & Gleason, 2002; Gajria et al., 2007). Therefore, despite limited research to date on upper elementary students with LD (Wanzek et al., 2010), the promising instructional practices tested in research trials should be considered. More research is required to investigate the effectiveness of new treatments and to certify that existing

treatments are evidence-based for students with LD in Grades 4 and 5 (Wanzek et al., 2010).

Content-Area Reading

The Challenges of Learning From Informational Text

Science and social studies content mastery standards are now included in accountability-based reform efforts and graduation requirements for all students (Bulgren et al., 2007; Scruggs & Mastropieri, 2003). Students must acquire proficiency in reading informational texts to succeed academically in these content-area classes, beginning in upper elementary school. To facilitate this growth, informational text reading and strategies or tools to heighten understanding should be a focal point of instruction beginning in upper elementary school (Gajria et al., 2007). Informational text reading is common in science and social studies classrooms and can be challenging for all students. However, when coupled with the specific needs of students with LD, learning from informational textbooks takes on a higher degree of difficulty in the absence of appropriate instructional strategies (Gersten et al., 2001; Scruggs & Mastropieri, 2003).

Informational text structure can hinder students with LD from reading for understanding (Gersten et al., 2001). Students with disabilities often develop knowledge of text structure at a much slower rate than nondisabled students (Gersten et al., 2001). A lack of experience in reading informational text, or the absence of strategic reading techniques, often results in students' recalling ideas in a disorganized manner and

struggling to cognitively organize central themes (Gersten et al., 2001; Griffin, Simmons, & Kame'enui, 1991).

Once an awareness of and a familiarity with text structure are established, research suggests that students often ask themselves important questions about the text they are reading and become actively engaged in the process of comprehension (Gersten et al., 2001). For students who are unable to become comfortable with complex text structures, teachers sometimes rely on alternatives to reading to help these students acquire content through videos, books on tape, or lecture. However, the previously listed activities are only short-term solutions to learning problems (Wade, 1983). For success in high school and beyond, students should have the ability to learn from textbooks, which are still the most commonly used medium for presenting content-area topics (Boon, Fore, Ayres, & Spencer, 2005).

To acquire information from a content-area text, the reader must possess at least average decoding and comprehension skills, coupled with an understanding of the purpose and unique organizational structure of informational texts (Griffin et al., 1991). However, even when students with LD are proficient decoders and read fluently, they often experience persistent difficulty with comprehension. Ignoring extraneous or irrelevant information, making associations to prior knowledge, and identifying main ideas are challenging responsibilities for students with LD (Gajria et al., 2007).

Given the various complexities found in science and social studies textbooks, tools to complement text reading may be essential for students with LD. In the next section, specific practices that can be used to help students better understand text by

highlighting pertinent information will be introduced. Tools that make abstract information more concrete and organized can be of great help to students with LD who struggle to learn from informational text (Boon et al., 2005; DiCecco & Gleason, 2002; Griffin et al., 1991).

Instructional Practices That Facilitate Learning From Informational Text

Content enhancements are tools that assist with reading comprehension and concept learning involving informational or content-area text (Bulgren et al., 2007). “The underlying assumption is that instructional devices can facilitate the selection, organization, and presentation of difficult-to-understand material and make the text more meaningful and accessible to students of varying ability levels” (Gajria et al., 2007, p. 213). Various types of content-enhancement tools have been studied to determine their effectiveness in improving the understanding and retention of important information found in informational texts. Chapter 2 will review several content enhancements in detail, as well as recent social studies treatment methods that provide access to content while minimizing time spent on reading.

Intervention research on students with LD in middle school and high school indicates that specific instructional and intervention strategies can be applied to improve learning and strategic processing in reading, including content-area reading. In a meta-analysis of 58 intervention studies, treatments that (a) specifically included advanced organizers to introduce and highlight new content and (b) extended practice opportunities accounted for the greatest percentage of variance to effect sizes compared to all other treatment components (Swanson, 2001). The following combination of instructional

components was associated with the highest impact: extended practice (including review and feedback), the introduction of new content or material in each intervention session, small-group instruction, and some type of an advanced organizer prior to instruction (Swanson, 2001; Swanson & Deshler, 2003).

Another tool for facilitating informational text learning and comprehension is a graphic organizer (GO). Graphic organizers are content enhancement tools that have been found to be effective for students with LD and struggling readers in general education (Boon et al., 2005; Gajria et al., 2007; Kim, Vaughn, Wanzek, & Wei, 2004). Graphic organizers can facilitate the learning of complex content-area information by organizing details from text and making abstract concepts more concrete (DiCecco & Gleason, 2002), and they also can be used as a study guide for social studies and science concepts (Darch & Carnine, 1986). Studies on the use of graphic organizers for students with LD have shown moderate to high effect sizes (Kim et al., 2004; Gajria et al., 2007). Additional instructional components often have been included in studies using graphic organizers, such as explicit instruction (Stagliano & Boon, 2009) and small-group instruction (DiCecco & Gleason, 2002), which significantly affected the learning of students with LD.

Theoretical Influences

When explicit instruction, or Direct Instruction (DI) (Becker & Engelmann, 1973), has been used as an instructional procedure with a graphic organizer, there is evidence of improved outcomes on content learning in science (Darch & Carnine, 1986) and social studies (DiCecco & Gleason, 2002) for students with LD in upper-elementary

school through high school (Dexter & Hughes, 2011; Kim et al., 2004). When a GO in combination with explicit or systematic instruction is used, students with LD have the potential to access and recall information from a story or expository passage that otherwise might seem abstract or disconnected (DiCecco & Gleason, 2002; Idol & Croll, 1987).

Theoretical influences supporting GO, advanced organizers, and DI have been written about extensively for the past four decades. Despite the separate conceptual frameworks of these theories, research indicates that when used in combination, the instructional components derived from the theories have yielded improved outcomes in research trials for students with LD (Boulineau, Fore, Hagan-Burke, & Burke, 2004; DiCecco & Gleason, 2002; Gardill & Jitendra, 1999; Stagliano & Boon, 2009). The conceptual framework for systematically previewing text, explicit instruction, and graphic organizers is demonstrated in Figure 1.

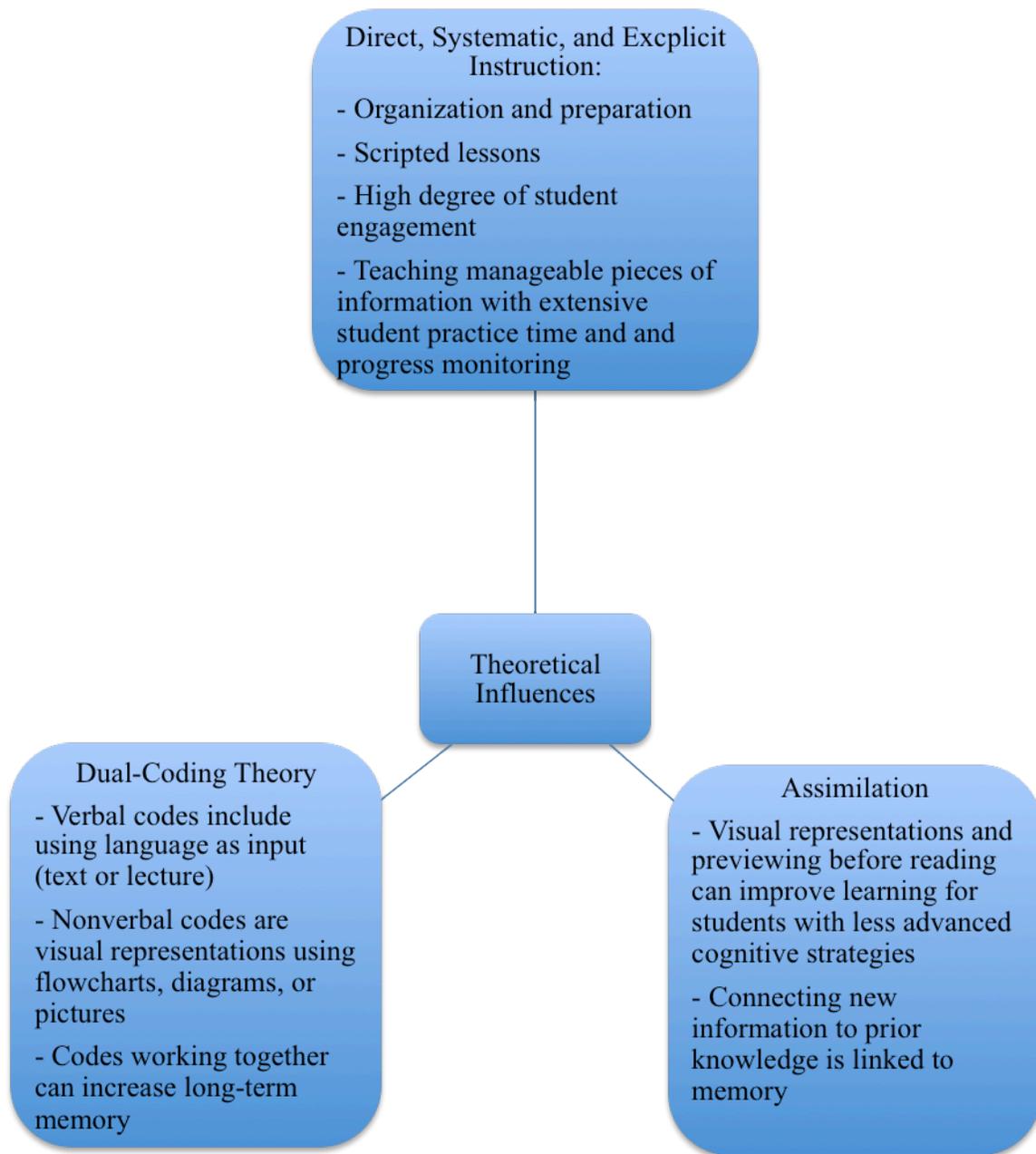


Figure 1. Theoretical influences supporting the use of previewing, systematic teaching, and Graphic organizers.

Direct instruction

Direct Instruction is a framework that has been used to teach students with LD and at-risk students, including students from low socioeconomic backgrounds, for decades. DI is a theory characterized by the following: (a) a highly structured educational setting (Engelmann, 1999), (b) small groups, (c) carefully planned and scripted lessons emphasizing deliberate skills and information (Carnine, Silbert, Kame'enui, Tarver, & Jungholmann, 2006), (d) teachers prepared and trained to maximize instructional time (Becker & Engelmann, 1973), (e) attention signals and reinforcers for maintaining engagement (Becker & Engelmann, 1973), and (f) frequent measurement of progress.

DI (also referred to as *systematic instruction* or *explicit teaching*) focuses on teaching manageable pieces of information, with student practice time built in, subsequent to the introduction of each new concept (Carnine et al, 2004). DI has been used to teach early reading skills and mathematics and is an instructional framework that can be applied to other subject areas and a wide range of grade levels (Engelmann, 1999).

DI has been incorporated into several studies using GOs to teach content-area information to students with LD (Darch & Carnine, 1986; DiCecco & Gleason, 2002; Griffin et al., 1991). DiCecco and Gleason taught students with LD in small groups; the teacher read each piece of information from the GO to the students and elicited choral and unison responses during studying and review. Darch and Carnine used scripted instruction to teach middle school science material to students. Although not all studies that have been influenced by DI apply an instructional plan identical to that used in previous large-scale studies, such as Project Follow Through (Becker & Engelmann,

1973) or Engelmann's current DI training model (<http://www.nifdi.org/15/>), the theoretical influence of DI continues to be relevant, and it complements the theory of assimilation (Mayer, 1979) and the dual-coding theory (Clark & Paivio, 1991). All three theories strive to improve memory, establish a clear organizational pattern, and make abstract topics more comprehensible for students with less sophisticated cognitive strategies (see Figure 1).

Assimilation theory

According to the theory of assimilation, visual representations, such as graphic and advanced organizers, can improve learning outcomes for students with emerging cognitive strategies in reading comprehension (Mayer, 1979). Mayer asserted that integrating new or unfamiliar information with existing knowledge could cultivate long-term memory. GOs and advanced organizers, if constructed properly, have the potential to present new information and ideas while also linking novel information to previously learned concepts. The cycle of comparing and contrasting new material to previously acquired material is useful for students in situations where the GO or advanced organizer encourages the learner to actively apply the new information to a learning activity, such as questioning, writing, or discussion (Mayer, 1979). Advanced organizers have been more valuable to students who lack sophisticated cognitive strategies compared to students who already possess well-developed cognitive strategies (Mayer, 1979).

Dual-coding theory

The dual-coding theory suggests that visual information, when it is represented separately but in addition to verbal information or text reading, is associated with

improved long-term memory of academic concepts (Clark & Paivio, 1991; Sadoski & Paivio, 2007). The verbal “code,” which relies on language as input during reading or when listening to a text, is an obvious and integral component of understanding. The nonverbal code (visually representing ideas) can be enhanced through visual displays such as boxes, flowcharts, or Venn diagrams. Nonverbal codes are associated with improved text recall when combined with the verbal code (Sadoski & Paivio, 2007).

The verbal and nonverbal codes actively working together can be beneficial for students’ reading comprehension. Sadoski and Paivio (2007) wrote that working with students to form concrete images in their minds during reading is an effective strategy for improving comprehension for students of all ages and ability levels. In addition to text reading, verbal explanations and elaboration, as well as pictures or diagrams such as graphic organizers, are useful for fact retrieval and long-term understanding (Clark & Paivio, 1991).

Statement of Purpose

Systematic instruction with a graphic organizer has been studied extensively for students with LD in secondary school, while far fewer studies exist for students in elementary school (Dexter & Hughes, 2011; Kim et al., 2004). To address this gap, this dissertation study investigated the effectiveness of applying systematic instruction and graphic organizers to the informational text learning and comprehension of fourth- and fifth-grade students with LD. This dissertation study will test the effectiveness of treatment components (explicit instruction, feedback, and GOs) that were effective at

other grade levels, with a younger population of students with LD. Given the importance of reading to learn, beginning in upper elementary school, treatments that engage students in reading while also providing a strategy or content enhancement to foster learning are necessary. This study will contribute to the extant research using graphic organizers with informational or content-area text for students in Grades 4 and 5.

The following research questions guided the dissertation study:

1. Do explicit instruction using a graphic organizer lead to increased informational text learning and reading comprehension compared to a typical practice baseline condition?
2. How do students perceive the efficacy of using graphic organizers as measured by a student questionnaire (social validity)?

Chapter 2: Review of Literature

The review of literature presented here accomplishes the following five objectives:

(1) Provides a rationale for why graphic organizers (GOs) were selected to improve informational text learning and comprehension as opposed to other social studies interventions and content enhancements. This section describes recent social studies treatments and content enhancement tools and explains why GOs were better aligned with the goals of the study.

(2) Reviews extant research on GOs for students with LD in the middle-grades. Treatments will be described to reveal how components from middle school studies influenced the development and design of the dissertation.

(3) Explains the historical importance of direct, explicit, and systematic instruction in LD intervention research to justify its use in the dissertation study.

(4) Describes social validity measures in GO single-case research for obtaining information on perceived effectiveness.

(5) Summarizes how the literature review influenced the dissertation study presented in chapter 3.

Distinguishing Between Treatments That Enhance Social Studies Access and Treatments That Promote Reading for Understanding

Success in content-area subjects such as social studies often depend on a student's ability to read a textbook to glean important information (Okolo, Englert, Bouck, & Heutchse, 2007). Reading to learn names, dates, and historical events is a common requirement in social studies (Twyman, McCleery, & Tindal, 2006). Although textbook reading is certainly not the only instructional method in content-area classes, social studies is still considered by many to be a "textbook-based curriculum" (Okolo et al., 2007, p. 4). Many students with LD experience profound difficulty with reading informational texts for understanding, which can make social studies class challenging (Gersten, Baker, Smith-Johnson, Dimino, & Peterson, 2006; Gersten & Okolo, 2007).

Despite the learning needs in reading for students with LD as described in chapter 1, content-area learning and reading comprehension are essential for success, beginning in upper elementary school (Wanzek et al., 2010). As the emphasis of instruction shifts from learning to read to reading to learn, two integral expectations are placed on students: (1) Students must learn from informational texts to demonstrate content mastery, and (2) students must engage in activities to demonstrate reading comprehension and higher-level thinking beyond the level of basic fact recall (Bulgren et al., 2007). In social studies, students must cognitively organize information and apply facts and details in a variety of ways. Students are responsible for explaining big ideas, comparing and contrasting, writing persuasively, and answering comprehension questions (Bulgren et al. 2007; Gersten & Okolo, 2007).

This section will describe contemporary social studies research for students with LD in the middle grades (Grades 4 to 8). The extent to which these interventions can improve learning from informational text while also enhancing reading comprehension will be discussed. The dissertation study presented in chapter 3 consists of students with LD in upper elementary school, but this review includes students in middle school because many studies for improving content-area learning were conducted with participants in middle school. The review of literature will be more comprehensive by including Grades 4 through 8 and will demonstrate how components of treatments in middle school can be applied to upper elementary learners with LD who are confronted with new academic challenges.

Improving Access to Social Studies Content for Students With LD

Recent research in social studies for students with LD has been based on the conceptualization that reading and learning from informational texts is difficult for students with LD (Gersten & Okolo, 2007). Reading comprehension challenges for students with LD are compounded by the following issues often found in social studies textbooks: challenging vocabulary, advanced readability levels, and an unfamiliar or confusing style of writing (Harniss, Caros, & Gersten, 2007; Okolo et al., 2007). To help students with LD learn essential information, researchers have designed interventions intended to teach social studies content to students using treatments that involve less reading.

For example, a multicomponent intervention designed to make content on the Civil Rights Movement accessible demonstrates how information can be acquired

through a variety of activities (Gersten et al. 2005). Seventy-six middle school students, including 33 with LD, were matched on grade level and reading fluency before being randomly assigned to either a social studies treatment or a comparison condition. They were taught identical content via videos, discussion, independent reading, and question-answering sessions. Treatment consisted of watching a documentary in brief segments with stopping points for clarification, explicit background knowledge instruction, partner think-pair-share activities, brief text passage readings with a partner, and compare/contrast worksheets (Gersten et al., 2005). Students with and without LD significantly outperformed the comparison group on a content interview ($D = 0.72$) and a content posttest ($D = 0.62$). On a written exam, no significant differences were found. Additionally, the performance of students with LD was similar to the performance of nondisabled students on the written exam and content test (Gersten et al., 2005). The authors concluded that students with LD could learn grade-level material when instructed with techniques that make content accessible, and when text reading is not a focal point (Gersten et al., 2005).

Web-based learning is another instructional option for students with learning challenges and LD. The Virtual History Museum (VHM) is a web-based tool that includes “artifacts” for students to learn from, such as pictures, videos, music, and primary source documents (Okolo et al., 2007, p. 5). Teachers can select activities and lessons for students to learn from on the VHM, including writing activities and questions about the historical topics students learn. The purpose of the VHM is to make learning history fun and engaging through the use of media (Okolo et al., 2007).

In a pilot study examining the effectiveness of the VHM, three groups of middle school students (students with LD, students without LD, and honors students) were taught a 2-week unit on Andrew Jackson. There was no randomization in the study, and the design was pre/post. All three groups used the computer lab for 6 days to learn about the presidency of Andrew Jackson through individual and group work that focused on newspaper artifacts, images, brief text passages, a discussion of the Indian Removal Act, and an essay assignment about Andrew Jackson. On a pre/post fact test, each group demonstrated improved mean scores, with no significant differences across groups. On a “reasoning” measure with open-ended questions, all three groups improved on the posttest, but students in honors classes differed from students with disabilities. On an essay, word count and accuracy of statements were significantly higher for students without LD and students in honors classes (Okolo et al.). The findings of this study indicate that all three groups were able to improve in fact acquisition following use of the VHM, but the VHM seemed to have a more significant impact on the reasoning ability (comprehension) and written expression skills of students in honors class and those in general education compared to students with disabilities.

Twyman et al. (2006) has cited poorly written textbooks that unfairly assume too much background knowledge and a “shallow” presentation of major concepts (Twyman et al., 2006) as a rationale for developing interventions that limit text reading. Two eighth-grade classrooms (7 students with LD) participated in a study in which one class was selected for the experimental condition while the other served as a comparison. The treatment involved (a) explicit instruction to teach relevant background knowledge and

review previously learned material, (b) structured note taking, and (c) problem-solving practice that taught students a think-aloud technique to formulate ideas for writing evaluative statements. The comparison group learned via group and teacher textbook reading, individual silent reading, and completion of comprehension questions. Results indicated no significant difference between groups on a content-learning posttest, but the students receiving explicit instruction outperformed the comparison group in vocabulary acquisition and problem-solving essays (Twyman et al., 2006).

