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The Effects of a Multicomponent Informational Text Reading Intervention on Comprehension: A Multiple Baseline Study

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The Effects of a Multicomponent Informational Text Reading Intervention on Comprehension: A Multiple Baseline Study

by

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DEDICATION

I dedicate this dissertation to my children, Isabelle, Andrew, and Cooper. You are the driving force behind my pursuit of knowledge and the embodiment of my deepest motivations and aspirations. You have been my constant source of inspiration and motivation throughout this academic journey. I dedicate this work to you as a testament to the love and gratitude I have for each of you. May this dissertation serve as a reminder of the importance of perseverance, hard work, and the pursuit of one's dreams. May it inspire you to always follow your passions and embrace the wonders of education. Know that your presence in my life has been the greatest gift, and I am forever grateful for the joy and purpose you bring. With boundless love and appreciation, you are my motivation, my pride, and my greatest achievement. With all my love, Mom

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ABSTRACT

In this dissertation, I present the findings from the implementation of an informational text reading comprehension intervention. Using a single-case multiple baselines across participants' experimental design, I examined results from three small heterogeneous groups of three to four students during the literacy block in a suburban fourth-grade classroom in a large school district in the southeastern United States. I designed a multi-component intervention with explicit instruction of informational text features to investigate the impacts on intermediate students' oral retell and main idea statements. My research was guided by the following questions: (1) To what extent does participation in ITMI improve fourth-grade students' oral retell scores? (2) To what extent does participation in ITMI improve fourth-grade students' main idea statement scores? (3) To what extent do fourth-grade students who are participating in ITMI demonstrate changes in their reading comprehension as measured with pretest and posttest assessment? The results inform efforts to increase informational text comprehension for students in the intermediate grades.

CHAPTER ONE: INTRODUCTION

Statement of the Problem

Reading Comprehension

Proficient reading comprehension, or the ability to understand and interpret text (Castles et al., 2018), is critical for success in school and life. Reading comprehension skills are essential for understanding text and are critical to academic, social, and economic success (Oakhill, et al., 2015; Rapp, et al., 2007). However, reading comprehension is a complex skill, requiring the ability to read text, process information, integrate new information with prior knowledge, develop schema, and recall information. The intention of reading comprehension instruction through intervention is to provide research-based instruction considered to be more intense than traditional classroom instruction (Gelzheiser et al., 2010) to improve students' reading comprehension performance.

The educational issues students in this country face are extremely critical (NCES, 2022). According to national standards, by the end of elementary grades, students should be able to understand narrative and informational texts, distinguish a variety of genres, and learn from texts Common Core State Standards (CCSS; National Governors Association Center for Best Practices (NGACBP) and Council of Chief State School Officers (CCSSO) 2010). Despite intensive instruction comprehension problems persist, especially when students enter fourth grade and have to make the transition from learning to read to reading to learn.

The Need for an Increase in Informational Text Instruction

The call for an increase in informational text in classrooms has been well documented dating back two decades (Duke, 2000). Changes in student performance have been documented in the past decade, but elementary school curriculum and libraries continue to focus predominantly on fictional stories (Braker-Walters, 2014; Jeong et al, 2010; Moss 2008; Salinger et al., 2005). Unfortunately, children in the U.S. continue to be underprepared for reading and comprehending informational texts as evidenced by their performance on comprehension tests at the State and National levels (NCES, 2022). The National Assessment of Education Progress (NAEP) reports the national average scores for reading comprehension of both literary (fiction, literary nonfiction, poetry) and informational texts (exposition, argumentation, persuasive) at grades 4, 8, & 12. Although, the scores do not provide discriminate results to separate literary from informational scores, the scores provide proxy variables for different strategies necessary to read distinct genres.

Fourth grade is the youngest grade level tested for reading comprehension in the (NAEP) and the 2022 results found nearly two thirds of American fourth graders can only read at or below the basic level (37% below basic and 29% at basic, total of 66%), meaning they exhibit only partial mastery of reading skills. Students who are unable to integrate and interpret texts, apply their understanding of the text to draw conclusions or make evaluations are labeled as falling at or below the basic level. NAEP item analysis indicates that they cannot make complex inferences, or construct and support their inferential understanding of the text, nor can they apply their understanding of a text to make and support a judgment (NCES, 2022). The percentage of students at this level has decreased slightly since 1992, when the percentage at or below basic was 71%, indicating that intervening federal initiatives (e.g., Reading First) to improve reading skills have met with questionable success.