In summary, the recent social studies research reviewed in this chapter has several implications. First, many of the recent studies on teaching social studies to students with LD were designed to provide access to content using strategies that limited reading time. The treatments, such as Web-based learning (Okolo et al., 2007), video-guided instruction (Gersten et al., 2005), and explicit instruction of concepts using lecture and notes, resulted in improved social studies content acquisition for students with LD. For researchers and practitioners interested in strategies for enhancing fact acquisition without extended reading responsibilities, the treatments reviewed here may be promising.

A second implication is that although the previously described treatments improved fact learning, students were not provided extensive opportunities to practice and improve their reading skills using informational text. Content-area reading is an integral part of middle school and high school (Gajria et al, 2007), so researchers and practitioners interested in promoting improved content-area outcomes and reading

comprehension may gravitate toward treatments that which include reading as a more central component to the research.

Finally, although the previously reviewed treatments did improve content acquisition, the dissertation study presented in chapter 3 asks slightly different research questions than the studies described here. This dissertation aims to enhance both learning in social studies and reading comprehension by maintaining text reading as a prominent component, along with a manipulated independent variable. Given the goal of improving comprehension and fact acquisition, the treatments described in subsequent parts of chapter 2 had a more substantial influence on the development of the dissertation.

Content Enhancements for Content Learning and Comprehension

Content enhancement tools can accelerate the understanding of material found in informational texts for students with LD (Bulgren et al., 2007; Gajria et al., 2007). Content enhancement tools are instructional devices that emphasize important concepts, events, and vocabulary to assist with recall and application of major concepts before, during, and subsequent to reading (Deschler et al., 2007). Given their potential for improving learning, this section briefly explains several content enhancements and provides a rationale for why graphic organizers were the treatment selected for this dissertation. Research conducted with middle-grade students with LD using content enhancements was reviewed.

Advanced organizers are content enhancement tools in that they have the potential to assist students with less-developed cognitive strategies remember the central purpose of a conceptual unit and to cognitively organize abstract information (Mayer, 1979).

Advanced organizers are defined as statements in a treatment that invite students to preview, or occasionally review, material, such as the central ideas and guiding questions of a topic (Swanson & Hoskyn, 2001). Advanced organization typically requires the teacher to make direct statements and identify instructional objectives, often using an outline or visual aid (Swanson & Hoskyn, 2001).

Advanced organizers are a content enhancement associated with improved content-area learning and comprehension in middle school and high school (Gajria et al., 2007; Swanson & Hoskyn, 2001). In a treatment component analysis of interventions for adolescents with LD, advanced organizers and explicit instruction were identified as the components that best predicted effect size. Sixteen percent of effect size variance in this comprehensive meta-analysis was attributed to the combination of advanced organization and explicit instruction (Swanson & Hoskyn, 2001).

For students in the upper elementary grades, limited research currently exists on the benefits of using advanced organizers, compared to such research for students in secondary school. Darch and Carnine (1986) used a visual display (VD) advanced organizer to teach science material to upper elementary students with LD. Students were randomly assigned to a VD condition, which used an advanced organizer, or a text-based group that learned via reading and teacher-led discussion. Students in the advanced organizer group outperformed the comparison condition on a researcher-generated science posttest (Cohen's d ES = 1.80).

Despite the effectiveness of advanced organizers for secondary students with LD (Swanson, 2001; Swanson & Hoskyn, 2001), advanced organizers cannot be generalized

to upper elementary and middle school students without future research because only one study to date (Darch & Carnine, 1986) has identified advanced organizers as the primary independent variable. For a treatment to be evidence-based, commonly accepted criteria are at least four experimental studies of acceptable methodological quality, or two high-quality experimental studies (Gersten et al., 2005). Darch and Carnine demonstrated that advanced organizers are promising, but replication studies are needed with students in the upper elementary grades to determine if the treatment is evidence-based (Gersten et al., 2005).

Content-enhancement routines (CERs) were developed by a team of researchers striving to promote achievement in social studies for students with LD in secondary school (Bulgren et al., 2007). CERs are a set of instructional techniques designed to equip students with strategies or routines to acquire concepts and apply them to content-area learning. CERs are relevant to this review because they could potentially be examined with upper elementary students in the coming years.

Curriculum maps are an example of a CER that enables acquisition of historical information and key terms. Curriculum maps are teacher-led notes that are displayed for students to highlight and review major concepts in a unit of study. Curriculum maps are similar to advanced organizers but are used during and after reading, as opposed to before, to focus on major concepts, headings, and questions (Lenz, Adams, Bulgren, Pouliot, & Laroux, 2007). Curriculum maps highlight important topics, contain a list of critical questions, and establish relationships between concepts.

Guided questioning is a routine requiring instructors to unveil a central question before reading; furthermore, the instructor occasionally stops during reading so students can record pertinent details to answer the question. Additionally, the teacher asks students what smaller questions must be answered before answering the guiding question. Curriculum mapping and guided questioning are separate treatments, but studies measuring the effectiveness of the strategies have included both conditions (Lenz et al., 2007).

Curriculum mapping and guided questioning were superior to a comparison concept-review condition for adolescents with LD in a repeated-measures-design study (Lenz et al., 2007). Students took part in all three conditions during the study. The CERs were associated with larger gains on a social studies content measure versus a comparison condition. Effects for the curriculum mapping treatment were superior to guided questioning, with an effect size of 0.67 (Lenz et al., 2007). Both treatments highlighted “big ideas” for answering more advanced comprehension questions at the conclusion of a social studies unit (Lenz et al., 2007).

Because students in the upper elementary grades face increasingly challenging academic requirements, such as social studies content learning, researching curriculum mapping and guided questioning for students in upper elementary school is a possible direction for future research. However, given that many content enhancements focus on teaching critical information while de-emphasizing text reading, a different treatment was chosen for this dissertation study: graphic organizers. The rationale for selecting a GO as an independent variable will be supplied in the subsequent sections of this chapter.

Graphic Organizers: A Viable Option for Content Learning and Comprehension

Two factors make graphic organizers a worthwhile treatment for this dissertation study:

- (1) The review of social studies literature and content-enhancement tools highlighted treatments that improved content learning. However, the reviewed treatments focused less attention on reading informational text and instead emphasized fact learning, as opposed to comprehension. A central goal of this dissertation is for students to use text as a resource for acquiring content and improving reading comprehension. A treatment that includes a substantial amount of time devoted to student reading is more appropriate, given the purpose of the study.
- (2) GOs typically accompany text reading. The statement of the problem in chapter 1 indicated that students with LD consistently struggle with informational text learning. By researching a treatment that includes reading and a tool for highlighting content, we can help students garner practice opportunities to help them meet the expectations of Grades 4 through 12. Further research is needed to determine whether GOs are effective in Grades 4 and 5, and this study will add to the extant research (Dexter & Hughes, 2011; Kim et al., 2004). The existing literature on GOs in the middle grades (Grades 4–8) will be reviewed in the subsequent section.

The Effects of Graphic Organizers for Middle-Grade Students With LD

GOs can facilitate recall of information, assist with organizing concepts, and contribute to comprehension of narrative or expository text (Dexter & Hughes, 2011;

Gajria et al., 2007; Kim et al., 2004). They are visual aids (paper or computer based) containing boxes, cells, or a sequential pattern of statements. GOs display facts and summarize key concepts and vocabulary to facilitate fact learning and comprehension. They can be student generated, teacher generated, or both (Dexter & Hughes, 2011; DiCecco & Gleason, 2002; Gajria et al., 2007; Kim et al., 2004; Griffin et al, 1991

This section describes the extant research on using graphic organizers to improve content learning and reading comprehension in middle-grade students with LD. Experimental, quasi-experimental, and single-case designs (SCDs) are discussed. The purpose is to review relevant literature, discuss implications, and explain ideas for future investigation. Treatment components that were effective in middle school that can be applied to upper elementary students as they encounter increased academic demands will be highlighted to explain their impact on the current dissertation study.

Informational/Expository Text

There is promising evidence suggesting that GOs can improve learning in science and social studies with middle school students with LD. DiCecco and Gleason (2002) randomly assigned seventh and eighth graders with LD to a GO/ direct instruction condition or a typical practice condition. The social studies unit that was taught was on the industrial revolution. In the GO condition, teachers reviewed GOs with students briefly before reading, and for 15 min following student text reading. Students in treatment and comparison scored similarly on assessments of factual knowledge on multiple choice ($ES = -.012$) and fact quizzes ($ES = 0.04$), with both groups improving.

On essays that measured relational knowledge such as cause and effect and inferences, students in the GO condition outperformed the comparison group ($ES = 0.97$).

DiCecco and Gleason's (2002) study has several implications. First, although the GO condition failed to outperform the comparison group on literal fact acquisition, students using the GO were able to more effectively apply the information to a post reading activity (essay writing). This finding is important to educators because in content classes, students are often asked to discuss material and write essays to demonstrate their understanding. Second, because textbook reading in social studies begins in elementary school, studies examining the effectiveness of using a GO as a study guide to accompany text should be explored for students with LD in upper elementary school. This concept was an influence on the development of the dissertation study.

Researcher-developed graphic organizers were used to teach science content (fossil fuels) to middle school students with LD (Griffin et al., 1991). Students were randomly assigned to a GO condition with explicit instruction or to a comparison group that learned via an outline/note format. The dependent measures revealed no significant differences between groups on immediate and delayed posttests. However, the study's duration was only four sessions, and figures included in the article reveal that the fact list used in the comparison condition was identical to the sequence of facts provided to students in treatment. The only noticeable difference between the figures is that the fact list was numbered and on the GO, information was circled or boxed (Griffin et al., 1991).

The visual-spatial sequence of the GO did not yield significantly superior learning of facts as compared to a basic numbered outline in Griffin et al. (1991).

A single-case study was conducted to consider the effectiveness of a graphic organizer treatment for upper elementary students with LD on expository text comprehension (Stagliano & Boon, 2009). The previously mentioned authors conducted several additional studies using graphic organizers for students with LD, including a study in which students used computer software to complete graphic organizers in social studies class (Boon, Fore, Ayres, & Spencer, 2006). However, computer-based graphic organizers for students with LD have yet to be examined for upper elementary students with LD and, therefore, should be an emphasis of future research.

Stagliano and Boon (2009) examined how effective GOs were for improving reading comprehension with expository text passages in fourth-grade students with LD. The research design was multiple probe, which is the design in the dissertation study described in chapter 3. In baseline, students read a passage and answered five comprehension questions. Teachers wrote common elements found in expository text (e.g., time/place, main idea) on the board for students as reference during reading and answering questions. After students attained a consistent baseline performance (40% or less on quizzes), treatment began for the lowest-scoring student (other students received treatment after the previous student demonstrated an experimental effect, or a substantial improvement over baseline). The treatment consisted of reading, completing a GO, and answering questions. Results indicate no overlap in quiz scores between baseline and

treatment, as all students' percentage of non-overlapping data (PND; Scruggs & Mastropieri, 1998) results were 100%. This study was subject to an important limitation that was not addressed by the authors (Stagliano & Boon, 2009) in the limitation section: The dosages (time per session) between baseline and treatment phase differed, which had the potential to positively skew results in favor of the treatment. In future research (including this dissertation), dosage between baseline and treatment should be held constant.

Semantic and syntactic maps are graphic organizers used to enhance vocabulary and concept comprehension in social studies and science (Bos & Anders, 1990; Kim et al., 2004). Bos and Anders conducted a series of studies for upper elementary and middle school students with LD, including bilingual students (Bos & Anders, 1992). Each study compared three mapping procedures to a definition-instruction group. In semantic mapping (SM), the first condition, students and teachers created a relationship map to demonstrate similarities among vocabulary words (Bos & Anders, 1990). The second condition studied was semantic feature analysis (SFA). SFA is a relationship matrix that displays similarities and differences between vocabulary words and major concepts in the form of a matrix chart (Bos & Anders, 1990). The third condition was semantic/syntactic feature analysis (SSFA). SSFA is the same as SFA, except cloze sentences are added to the bottom of the matrix so that students can demonstrate understanding of vocabulary words (Bos & Anders, 1990). A definition-instruction group served as the comparison group for each study.

The three GO conditions yielded high effect sizes on researcher-developed measures of science and social studies learning across all studies for students in the middle grades receiving treatment, as compared to definition instruction. In four studies on middle school students with LD, the effect size ranged from 0.50 to 1.51 on posttests in favor of treatment groups (Bos & Anders, 1990). Similar results were found in studies with elementary bilingual students with LD. In three studies using an identical research design and treatment, effect sizes in favor of the content enhancement conditions were $d = 0.81$, $d = 1.46$, and $d = 0.48$.

Results in favor of the mapping procedures provide external validity to the findings because the instruction in the final three studies was conducted by classroom teachers (Bos & Anders, 1992). In the first three experiments, researchers served as the interventionists instructing the students in each treatment. In later replication experiments, classroom teachers delivered the treatment, which gives the results external validity. Future research can benefit from Bos and Anders's (1992) work by using teachers as intervention agents after initial effectiveness trials are held. The rationale for using teachers as interventionists is to determine whether the treatment is as effective when implemented by practitioners, as it is when other intervention agents, including researchers, administer the treatment. Replicating a practice with different interventionists can add external validity to the study and provide consumers of research with more confidence that the findings can be duplicated (Gersten et al., 2005; Stanovich

& Stanovich, 2003). Additional implications for future research with upper elementary students with LD will be discussed near the conclusion of chapter 2.

Narrative Text

There is less evidence for using GOs with narrative text for students with LD in the middle grades than for using GOs with expository/informational text. Only four studies to date have used a GO treatment with narrative text in the middle grades (Boulineau et al., 2004; Gardill & Jitendra, 1999; Idol & Croll, 1987; Taylor, Alber, & Walker, 2002). Each study used a single-case research design.

A story map is a graphic organizer that is used to summarize story events from narrative text. It is a document containing sections wherein story components such as characters, setting, and theme can be filled in by students or teachers, either on paper or on a computer (Gardil & Jitendra, 1999; Idol & Croll, 1987). Previewing, modeling, and instructor prompting of story map completion during reading were used in Idol and Croll's study (1987). After students learned the process with support, students independently completed the story maps. Students read each passage aloud with immediate corrective feedback. Gardill and Jitendra (1999) conducted a similar treatment. Teachers modeled the use of GOs during a modeling phase, but during a "lead phase" responsibility shifted to students. Finally, students completed story maps in dyads and answered comprehension questions. Similarly, in Boulineau et al. (2004) the teacher reviewed the basics of story grammar (plot, setting, etc.) prior to reading and discussed examples of each component before students worked independently.

The proximal dependent measure in Idol and Croll (1987) was 10 comprehension questions focusing on story components such as setting, plot, characters, and sequence. Two students improved substantially (PND = 94%, 100%), while two demonstrated small to moderate gains (PND = 52%, 59%). Small comprehension increases were also found on standardized measures of comprehension. Three of five students improved their grade equivalency comprehension score on the *Stanford Diagnostic Reading Test*, while one scored the same and one student declined slightly (Grade 3.0 to 3.1). On the *Nelson Reading Skills Test*, which measures listening comprehension, four of five students improved and one student scored the same. Due to the small sample size of this study ($N = 5$), the researchers did not conclude that these gains can be generalized; but including standardized measures increases confidence in a study's findings by providing a more complete picture of impact (Gersten, Baker, & Lloyd, 2000). Standardized measures of comprehension are used in the dissertation study described in chapter 3.

In Gardill and Jitendra's (1999) story-mapping study, reading comprehension increases were present for several students. On the measure of story elements recalled, five of six participants increased from pre- to posttest. The group mean score on pretest was 35.8% (range = 14%–57%) compared to 56.5% on posttest (range = 23% –69%). PND results were moderate to strong for four of the students (50%–100%) on a basal comprehension test, while all students scored 100% PND (no overlap between baseline and treatment scores) on story grammar tests. Story retell scores were less impressive, as only two students improved. Maintenance scores on the basal literal and inferential

comprehension test also decreased when testing following the treatment is compared to maintenance testing several weeks later. The group's average decrease was 67% to 58% on literal comprehension and 66% to 62% on inferential comprehension questions. The results demonstrate that explicit story map instruction resulted in short-term effects for most students, but findings did not support long-term comprehension growth.

In another story-mapping study with elementary participants with LD, two of the sample's participants were fourth graders (Boulineau et al., 2004). Students demonstrated significant improvement in story grammar comprehension scores during a story-mapping phase compared to a typical-instruction baseline. The baseline phase consisted of shared oral reading, brief discussions, and independent story-map completion. In treatment, teachers reviewed story grammar components, with detailed examples for each, shared text reading, and student completion of the map. PND scores for the seven-question story-grammar map used as the dependent variable were 100% (no baseline to treatment overlap) for both students. A "no intervention" maintenance check consisting of reading and story-map completion also took place. Both students' PND scores were 100% on the maintenance test (Boulineau et al., 2004).

Despite the improved comprehension scores in Boulineau et al. (2004), the study had several limitations that may diminish the findings. The first limitation is the small sample size of upper elementary students ($N = 2$). Additionally, students were given an unlimited amount of time to complete the story grammar assignment, so intervention dosage was inconsistent and not reported on. Finally, the authors stated that no functional

relation (experimental effect) was established between the baseline and treatment phase (Boulineau et al., 2004).

Future research, including this dissertation study, might improve on the limitations identified in previous studies. This would include attempting to include as many participants as possible in Grades 4 and 5 and ensuring that a functional relation was established at multiple points during the study across students.

One identified study compared graphic organizers to another established reading strategy. An alternating treatments design compared story mapping, self-questioning, and a no-intervention phase for students with LD (Taylor et al., 2002). There were five upper-elementary participants with LD in the study, and they were engaged in the story map treatment first. Students learned narrative story elements (e.g., main characters, plot), collaboratively completed story maps, and then completed maps independently. In the self-questioning phase, students orally read 10 predetermined questions common to narrative stories on a tape recorder. At predetermined stopping points, students answered the questions. After reading, students listened to the tape and were given an opportunity to alter their answers. Students scored higher in both treatment phases compared to the no-intervention condition that consisted of individual silent reading and a quiz. The mean average for the story mapping condition on researcher-developed comprehension quizzes was 86% across students, compared to an average score of 76% when receiving no intervention. The average of the self-questioning scores was 90%.

In summary, students improved when using story maps and self-questioning, but their comprehension scores were higher when using a self-questioning procedure (Taylor et al., 2002). Although only one study compared graphic organizers to another comprehension treatment, additional research is necessary to compare the relative effects of graphic organizers to those of other reading treatments. Comparing GOs to other reading strategies should be considered in future research studies for both narrative and informational text.

Direct, Explicit, and Systematic Instruction

Direct Instruction (DI) has been used since the 1970s, when Engelmann and colleagues used DI in Project Follow Through, a large, federally funded research study examining practices for students at risk, including students living in poverty (Becker & Engelmann, 1973; Stein, Carnine, & Dixon, 1998). DI's framework is characterized by the following components: small groups, scripts, progress monitoring, corrective feedback, background building, and choral and unison responses (Stein et al., 1998; Becker & Engelmann, 1973).

Intervention studies for students with LD often contain practices that have been influenced by DI. Despite DI's influence, the interventions themselves are not always classified as Direct Instruction. *Explicit instruction* and *systematic instruction* are terms frequently used to define teaching to small groups, modeling, immediate corrective feedback, and progress monitoring. Findings from syntheses and meta-analyses demonstrate that explicit or systematic teaching has been an important practice in studies

that have yielded significant effect sizes in reading and writing (Swanson & Hoskyn, 2001; Vaughn, Gersten, & Chard, 2000). For adolescents with LD, explicit skill modeling, explicit practice, small groups, and scaffolding are elements found in most successful interventions (Swanson & Hoskyn, 2001). Vaughn et al. (2000) summarized results from research syntheses for students with LD to identify collective findings and integral instructional characteristics. Generalizable principles of instruction gleaned from the articles indicate that the following elements were effective: (a) explicit instruction in reading and writing, (b) quality student feedback and student teacher interaction, (c) small-group instruction for reading and writing, (d) strategy instruction in reading, and (e) careful instructor attention to task difficulty (Vaughn et al., 2000).

DI/explicit frameworks have been used to teach students with LD and students in general education to use a GO to learn content material. For example, Griffin, Malone, and Kame'enui (1995) were interested in the effectiveness of GOs for nondisabled students in social studies. They conducted a study with four conditions: (a) graphic organizers with explicit instruction, (b) graphic organizers without explicit instruction, (c) explicit instruction without a graphic organizer, and (d) a traditional basal condition. Students assigned to explicit instruction and a GO significantly outperformed all other groups on immediate and delayed posttests, as well as on fact recall (Griffin et al., 1995). A step-by-step review of social studies concepts, teacher modeling, and teacher-directed reading and writing were deemed the crucial components of the explicit and GO condition.