Benefits of Informational Text Instruction

The corpus of literature interrogating the benefits of including informational text in instructional practices suggests that informational genres present a wealth of instructional opportunities for teachers and students. Informational text exposes students to specialized vocabulary and content-specific language (Duke & Kays, 1998; Duke et al., 2003), supports the growth of background knowledge that promotes reading comprehension (Hirsch, 2003; Moss & Hendershot, 2002; Yopp & Yopp, 2000; Young et al., 2007), increases reading motivation (Moss, 2005; Moss & Hendershot, 2002), and increases exposure to text structure and text features necessary for later use in secondary schooling and the workplace (Kambrerelis, 1998; Ogle & Blachowicz, 2002).

Informational Text Instruction in the Intermediate Grades

Much of the literature on reading comprehension at the elementary level focuses on narrative texts and what little research that has been conducted on informational text is focused on the early grades, resulting in a significant gap in the literature related to informational text comprehension in the intermediate grades. National high-stakes assessments (NAEP, 2022) continue to demonstrate intermediate-grade students' struggles with foundational reading comprehension skills. This translates to millions of fourth-grade students who have failed to master reading. When children have reading challenges, they are precluded from understanding content area texts, and they may have increased potential for developing negative attitudes towards reading, which might prevent students from reading for enjoyment and becoming successful, lifelong readers. It is improbable that students who struggle to read in the intermediate grades will spontaneously become successful readers through developmental changes. Therefore, effective research-based comprehension instruction provided by knowledgeable teachers is necessary to meet the needs of intermediate students.

The Challenges of Comprehending Informational Text

The difficulties with informational text comprehension that students encounter typically begin in elementary school (Harris et al., 2003; Saenz & Fuchs, 2002). Students who have difficulty with comprehension have problems effectively accessing text manifested through problems with decoding and/or comprehending print (Swanson & Alexander, 1997; Ciullo et al., 2014). This population of readers frequently experience issues with acquiring and retaining germane concepts and background knowledge (Cain et al., 2001), affecting their ability to draw on complex ideas. These students also have trouble monitoring their comprehension, which results in reading comprehension deficits including the inability to recall key information (Nation, 2005). These challenges ultimately limit students' learning in middle and high school when the general education curriculum shifts to predominately content-based instruction (Baker et al., 2002).

Despite calls for an increase in instruction with complex informational text in elementary classrooms following the advent of the Common Core State Standards (CCSS; NGACBP; CCSSO) 2010), as well as an increased presence of informational text in high stakes testing, the literature (Jeong et al., 2010; Jones et al., 2016; Moss, 2008; Moss & Newton, 2002) indicates there continues to be a scarcity of complex informational text for intermediate students in both adopted core curriculum.

Zimmerman's (2000), research on self-efficacy indicates students who encounter difficulties with literacy related tasks do not consistently use efficient strategies to monitor comprehension (e.g., re-reading, reading out loud, using context clues, asking questions, making connections, slowing down). Instead, students often rely on simpler, less efficient strategies resulting in ineffective, reactive methods for learning. For example, instead of reading the text in its entirety, students jump back and forth between the text and the assigned questions or tasks, or

they skim and scan the text for words that answer the question, or they read with one single objective in mind to finish and they don't pay attention to what they encounter along the way like ideas and information). Allington and McGill-Franzen's (2017) research on comprehension difficulties and struggling readers suggest a need for studies that examine the efficacy of explicit instruction of higher cognitive skills (e.g., comprehension and metacognitive strategies) to improve informational text comprehension outcomes for intermediate students who are approaching mastery with reading comprehension.