The subsequent section focuses on two components found in the literature for using GOs and explicit instruction or DI for middle-grade students with LD. Those components are the use of highly organized or scripted lesson plans and immediate corrective feedback. These two components are highlighted due to their effectiveness in studies with middle school students with LD. The components will be integrated into the treatment described in chapter 3, so a brief summary of previous literature is used to demonstrate how they can be applied to the dissertation study:

Scripted Teaching

Although each study described in the literature review manipulated an independent variable (GO), the instructional delivery mechanism for the majority of studies was explicit instruction or DI. Despite the importance of the content-enhancement tool as noted in previous syntheses (Gajria et al., 2007; Kim et al., 2004), the teaching method (explicit instruction) plays an important role in the outcome of successful treatments for students with LD in reading (Swanson, 2001; Vaughn et al., 2000). Scripted instruction is an organizational strategy often interpreted by practitioners as an approach consisting of memorization and passive learning (Stein et al., 1998). However, scripts can be effectively implemented to describe to students how to practice strategies in math, reading, or writing. “The script, in and of itself, is simply a tool that facilitates clear communication between teachers and students” (Stein et al., 1998, p. 228).

Two previously reviewed content-area studies using GOs relied on instructional scripts to guide lesson delivery (DiCecco & Gleason, 2002; Griffin et al., 1991). In Griffin et al., scripts were developed for treatment and comparison conditions. The

scripts ensured that instructors emphasized only the most relevant parts of the material students were asked to learn, for example, “Before you read this page on petroleum, I will show you a picture of the information” (Griffin et al., 1991, p. 361). Instructional scripts guided social studies teaching in DiCecco and Gleason for treatment and comparison conditions. The scripts focused student attention on cells within the GO and established consistency across instructional periods (DiCecco & Gleason, 2002).

Several of the single-case studies discussed in chapter 2 relied on highly structured and systematic teaching to facilitate communication (Gardill & Jitendra, 1999; Idol & Croll, 1987). Explicit teacher modeling of story map completion and modeling of appropriate oral responses to questions before independent student practice were used in Idol and Croll. This framework was applied to each part of the intervention to ensure that students understood directions. Teaching scripts were developed for another narrative study using GOs (Gardill & Jitendra, 1999). The scripts were used to clearly communicate information from the text and to maintain consistency across students.

A recent study using GOs to enhance expository text comprehension employed an explicit procedure (Stagliano & Boon, 2009). Treatment included step-by-step modeling of story mapping procedures, scripted questions during a student training phase, and teacher modeling of how to appropriately respond to questions regarding story grammar components. Although this study and other studies including graphic organizers as content enhancements used an explicit style of instruction (e.g., Boyle, 1996), these studies did not employ DI. However, they are aligned with widely accepted descriptions of explicit and systematic teaching as reviewed in previous influential intervention

syntheses and articles (Vaughn et al., 2000; Vaughn & Thompson, 2003) and will continue to influence future intervention research.

The research presented in this section on scripted and systematic lesson planning influenced the treatment found within the dissertation study. The description in chapter 3 of the methodology includes a description of how a structured lesson plan was used to guide the instructional delivery of the dissertation. Although the entire lesson was not scripted, the lesson plan contains explicit directions for each major part of the baseline and treatment lesson plan, as well as specific teacher speaking prompts designed to engage students.

Corrective Feedback

Immediate corrective feedback is an integral component of DI (Becker & Engelmann, 1973). Feedback was used to help students acquire the procedures and content, as well as for redirection purposes, in many of the studies discussed in this review. The feedback practices gleaned from the literature presented here guided several aspects of the treatment described in chapter 3.

Immediate corrective feedback on word-reading errors appeared in two studies (DiCecco & Gleason, 2002; Idol & Croll, 1987). In the former, a study with middle school students with LD who were reading social studies text, corrective feedback was prominent. Students read passages orally and received feedback on reading decoding errors. Additionally, literal and inferential questions were embedded into the lesson plan. When students provided incorrect information in response to a question, instructors reread the relevant paragraph, repeated the question, and provided the correct response.

In Idol and Croll's study, teachers immediately provided correct words when decoding errors occurred during oral reading of stories. The purpose of these studies was to measure content learning and comprehension. By using feedback to limit frustration during oral reading, the instructors and students could focus on reading for understanding.

Accurate, systematic, and corrective feedback is a strategy that has been deemed an important part of special education instruction for decades. Training teachers to provide timely feedback to reinforce student response was a component of Project Follow Through in the early 1970s (Becker & Engelmann, 1973). Feedback from peers or teachers is recognized as an effective strategy for students with LD (Swanson & Hoskyn, 2000; Vaughn et al., 2000; Vaughn & Linan-Thompson, 2003). This instructional strategy will most likely continue to be an emphasized component of lesson procedures in future treatments for students with LD. The influence of the feedback techniques described in the GO literature contributed to the creation of the dissertation study and is reflected in the methodology. Specifically, immediate corrective feedback on word-reading errors, and re-reading of relevant paragraphs following inaccurate student answers to questions, were employed as a critical feature of the treatment lesson plan.

Social Validity in Single-Case Design GO Research

The Purpose of Social Validity Data

A measure of social validity often appears in single-case design studies to give voice to those potentially impacted by a treatment. "Social validity is the estimation of

importance, effectiveness, appropriateness, and/or satisfaction various people experience in relation to a particular intervention” (Kennedy, 2005, p. 219). Social validity can also be used to determine if participants believe that a treatment is sustainable and how it can be improved upon (Kennedy, 2005). Social validity was mentioned as a quality indicator for designing high-quality single-subject research (Horner et al., 2005). The quality indicators for single-subject research in special education indicate that social validity is important because it can demonstrate if the dependent variable is important to the participants and if the implementation of the treatment is practical (Horner et al., 2005).

Perceived Effectiveness of GOs in Previous SCD Studies

Four previous SCD GO studies included a measure of social validity (Fore et al., 2007; Gardill & Jitendra, 1999; Stagliano & Boon, 2009; Taylor et al., 2002). Two of the previous studies used student questionnaires to gather data, and this was the format that influenced the development of the questionnaire presented in chapter 3. Fore et al. used a student questionnaire to capture student perception regarding the effectiveness of a GO that was used for learning vocabulary. This measure asked students to provide a rating indicating the extent to which the GO helped with defining words and studying, and whether students enjoyed using the GO. The survey results demonstrated a high degree of satisfaction. Five was the highest possible score, and 1 was the lowest possible rating score for each item. The mean response was 4.5 for the entire questionnaire, with a range of responses from 3 to 5 (Fore et al., 2005).

Gardill and Jitendra (1999) developed a questionnaire to examine the extent to which students found the intervention useful for improving their reading comprehension. The rating scale for items was 1 to 5, and the range of responses was 3 to 5. To determine the sustainability of using story grammar note sheets, the researchers asked students if they would strongly recommend the practice to classmates; the majority of students said they would. The researchers also included an open-ended response question regarding what students enjoyed or did not enjoy about the intervention. Students responded that the tool was helpful for recalling information, but they did not enjoy reading orally (Gardill & Jitendra, 1999).

Two studies opted to use a student interview to collect social validity information (Stagliano & Boon, 2009; Taylor et al., 2002). In Taylor et al.'s study, the questions helped to ascertain which of two interventions students found to be more beneficial: graphic organizers or self-questioning. Students responded that both treatments were preferable to the typical practice baseline, but 4 of 5 students preferred the self-questioning routine because listening to their voices on a tape recorder was a more meaningful reminder of what happened in the story. The student that preferred the story map said he did not enjoy the interruptions in the middle of the story during the self-questioning treatment (Taylor et al., 2002). Finally, Stagliano and Boon conducted individual student interviews, and the questions focused on whether the students would continue to use the GO and if it helped with understanding reading passages. Students enjoyed using the tool because it helped them to organize ideas, and they indicated that it

was difficult to answer questions without the GO because reading was a difficult endeavor for them (Stagliano & Boon, 2009).

The literature on social validity within GO treatments impacted the creation of the social validity measure included in the dissertation study. The questionnaire seemed to be practical because it is time-efficient and has the potential to capture pertinent information in relation to the independent and dependent variables. Additionally, the results provided in this section demonstrate that students who participated in studies using GO treatments seemed to enjoy using the tool and found it effective for improving understanding of text. By including a measure of social validity in this dissertation study, I provide an opportunity to examine whether the responses are consistent with the previous findings.

Implications of Extant Literature for Developing a Dissertation Study

Given the importance of reading to learn in upper elementary school and beyond, additional research can support learners with LD in Grades 4 and 5. Despite social studies treatments that have positively influenced content-area learning, most of the reviewed SS studies required students to read less than most of the previous studies that included a graphic organizer. Graphic organizers have been effective for improving the content-area learning and comprehension of secondary students with LD compared to typical practice conditions in previous research (Dexter & Hughes, 2011; Gajria et al., 2007; Kim et al., 2004), but there is less research supporting the effectiveness of using GOs and explicit instruction in upper elementary school.

Since 2000, only one published graphic organizer treatment using expository or content-area text has been conducted for learners with LD in the upper elementary grades (Stagliano & Boon, 2009). Although they demonstrate the effectiveness of GOs, recent single-subject studies have had limitations, such as an inconsistent dosage of instructional time across phases (Stagliano & Boon, 2009). The dissertation study presented in chapter 3 attempted to improve upon previous studies, while remaining transparent regarding limitations that occurred.

This dissertation study applied treatment components used in studies for middle school students and adapted them to a study in upper elementary school. This research contributes to the existing literature base and can potentially serve as an exploratory study for future research on using graphic organizers to improve learning with informational text sources.

Chapter 3: Method

Method

Overview

The following study was conducted to determine the effectiveness of a treatment consisting of graphic organizers (GOs) and explicit instruction using social studies text with fourth- and fifth-grade students identified as having LD. The following rationale and research questions were used to guide this dissertation study.

Students in Grades 4 and 5 are expected to read for understanding more intensively than are younger students. The amount of reading material assigned, including informational text, increases substantially in upper elementary school compared to the primary grades. Students with LD often struggle with learning from informational text in upper elementary school. This study examined the extent to which treatment components (GOs used as a study guide and explicit instruction) that are associated with improving informational text learning in middle school can enhance the social studies learning and reading comprehension of fourth and fifth graders with LD. This single-case study could also provide information helpful to the design of a larger experimental study and contribute to the limited research on students with LD in Grades 4 and using graphic organizers for content-area reading.

The investigator prepared one interventionist to deliver this treatment to 7 students with LD at two elementary school sites. A multiple-probe design was used to

compare the effects of a typical practice baseline condition to instruction directed by the use of a graphic organizer.

Research Questions

1. Do explicit instruction and a graphic organizer lead to increased informational text learning and reading comprehension compared to a typical practice baseline condition?
2. How do students perceive the efficacy of using graphic organizers as measured by a student questionnaire (social validity)?

Research Design

Single-case methodology was used for the following treatment. The design selected was the multiple-probe across participants technique (Horner & Baer, 1978). Multiple-probe is a design that is similar to the multiple-baseline-across-participants design. In the latter, each student is continuously engaged in a baseline condition in each consecutive session until students change phases and begin receiving a specified treatment. In a multiple-probe study, all students begin baseline on the same day, but data points (probes) are not taken daily to safeguard against students' becoming lethargic or disinterested during baseline (Horner & Baer, 1978). The design was selected because the study involved an academic treatment for students with LD who have experienced difficulty with reading for understanding and answering questions subsequent to reading, and a continuous baseline may have caused frustration or disinterest.

The baseline condition was programmed to represent typical practice. A similar baseline condition was used in previous single-case studies using graphic organizers for reading comprehension and vocabulary (Fore, Boon, & Lowrie, 2007; Stagliano & Boon, 2009). The students read a chapter from a fifth-grade social studies textbook by alternating oral reading responsibility with the interventionist every other paragraph, and they received immediate corrective feedback on word-reading errors (Boutineau et al., 2004). Following reading, the student and interventionist engaged in a text-based review and discussion. The student orally stated everything he or she remembered and then went through each page in the chapter summarizing the main idea or events using pictures and headings as prompts. When students provided incorrect facts or summaries, the interventionist identified the correct information and re-read the section to the student. Finally, the student took a 10-question quiz (worth 30 points total) based on the day's reading. This daily quiz was read to the student and was a proximal dependent measure for the study.

When a negative or stable trend of failing quiz grades in baseline (e.g. 3–4 grades below 65% on daily quizzes) occurred, treatment began for the lowest-performing student. While Student 1 received intervention, the other students remained in baseline and were administered probes after each baseline session. When Student 1 demonstrated a positive trend of at least three improved daily quizzes with no overlapping data points between baseline and treatment, an experimental effect was considered established (Kennedy, 2005) and Student 2 began treatment (see a more detailed explanation of experimental control and experimental effects in the next paragraph). The same pattern

continued until all students received the treatment at the first school site. Identical procedures were conducted at the second school site.

Within single-case studies, experimental effect and experimental control are vital to controlling against threats to internal validity and analyzing the effects of the independent variable on the dependent variable (Kratochwill et al., 2010). An experimental effect is present when changes in the dependent variable covary with the introduction and manipulation of an independent variable. Experimental control is directly related to the experimental effect of a treatment. Horner et al. (2005) wrote, “In most cases experimental control is demonstrated when the design documents three demonstrations of the experimental effect at three different points in time with a single participant (within-subject replication), or across different participants (inter-subject replication)” (p. 168).

Experimental control is established by repeatedly measuring the dependent variable in order to locate changes in performance trends between a baseline condition and a treatment phase. The pattern of academic performance within the treatment phase must be a pattern of increasing positive performance in the direction predicted by the intervention (Horner et al., 2005). In summary, this study attempted to establish experimental control by demonstrating that each student significantly improved performance after receiving treatment. Furthermore, by applying inter-participant replication with at least three different students, experimental control was established (Kratochwill et al., 2010).

The design selected was optimal for three reasons. First, single-case designs are opportunities to replicate an intervention's impact numerous times in a single study (Horner et al., 2005). Six to 10 replications of a single-case academic or behavioral intervention with different researchers are necessary for a practice to be deemed evidence based (Horner et al., 2005). Second, a multiple-probe design does not require a prolonged baseline for all students (Horner & Baer, 1978). Because difficulty in learning content was a factor impacting the students in this study, the selected design did not require students to remain in a baseline situation in which they struggled longer than necessary. Finally, by using this methodology in two schools, the interventionists' time was maximized and used efficiently by avoiding scheduling issues that could have adversely impacted participants.

IES Guidelines and Quality Indicators for Single-Case Research

Several components of this study's design and implementation were influenced by guidelines and recommendations for single-case (formerly referred to as "single-subject"), methodology. In 2010, nationally recognized experts in the area of single-case designs (SCD) developed a technical report for the Institute of Educational Sciences (IES). The document provided guidance on ensuring quality research (Kratochwill et al., 2010). The report was structured around four major topics. After introducing each major topic below, I will offer an explanation of how the present study attempted to meet the IES recommendations, and what areas were not completely aligned. The major topics are as follows:

- (a) a summary of the research questions that SCDs are designed to answer
- (b) how to control against major threats to internal validity
- (c) criteria for meeting “evidence standards,” including the number of data points required to judge an intervention effect
- (d) standards for data analysis

SCD Research Questions

The question to pose regarding this study’s SCD research question is, “Is this intervention more effective than the current baseline, or is it a business-as-usual condition?” Additionally, my design explores the IES question as to whether a causal relation exists between the introduction of an independent variable and a change in the dependent variable (Kratochwill et al., 2010). By taking careful steps to ensure that the baseline condition’s time, materials, reading length, and intensity were equivalent to treatment (except for the graphic organizer), adequate steps toward meeting guidelines for this category were taken.

Threats to Validity

To control for threats to internal validity, multiple replications of effect within an SCD study are essential. Within a study, three or more demonstrations of experimental effect at three different points in time should be completed to strengthen internal validity and meet the current IES “evidence standard” (Horner et al., 2005; Kratochwill et al., 2010). Although a single-case study may be published by a single researcher demonstrating several replications of effect within a study, additional replication studies must be utilized by other researchers in different settings to arrive at a reliable evidence

base and to increase generalization (Horner et al., 2005). Other threats to internal validity that IES highlights are systematic participant selection differences, history events, and significant attrition (Kratochwill et al., 2010).

This study meets several of the criteria for avoiding threats to validity. There are more than three demonstrations of experimental effect at different points in time. There were no history events reported during this study or attrition following the beginning of baseline. However, a single researcher conducted this research, and different research teams did not establish the replications of effect.

Evidence Standards Criteria

IES explains that one of the central goals in an SCD study is to determine whether a functional relation exists between a manipulated independent variable and a change in the dependent variable. Specifically, to demonstrate “experimental control,” the method of staggering the independent variable across different points in time with different participants, or cases, should be used (Kratochwill et al., 2010). This procedure was conducted in the dissertation study by using a multiple-probe design with more than three attempts to demonstrate an intervention effect at three different points in time.

Other indicators of quality were adhered to in order to influence design and implementation. The following quality indicators played a major role in the design of the SCD described in this paper: a description of the baseline condition and independent variable with replicable precision, a measurement of treatment fidelity, and assurance that the treatment is practical in typical settings and cost-effective for practitioners (Horner et al., 2005).

Data Analysis Standards

IES recommends a detailed visual analysis including a demonstration of a behavior in baseline that requires treatment or remediation. Furthermore, a trend in each phase must be clearly demonstrated to display consistency in performance. IES recommends combining studies to meet evidence standards for an SCD treatment (Kratochwill et al., 2010). This entails combining other papers of a similar treatment and providing evidence for at least 20 different participants at different geographical locations. This study does not meet those standards but hopefully can be used to provide some initial evidence of effectiveness for the practice.

Setting

The research was carried out at two elementary schools in a suburban district in the south-central region of the United States in a fast-growing suburb of a major city. The total student enrollment of the district in 2009 was 22,060 students. The district has 3 high schools, 5 middle schools, and 18 elementary schools. The student population in the district is 37.5% Caucasian, 22% African American, and 31.9% Hispanic. Nine percent of the total student enrollment is classified as having a disability. Forty-two percent of students in the district receive free or reduced-price lunch. Eleven percent of students in the district have limited English proficiency (LEP). The primary service delivery model for students with LD in this district is resource room instruction. The treatment described in this paper took place in the resource room.

Description of Sample

Selection Process

A multistep selection process was used to ensure that students who participated were the most appropriate sample for investigating the research questions of the study. The following procedures represent the complete process for selecting students.

- (a) All special education teachers in Grades 4 and 5 in a selected district were approached on a professional development day. The lead researcher spoke to the teachers and explained the goals of the study, research questions, and participation criteria. The teachers were asked to email the researcher if they had students who they felt would benefit and also who met criteria.
- (b) Three teachers from the district contacted the researcher stating that they had potential participants.
- (c) The criteria for student participation were as follows: The student was in fourth or fifth grade and was classified with a learning disability in reading. He or she needed an attendance record of 90% or more during the previous academic year and to attain a word-reading level of Grade 2.5 or above according to the *Test of Word Reading Efficiency* (TOWRE) (Torgeson, Wagner, & Rashotte, 1999). Furthermore, at least one goal or objective must have been written on the student's Individualized Education Program (IEP) addressing reading comprehension. Finally, the student's special education teacher confirmed

- through progress monitoring data that the student experienced persistent difficulty with comprehension and learning from informational text.
- (d) Thirteen students were selected for screening. A parental consent form (see Appendixes D) was sent home, and students also signed assent forms in school (Appendix E). All 13 students returned assent and consent forms.
 - (e) The TOWRE was administered to all 13 students. Nine students scored above a grade level 2.5 in word reading, while 4 scored below 2.5.
 - (f) Of the 9 participants, 2 students opted out of the study prior to baseline (1 student from each school). Both students declined to participate due to other commitments, which would have interfered with regular attendance.

Participants

Table 1 provides demographic information for the 7 students that participated in the two-site SCD study. It is important to note that all participants in the study received their daily special education services for reading in a resource room. Each student was enrolled in special education due to problems with reading comprehension. Students were typically pulled out for 60 to 90 minutes a day to work on their IEP goals in reading, which was in addition to daily English Language Arts (ELA) instruction in general education. For the duration of the study, each student worked with the interventionist for a 45-minute part of his or her typically scheduled pullout time.

Table 3.1. Student Demographic Data

Name	Grade	Age	TOWRE sight words (GE)	Ethnicity	Classification /years receiving services	Free/reduced- lunch
Kenny	5	11	4.2	Hispanic	LD (2)	No
Site 1						
Emmanuel	4	10	3.2	Hispanic	LD (2)	No
Site1						
Juan	4	10	3.0	Hispanic	LD (1)	No
Site 1						
Amy	5	11	4.0	African American	LD (3)	Yes
Site 2						
Daniel	4	10	2.5	Hispanic	LD (1)	No
Site 2						
Ramon	4	10	2.8	Hispanic	LD (1)	No
Site 2						
Charles	4	10	2.9	Caucasian	LD (2)	Yes
Site 2						

Note. LD= learning disabilities; GE= grade equivalence; TOWRE = Test of Word Reading Efficiency.

Interventionist

One interventionist was taught by the lead researcher to conduct baseline and treatment sessions for the entire two-site study. The interventionist was a former teacher

with 6 years of teaching experience in middle school ELA classrooms. A detailed description of the procedures used to ensure that the interventionist was prepared to conduct this research appears in a later section of this chapter.

Procedure

General procedures included: (a) pretesting of all participants, (b) implementation of baseline and treatment by an investigator, and (c) posttesting of all participants and collection of social validity surveys.

This study took place at two school sites for approximately 12 weeks (6 weeks per site). At Site 1, all participating students were administered the social studies pretest in a group at the same date and time and the Gates MacGinitie (MacGinitie, MacGinitie, Maria, & Dreyer, 2000) comprehension subtest the following day, also as a group. Once treatment ended at Site 1, both tests were given again as a posttest in the identical order as a group. The same assessment procedures took place at Site 2 beginning 1 week after completion of the study at Site 1.

The average amount of sessions per student was 10 total. The baseline length was 5 sessions per student, and the average length during treatment was five 45-min sessions. At Site 2 the average study length was 14 total sessions. That included 5 baseline sessions per student, and the average treatment length was nine 45-minute sessions.

Baseline Condition

Baseline was created to demonstrate typical practice conditions for content-area reading. A typical practice baseline condition was also used in previous graphic organizer

studies for reading and vocabulary (Fore, Boon, & Lowrie, 2007; Stagliano & Boon, 2009). However, the baseline condition in this study was more academically challenging than in a previous study (Stagliano & Boon, 2009), and the dosage was consistent between baseline and treatment conditions. Students worked with an interventionist individually at a table in the resource room at Site 2, and in a separate “reading room” down the hall from the students’ classroom at Site 1.

The baseline procedures were as follows (see Appendix A):

(a) The teacher previewed and defined important proper nouns and vocabulary words that were highlighted in the text before reading. The practice of systematically previewing critical words and proper nouns was also used in a recent social studies intervention that taught vocabulary and comprehension to fourth graders (Simmons et al., 2010). The teacher and student then previewed the pictures and maps in the book before reading. The teacher provided a brief synopsis of the reading for the day, for example, “Today we will be learning about some of the key causes of the Civil War. We will read about how the Northern and Southern states had different opinions about the role of government and slavery.”

(b) The student and interventionist read a passage from a social studies textbook (U.S. History) beginning with the “Westward Expansion” chapter. The teacher provided a brief synopsis of what they were going to read, for example, “Today we will be learning about some of the causes of the Civil War. We will read about

how the Northern and Southern states each had different opinions about the role of government and slavery.”

(c) Reading was accomplished through alternating paragraphs until the passage was complete. Reading took approximately 15 min per day. The teacher provided immediate corrective feedback for student word-reading errors.

(d) Immediately following reading, the student and teacher discussed the passage. This consisted of the student sharing one important fact or event that took place on each individual page that was read. When students offered an incorrect summary, the teacher found the relevant paragraph and reread the section to the student. The student and teacher also discussed how the fact or event had a long-term impact on U.S. history.

(e) A 10-question multiple choice fact quiz (daily check) was given each day as a proximal measure of understanding. Because the material covered was from a social studies chapter, there was a slight chance that a few of the events could have been known prior to reading.

Treatment

The following procedures were used (see Appendix B):

- a. The student and teacher previewed the chapter before reading. This included looking at pictures, maps, and the content headings. Next, the student and teacher reviewed each highlighted vocabulary word and important proper

nouns (vocabulary words for each section appear in bold print). This process was used in a recent social studies vocabulary and comprehension intervention in social studies (Simmons et al., 2010). The teacher provided a brief synopsis of the reading for the day, for example, “Today we will be learning about some of the key causes of the Civil War. We will read about how the Northern and Southern states each had different opinions about the role of the government and slavery.”

- b. The student and teacher engaged in shared oral reading of the chapter. The teacher provided immediate corrective feedback on student word-reading errors (Gardill & Jitendra, 1999). The instructor and student alternated reading every other paragraph (for approximately 15 min).
- c. The teacher presented a graphic organizer (see Appendix C). For two out of every three sessions, the GO was completed in advance with pertinent information from that day’s reading, such as names of key figures, locations, events, and vocabulary. One out of every three times, some of the information on the GO was left blank for students to complete (this process was also used in DiCecco & Gleason, 2002).

Next, the teacher reviewed each cell and box on the GO and verbally stated the information. The student repeated back the information from each box on the GO. The teacher then asked discussion questions, such as, “Why do you think some of the settlers decided to move West even though they didn’t have a home there yet”? Finally, the student took a turn “being the teacher” and

explained the main events and ideas from the graphic organizers back to the teacher (for approximately 15 min).

- d. The student answered questions based on that day's reading (daily quiz). This daily quiz (proximal measure) included literal fact questions and inferential questions and took approximately 5 min.

Instructional Materials

Researcher-developed graphic organizers were the independent variable and instructional tool used during the treatment phase of the study (see Appendix C). For each chapter selected from the fifth-grade social studies textbook *Horizons*, by Harcourt (Berson, 2002), a graphic organizer was constructed to display the most important information. To ensure that none of the participants had previously read the chapters used during the study, the researcher checked with the students' teachers for confirmation and consulted district curriculum maps.

The following list represents the materials used in the study:

- (a) the TOWRE Sight Word Efficiency subtest (screening measure);
- (b) a researcher-developed 30-item social studies test (see Appendix F);
- (c) the Gates MacGinitie Reading Comprehension subtest, Level 4 forms S & T (distal reading comprehension measure);
- (d) writing utensils;

- (e) 10-item daily quizzes used during baseline and treatment (see Appendix H-J);
- (f) a timer used by the interventionist;
- (g) *Horizons*, by Harcourt (Berson, 2003), fifth-grade social studies textbook copies (baseline and treatment);
- (h) a three-ring student binder containing quizzes and GOs (treatment); and
- (i) graphic organizers (student and teacher copies during treatment);

Interventionist

Prior to the study, the interventionist met with the lead researcher to learn the procedures of the study. A research assistant that assisted with fidelity observations and scoring quizzes for reliability attended this session as well. The entire session between the researcher and the interventionist lasted 6 hours, and the research assistant attended for the final 2 hours. The following is a description of what was accomplished on this workday:

- (a) an overview of the study was offered, including the purpose and research questions;
- (b) the study's design was explained using examples from earlier studies;
- (c) each reading passage, lesson plan, and quiz was reviewed and discussed; and
- (d) the interventionist taught a baseline lesson and a treatment lesson for demonstration purposes and feedback regarding fidelity of implementation. The lead researcher

completed the fidelity form during the lesson and provided detailed feedback. The lesson was taught with a 90% fidelity score when rated by the lead author and the research assistant. (The formula for fidelity ratings is described in the Measures section below, including an explanation of how the tool was created.)

Following the completion of treatment at Site 1, a “booster” session, or review session, was held between the interventionist and lead researcher. The booster session lasted 3 hours and was conducted to review the baseline and intervention procedures.

Measures

TOWRE

The measure used for screening potential participants was the *Test of Word Reading Efficiency*. Students were required to attain a word-reading level of Grade 2.5 or above on the TOWRE to qualify for the study. The TOWRE is a nationally normed measure. Alternate-form reliability is above .90. The test–retest coefficients range from .83 to .96. There are two subtests for the TOWRE: Sight Word Efficiency and Phonetic Decoding Efficiency. The sightword efficiency subtest was used for this dissertation study.

Gates- MacGinitie

A standardized reading comprehension measure was administered as a pre/post test. The assessment selected was the Gates-MacGinitie Comprehension subtest (<http://www.riversidepublishing.com/products/gmrt/index.html>), Level 4. Version S was used

for pretest, and Version T was given as the posttest distal measure. The Gates MacGinitie comprehension subtest is group administered and includes 48 reading comprehension items. The test includes narrative reading passages as well as expository passages to assess reading comprehension ability. Each student reads the entire test silently, with no modifications or test accommodations provided by the test administrator. For the Gates MacGinitie test, alternate-form reliability ranged from .80 to .87 (MacGinitie, MacGinitie, Maria, & Dreyer, 2000).

Daily SS Quizzes

Researcher-developed quizzes were a daily proximal measure of growth. The 10-item quizzes were worth 30 points (score range 0–30 possible points), with each individual question worth 3 points (see Appendix H-K). The framework was influenced by social studies fact quizzes used in a previous study by DiCecco and Gleason (2002) and “Bloom’s taxonomy” question stems. “Bloom’s taxonomy” refers to questions varying in the degree of cognitive complexity and comprehension (see <http://www.nwlink.com/~donclark/hrd/bloom.html>).

The interventionist read the entire quiz to each student and served as a scribe on short-answer questions. The following format was used for each quiz:

- (a) Six multiple-choice questions, each worth 3 points, measured fact acquisition. Questions 1 through 6 were “knowledge” or “comprehension” questions within Bloom’s taxonomy. These entail recalling facts or identifying main ideas.
- (b) Two “analysis” (Bloom’s taxonomy) or inference questions were asked and were worth 3 points each. The format was oral student response, with the

interventionist serving as a reader and scribe. The instructor recorded the response and scored the answer based on a rubric developed for each quiz (see Appendix I). The questions required students to use information from the text to develop inferential statements or an analysis, for example, "How did the Louisiana Purchase make the United States a more powerful country?"

(c) The final two questions asked students to synthesize or evaluate. These questions were open-ended oral response and were worth 3 points. The questions invited students to use the reading material to justify a position, evaluate, or synthesize. An example is "Using details, explain why you agree or disagree with the following statement: The Battle of Gettysburg was not a turning point for the Union during the Civil War."

The quiz questions were significantly influenced by the end-of-chapter quiz questions in the textbook and by highlighted questions embedded in the passages. Several literal questions had to be adapted in order to assess higher-level-style (synthesis and evaluation) questions for quiz items 9 and 10.

A scoring rubric was created to score each quiz. Questions 1 through 6 were scored as either 3 points for full credit or 0 points for no credit since they were multiple choices. Questions 7 through 10 were also worth 3 points each, but partial credit (1.5) points were allowed (see Appendix I). For example, on Quiz 5, one question asked, "Which industrial revolution invention do you think was the most important one? Explain why the invention was important to people." Students that identified an invention from the chapter were given 1.5 points, and an additional 1.5 points for a rationale, such as,

“The cotton gin was the most important because it helped people make clothing easier and faster.” Fifty percent of all daily quizzes were scored for reliability (details are found below in the interrater reliability section).

Researcher-Developed Social Studies Pre/Post Test

A pre/post curriculum-based history measure was administered (see Appendix F) to all participating students at the same time, immediately before and after the study at each school site. This measure captured the extent of each student’s content knowledge prior to baseline and immediately following treatment. The researcher developed the measure through a process of identifying the major concepts from each unit and creating multiple-choice questions for each major concept and term. The concepts were taken from the end-of-chapter textbook quizzes, unit tests found within the textbook, and highlighted key terms throughout each designated reading.

The assessment consisted of the following items: (a) 8 vocabulary items presented in a matching format and (b) 22 multiple-choice items that were created using the Bloom’s taxonomy format discussed previously. Eighteen of these items were knowledge-based questions that measured fact retention, such as “What was the Underground Railroad?,” and 4 items were written in synthesis or evaluation format, such as, “How did the Industrial Revolution change people’s lives?” In the subsequent section a more detailed explanation regarding the creation of this measure and the researcher-developed quizzes is offered.

Development of researcher-developed measures. Three steps were taken by the researcher in an attempt to ensure that items on the curriculum-based test and quizzes

were written according to Bloom's taxonomy and that quizzes were similar in level of difficulty across quizzes.

On the daily quiz for each item written, the researcher used questions written in the student's textbook whenever possible, and double-checked to ensure that each was written according to Bloom's taxonomy. Second, after the test and quizzes were written and double-checked by the researcher, a graduate research assistant (GRA) not associated with the study was asked to examine the test and quizzes. The GRA examined the items to check for an equal degree of difficulty across items (on the test and each individual quiz), across quizzes, and confirmed that each quiz contained the appropriate number of knowledge-based questions (items 1–6) and higher level comprehension questions. After examining the measures independently, the GRA notified the lead researcher that there were no problems identified.

Finally, an informal item analysis was conducted by the researcher to provide additional information regarding the items written for the test and quizzes. The purpose of conducting the informal item analysis was to attempt to identify any unusual patterns in the items following the study. On Quiz 2, every participant scored incorrectly on Question 8. The question asked, "Why did President Monroe want to stop European countries from creating colonies in the Americas?" This content was covered during the daily reading but may have been worded in a way that was difficult to comprehend, due to lack of familiarity with the word *colony*. Additionally, there was an item on the pre/post test that all students scored correctly and that may have been too basic. Question 16 on the social studies measure said, "What country did Texas belong to prior to 1845?"

Students in Texas are often exposed to literature, movies, and oral stories about the history of Texas, so this question may have been unnecessary.

The researcher-developed pre/post test and the daily quizzes were not piloted prior to the study. Piloting items or including a more systematic item analysis would have strengthened the measures used for this study (this will also be discussed in the study-limitations section of chapter 5).

Fidelity of Implementation

Procedural Reliability. Procedural reliability (fidelity of implementation) was assessed for this study. Using a fidelity rating form (see Appendix L), the researcher and a research assistant at the Meadows Center for Preventing Educational Risk observed an intervention lesson during the interventionist's preparation day and rated the lesson in terms of treatment integrity to establish interrater reliability for the study. The fidelity rating form was constructed according to the framework and organization of the treatment lesson plan. For each section of the lesson plan in which the interventionist or student was asked to perform an observable action, such as "student and teacher read each line on the GO in unison," a score was entered by the observer (see Appendix L).

During the practice session prior to the study, both independent observers agreed on 100% of items on the form to establish reliability during the observation. Reliability between the two raters was calculated using the following procedure: dividing the total number of agreements by the number of agreements plus disagreements, and then multiplying by 100. This resulted in a reliability percentage of 100%, which established interobserver agreement (reliability) for the fidelity tool.

Twenty-four percent of the treatment sessions were observed for fidelity at the two school sites. The research assistant observed just two of the treatment sessions for reliability, with the remainder of sessions observed by the lead researcher. (Results for treatment integrity will be displayed in chapter 4 to correspond with the Results portion of the study.)

Interrater agreement. Following each baseline and treatment session, the interventionist immediately scored the quizzes for each student using the specific answer key created for each quiz. Approximately 50% of the daily quizzes were scored for interrater agreement between the lead researcher and the interventionist and twice between the research assistant and the interventionist. Initially, interrater agreement was established based on a fictional student quiz at the practice session between the lead researcher, interventionist, and research assistant by dividing the number of agreements by the number of agreements plus disagreements multiplied by 100 (Taylor et al., 2002). Interrater reliability was 100% on the day of training. Over the duration of the two-site study, interrater agreement was above 90% on the daily quizzes. The interventionist immediately scored each quiz. On a daily scheduled phone call later in the day, the interventionist read each student's answer to the lead researcher so that the researcher could score the quiz. Next, the results between the interventionist and researcher were shared for accuracy. In instances where interrater agreement on a student quiz was less than 100%, the two individuals immediately referred to the quiz rubric for clarity. The lead researcher provided feedback and clarification to the interventionist immediately following each interrater conversation.

Social Validity

Finally, a questionnaire was given to each student immediately following the final session (see Appendix G). This was used for the collection of social validity data regarding the efficacy and usefulness of the intervention according to students. It was created based on an example provided by a previous studying using graphic organizers to improve vocabulary acquisition (Fore et al., 2007). Five questions explored how useful and effective the GO was for learning, and one open response short-answer item asked for advice on improving the GOs. Students answered the questions by filling in one of the following choices: 1: graphic organizers were very helpful, 2: graphic organizers helped a little, 3: not sure, and 4: the graphic organizer was not helpful for learning.

The social validity questions were as follows:

1. How easy was it to follow what the teacher was explaining when using the graphic organizer?
2. How much did the graphic organizer help you learn what the most important parts of the reading were?
3. Did the graphic organizer make it easier to answer questions and remember information for the quizzes?
4. Do you like the graphic organizers better than reading the book and having discussion after reading?
5. If a friend asked you if graphic organizers would help him or her improve in understanding reading, what would you say?

6. What advice would you give teachers to help make the graphic organizers better for understanding what you read?

The results of the social validity questionnaire will be demonstrated in chapter 4. For each question, the range of responses will be provided, as well as mean ratings for each question.

Analysis Plan

Data were analyzed in three ways. First, line graphs using Microsoft Excel were created for each school site and each individual student. This was accomplished by entering in the data for baseline and intervention for each student immediately following each session. Next, lines were inserted to create sections that visually separate the baseline and treatment phases and the amount of time that elapsed between treatment and maintenance. This allowed for a visual inspection of student performance, which is the recommended method of analysis used in single-case research in order to observe an experimental effect for students after treatment begins, and to demonstrate experimental control through replication across different students (Horner et al., 2005; Kennedy, 2005).

Second, a procedure called “percentage of non-overlapping data” (PND) was conducted in order to quantitatively analyze and discuss the data. This technique required identifying how many points of performance fell above the highest data point existing in the baseline condition. Next, the total number of treatment sessions was divided by the

number of data points above the highest baseline point. This results in a PND score (Scruggs & Mastropieri, 1998). The interpretation of PND is as follows: (a) < 90 = very effective treatment, (b) 70 to 90 = effective treatment, (c) 50 to 70 = questionable treatment, and (d) below 50 = ineffective (Scruggs & Mastropieri, 1998). This procedure was selected because it can demonstrate the degree to which students did or did not maintain a constant level of improvement in content learning once engaged in the treatment, compared to the level of performance in baseline.

Immediately before and after the study a standardized reading comprehension test and a researcher-developed curriculum test (pre/post test of social studies content) were given. The standardized assessment used was the Gates-MacGinitie Comprehension subtest. The fourth-grade version was selected (Version S for pretest and version T as posttest). For each student, the following information will be shared for the Gates MacGinitie:

- (1) raw scores on pretest (S) and posttest (T);
- (2) grade equivalence for each student on pretest and posttest;
- (3) National Percentile Rank (NPR) for each student, which describes the position of each student's score within the larger set of student scores by students in that grade's national norming group. For example, an NPR score of 30 at the end of the year would mean that the student scored higher than 30% of scores in that norming sample and lower than 70% of scores.

Finally, for the social studies content test, scores will be displayed in a table to highlight the following key areas: raw scores comparing pretest to posttest for each

student and for the students as a group at each school; percentage scores out of 100% for students, individually and as a group; and means and standard deviations for the group of students, for both pretest and posttest, to show the average and the degree to which scores dispersed from the mean.

Chapter 4: Results

This study examined the effects of explicit instruction and graphic organizers (GO) compared to a typical practice baseline condition for students with LD in upper elementary school. This research examined the extent to which GOs and explicit teaching improved content-area learning and reading comprehension as measured by researcher-designed quizzes, a pre/post content test, and a standardized measure of reading comprehension. A multiple-probe, single-case design was employed. Seven upper elementary students with LD from two separate schools participated in the study, which took place in resource rooms for approximately 6 weeks at each school. All baseline and treatment sessions were conducted with each student individually and lasted 45 min. A social-validity questionnaire was given to all students after completing the study to obtain information regarding participants' perceptions regarding the effectiveness of graphic organizers for improving their learning.

The following five sections represent the organizational structure for chapter 5.

(1) Results of the researcher-developed curriculum-based social studies test. A comparison of pretest to posttest for each school is provided, including individual student results and collective results.

(2) Results of the daily proximal measure (social studies quiz). This includes quiz percentage scores, line graphs for visual analysis of student performance and experimental effect, and percentage of non-overlapping data (PND) calculations and interpretation.

- (3) Gates MacGinitie pre/post results (standardized measure of comprehension).
- (4) Fidelity of implementation results: procedural reliability and interrater agreement.
- (5) Social validity questionnaire results.

Research Questions

1. Do explicit instruction and a graphic organizer lead to increased informational text learning and reading comprehension, compared to a typical practice baseline condition?
2. How do students perceive the efficacy of using graphic organizers as measured by a student questionnaire (social validity)?

Researcher-Developed Social Studies Test

School A

The researcher-developed social studies test was a 30-item test (8 matching vocabulary terms and 22 multiple-choice items). At each school site the pretest and posttest were administered on the same day to each participating student at each respective school. Following the pretest, neither the results of the measure nor any information regarding items correct or incorrect was shared with the students.

The results will be described narratively and then demonstrated in a table below (see Table 4.2). For each student, the raw score correct out of 30 and percentage score out of 100% will be provided. All three students improved from pretest to posttest at School

A, but the posttest scores were lower when compared to the overall performance of students at School B.