Interventions

The research on narrative comprehension interventions with students who are approaching mastery clearly demonstrates that improving comprehension of material that has been read is possible (Gersten et al., 2001; Mastropieri & Scruggs, 1997; Oakhill & Yuill, 1996; Vaughn et al., 2000; Vaughn et. al., 2000). Unfortunately, there remains a dearth of informational text interventions in the intermediate grades, and at the same time, the amount of informational text content continues to increase in standardized tests. This rise in standardized assessment of informational text comprehension was a direct result of the implementation of the Common Core State Standards (Common Core State Standards Initiative, 2010), which raised the informational text expectations (Haager & Vaughn, 2013) and required students to read and write more informational texts (Maloch & Bomer, 2013).

This mismatch perpetuates the widening reading comprehension gap between grade-level expectations and student achievement. Given this paucity of studies for intermediate readers, there is a need for experimental studies that test the efficacy of multicomponent informational text reading comprehension interventions addressing the causality of reading comprehension and informational text, specifically where students who have yet to master informational text comprehension are concerned.

The Need for Multicomponent Informational Text Interventions. Students in the intermediate grades are a heterogeneous group, meaning the present level of reading ability is not always commensurate with grade placement. By the time students matriculate to the intermediate grades the differences in current ability and areas of need are wide-ranging from child to child. Intermediate students' literacy skills, strategies, and background knowledge differ with age (Riddle-Buly, & Valencia, 2002; Valencia et al., 2010) as they have many different distinct factors that contribute to their identified problem areas in reading. Research indicates a need for studies that examine the efficacy of multicomponent interventions to address the needs of this heterogeneous group (Allington and McGill-Franzen, 2017; Mason, 2004; NRP, 2000).

There are few studies of multiple component interventions for students in the intermediate grades targeting more than one reading domain (Baker et al., 2011; Kelly, 2019; Mason et al., 2006; McCown & Thomason, 2014; Ritchey et al., 2012; Ritchey et al., 2017).

Conceptual Framework

The conceptual frameworks of effective research-based reading comprehension strategies and Transactional Strategy Instruction (Brown et al., 1996; Pressley et al, 1992) served as the foundation for this study. I investigated the efficacy of a multi-component informational text intervention on the reading comprehension abilities of fourth-grade students identified as approaching mastery of comprehension of informational texts. The Transactional Strategy

Instruction approach in the current study included a responsive menu of strategies used flexibly (Reutzel et al., 2005) following three phases including (a) selecting strategies (e.g. use of complex texts, inclusion of graphic organizers, comprehension monitoring through note-taking, and attention to text features), (b) explicit teaching of the strategies (e.g. explain and model strategy uses and processes using teaching, think-aloud, the provision of scaffolded support, and

(c) gradual release of responsibility of the strategies from the teacher to the students over time (Duke & Pearson, 2002; Pearson & Gallagher, 1983).

My study revealed the combination of using (a) complex texts, (b) explicit instruction of text features, (c) use of graphic organizers, and (d) comprehension monitoring through notetaking, positively supported a majority of the participants' reading comprehension. Single Case

Design data revealed the following:

1.Students' ability to determine the main idea improved during intervention phase.

2.The amount of information present in students' oral retell of a text increased during intervention phase.

3. Pre- and post-intervention assessment data revealed improved performance on post-test reading inventory scores for oral retell and ability to answer implicit and explicit comprehension questions.

Reading Comprehension. The RAND group defines reading comprehension as the process of simultaneously extracting and constructing meaning through interaction and involvement with written language (Snow, 2002). The transactional nature of reading is emphasized in this definition with a focus on the process of extracting and constructing meaning as a dialectical process, mediated by the readers' interactions with the text (e.g., scaffolds, peers, cultural tools.) Research on what effective readers do as they read indicates that across different contexts and situations, expert readers can successfully execute many strategies (e.g., underline, take notes, re-read, make inferences, monitor and then clarify their understanding, and visualize/organize what they understand through constructing mental images or mapping information on graphic organizers (McEwan, 2004; Pressley & Afflerbach, 2012). However, this is not the case for students who are approaching mastery of reading comprehension. Research

shows that students who have not mastered grade-level comprehension skills are characterized as not using many of the strategies that effective readers use when reading (Elleman et al., 2011). In what follows, I describe the multiple components of effective research-based interventions included in the current study.