Kenny. Kenny demonstrated growth from his pre-baseline test to post treatment performance according to the researcher-generated social studies assessment. On the pretest, Kenny scored 12 out of 30 items correct, which was a score of 40%. On his posttest immediately following treatment, Kenny correctly answered 29 out of 30 items correct, for a total score of 96.7%. This increase in performance from 12 to 29 correct demonstrates that Kenny almost completely mastered the content that was taught to him through a treatment of text reading with feedback, student and teacher studying, and discussing the content using a GO and explicit instruction.

Emmanuel. Emmanuel more than doubled the number of items correctly answered on the posttest, but his overall percentage score was still lower than 50% on the posttest. Emmanuel scored 5 of 30 items correct on pretest, for a score of 16.7%. On posttest, Emmanuel improved by answering 13 of 30 correct, for a final score of 43%. The increase in score indicates that Emmanuel learned social studies content during treatment. However, the final score is lower than the 65% passing grade generally used in most schools. In a subsequent section of this chapter we will learn that Emmanuel demonstrated his ability to recall items proficiently and succeed on the daily quizzes, but his SS posttest score indicates that long-term retention and transfer is an issue for this student. The implications of these results will be discussed in chapter 5.

Juan. Juan, the third and final student at School A, also improved following treatment. However, Juan's gains on the posttest were smaller compared to those of the

other two students at School A. Juan scored 7 out of 30 items correct on pretest, which is a score of 23.3%. On his posttest, Juan answered only 10 out of 30 items correct, for a final score of 30%. As with Emmanuel, Juan's results on the daily quizzes (described in the next section) reveal that he was able to respond to daily instruction by demonstrating an experimental effect. However, Juan's ability to transfer his acquired knowledge to a cumulative and broader assessment of performance was minimal.

Juan's attendance was erratic over the course of the study. Additionally, his special education teacher notified the researcher that his classroom behavior was becoming a serious issue during the duration of the study. Several times Juan had to be removed from the principal's office in order to participate in the GO treatment. However, due to his demonstration of effort during sessions with the interventionist and his willingness to continue, Juan was allowed to continue with the study. These extraneous variables could have impacted his posttest score and will be discussed briefly in chapter 5.

Table 4.2. Thirty-Item Social Studies Content Measure

Name	Pretest amount correct	Pretest %	Posttest amount correct	Posttest %
Kenny	12/30	40%	29/30	96.7%
Emmanuel	5/30	16.7%	13/30	43%
Juan	7/30	23.3%	10/30	33.3%
School A (group average)	8/30	26%	17/30	56.6%

In summary, results at School A on the pre/post researcher-developed social studies test indicate that all three students improved in content knowledge following treatment. Emmanuel and Juan's posttest scores were lower than Kenny's, although these two students with LD in reading did improve slightly. As a group, the students' test average increased from 26% to 56.6%.

School B

Results of the researcher-developed posttest for School B will be discussed narratively and also displayed in a table below (see Table 3). Overall, the posttest scores were higher at School B compared to those at School A. For each student the raw score and percentage score will be provided, in addition to the group average. At School B all four students improved and attained at least 65% on the posttest.

Amy. On the pretest, Amy earned 10 of 30 items correct, for a score of 33%. Amy displayed growth by improving to 28 out of 30 items correct on posttest, for a score of 93.3%. The interventionist noted that Amy worked extremely hard during all sessions and tried diligently to read more accurately and remember the information. Despite a death in Amy's family during the middle of treatment, she still managed to score 28 out of 30 on her posttest.

Greg. Greg was another student at School B who demonstrated a positive response to treatment. Greg scored 6 of 30 questions correct on the pretest. On posttest, Greg displayed a knowledge gain by scoring 26 of 30 correct, which is a score of 86.6%.

Raul. Raul is Greg's identical twin brother. Raul identified 6 out of 30 questions correct on his pretest. Raul also demonstrated growth following treatment by scoring 20 out of 30 items correct on the researcher-developed posttest. His final score was 66.6%.

Collin. Collin also improved from pretest to posttest. Collin attained 12 of 30 correct on the pretest, which was 40%. On the posttest following treatment, Collin answered 23 items correct, for a final score of 76.6. The interventionist who taught each lesson noted that Collin demonstrated an interest in improving his reading ability during the course of the study.

Table 4.3. Thirty-Item Social Studies Measure of Content Knowledge

Name	Pretest amount correct	Pretest %	Posttest amount correct	Posttest %
Amy	10	33.3%	28	93.3%
Gregory	6	20%	26	86.6%
Raul	6	20%	20	66.6%
Collin	12	40%	23	76.6%
School B (group average)	8.5	28.3%	24	81%

Combined Results and Summary

Students at School B earned scores similar to those of the students at School A on the content pretest. According to the posttest, the students at School B acquired more social studies content knowledge, particularly due to Emmanuel and Juan’s more minimal growth. Each student at School B scored above the typically accepted passing mark of 65%; and as a group, the mean score was 81%. Results of the content posttest suggest that text reading with feedback, student and teacher studying and discussing content via graphic organizers, and explicit instruction proved to be more effective than the baseline lesson plan.

Table 4.4 provides descriptive statistics for students at Schools A and B combined. The group of students combined is a small amount of study participants ($N = 7$), but the group mean and standard deviation is provided to offer the most complete and transparent picture of the findings as possible. When combining the results of all 7

participants, the students with LD in upper elementary school attained an average score of 27% on the social studies content pretest. As a group, the overall score on the posttest increased to 71%. The standard deviation was 7.3, which was expected due to the variance in posttest scores between the two participating schools. Overall, improvement from 27% to 71% provides some preliminary evidence of the effectiveness of the GO treatment in terms of enhancing understanding of concepts in American history.

Table 4.4. School A and School B Combined Content Test Results

Mean pretest raw score	Raw score SD	Pretest mean score	Pretest SD percentage	Mean posttest raw score	Raw score SD	Posttest mean score	Posttest SD percentage
8	2.9	27%	10%	21	7.3	71%	25%

Note. *SD* = standard deviation.

Quiz Results: Daily Proximal Dependent Measure

School A

After each session in baseline and treatment, students took a daily content quiz to measure their understanding of the major concepts taught that day. During the description of the study's design in chapter 3, there was also an explanation of how the quizzes were used to demonstrate a response to treatment for each student (experimental effect) by comparing the scoring trends when students switched phases. After an experimental effect was demonstrated for a single participant (Kennedy, 2005), as evidenced by a stable upward performance trend, then the treatment lessons began for a subsequent student. By replicating the intervention with the next-lowest-scoring participant and

identifying an experimental, or treatment, effect by observing substantial improvement over baseline across at least 3 different participants, the researcher felt confident that experimental control was established. Experimental control is when an effect, or a positive response to treatment, occurs across three or more participants in a given study (inter-participant replication; Horner, 2005).

Emmanuel. The results demonstrate a downward performance trend for Emmanuel while he was engaged in the typical practice baseline phase. Emmanuel's baseline quiz scores were 50%, 40%, and 13% before switching phases to treatment. Emmanuel showed an immediate improvement by scoring in the range of 60% to 75% and obtaining 75% after a maintenance (follow-up) session given 1 week after the conclusion of treatment. Emmanuel's PND score for the study was computed as 100%, which is interpreted as a highly effective treatment for this participant (Scruggs & Mastropieri, 1998). There was no overlap in data points between baseline scores and results while receiving the GO/explicit instruction treatment (see Figure 2).

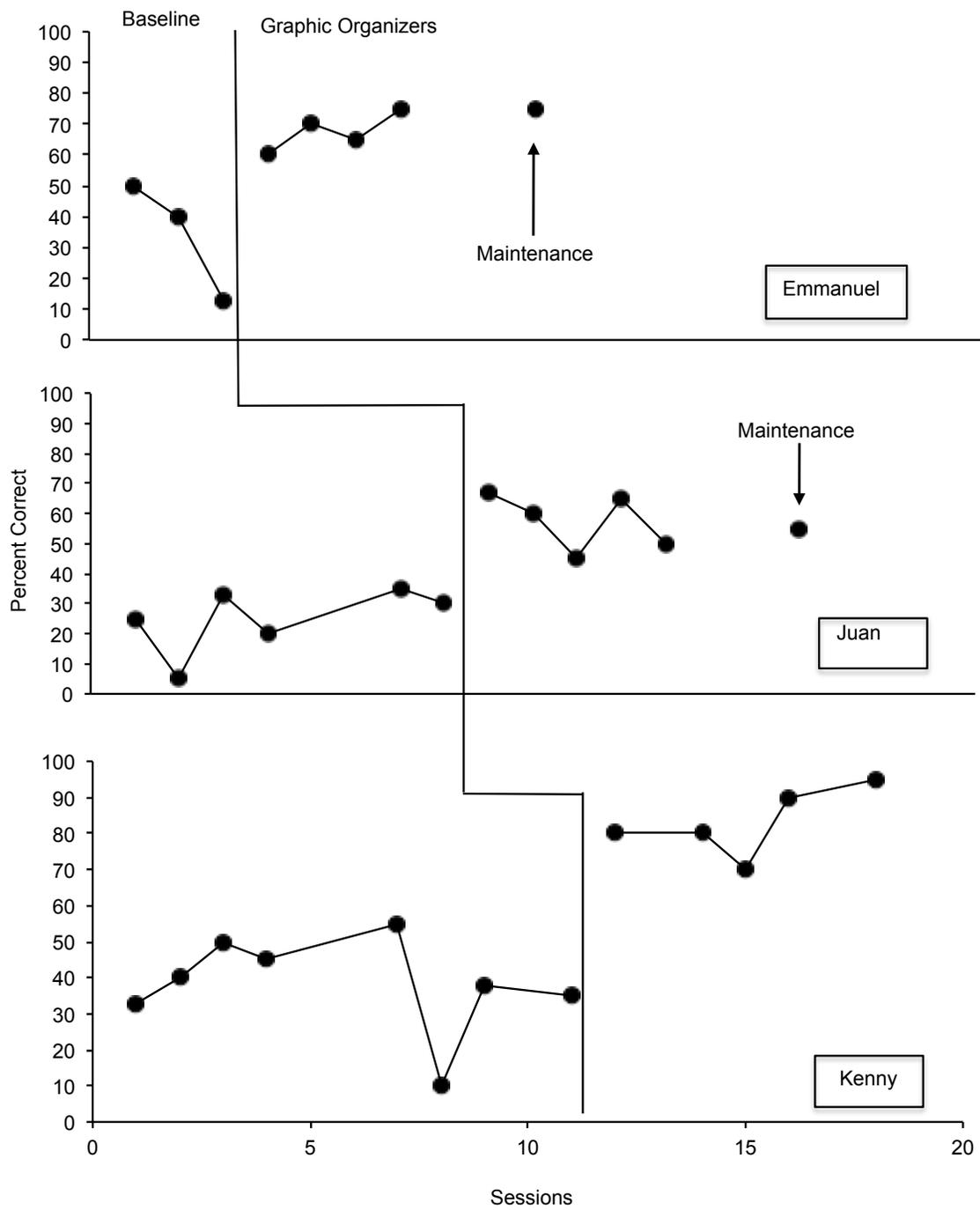


Figure 2. School A daily social studies quiz results.

Juan. Juan began treatment after a stable trend of failing quiz scores in baseline covaried with a positive response to treatment for Emmanuel (inter-participant replication). In baseline Juan's performance on quizzes was low, with an average score of 25% for his six lessons. Juan appeared to quickly demonstrate an experimental effect by improving sharply to 67% on his first quiz in the treatment phase. His treatment quiz average for six treatment sessions, including maintenance (follow-up), was 57%. Juan's performance never dropped back down to his performance during baseline, and he had no overlapping data (PND of 100%). PND of 100% indicates that this treatment was highly effective in regards to improving performance on quizzes, compared to typical practice (Scruggs & Mastropieri, 1998). Despite demonstrating substantial improvement in scores and acquiring more than double the amount of daily content knowledge compared to baseline, Juan's treatment condition scores would probably be considered low by classroom standards. The practical implications concerning students with LD will be discussed in chapter 5.

Kenny. Kenny, the final student to participate at School A, had a PND score of 100%, indicating that the treatment was extremely effective for improving his SS knowledge acquisition (Scruggs & Mastropieri, 1998). Kenny's range in baseline scores across eight baseline sessions was 10% to 50%, with a baseline quiz average of 38%. His treatment score range was 70% to 95%, for an average of 83%. Kenny's achievement on the daily quizzes, in addition to his high score on the social studies content test, indicates the positive short-term effect of graphic organizers, explicit instruction, and the student's and teacher's studying of concepts from a GO for this participant. Due to time restrictions

caused by the school's preparation for state testing, a follow-up maintenance session was not conducted with Kenny.

Table 4.5. School A Daily Quiz Results

Student	PND	Baseline avg.	GO avg.
Emmanuel	100	34%	69%
Juan	100	25%	57%
Kenny	100	38%	83%

Note. PND = percentage of non-overlapping data; Avg.= average; GO = graphic organizers.

School B

A visual analysis of School B's graphs (see Figure 3) suggests that a treatment condition consisting of explicit instruction and graphic organizers, used to facilitate discussion and as a study guide to acquire social studies content, was more effective than typical practice for students with LD in Grades 4 and 5 with LD. Such analysis also indicates that the student who initially struggled the most in baseline, Collin, received treatment first and that this resulted in a noticeable and immediate performance change. After Collin's experimental effect was identified following three or four daily quizzes with performance above baseline, treatment began with the second student, Amy. After an identical trend was demonstrated with Amy, the same technique was followed for the remaining two students. This replication of the treatment's effect across all four students

led the researcher to conclude that experimental control was present at School B according to recent recommendations for single-case research (Kratochwill et al., 2010).

The line graphs reveal that only two students (Amy and Collin) experienced overlap in data between GO treatment and baseline. The extent of overlap was two sessions for Amy and a single maintenance session in which Collin scored 60% on a quiz. As the graph indicates, an additional maintenance session was conducted with Collin to investigate whether his failing maintenance score was an anomaly or would turn into a stable pattern of decreasing scores. As the graph illustrates, in the next session, Collin scored 100%, so it was concluded that a negative trend was not developing.

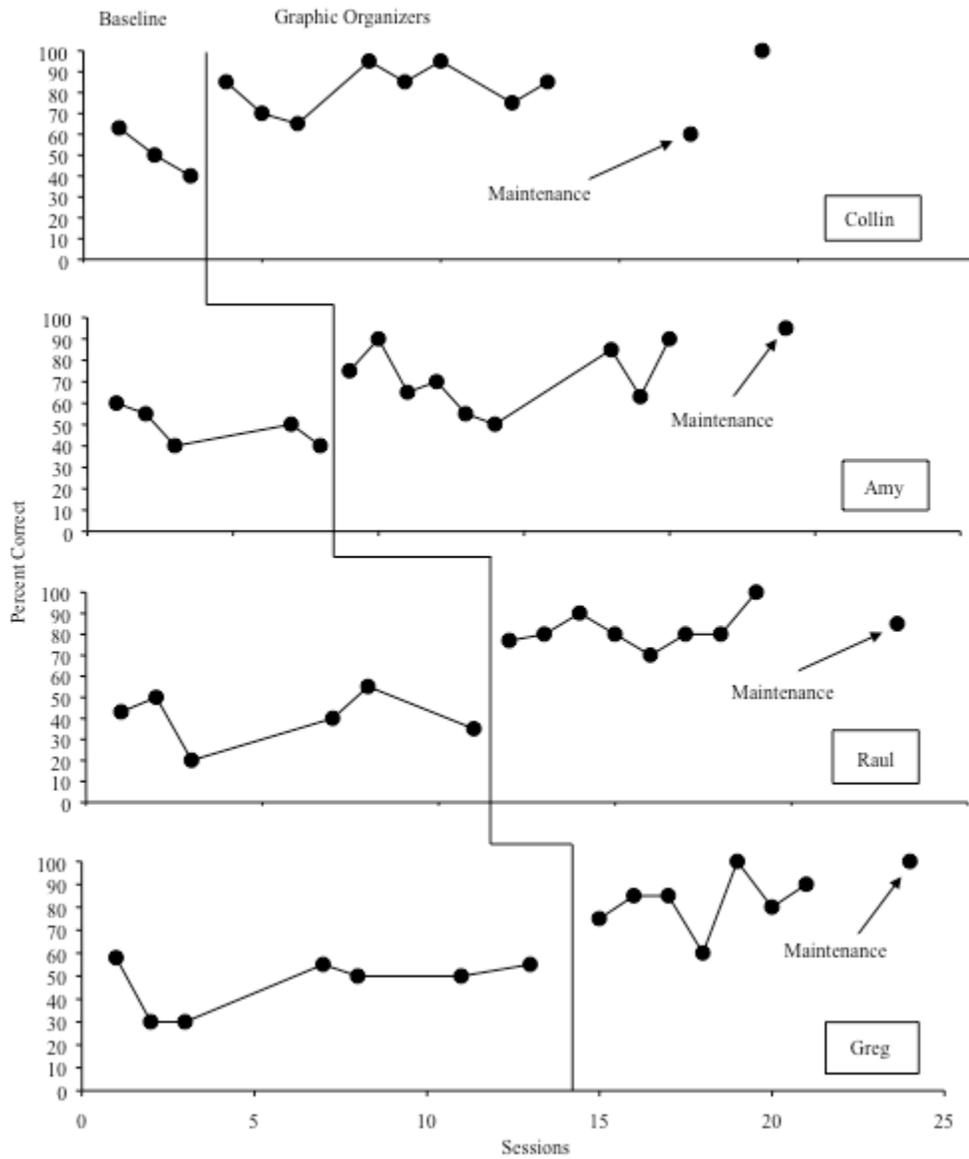


Figure 3. School B daily quiz results.

Amy. Amy’s final PND score was 86.6%. A score of 86% connotes an effective treatment (Scruggs & Mastropieri, 1998). As mentioned in a previous section of this chapter, Amy experienced the death of a family member during the study; however, she

remained focused upon her return to school and finished treatment with quiz scores above 80%. On a maintenance session (follow-up), Amy scored 100% on the quiz.

Raul. PND was 100% for Raul. Raul's average quiz score in baseline was 40%. Once Raul began the explicit instruction and GO discussion and study treatment, he attained an average quiz score of 82% during the treatment condition. Raul scored 85% on his follow-up/maintenance session.

Greg. Greg's quiz scores in the typical practice baseline phase were very similar to his brother's. Greg's baseline quiz average was only 47%. The GO treatment condition also positively impacted his ability to remember important facts and understand the day's reading. Greg's treatment quiz average score was 84%. Greg attained a final PND score of 100%. Once again, a PND score of 100% connotes a highly effective treatment for single-case research (Scruggs & Mastropieri, 1998). Greg scored 100% on his 1-week follow-up maintenance session quiz.

Collin. Collin also responded positively to the treatment in this study. Collin's PND score was 92%, with one low quiz score in treatment that overlapped with his baseline performance. To determine whether this low score was the start of a pattern, an additional maintenance session was held with Collin, in which he scored 100%. Collin's baseline quiz average was 51% and his treatment quiz average was 81% (see Table 5.6).

Table 4.6. School B Daily Quiz Results

Student	PND	Baseline avg.	GO avg.
Amy	86.6	49%	74%
Greg	100	47%	84%
Raul	100	40%	82%
Collin	92	51%	81%

Note. PND = percentage of non-overlapping data; Avg.= average; GO = graphic organizers.

Reading Comprehension: Gates MacGinitie Results

To measure the potential impact of the treatment on reading comprehension, a standardized measure was selected. The Gates MacGinitie Comprehension subtest, Level 4, was given to all participating students as a pretest (Version S) and posttest (Version T). Gersten et al. (2000) wrote that researchers should include enough measures to adequately address all research questions in a given study. Because the purpose of the dissertation study was to learn about the effectiveness of explicit instruction and graphic organizers on informational text learning (SS content) and reading comprehension, a standardized comprehension test was selected. Measures that are closely aligned to the curriculum identify whether students learned the content that was taught, but a combination of proximal and dependent measures can determine if students can apply learned skills to a broader assessment (Gersten et al., 2000).

The sample size of the multiple-probe study conducted for this dissertation was seven participants. However, a standardized measure was administered to provide a

comprehensive picture of the study's effectiveness and address each part of the study's research questions. Additionally, the results of the Gates MacGinitie test were valuable in providing the researcher with a snapshot of current levels of reading comprehension for each student (see Table 7). Despite providing information regarding reading comprehension, there are potential limitations associated with using this measure in a single-case study of relatively short duration. These limitations will be discussed in chapter 5.

In chapter 3 a description regarding each score type and its purpose was provided. These score types from the Gates MacGinitie will be reviewed briefly again to offer context for the subsequent results:

- (1) Raw scores—the number correct out of 48 possible questions
- (2) Grade equivalent (GE)—the grade level that the student's score is equal to in years and months.
- (3) National Percentile Rank (NPR)— describes the position of each student's score within the larger set of student scores by students in that grade's national norming group. For example, an NPR score of 30 at the end of the year would mean that the student scored higher than 30% of scores in that norming sample and lower than 70% of scores.

Comprehension Results

Six of the seven students in the study scored within a narrow range of performance on the pre- and the posttest. Juan, Emmanuel, Gregory, and Raul improved slightly (see Table 5.7). Amy's improvement on posttest was larger than that of all the

other students, whereas Kenny and Collin's scores declined slightly. With the exception of Kenny, all grade-equivalent scores on pretest were within the range of Grade 2.3 to 3.0. These pretest scores indicate that when this study commenced, the majority of students were at least two grade levels behind in reading comprehension. Kenny's pretest grade equivalent was 4.4, which indicates more than a 1-year delay, as Kenny and Amy were the study's only fifth-grade students.

Juan's raw score on pretest was 11, and his posttest score was 16 (GE 2.3–2.8). Emmanuel's pretest raw score was 16 and his posttest score was 21 (GE 2.9–3.3). Kenny answered 28 questions correctly on pretest and 28 on posttest (GE 4.4–4.1). Gregory and Raul scored 13 on pretest and 16 on posttest (GE 2.5–2.8). Collin's raw score decreased from pretest to posttest by scoring 17 correct to 14 correct (GE 3.0–2.6). Ashley (fifth grade) improved more significantly than all other students by obtaining 13 correct on pretest and 21 on her posttest (GE 2.5–3.3).

As mentioned at the outset of this section, these results are provided only to offer a snapshot of each student's growth, or lack thereof, over approximately 6 weeks of time, during which they received a treatment requiring the reading of informational text orally, explicit instruction, studying of a GO and concepts discussion, and answering of questions. In chapter 5 a more detailed discussion regarding how this measure should be interpreted will take place. Chapter 5 discusses whether or not the growth demonstrated by these students is different from what would be typically expected over a 6-week span. The small sample size and the absence of randomization to treatment or comparison conditions limit the ability to make causal statements.

Table 4.7. Gates MacGinitie Comprehension Measure

Student (grade)	Pre raw	(S) raw	Post raw	(T) GE pre	GE post	NPR pre	NPR post
Juan (4 th)	11		16	2.3	2.8	5	11
Emmanuel (4 th)	16		21	2.9	3.3	17	23
Kenny * (5 th)	28		28	4.4	4.1	48	39
Greg (4 th)	13		16	2.5	2.8	8	11
Raul (4 th)	13		16	2.5	2.8	8	11
Collin (4 th)	17		14	3.0	2.6	18	7
Amy * (5 th)	13		21	2.5	3.3	3	11

Note. GE = grade equivalent; NPR = national percentile; * = out of grade-level norms.

Results from the Gates MacGinitie demonstrate that five students improved on posttest in terms of raw scores, grade equivalents, and national percentile ranks. Two students showed a slight decline in grade-equivalent score and percentile rank. The implications of the study are discussed in light of the fact that the students with LD included in the study were in Grades 4 or 5 and had an average grade equivalence of 2.87

at pretest and 3.1 at posttest. The small sample size of the study does not allow for an in-depth analysis or statement of causality.

Fidelity of Implementation Results

Procedural Reliability Results

Reliability on the fidelity-rating instrument (see Appendix L) was established between the lead researcher and a research assistant at the Meadows Center for Preventing Educational Risk. During the practice session for the interventionist prior to the study, both independent observers observed a practice lesson and agreed on 100% of items on the fidelity form to establish reliability. Reliability between the two raters was calculated using the following procedure: dividing the total number of agreements by the number of agreements plus disagreements, and then multiplying by 100. This resulted in a reliability percentage of 100, which established interobserver agreement (reliability).

Twenty-four percent of the total treatment sessions were observed for fidelity at the two school sites during the study. The research assistant observed two of these lessons for reliability, with the remainder of sessions being observed by the lead researcher. Across both school sites, a total of 54 GO treatment sessions were conducted. Of these sessions, 13 were observed for procedural reliability using the treatment fidelity form (see Appendix L) and a timer to record any irregularities in lesson dosage. Results of the observations indicate strong adherence to the treatment protocol for this study, or a high level of fidelity of implementation. The highest rating the interventionist could obtain for each observable section of the fidelity form was a score of 2, which meant,

“Teacher implemented this activity with sufficient instruction and organization.” The instructor received a procedural reliability score of 100% for every observed lesson during the study, based on her successful implementation of each part of the lesson script and corresponding fidelity protocol. However, on two of the observations, the lesson lasted longer than 45 minutes. One session went 52 minutes, and another went 50 minutes. Following these two lessons, the researcher and interventionist discussed the need to rely on the timer to adhere to the proper amount of time allowed for each part of the lesson, as indicated in the teaching script. Additionally, after each observed lesson, the researcher and interventionist discussed the lesson, and any outstanding questions were immediately addressed.

Interrater Agreement Results

More than 50% of the daily quizzes were scored for interrater agreement by the lead researcher and the interventionist and twice between the research assistant and the interventionist. Interrater reliability was established based on the scoring of a fictional student quiz at the practice session between the lead researcher, interventionist, and research assistant by dividing the number of agreements by the number of agreements plus disagreements, multiplied by 100 (Taylor et al., 2002). Interrater reliability was 100% on the day of training, thus establishing reliability between the three raters.

Over the duration of the two-site study, interrater agreement was above 92% on the daily quizzes. In instances where interrater agreement on a quiz was not 100%, feedback and clarification were provided to the interventionist by the researcher and the issue was resolved through a conversation guided by the scoring rubric. Interrater

agreement was 100% on the 30-item matching and multiple-choice social studies content measure and 100% while computing and identifying raw scores on the Gates MacGinitie test of comprehension, which is also a multiple-choice measure.

Social Validity

To ascertain participant information regarding perceived effectiveness of the GO treatment, a social validity questionnaire was administered to all participating students on their final day of participation. The questionnaire contained five multiple-choice items asking students to provide a rating based on their perception of usefulness. The sixth question was open ended, to elicit student opinions for improving this content enhancement tool. The following scale was included on the questionnaire (see Appendix G): 1, *graphic organizers were very helpful*; 2, *graphic organizers helped a little*; 3, *not sure*; and 4, *the graphic organizer was not helpful for learning*.

The social validity questions were as follows:

1. How easy was it to follow what the teacher was explaining when you were using the graphic organizer?
2. How much did the graphic organizer help you learn what the most important parts of the reading were?
3. Did the graphic organizer make it easier to answer questions and remember information for the quizzes?
4. Do you like the graphic organizers better than reading the book and having a discussion after reading?

5. If a friend asked you if graphic organizers would help him or her improve in understanding reading, what would you say?
6. What advice would you give teachers to help make graphic organizers better for understanding what is read?

There were two research questions that guided this dissertation. The second research question was: How do students perceive the efficacy of using graphic organizers as measured by a student questionnaire (social validity)? Combining the student responses for each item on the social validity survey and then analyzing the results answered this research question. Across all items on the survey, the majority of the answers indicated that graphic organizers were perceived as being effective for understanding the lesson and learning information for success on assessments.

The first question asked students how easy it was to follow the teacher's lesson using the GO. Six students indicated that the GOs were "very helpful," and one student said the GO helped a little. The second question asked, "How much did the GO help you learn what the most important parts of the reading were"? Three students said it was very helpful, three said the GOs helped a little, and one student said "not sure."

The third question was designed to obtain information regarding the educational value of using a GO as a content enhancement tool with informational text. The question was: "Did the GO make it easier to answer questions and remember information for the quizzes"? All seven students wrote down choice 1, that GOs were "very helpful." Because the purpose of the study was to explore how effective this treatment was for

enhancing reading for understanding in upper elementary school, the response to this question was important for gaining student feedback on educational value.

Student responses to Question 4 (“Do you like the GOs better than reading the book and having a discussion following reading?”) were mixed in terms of perceived effectiveness. This question was developed to ascertain how students felt about the treatment compared to the typical practice framework. Three students answered that the GOs were very helpful, three students indicated that the GOs helped a little, and one student answered “not sure.” Implications for this and all other items and social validity results will be discussed in greater detail in chapter 5. However, responses overall indicated that students perceived GOs as valuable, but three of them still saw value in the role of discussion. The fifth question asked, “If a friend asked you if GOs would help him or her improve in understanding the reading, what would you say”? All seven students answered that the GOs were very helpful.

An open-ended response item was the final item on the questionnaire. Students were asked to share what advice they would provide teachers to make the GOs better for improving their understanding. Three students declined to comment on this item, but four students wrote a response. Three said the GO should remain in its current form because it was beneficial to their learning, and one student, who was the lowest-performing student in the study on all measures at posttest and on daily quizzes, said he would prefer a GO that could somehow read the information to students. This student elected not to elaborate on this answer, but his response has technological implications that will be addressed in chapter 5.

In summary, students with LD believed that the GO was extremely useful for following the lesson and remembering important information, and they said that they would recommend it to other students. Additionally, although all students perceived the tool as helpful and valuable, they also saw the continued value of discussion in their learning process. Implications regarding the social validity results for instruction of upper elementary students with LD, and for continuing or improving on GO research, will be discussed in chapter 5

Chapter 5: Discussion

Reading to learn from informational text becomes a curricular emphasis in fourth and fifth grade (Gajria et al., 2007; Wanzek et al., 2010). Learning in content-area classes is typically associated with a student's ability to read, organize concepts, and apply novel information to activities such as discussion and writing. Students with learning disabilities (LD) experiencing difficulties with learning from text are frequently taught to use strategies or enhancement tools that have the potential to improve their capacity for understanding text and attaining success in content-area subjects (Deschler et al., 2007; Gersten et al., 2006).

Graphic organizers (GOs) are associated with improved performance on content-area measures and reading comprehension in secondary students with LD (Dexter & Hughes, 2011; Kim et al., 2004). GOs complement reading by highlighting essential information, serving as a study guide, helping to facilitate discussion, and organizing major concepts and terminology (Dexter & Hughes, 2011; DiCecco & Gleason, 2002; Griffin et al., 1991).

This study explored the effects of treatment components that were used in GO studies in secondary school with students with LD in Grades 4 and 5. Learning in a typical practice baseline was compared to learning in a treatment involving explicit instruction, corrective feedback, and studying and discussing of content from a GO. A multiple-probe, single-case study with seven students with LD in upper elementary

school was conducted to learn about the utility of this treatment for gaining content knowledge and improving reading comprehension.

Two research questions were evaluated in this study:

1. Do explicit instruction and a graphic organizer lead to increased informational text learning and reading comprehension, compared to a typical practice baseline condition?
2. How do students rate the efficacy of using graphic organizers as measured by a student questionnaire (social validity)?

The first part of this chapter is a discussion of the results for Research Question 1. The results for content knowledge will be explained first, and then comprehension will be addressed. The next section explores Research Question 2, which will be discussed within the context of how the social validity findings compare to previous GO studies and the possible influence of student responses on future investigation. The chapter concludes with a discussion of limitations, implications for practice, and recommendations for future research.

A Discussion of Content Learning and Comprehension

Three key findings related to informational text learning in social studies were identified in chapter 4 and will be discussed: (1) The treatment was associated with improved understanding of social studies content for all students in this study; (2) overall, the results are promising because they indicate that components for enhancing content learning in secondary school may also have value for students in Grades 4 and 5 who are

exposed to new learning expectations; and (3) two students in the sample that had PND of 100% struggled on the cumulative posttest. Potential causes and solutions are discussed.

This study addressed the need to identify treatments that will enable students with LD to understand content in informational texts. While numerous interventions have been effective for assisting students in secondary school with reading for understanding (Gajria et al., 2007; Swanson & Hoskyn, 2001), there is less research for students with LD in the upper elementary grades. In a recent synthesis that systematically reviewed reading interventions since 1990, only five experimental and quasi-experimental studies focusing on comprehension and four single-case studies for students with LD in Grades 4 and 5 were located (Wanzek et al., 2010). To contribute to the research base for upper elementary students with LD and explore the effectiveness of treatment components that were successful with older students (e.g., text reading with feedback, explicit instruction, GOs), this dissertation was conducted.

Content Learning for Upper Elementary Students With LD

Gains on content measures. All seven students were identified by their school as having a learning disability in the area of reading. Each student's IEP contained at least one goal for improving comprehension. Each student's teacher confirmed that the students experienced persistent difficulty in reading for understanding of narrative and informational text. Given the previously stated student difficulties with learning from text, this study attempted to test the effectiveness of a GO treatment that could enhance reading for understanding and contribute to social studies content learning.

Explicit lessons consisting of 15 min of daily reading with corrective feedback and a GO for eliciting discussion and studying content were implemented. Results on daily quizzes indicated an experimental effect. Each quiz comprised fact-recall questions and higher level Bloom's taxonomy questions. With five out of seven students attaining a PND of 100% and two students scoring above a PND of 85% (Amy, 86% PND; Collin, 92% PND) the treatment was encouraging for enhancing literal and inferential understanding on a daily check of understanding.

The researcher-developed pre/post social studies test results demonstrate that each student improved in content acquisition. Five of the seven students with LD displayed much higher gains. The average pretest score was 27%, meaning that an average of 8 out of 30 questions were answered correctly. On the posttest, the average score was 71%, with an average of 21 items correct. Kenny (96.7%), Amy (93%), Gregory (86.6%), Collin (76.6%), and Raul (66.6%) performed the highest on the posttest, offering evidence of promising improvement following the GO treatment.

This study contributes to the extant research base by suggesting that GOs and explicit or systematic instruction are associated with improving performance on measures closely aligned to the curriculum. Similar findings of improved performance on proximal measures were found in Darch and Carnine (1986), which used a DI lesson plan and a visual display to teach science content, and in Stagliano and Boon (2009). In Stagliano and Boon, a multiple-probe design was implemented, and students also engaged in daily reading, completing a GO/story map, and answering questions. All fourth-grade students

in Stagliano and Boon attained a PND of 100%, but dosages between the baseline and treatment were not equivalent.

The baseline phase of this dissertation study was intentionally rigorous, and the dosage remained constant. The baseline lesson plan was designed to portray typical practice. Quality indicators for special education research state that a transparent and well-designed comparison or baseline condition is important for conducting a quality research study (Gersten et al., 2005; Horner et al., 2005). The baseline included a text preview that included a review of important proper nouns, 15 min of reading with feedback, a student-led text-based summary with feedback for accuracy, and quiz completion. The research design was single-case, but the baseline was fundamentally influenced by robust comparison conditions in two group studies teaching social studies content to students with LD (DiCecco & Gleason, 2002; Gersten et al., 2006).

Effective treatment components. The conception of this study was fundamentally shaped by previous components of LD research and GO studies. This study indicated that the components used in this treatment could be applied to students in upper elementary school with LD who are assigned to read informational text. Future studies should replicate this treatment to further explore its efficacy (Horner et al., 2005). Another option for extending this research and applying the information gleaned from this study is to design a group study with random assignment to learn about its effectiveness.

Reading was a fundamental component of this intervention. Recent social studies treatments for students with LD have been developed that hold that reading time should

be decreased and replaced by efforts to provide curriculum access through a variety of techniques (Gersten et al., 2006; Twyman et al., 2006). However, this study purposefully engaged students with LD in a sustained period of reading using a fifth-grade social studies textbook. Other studies in which reading played an integral role in the learning process provide additional support that despite difficulties with decoding and comprehension, students with LD can acquire information by reading text (Bos & Anders, 1992; DiCecco & Gleason, 2002; Gardill & Jitendra, 1999; Stagliano & Boon, 2009).

This study was influenced by several other research components that have been associated with high effect sizes in intervention studies for students with LD. Explicit, or systematic, teaching has been an essential component in LD intervention research (Gajria et al., 2007; Swanson & Hoskyn, 2001; Vaughn et al., 2000). Explicit instruction and providing quality feedback (Vaughn et al., 2000) were two generalizable principles of effective instruction that were gleaned from LD research and that were employed in this study within the treatment lesson framework. Finally, systematically and purposefully previewing content and key terms prior to reading (advanced organization) was a component that contributed considerable variance to effect sizes in reading comprehension studies for secondary students with LD (Swanson & Hoskyn, 2001).

A fundamental purpose of this dissertation was to investigate instructional practices that enhance students' ability to read for understanding. Because Grades 4 and 5 are important for transitioning to further content-area reading (Gajria et al., 2007), a study investigating whether treatment components that enhanced expository text in

middle school are also effective in upper elementary school was conceived. DiCecco and Gleason's (2002) intervention of GOs and DI for students with LD in middle school social studies classes influenced this study. The following procedures in DiCecco and Gleason's intervention shaped this dissertation: previewing before reading, reading text with corrective feedback, studying GOs by eliciting choral reading of GO content, and measuring literal recall and inferential-style questions.

In summary, the improved average on quiz scores when comparing baseline to treatment, and substantial improvement on the social studies posttest, imply that instructional practices effective for middle school comprehension and content learning also enhance learning in upper elementary school. Despite being influenced by various components listed in this section and by a previous study (DiCecco & Gleason, 2002), this study was not a replication study. This dissertation differed from previous DI/explicit GO studies (DiCecco & Gleason, 2002; Griffin et al., 1991) in that this was single-case research, students were taught individually, and students taught the concepts on the GO back to the teacher prior to the quiz. The latter aspect of the treatment, as outlined in chapter 3, allowed students to use academic language and the GO to learn through purposeful speaking. Developing academic language skills through purposeful speaking is also currently being emphasized for students who are English-language learners (ELL) to enhance academic growth and to use speaking opportunities to learn concepts (Echevarria, Short, & Powers, 2006).

Minimal responders on posttest. A single-case research design allowed for a closer examination of the performance of two students who succeeded on content quizzes

compared to baseline, but failed to transfer learning to a cumulative posttest. Juan and Emmanuel demonstrated a small improvement on the posttest of the SS content measure. Juan's score went from 23% on the pretest to 33% on posttest; Emmanuel scored 16.7% on the pretest and 43% on posttest. Despite performing better in treatment compared to typical practice, these cumulative scores are still lower than most educators would expect in the classroom.

Juan was involved in several serious behavior altercations at school during the study. Behavioral consequences for Juan included being sent home, detention, and frequent visits to the school principal. The classroom teacher and the principal informed the interventionist and researcher of these issues. However, the interventionist conducting this study reported that Juan was generally focused during sessions and seemed to enjoy participating in the study. In summary, Juan's behavioral issues may have been a variable that affected his performance, but this cannot be proved.

Emmanuel did not seem to experience any outside distractions or behavioral issues that could have adversely affected his performance. Therefore, the matter remains that despite improving on fact learning and inferential comprehension on daily performance measures, Juan and Emmanuel experienced the GO treatment as less beneficial when compared to the other five students. A follow-up study with minimal responders comparing a GO treatment to another established reading strategy could yield valuable information regarding the effectiveness of this content-enhancement tool.

A Discussion of Potential Impact on Reading Comprehension

The majority of previous studies using GOs for students with LD have exclusively relied on researcher-developed measures to study growth, instead of using standardized measures of comprehension (Dexter & Hughes, 2011; Kim et al., 2004). Gersten et al. (2000) wrote that researchers should use measures closely aligned to the curriculum in addition to standardized measures. Although it is impossible to determine why most GO studies elected to use only researcher-developed measures, one possibility is that short interventions (e.g., Griffin et al., 1991) are best suited to content measures because standardized tests may require a longer intervention period to detect change. The treatment phase for this dissertation was relatively short. Furthermore, the small sample size makes it difficult to differentiate between typical growth and growth caused by the treatment. The limitations section of this chapter will discuss the potential pitfalls of including the Gates MacGinitie in more detail.

Despite the potential downsides to including a standardized comprehension measure, this single-case dissertation study administered a standardized measure of comprehension for three reasons. First, information gleaned from this study can be used to facilitate the design a group study with randomization. A future study using this treatment would include more participants and longer treatment duration, so it made sense to design this dissertation with measures that can be replicated. Second, the pretest and posttest scores are useful because they offer a thorough description of the reading needs of the participants in this study. Discussing these students' current levels of comprehension provides a valuable context for understanding the difficulties faced by the study's participants. Finally, studies that employ a standardized measure of performance

may increase confidence in practitioners who use research to inform their classroom instruction (Gersten et al., 2000).

Typical growth. Five students in this study improved their raw scores, grade equivalences, and national percentile ranks (NPR) according to the posttest of the Gates MacGinitie Comprehension test. Two students exhibited a slight decrease from pretest to posttest. Following is a list of the grade equivalence from pretest to posttest for each student: Juan, 2.3 to 2.8; Emmanuel, 2.9 to 3.3; Greg, 2.5 to 2.8; Raul, 2.5 to 2.8; Kenny, 4.4 to 4.1; Collin, 3.0 to 2.6; and Amy, 2.5 to 3.3. In summary, Juan, Emmanuel, Greg, and Raul showed a small improvement in comprehension over the 6-week period. Amy demonstrated a more pronounced improvement in her comprehension by increasing by almost a full grade level; and two students showed a small decline.