Complex Text. Student achievement data reports that students graduating from high school are not college and career ready (NAEP, 2019). The resultant new standards call for an increase in text complexity in grades 2 – 12. The onset of the Common Core State Standards (CCSS; National Governors Association Center for Best Practices (NGACBP) and Council of Chief State School Officers (CCSSO) 2010) lead to a renewed focus on the types of texts used in instruction. However, with the onset of the Common Core also came new goals and standards but left the curricula and materials in the control of the local states and districts, it also determined school funding, school ratings, and teacher income based on standardized test scores.

The new standards require the use of informational text, with the intention to expose students, even in the early grades, to complex texts. The intention is for students to participate in active engagement with complex texts to support vocabulary growth (Hadley & Mendez, 2021), language (Hadley & Dickenson, 2019) and knowledge acquisition (O'Brien, & Leighton, 2015) to increase deep comprehension through intentional interaction between the reader and the text to extract or construct meaning (National Reading Panel, 2000; Santoro et al., 2016).

Students need exposure to grade-level text with complex syntax and complex background knowledge to build schema and develop increasingly strategic and automatic readers. Vaughn (2021) explains students who read less learn fewer words, so background knowledge is compromised and the challenge of learning to read effects reading in content area learning in later grades. Valencia and colleagues (2014) argue that text complexity should be considered in light of the specific task attached to reading complex text. Their perspective includes

instructional conditions, curricular demands, and assessment. They argue tasks are malleable and can be used by the teacher to make a text more or less difficult for the reader (Goldman and Lee 2014). The complexity of a text can be moderated by additional factors including a reader's interaction with the text, and reader characteristics, or by the task or activity in which the reader/text interaction occurs (Valencia, 2014).

The existing research base indicates that if we are to expose elementary students to complex text it should be done so with scaffolding and instructional support necessary to facilitate students' successful reading of complex texts.

Explicit Instruction of Informational Text Features. In the intermediate grades, students are required to read informational texts to learn more complex content. Accessing the information can be difficult due to the genre attributes associated with disciplinary content. Specifically, informational texts often have concept-dense content and higher-level vocabulary knowledge (Allington, 2002). In addition to these complexities, informational texts often contain a variety of text features (e.g., titles, diagrams, captions, bold words, charts, and tables) that supplement and present important content that the student must read in order to fully comprehend the topic (Duke, 2000; Maloch and Bomer, 2013). Explicit instruction of operational definitions associated with informational text features is critical, as the ability to identify and discriminate between informational text features is important and their role in communicating information is an essential component of strategic approaches to comprehending informational texts.

Research suggests students often ignore these essential text features (Kozdras et al., 2015; Spencer, 2003), and students who have not yet mastered comprehension skills are even less likely to attend to text features. When students use text features, they become familiar with the text's organization and access important background knowledge related to the content (Honig et al.,

2000). They are able to make better predictions, anticipate their learning, and comprehend the content being studied (Kelley & Clausen-Grace, 2010).

All informational texts are not the same. It is essential to provide exposure to a wide range of informational texts in order to develop proficiency with the genre (Dreher & Voelker, 2004). Specific informational text types provide exposure to and familiarity with discourse forms associated with specific content areas; provide opportunities to engage with visual representations such as maps, graphs, charts, and tables; and provide preparation for engagement with increasingly complex texts (Chambliss & Calfee, 1998; Moss, 2008). The ability to read different forms of informational texts (e.g., exposition, argumentation, persuasive, procedural texts, and documents) requires different skills, but all are critical for reading and comprehending across the content areas (Moss, 2008; Saul, 2006).

Graphic Organizers to Support Reading Comprehension. Students working towards grade-level mastery of reading comprehension often have difficulty identifying and ignoring extraneous information (Dexter & Hughes, 2011), identifying main ideas and supporting details (Baumann, 1984; Holmes, 1985), making inferences (Hall, 2016), and connecting new information to prior knowledge (Johnson et al., 1997; Kim et al., 2004). To support readers in understanding the relationships between related information and concepts, the visual and spatial displays provided by graphic organizers (Gajria et al., 2007; Kim et al., 2004), facilitate understanding and retention of new information by making abstract concepts more concrete and to connect new information with prior knowledge (Ausbel, 1968; Mayer, 1979).