As students progress through a school year, they are typically expected to improve their academic proficiency. In addition to participating in a baseline and treatment condition that included daily reading followed by a typical practice baseline lesson or a GO procedure, these students continued to receive their general reading instruction at school. The gains in comprehension seen in this study are encouraging, but causal claims cannot be made. In other words, it cannot be determined whether the improvements identified on the Gates MacGinitie were attributed to the treatment or represent what would be typically expected for students with LD.

The following issues hinder the ability to claim that the treatment is what caused improved comprehension in five of the students in this study. First, the size of this study was small. Although the sample was sufficient for observing an experimental effect in

students and for replicating the treatment across the sample (Horner et al., 2005; Kratochwill et al., 2010), test data from seven students limit the opportunity to analyze data in a comprehensive way. A larger data set of standardized test scores would be optimal for a quantitative analysis of standardized test results.

The research design selected for this study, single-case, allows for determination of whether a practice is evidence-based if the treatment is replicated with different participants and other research teams. However, educational researchers have written that randomized control trials are the preferred research design for determining causality. Stanovich and Stanovich (2003) wrote, “The investigator in a true experiment manipulates the variable thought to be the cause (the independent variable) and looks for an effect on the variable thought to be the effect (the dependent variable) while holding all other variables constant by control and randomization” (p. 8). According to current standards, the absence of randomization does not mean that other research designs cannot answer important research questions; it means merely that causation cannot be verified with a single study.

The length of the treatment is another issue to consider when discussing impact. While the length of this study (average of 10 sessions at School A and 14 sessions at School B) was sufficient for observing a treatment effect in terms of experimental control and ascertaining positive effects on proximal measures, the duration was probably too short to expect significant effects on standardized measures. Comprehension studies for students with LD in upper elementary school where the treatment duration was longer have resulted in only modest effect sizes, such as a study looking at sustained reading and

repeated reading (Mathes & Fuchs, 1993). After 30 days of treatment, the repeated reading condition outperformed a control condition with an effect size of .20, which represents a small effect for the intervention. Therefore, it would be very difficult to witness profound comprehension growth following this dissertation study.

Snapshot of performance. With the exception of Kenny, all students in this study scored at either a second- or third-grade level on pretest and posttest on the Gates MacGinitie Comprehension subtest. This information helps portray a more comprehensive description of the participants. Despite having LD and facing difficulty with comprehension, these students read a fifth-grade textbook and responded to a GO treatment according to researcher-developed measures of content acquisition and inferential comprehension. Although these students were all at least one grade level behind in comprehension at posttest, the results on the proximal measures indicate that students with LD can improve their understanding of informational text with the support of explicit instruction and GOs.

Despite the absence of causality, the inclusion of a standardized reading assessment may have been a useful addition to this study. Researchers have written about the importance of including both proximal measures and empirically validated standardized tests in studies (Gersten et al., 2000). As a dissertation study that could potentially be replicated to further explore the treatment's efficacy, or expanded into a group-design study, including the Gates MacGinitie measure was notable. Its use provides an assessment framework for future studies. In a recent meta-analysis of graphic organizers for students with LD (Dexter & Hughes, 2011), only 1 study out of 29 that

employed a GO treatment used a standardized comprehension measure. However, future group studies by this researcher using this treatment will include longer treatment durations and administer measures that can accurately answer each research question, including standardized measures of comprehension.

Discussion of Social Validity: Perceived Effectiveness

In single-case research studies, interviews or questionnaires are often administered to gather information from the participants regarding the treatment they participated in (Kennedy, 2005). This process is completed to confirm that the variables being tested are important, to understand how effective the participants deemed the treatment to be, and to obtain ideas for improving the research in future studies (Horner et al., 2005; Kennedy, 2005). The questionnaire developed for this study was influenced by a measure used in a story-mapping vocabulary study with students with LD in the middle grades (Fore et al., 2007). The survey (see Appendix G) was analyzed to help answer the second research question: How do students rate the efficacy of using a GO to learn from informational text?

Student Perceptions

Three central themes were evident from the results of the social validity measure: (1) Student responses regarding perceived efficacy were consistent with the three other GO studies that collected social validity data (Fore et al., 2007; Gardill & Jitendra, 1999; Stagliano & Boon, 2009); (2) despite obtaining valuable information regarding the perceived impact of GOs on learning, future studies could benefit from a slightly adapted

measure; and (3) technology should be considered in future GO research to facilitate student buy-in and enhance content for students with persistent reading difficulties.

Consistency across studies. Results from the social validity questionnaire confirmed a theme found in three previous GO studies (Fore et al., 2007; Gardill & Jitendra, 1999; Stagliano & Boon, 2009). The shared theme was that students view graphic organizers as a valuable tool for helping them stay engaged in a lesson and for ascertaining content. One of the items on the measure asked, “Did the GO make it easier to answer questions and remember information for the quizzes”? All seven participants responded that GOs were very helpful with this aspect of learning. This finding is important because in content-area classes like social studies, recalling details of historical events and answering questions are important to practitioners who are expected to help students with content mastery skills. A similar question in Stagliano and Boon’s study (2009) yielded similar student responses. Students indicated that remembering information from stories is easier when they write down facts on a story map (Stagliano & Boon, 2009). In Gardill and Jitendra (1999), the students also confirmed that their story map/GO was helpful for remembering the most important information from the reading.

The social validity measure was also beneficial for confirming how students perceived the role of discussion. One question asked, “Do you like the GOs better than reading the book and having a discussion following reading”? Three of the students responded by saying that the GOs were very helpful, and three other students indicated that the GOs helped a little (one student said “not sure”). This suggests that although

students perceive a GO as effective for learning, they still see discussion as playing a prominent role in the learning process. The responses to this question suggest that future research on GOs should continue to have academic language opportunities built in. In this study, students in baseline discussed the reading by leading a text-based summary, and in the treatment phase, students taught the GO content back to the teacher. These speaking opportunities will remain in future studies designed by this researcher.

Adapting the social validity measure. Two changes to accurately capturing social validity information would be useful in subsequent studies: conducting student interviews to elicit more specific information regarding perception, and including advice for future research. Time constraints and sensitivity regarding removing students from instructional time were considered for this dissertation and were the reasons why a questionnaire was given.

Another change to adapt the measure would be to rephrase item 4. The fourth question asked, “Do you like the graphic organizers better than reading the book and having discussion after reading?” However, the answer choices that students were forced to choose from may not have been appropriate for accurately answering this question. If this form is used in the future, this question will be given as an open-response item, where students can respond in writing or have the teacher serve as a scribe.

Incorporating technology. The lowest-performing student in the study, Juan, suggested that technology could be incorporated into future GO research. When asked what advice he would give educators for making the GOs more useful, Juan asked for a GO that can read the information to the students. Although Juan did not elaborate, this

response could have implications for future research involving technology. Since Juan's word-reading ability according to the TOWRE was just above Grade 2.5 and his Gates MacGinitie Comprehension posttest score was GE 2.8, there is reason to believe that this student experiences frustration while reading, and he perceives that his ability to comprehend would improve if he were listening. Another option for incorporating technology would be to expand on Boon et al.'s (2005) study, which used computer software to create cognitive organizers for high school students with LD. Social validity survey information following this study indicated that student motivation was increased when the students were completing GOs on the computer, and they found it helpful for organizing and summarizing important SS information (Boon et al., 2005). Technological uses of GOs for future research will be discussed further in a subsequent section of this chapter.

Implications for Future Research and Classroom Practice

Reading to learn is important for school success beginning in upper elementary school (Gajria et al., 2007; Wanzek et al., 2010). The present study suggests that treatment components for informational text reading that were successful in middle school for students with LD may have utility for improving reading outcomes for upper elementary students with LD. The following treatment was used to demonstrate experimental control across participants in this study: previewing text and proper nouns, reading text daily with corrective feedback, systematically studying a GO, "teaching" the GO to the interventionist, and monitoring progress daily via a daily quiz. This research adds further evidence to the extant studies that used a GO for students with LD in upper

elementary school for reading expository or content-area text (Bos & Anders, 1992; Darch & Carnine, 1986; Stagliano & Boon, 2009).

Despite gains in literal and inferential comprehension on content measures, the research design, study duration, and sample size make interpreting the standardized comprehension results challenging. This study was designed to strengthen internal validity by using a highly qualified interventionist to teach the lessons, and by reporting the high levels of procedural reliability that were observed (Simmerman & Swanson, 2001). Threats against external validity were addressed by providing precise descriptions of the variables, standardizing the administration of the treatment delivery through a scripted lesson plan, and outlining a coherent research hypothesis and purpose (Simmerman & Swanson, 2001). Implications for future research, classroom practice for students with LD, and study limitations will be discussed in the subsequent sections.

Implications for Future Research

Researchers in the field of special education have written that programs of research occur in three stages. The first stage is initial descriptive research, including preliminary ideas, observations, and hypotheses. The second stage involves controlled laboratory experiments and classroom-based research studies using a variety of designs to learn about treatment effectiveness. The third stage of research is large-scale randomized classroom trials, which influence wide-scale adoption of an instructional practice or intervention that is deemed to be evidence-based (Odom et al., 2005). The third stage helps to generalize practices and interventions to a wider student population. This single-case dissertation study falls within the second stage of research because it was a

classroom-based experiment, according to Odom et al. (2005). The treatment lesson plan and results gleaned from this study can be replicated or used to inform the design of a randomized control trial.

Future research for students with LD in upper elementary school should continue to incorporate text reading as a prominent treatment component. This study contributes to the research base of studies that have included student reading of informational/expository text as an integral treatment feature with students in upper elementary school (Bos & Anders, 1990; DiCecco & Gleason, 2002; Stagliano & Boon, 2009). Although there is evidence demonstrating that students with LD can learn content-area material using strategies such as video-based instruction and technology with less reading (Gersten et al., 2005; Okolo et al., 2007), strategies that combine reading and content enhancements can improve student outcomes (Bulgren et al., 2007).

This study integrated treatment components that have been widely used in intervention studies for students with LD and research with GOs. Future research should continue to emphasize practices that are effective for students in special education. Vaughn and Linan-Thompson (2003) discussed instructional practices for students with LD that are special or unique. Although curriculum selection is important, future research should continue to emphasize effective instructional components. Vaughn and Linan-Thompson wrote, “What should be special is the delivery of instruction, given that their needs are rarely met through general education alone. Students with LD benefit from explicit and systematic instruction that is closely related to their area of need. (p. 145)” Future research for students with LD in Grades 4 and 5 should continue to employ

explicit and systematic instruction, as well as treatment components that were included in this study: systematic previewing, text reading, and discussion in small groups or individual settings.

Further research using GOs is needed for students with LD who are English-language learners (ELL) and culturally and linguistically diverse students. The majority of students who participated in this dissertation were Latino, but the sample size was much too minimal to make generalizations. Although Bos and Anders (1992) conducted studies demonstrating that GOs are effective for bilingual students with LD, future studies should continue to include culturally and linguistically diverse students.

There are two final recommendations for future research. Because technology is so prevalent in our academic and social cultures, studies wherein students use computers or tablets to create, complete, and manipulate a GO could be an interesting avenue for future research and could improve learning and increase student buy-in. One study in which specialized software was used to help students complete cognitive organizers (Boon et al., 2005) increased student enthusiasm. Finally, standardized measures of comprehension should be considered in future studies to confirm that student gains can be applied to other settings and assessments (Gersten et al., 2000). In a recent meta-analysis of GOs for students with LD, only one identified study included a standardized reading measure (Dexter & Hughes, 2011).

Implications for Classroom Application

There are three implications of this study for applied practice. First, this study demonstrates that using GOs and a systematic lesson plan is promising for improving

content-area learning in fourth- and fifth-grade students with LD. The lesson procedure taught during this study involves highly explicit instructions and could realistically be applied to resource room or classroom instruction with minimal training or practice. This dissertation provides some evidence that the designed treatment is superior to the learning strategies used during the baseline/typical practice phase. This study contributes to the extant research for using GOs with informational text for students with LD in upper elementary school (Bos & Anders, 1992; Stagliano & Boon, 2009). One study using a GO and DI to teach science content found that students in the GO treatment did not outperform students in a comparison/outline condition (Griffin et al., 1991). Therefore, despite some evidence of effectiveness for upper elementary school, more research and replication studies are necessary to determine that this practice is evidence-based.

A second implication is that students perceive using GOs as effective for improving their learning. The social validity survey suggests that participants found the GO treatment to be useful for following along during the lesson, remembering information, and increasing their potential to succeed on assessments. Other GO studies that have collected social validity information also have confirmed that students recognize the value in using this content-enhancement tool (Gardill & Jitendra, 1999; Stagliano & Boon, 2009; Taylor et al., 2002). Using practices that are academically effective and promote student buy-in hold practical value for educators.

A final implication is that students with LD can learn through reading informational text and engaging in post-reading activities. Many educators agree that social studies textbooks are sometimes written in ways that are difficult for all students to

understand (Twyman et al., 2006) and that high readability levels make textbooks challenging for students with LD (Okolo et al., 2007). Despite these barriers, this study demonstrates that students with LD can still learn from reading text if supported by a teacher who uses such techniques as feedback on miscues and purposeful questioning. Additionally, when the teacher extends students' chances to understand the text through studying a GO, and has the students use academic language to teach him or her the content, the process of acquiring content from a textbook can potentially be less intimidating for students with LD. Students are expected to learn from a wide range of text sources throughout their academic careers (Bulgren et al., 2007), so practicing informational text reading in upper elementary school is a worthwhile endeavor.

Limitations

Several limitations to this dissertation study warrant consideration. The first is its small sample size. Seven students were sufficient for a single-case study because at least three replications were evident and experimental control was established at each site (Horner et al., 2005; Kratochwill, et al., 2010). However, the small sample size limits the generalizability of the findings. The school district that approved this research recommended a smaller-sized study. Currently, randomized control trials are recognized as studies that can be used to identify causality in special education research (Stanovich & Stanovich, 2003) without repeated replication efforts by several different research teams (Horner et al., 2005).

The researcher-developed quizzes and the cumulative social studies test were not piloted prior to this study. Piloting measures or having a professional item analysis

conducted would have instilled more confidence in the results. Although the researcher took several steps to attend to Bloom's taxonomy question styles for the quizzes and to verify that each quiz was written in the same format, a systematic technical adequacy phase would have bolstered the measures. As described in chapter 3, all students answered one question on Quiz 2 regarding President Monroe incorrectly. Although this question was covered in the reading and lesson plan, the way it was written may have been confusing. Additionally, a post hoc analysis of quiz results revealed that Quiz 11, which focused on reconstruction after the Civil War, was the measure on which students at both schools attained the lowest score. The content consisted of a discussion of the differences between the Thirteenth, Fourteenth, and Fifteenth Constitutional Amendments. The low performances on Quiz 11 could be due to extensive and challenging content, but without technical adequacy it cannot be ruled out that the low scores were due to the researcher having created a quiz that was exceedingly difficult.

Another limitation was that the duration of the study was relatively short. Despite being longer than some GO studies with middle-grade students with LD (Boyle, 1996; Griffin et al., 1991), or similar in length to other GO studies (Darch & Carnine, 1986), a treatment that lasted longer would have been beneficial in providing more information regarding the effectiveness of this treatment. Future studies should explore the effectiveness of this treatment compared to a technology-based GO condition will last more than 12 weeks.

The inclusion of a standardized measure of comprehension, the Gates MacGinitie, may have been unnecessary. While previous research with GOs has inadequately

represented standardized measures, it was not certain that this study benefited from the Gates MacGinitie due to the small sample size and relatively short treatment duration. Therefore, the amount of beneficial information yielded from this measure is questionable.

Finally, although a maintenance (follow-up) lesson was conducted with six of the seven students in this study, one student did not receive a maintenance session. Kenny, the final student to receive treatment at School A, did not experience a follow-up lesson. The amount of time allotted by the school to conduct this study was ending as a result of the necessity to prepare for state testing. As a consequence, Kenny did not receive a maintenance session, which would have helped determine whether his improvement on daily quizzes would continue.

Summary

The purpose of this study was to examine the effects of using explicit and systematic instruction and a graphic organizer to enhance the content knowledge and reading comprehension of students with LD in Grades 4 and 5. This study benefited from previous research for students with LD and a GO study in middle school (DiCecco & Gleason, 2002). Given the importance of being able to read for understanding beginning in upper elementary school, studies examining ways to improve informational text understanding, such as this dissertation, are warranted.

The results of this dissertation revealed that students showed significant improvement in content learning from pretest to posttest at both schools. Furthermore,

performance on daily measures was better when students received treatment than when they engaged in a typical practice baseline. Although five of the students in this study improved their raw scores, grade equivalences, and national percentile ranks on the Gates MacGinitie Comprehension test, there is not enough information to conclude that these gains were a direct result of the treatment, rather than representative of typical growth. Despite several limitations, the GO treatment taught in this study is promising for improving learning in upper elementary students with LD.

APPENDIX A: Baseline Lesson Plan

Date _____

Lesson and Chapter _____

Text Preview (3–5 minutes) Examine each picture in the chapter.

- Review each highlighted vocabulary word (vocabulary words for each section appearing in bold print).
- Provide a brief synopsis of what students will be reading for the day. (The synopsis is taken from the “Main Idea” section on the first page of each new chapter.) For example, say, “Today we will be learning about how the United States grew west of the Mississippi River.”
- Ask students what they already know about the topic.

Reading (15 minutes)

- Alternate paragraph reading: The instructor begins by reading the first paragraph.
- Provide immediate corrective feedback for word-reading errors. For example, if the student says “grounding” instead of “government,” you say, “That word is *government*.”
- Ask literal and inferential questions during reading. Stop every few paragraphs to check for understanding. Ask questions based on reading, such as, “Which president made the Louisiana Purchase?”

Discussion (10–15 minutes)

- Ask the student what he or she learned or recalled from today’s reading: “Please tell me about the important things that you read today.”
- Have students go through the pages that were read and summarize AT LEAST ONE important concept from each page.
- For concepts or events that the student is confused about or offers an incorrect response for, teacher says, “I’m not sure you remembered that the way it was written. Let’s take a look at that in the book.” Next, the teacher refers the student to the relevant paragraph in the text to locate the correct information, and the instructor re-reads or restates the information to the student.

Quiz (5–10 minutes)

- Each quiz item will be read orally to the student.
- For multiple-choice questions, ask the student to listen to each answer choice before selecting.
- A **maximum of 1 minute** will be given for each question (instructor will use a timer). If the student does not provide an answer within 1 minute, say, “That is alright, let’s try another one.”
- Scribe all answers for Questions 6–10.
- Following the quiz, provide the student with immediate feedback: Review each incorrect response and provide the correct response.

APPENDIX B: Treatment Lesson Plan

Date _____

Lesson and Chapter _____

Preview (3–5 minutes)

Introduce new vocabulary (in bold) and key headings/titles, and preview pictures appearing in text passage.

- Provide a brief synopsis of what the students will be reading for the day. (The synopsis is taken from the “Main Idea” section on the first page of each new chapter). For example, say, “Today we will be learning about how the United States grew west of the Mississippi River.”
- Briefly introduce the GO to students and explain how the GO will be used as a tool to help remember the important facts and ideas from the reading. One at a time, review each category heading on the GO. Also, read the BIG IDEA question of the day!
- After pointing to each box heading, ask, “Can you tell me what we are going to use the graphic organizer for?” Then ask, “What types of things are we going to be looking for during reading today?”
- If the student does not state the categories on the GO, provide immediate feedback by saying, “Today we are going to be looking for _____.”

Reading (15 minutes)

- Alternate paragraph reading: The instructor begins by reading the first paragraph.
- Provide immediate corrective feedback for word-reading errors. For example, if the student says “grounding” instead of “government,” you say, “That word is *government*.”
- Ask literal and inferential questions during reading. Stop every few paragraphs to check for understanding. Ask questions based on the reading, such as, “Which president made the Louisiana Purchase”?

Graphic Organizer (10–15 minutes)

- Next say, “Today we are going to study what we learned today by going over this GO together.”
- Go through each cell and read the information to the student while pointing to the box. Then, read each cell chorally with the student while pointing at each box.
- Next, ask students to share additional information they remember regarding each fact on the GO. This is where the student gets to “be the teacher” and teach what he or she learned by going through the entire GO and explaining each piece of information.
- Refer back to the text to re-read any confusing information based on student responses.

*NOTE: Every third lesson, the GO will be partially completed to promote active participation

- Go through cells one at a time. Ask students what information should fill in the blank boxes as you proceed through the GO.
- For incorrect or incomplete answers, refer the student back to the relevant part of the text to re-read and identify the correct information.
- Check for accuracy on all completed information.

Then

- Go through each cell and read the information to the student while pointing to the box. Read each cell chorally with the student while pointing at each box.
- Have students point to each box and read the information.
- Invite students to share more information from each box in their own words.
- Refer back to the text to re-read any confusing information, based on student responses.

Quiz (5–10 minutes)

- Each quiz item will be read orally to the student
- For multiple-choice questions, ask the student to **listen to each answer choice before selecting.**
- A **maximum of 1 minute** will be given for each question (instructor will use a timer). If the student does not provide an answer within 1 minute, say, “That is alright, let’s try another one.”
- Scribe all answers for Questions 6–10.
- Following the quiz, provide the student with immediate feedback: Review each incorrect response and provide the correct response.

APPENDIX C: Graphic Organizer Example

BIG IDEA QUESTION- Quiz 9

What important events happened early in the Civil War?

PEOPLE OR GROUPS

African Americans- 180,000 African-Americans fought with the Union Army.

Union Army- Northern States

Confederate Army- Southern States

VOCABULARY

Blockade- Using ships to block the South from shipping goods at their ports

Emancipation Proclamation- In states that left the Union, the slaves could go free.

EVENTS

1861- The first battle of the Civil War (the Battle of Bull Run)

Anaconda Plan- A plan to make a blockade of the sea ports in the South so they could not ship goods or get supplies. Everyone did not agree with the plan- *Some people thought it would take too long.*

Battle of Antietam- A battle in Maryland where many soldiers died. After losing many soldiers, the Confederate Army left Maryland.

Emancipation Proclamation- Lincoln said that in states the left the Union, those slaves were now free. This did NOT mean all slaves were free- only slaves in states that left the Union.

HOW THIS CHANGED AMERICA AND PEOPLE'S LIVES

Emancipation Proclamation helped the Union in the war because:

- a. France and Spain no longer wanted to help the South
- b. African-Americans began joining the Union (North) army- 1800,000 joined

Was the Emancipation Proclamation good enough?

Some people thought it should have said ALL slaves could go free. The slaves in the border - states were still not free

APPENDIX D: ASSENT FORM

Using Graphic Organizers to Improve Reading Skills

I agree to be in a study that is about reading. This study was explained to my (mother/father/parents/guardian) and (she/he/they) said that I could be in it. The only people who will know about what I say and do in the study will be the people in charge of the study and my teachers.

In this study, I will be working with a teacher from UT on reading. We will be reading and learning ways to help me understand what I read.

Signing my name on this page means that the page was read (by me/to me) and that I agree to be in the study. If I decide to quit the study, all I have to do is tell the person in charge.

Child's Signature

Date

Signature of Researcher

Date

APPENDIX E: CONSENT FORM

IMPROVING NON-FICTION READING COMPREHENSION USING GRAPHIC ORGANIZERS

Your child is invited to participate in a study on improving the reading skills of students in fourth and fifth grade. This study will teach students with learning disabilities a strategy for reading non-fiction books. I am asking permission for your child to work with a University of Texas tutor (a certified special education teacher), for 3 to 6 weeks, 35 minutes per day.

My name is Stephen Ciullo and I work in the Department of Special Education at UT. I am also a graduate student, and this study will be used for my dissertation project. The names of all students will be confidential. Performance and participation in this study will not affect your child's grade in any way. The following things will happen:

- All students will be given a 5-minute word-reading test. The word-reading test will take place in early October. To participate, students must read words at a 2.5 grade level or above.
- Students will be assessed twice: once before working with the tutor and once after, so we can look for improvement. The assessments will be on reading comprehension and knowledge of social studies topics. The first tests will be given in October or November, approximately 1 week before the tutoring begins. The tests to check for improvement will be given 1 week after the tutoring stops, in January.

- Students will work with the tutor for 3 to 6 weeks. The student and teacher will read, and the tutor will teach students how to use a graphic organizer to remember details for answering questions. A graphic organizer is a page with boxes where students can take notes to help remember ideas from reading. Students with learning disabilities have benefited from this strategy in research studies across the United States.
- Following working with the tutor, each student will fill out a brief questionnaire, saying how much he or she enjoyed learning this new strategy and offering his or her opinion of it.
- Only you, the child’s parents, and the special education teacher will have access to the results. All of the information on the project will be kept in my locked office.
- When summarizing this study for my papers at UT or in journal articles, “pseudo names,” or fake names, will be given to each child for confidentiality.

We see no risk in participation. Your child may benefit from a new reading strategy. You are free to stop participating at any time, and your decision will not affect your or your child’s relationship with the University of Texas. If you have questions regarding the study, contact Stephen Ciullo at 512-232-4254 or ciullos@mail.utexas.edu. You can also contact the University of Texas Institutional Review Board at 512-232-2685.

Sincerely,

Stephen Ciullo

The University of Texas at Austin

You are making a decision about allowing your child to participate in this study. Your signature below indicates that you have read the information above and you are allowing your child to participate in the reading study. If you later decide to withdraw your permission, simply tell me at any time. Thank you.

Printed Name of Son or Daughter

Signature of Parent(s) or Legal Guardian(s)

Date

Stephen Ciullo, Investigator

Date

APPENDIX F: Pre/Post Social Studies Test

1. A form of government where the people vote to decide who will run the government.

a. emancipation

2. A feeling of pride or respect for your country.

b. Confederacy

3. The belief that the United States should stretch from the Atlantic Ocean to the Pacific Ocean.

c. democracy

4. When a country gives something up, such as land, to another country.

d. Manifest Destiny

5. Slaves that have been set free.

e. immigrants

6. Seven states in the southern part of the US that formed their own government because they wanted slavery to continue were called the _____.

f. cession

7. This means bringing the country back together and rebuilding after the Civil War. _____

g. nationalism

h. dictator

8. A group of people that leave another country to live in the United States.

i. Reconstruction

9. The United States bought land from France. This land was west of the Mississippi River and now makes up the central part of the United States. This was called_____.

- a. the Pacific Ocean
- b. Texas
- c. the Louisiana Purchase
- d. Mexico

10. The two men who explored the new land in the United States were_____.

- a. George Washington and Abe Lincoln
- b. Lewis and Clark
- c. Smith and Davis
- d. Thomas Jefferson and Ben Franklin

11. Why was the Louisiana Purchase important?

- a. It helped the United States defeat Canada.
- b. It was land for Christopher Columbus to explore.
- c. It doubled the size of America and created new land to settle in.
- d. The United States began sharing land with Mexico.

12. Who did the United States fight against in the War of 1812?

- a. Great Britain (England)
- b. Canada
- c. France
- d. Germany

13. Why was the United States considered a “world power” after the War of 1812?

- a. The United States beat France.
- b. The United States added new land and stood up to a powerful nation.

- c. The United States had the largest navy in the world.
- d. The United States lost the war of 1812.

14. Which President ordered Indian tribes to move away from their land?

- a. George Washington
- b. James Monroe
- c. Abraham Lincoln
- d. Andrew Jackson

15. What was the “Trail of Tears”?

- a. U.S. families traveling West in a long road
- b. Texans who were upset with Santa Anna
- c. Cherokee Indians that died during the long, cold trip to the Indian Territory
- d. A sad movie

16. What country did Texas belong to before 1845?

- a. Mexico
- b. The United States
- c. France
- d. Japan

17. What did the United States gain after the Mexican War?

- a. Florida
- b. Mexico
- c. Texas and other new lands
- d. Mexico paid the United States money

18. Where was the “Gold Rush”?

- a. Texas
- b. California
- c. New York
- d. Japan

19. How did the Industrial Revolution change people’s lives?

- a. It made people start going to college.
- b. New inventions, such as railroads, made people’s lives easier.
- c. It added more land to the United States.

d. People became angry with the president.

20. Why did people begin using railroads and steamboats?

- a. Cars were not fast enough yet.
- b. To travel for vacation
- c. Because they were easy to build
- d. They made traveling easier and cheaper.

21. Which president wanted to stop slavery from spreading?

- a. George Washington
- b. Abraham Lincoln
- c. Harry Truman
- d. George W. Bush

22. What did the Supreme Court decide about the slave Dred Scott?

- a. Slaves had no rights, so he could not go free.
- b. Because his owner died, he was free.
- c. He could go free when he turned 40 years old.
- d. His children were given freedom.

23. What was the Underground Railroad?

- a. a train that ran under the ground
- b. a boat that took people up a river
- c. a secret escape route that helped take slaves to freedom
- d. a train that allowed slaves to ride in secret

24. What was one reason for the Civil War?

- a. taxes
- b. farming
- c. slavery
- d. trade

25. What famous speech did President Abraham Lincoln give?

- a. the Emancipation Proclamation
- b. the Bill of Rights speech

- c. the Axis of Evil speech
 - d. a speech about giving the right to vote to Native Americans
26. Which battle in Pennsylvania was the most deadly and helped the North win the war?
- a. the Alamo
 - b. the Battle of Philadelphia
 - c. Gettysburg
 - d. the Iraq War
27. How did the Civil War end?
- a. The Union (the North) surrendered and stopped fighting.
 - b. The Union (the North) and the Confederacy (the South) called a truce (a tie).
 - c. France helped the Union win.
 - d. The Confederacy (the South) surrendered, so the Union (the North) won.
28. How would you describe the United States after the Civil War?
- a. After the war, slaves began getting good jobs and the states became united.
 - b. The treatment of African Americans became worse than before.
 - c. The Fifteenth Amendment changed the country; all citizens could vote and were truly equal.
 - d. Many people in the South were not ready to give African Americans equal rights.
29. Why did many Americans and immigrants move west to the Great Plains in the late 1800s?
- a. New factories were being built, offering jobs to immigrants.
 - b. The Homestead Act gave land to families willing to move west.
 - c. Abraham Lincoln opened up new land to former slaves.
 - d. People became upset with the traffic in cities.
30. What discovery helped American businesses make a lot of money in the late 1800s?
- a. The first airplane was invented.
 - b. The first car was invented.
 - c. Oil

d. Air conditioning

APPENDIX G: Student Questionnaire

For each question, please write in the number that best explains how you feel.

1— graphic organizers were very helpful

2—graphic organizers helped a little

3—not sure

4—the graphic organizer was not helpful for learning

1. How easy was it to follow what the teacher was explaining when using the graphic organizer? _____

2. How much did the graphic organizer help you learn what the most important parts of the reading were? _____

3. Did the graphic organizer make it easier to answer questions and remember information for the quizzes? _____

4. Do you like the graphic organizers better than reading the book and having discussion after reading? _____

5. If a friend asked you if graphic organizers would help him or her improve in understanding reading, what would you say? _____

6. What advice would you give teachers to help make the graphic organizers better for understanding what you read?

APPENDIX H: Quiz Sample (# 6)

Name _____

Date _____

1. Why did most people living in the North like the tariffs (taxes) on goods from Europe?
 - a. The tariff made products from Europe more expensive, so more people began buying things made in the United States.
 - b. Tariffs helped to increase trade between the United States and Europe.
 - c. A result of the tariff was that goods made in Europe were cheaper for people living in the North and South.
 - d. The tariff gave more money to states by raising taxes on goods.

2. In the Missouri Compromise, when Missouri became a slave state, what state became a free state?
 - a. Kentucky
 - b. Illinois
 - c. Maine
 - d. Kansas

3. In the Compromise of 1850, what country joined the Union as a free state?
 - a. Texas

- b. Kansas
- c. Nebraska
- d. California

4. What famous leader was known as “The Great Compromiser”?

- a. James Calhoun
- b. Henry Clay
- c. Roger B. Taney
- d. Andrew Jackson

5. What did the Kansas-Nebraska Act do?

- a. It was a compromise that kept the number of free and slave states equal.
- b. It allowed people to vote to decide if slavery was legal.
- c. Kansas joined the Union as a free state, and Nebraska joined the Union as a slave state.
- d. Kansas and Nebraska became slave states in order to keep the balance equal.

6. Explain what the court decided in the Dred Scott case.

7. What effect did the Dred Scott case have on how people in the United States felt? Why?

8. What part of the country wanted slavery to continue? Why did they want it?

9. What did the president say about states' rights? What did the vice president say? Who was correct and why?

10. If you were a farmer living in the South, how would you have felt about the tariffs (taxes)? Why would you feel this way?

APPENDIX I: Quiz # 6 Answer Key

1. a
2. c
3. d
4. b
5. b
6. Partial credit awarded (1.5 points for partially completed answers). The court decided that Dred Scott would not be granted freedom. The reason was because slaves were “property” according to the Court, and the court said that landowners had a right to own slaves.
7. Partial credit awarded (1.5 points for partially completed answers). Following the Dred Scott decision, people still felt angry because the North and South were divided over slavery and other issues of states’ rights. Other “reasonable text-based” responses may be accepted, such as that people were ready for fight for their beliefs.
8. Partial credit awarded (1.5 points for partially completed answers). People in the South wanted slavery to continue because the South was an agricultural economy; or they believed it was up to states to decide.

9. Partial credit awarded (1.5 points for partially completed answers). President Jackson said the government should decide what states do. Vice President Calhoun said that states should decide on such things as slavery and tariffs.

The student must also state who he or she believes is correct and provide a reason.

10. Partial credit awarded. A farmer in the South would have probably been upset about the tariffs because it meant he had to pay more to purchase goods from Europe.

APPENDIX J: Quiz Sample (# 11) – Reconstruction

Name _____

Date _____

1. Who is the person that shot and killed (assassinated) President Lincoln?
 - a. Blanche Bruce
 - b. John Wilkes Booth
 - c. Andrew Johnson
 - d. Edmund Ross

2. Bringing the country back together and rebuilding after the Civil War was called _____.
 - a. Reconstruction
 - b. World War II
 - c. Slave codes
 - d. The Thirteenth Amendment

3. What did the Thirteenth Amendment of the Constitution say?
 - a. Slavery was allowed only in states that did not return to the Union.
 - b. All slaves could now vote.
 - c. Slavery was allowed only in South Carolina.
 - d. Slavery was not allowed anywhere in the United States now.

4. What African American man opened up schools for everyone in Florida?
 - a. Martin Luther King Jr.
 - b. Edmund Ross
 - c. Jonathan Gibbs
 - d. Fredrick Douglass

 5. What laws did the South pass that tried to keep African Americans from being free?
 - a. Slave codes
 - b. Black codes
 - c. the Tenth Amendment
 - d. the Kansas-Nebraska Act

 6. Why were some southerners upset after President Lincoln was killed?
-
-

7. Why was the Fifteenth Amendment important? What did it say?

8. Name at least two accomplishments that Black citizens (African Americans) made during Reconstruction?

9. Why was Reconstruction a difficult process after the Civil War?

10. Why do you think many people living in the South were not ready to reunite during the Reconstruction period?

APENDIX K: Quiz # 11 Answer Key

1. b
2. a
3. d
4. c
5. b
6. Partial credit allowed. Some were upset because the president of the United States was killed (1.5). For full credit: Southerners were upset because it could have made peace and Reconstruction more challenging
7. Partial credit—for 1.5: The Fifteenth Amendment said that all citizens could vote. For full credit: All citizens could vote, and now African Americans could elect representatives or leaders who would help get them equal rights.
8. Partial credit—1.5 for each accomplishment listed: (a) better jobs, (b) some African Americans were elected to Congress, or (c) Jonathan Gibbs helped to open public schools in Florida,
9. Partial credit—1.5 points awarded for PARTIALLY complete responses: Reconstruction was difficult because many Southerners were not ready to grant African Americans equal rights. Southerners wanted slavery to continue so they could have help with their farms. President Lincoln's assassination also hurt the Reconstruction process.

10. Partial credit allowed. 1.5 points awarded for each response: Some Southerners were racist, they wanted slaves to work on farms still, and they believed that states should be allowed to decide on their own laws.

APPENDIX L: Treatment Fidelity

Using Graphic Organizers to Enhance Informational Text Understanding

Campus _____

Teacher _____

Date _____

Fidelity Observation Number/Observer _____

Please fill in the number that best matches your experience.

Organization (prior to lesson)

0 = Teacher did not do this activity when it was required by the lesson plan.

1 = Teacher implemented this activity with insufficient instruction and/or organization.

2 = Teacher implemented this activity with sufficient instruction and organization.

NA = This activity was not required.

Teacher ensures that required materials are available (e.g., textbook, notebooks, GO handouts). _____

Vocabulary and Pre-reading (3–5 minutes) Actual Time Spent _____

0 = Teacher did not do this activity when it was required by the lesson plan.

1 = Teacher implemented this activity with insufficient instruction and/or organization.

2 = Teacher implemented this activity with good instruction and/or organization.

NA = This activity was not required.

Teacher introduces vocabulary that is highlighted in text, key headings/titles, and preview pictures appearing in text passage.

Teacher briefly introduces the graphic organizer to students and explains how the GO will be used as a tool for organizing the ideas learned in the reading passage. Teacher reviews the main categories on the GO, and the Big Idea of today's lesson.

Reading (10–15 minutes)

Actual Time Spent _____

0 = Teacher did not do this activity when it was required by the lesson plan.

1 = Teacher implemented this activity with insufficient instruction and/or organization.

2 = Teacher implemented this activity with good instruction and/or organization.

NA = This activity was not required.

Teacher and student read passage orally, alternating paragraphs. Teacher provides immediate corrective feedback on student word-reading errors. _____

Teacher asks literal questions (e.g., Which president passed the Homestead Act?) and inferential comprehension questions (e.g., How do you think this law helped settlers?) during reading. For incorrect answers, the relevant paragraph is re-read and questions repeated. Teacher provides answers and explanations if students are still unable to answer correctly. _____

Graphic Organizer Instruction (15 minutes)

Actual Time Spent _____

0 = Teacher did not do this activity when it was required by the lesson plan.

1 = Teacher implemented this activity with insufficient instruction and/or organization.

2 = Teacher implemented this activity with good instruction and/or organization.

NA = This activity was not required.

Teacher and students review graphic organizer. Teacher verbally states relationships and facts contained in GO while student follows along. _____

Instructor points to each cell on the GO while speaking, and guides students through GO eliciting responses. The students must repeat everything the teacher says and explain anything else they remember about the concept. For incorrect or inaccurate answers, refer back to that part in the book. _____

(When necessary:) When prompted by teachers, students finish partially completed GOs. Provide feedback and redirection for errors or confusion to ensure that accurate facts are reflected. _____

The student summarizes the GO for the teacher, with prompting as needed, to promote active engagement. _____

Assessment (5–8 minutes)

0 = Teacher did not do this activity when it was required by the lesson plan.

1 = Teacher implemented this activity with insufficient instruction and/or organization.

2 = Teacher implemented this activity with good instruction and organization.

NA = This activity was not required.

Teacher reads directions and questions to students with appropriate pacing

_____.

Teacher Behavior/Classroom Management

Teacher provides positive feedback. _____

Teacher redirects off-task behavior. _____

0 = Teacher did not do this activity when it was required by the lesson plan.

1 = Teacher implemented this activity with insufficient instruction and/or organization.

2 = Teacher implemented this activity with good instruction and organization.

NA = This activity was not required.

Teacher Rating

My overall rating of the instruction provided by this teacher is:

Above average _____ Average _____ Less than average _____

APPENDIX M : Key Terms

Advanced Organizer – A tool used to preview information or concepts prior to reading and instruction. Previewing and setting a purpose through various types of advanced organizers are cited as factors that have contributed variance to successful treatments for students with disabilities (Swanson & Deshler, 2003).

Content Enhancements – Tools used to highlight important information during informational, or expository, text reading. These devices facilitate the selection, organization, and summary of information to make text more accessible and meaningful. Commonly used content-enhancement tools include diagrams, mnemonic devices, advanced organizers, and graphic organizers.

Content-Enhancement Routines (CERs) – A set of instructional strategies created to equip students with specific strategies, or routines, to acquire and retain concepts in social studies. CERs facilitate instructional planning, teaching, and assessment of social studies learning, as well as comprehension.

Experimental Control – Demonstrating that an intervention reliably produces a change in behavior or academic performance (Kennedy, 2005).

Experimental Effect- When a change in behavior or academic performance corresponds with the introduction or manipulation of an independent variable.

Explicit/Systematic Instruction – A structured teaching approach for instructing students with LD and students with reading difficulties. Systematic instruction, largely influenced by the theoretical framework of Direct Instruction, is characterized by a highly organized or scripted lesson, small groups, a thorough introduction of new material followed by immediate student practice, and frequent progress monitoring.

Graphic Organizers – Visual displays of information (an example of a content-enhancement tool) used to organize textual information in a diagram, box, flowchart, sequencing chart, or an outline. Graphic organizers are used for narrative and informational text as study guides, for analysis of story elements (story grammar), to capture details supporting main idea and summary, and/or sequencing.

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Vita

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