Research on graphic organizers used as a post-reading activity suggests the approach supports middle school students' ability to provide written relational knowledge statements in content area instruction (DiCecco and Gleason, 2002), while research on middle school students' thinking processes while constructing graphic presentations of textbook content showed the

process of restating content when writing in an organizer supported students' comprehension of social studied content when writing the ideas on the graphic organizer (Scott and Dreher, 2016). Restating the text appeared to be evidence of students storing and processing the information in the working or short-term memory while they were writing it on the graphic representation.

Stagliano and Boon (2009) reported the use of the story-mapping procedure with expository text in elementary grades improved students' comprehension and subsequent research by Dexter and Hughes (2011) suggests graphic organizers support elementary students' comprehension by supporting their ability to recognize the differences between main and supporting ideas, and to synthesize content. Their study demonstrated that regardless of the graphic organizer type (e.g., cognitive mapping, semantic mapping, semantic feature analysis syntactic/semantic feature analysis) explicit instruction of a given graphic organizer positively impacts student comprehension.

In addition to investigating the efficacy of organizing strategies there is also an area of research focused on when and how the organizer is filled out, learning by viewing and learning by doing. Previous research by Barron and Schwartz (1984) conceptualized advanced organizers as "something the teacher did *for* students" (p. 279, original emphasis). In this study participants simply viewed the information provided in the graphic organizer and learned by viewing. It was thought that study participants may have viewed the information in the provided organizer as isolated pieces of information and therefore did not integrate the information with their existing knowledge structure. Building on this research, Barron and Stone (1974) developed a technique referred to as a graphic post-organizer. They postulated that student participation in the process, or learning by doing, through the development of the organizer would facilitate integration of new knowledge with their existing knowledge. These studies point to the importance of

incorporating the use of evidence-based organizer strategies that have been found effective for enhancing students' comprehension skills.

Note-Taking. The practice of note-taking is widespread in higher education (Chen, 2019; Wu, 2020), and much of the existing research focused on note-taking is focused on older students- typically high school or college (Boyle, 2010; Faber et al., 2000; Kobayashi, 2005, 2006; Rahmani and Sadeghi, 2011; Shrager and Mayer, 1989) and predominately conducted in countries where the participants' first language was something other than English (Bahrami, & Nosratzadeh, 2017; Chang and Ku, 2015; Marzuki & Wekke, 2018). Studies conducted with high school and college students suggest note-taking is effective because it helps students to recall and engage with the content (Salame & Thompson, 2020). This is because note-taking appears to not only improve student learning (van de Sande et al., 2017), but also performance (Luo et al., 2018).

Note-taking is considered a common practice for older students as an approach to test preparation, however with the increased focus on reading to learn in the intermediate grades, and the demand for an increase in complex informational text in the curriculum (NAEP, 2022) the need for quality note-taking to support comprehension in elementary grades is warranted. Studies indicate there is a high degree of correlation between whether learners incorporate reading comprehension strategies and the extent to which they comprehend reading materials (Lau, 2006; Magliano et al., 1999; Pressley, 2002; Samuelstuen & Braten, 2005). Research suggests that the active process of strategic note-taking seems to improve student learning (Prince, 2004). Notetaking supports the development of coherent outlines of informational text and serves as an active participation approach to reading informational text (Cook & Mayer, 1983). Research suggests that student achievement improves when students actively engage in the learning activity. More specifically, they perform better on student-generated materials as opposed to the

passive alternative wherein materials are created by others and provided to the student (Lee et al., 2007).

It has been suggested that student note-taking can positively impact reading comprehension including recall and retention (Kiewra et al., 1995). In a recent study, researchers found that college students' note-taking improved learning and increased understanding through active engagement in note-taking with the content (Bohay et al., 2011). When students actively listen and write down important information, it allows them to cognitively process it, which in turn allows them to better understand the information that they are learning. Pioliat and colleagues (2005) suggest this is because the process of writing note-taking supports comprehension through storage in long-term memory. This cognitive approach supports students' ability to meaningfully integrate reading material with prior knowledge during the note-taking process as students are better able to analyze information in depth and distinguish between main ideas and details.

Purpose of Intervention and Research Questions

To extend the current literature, this study examined a novel reading comprehension intervention (Informational Text Mapping Intervention) designed to increase students' reading comprehension of informational texts through explicit text feature instruction in a classroom context. The specific research aims were to determine: (a) the extent to which participation in ITMI improves fourth-grade students' oral retell scores, (b) the extent to which participation in ITMI improves fourth-grade students' main idea statement scores, and (c) the extent to which fourth-grade students who are participating in ITMI demonstrate changes in their reading comprehension as measured with pre-and post-test assessment.

Examining the successful characteristics of interventions can provide insights for establishing even more comprehensive efforts to help students who struggle with comprehension of informational texts.

This intervention combined high-quality instruction provided by the researcher, an experienced and certified reading and Exceptional Student Education (ESE) teacher, to small groups of students (e.g., students reading above-level, on-level and below grade level with various levels of comprehension ability) during the literacy block.

Reading is a complex act and reading comprehension rests on many components including motivation, fluency, and the application of strategic reading behaviors. There are wide variety of constructs and theories that guide the many models of reading comprehension and a significant amount of differing processes that can be implemented when approaching reading comprehension. Acknowledging that there are many components of reading comprehension outside of the purview of the current study (e.g., reading motivation and attention, prior knowledge, social construction of knowledge, text structure instruction), the intervention used a multi-strategy approach, focused on (a) complex informational texts, (b) explicit text feature instruction, (c) graphic organizers, and (d) note-taking. Through the combination of multiple strategies this intervention was more ecologically valid than a single-strategy intervention because it more closely approximated typical practice in a classroom where the teacher supports groups of students with a variety of abilities and needs. This approach augmented the singlestrategy approach to reading comprehension interventions typically conducted with leveled, prepackaged, basal materials. The existing research base for intervention methods supported the use of these key reading comprehension features individually and in various strategic combinations and it is the goal of this intervention framework to determine if they are effective when integrated into one reading comprehension intervention for fourth-grade students.

It was hypothesized that students' reading comprehension of informational text would increase significantly as a result of ITMI. The null hypothesis stated the intervention would have no effect on the reading comprehension of informational text for fourth-grade students. The following research questions were examined:

1. To what extent does participation in ITMI improve fourth-grade students' oral retell scores?
2. To what extent does participation in ITMI improve fourth-grade students' main idea statement scores?
3. To what extent do fourth-grade students who are participating in ITMI demonstrate changes in their reading comprehension as measured with pre-and post-test assessment?

Potential Limitations

The following factors may have limited and potentially influenced my study:

The duration of the study was 17 sessions conducted over four months. While a longerterm study, perhaps a year or more, would have been preferable, the time constraints on this study was prohibitive. Further, regarding timing, this study was limited in part due to the participating school experiencing school cancellations and delays due to severe weather.

This study employed a multiple baseline single case experimental design using an intact fourth-grade class of students, wherein the participants included only white students from middle-class backgrounds, as such, results are not generalizable to the larger population of all students. The results of this study are limited only to those students participating in this study. Pure randomization and sample selection was neither possible, nor appropriate, due to the nature of the host county's placement procedures, teachers' willingness to volunteer as a host classroom, and the inability to rearrange the students enrolled in an intact class.

Definition of Terms

Informational Text: Informational text here means text that is written to describe or explain an actual phenomenon, event, situation, or procedure where the primary purpose of the text is to convey information about the natural or social world (Duke, 2000).

Intervention: For the purpose of this study, Intervention is defined as an instructional approach designed to prevent reading difficulties, specifically, those skills related to reading comprehension including- oral retell, determining the main idea of a text, and implicit and explicit comprehension of a text.

Main Idea: For the purpose of this study, main idea is defined as a "coherent memory representation showing the logical connections" between the most important ideas of the text (i.e., the "GIST") (Wijekumar et al., 2020, p.324). There can be a main idea for a paragraph, a section of the text, or the entire text.

Oral Retell: Oral retell is a free recall task where participants are not prompted for inclusion of literal or inferred information, allowing for the retell to capture recall of a given text (i.e., literal information or shallow comprehension) *and* higher order inferential processes (i.e., deep comprehension).

Reading Comprehension: Durkin (1993) defines reading comprehension as "the essence of reading" and is "the process of simultaneously extracting and constructing meaning through interaction and involvement with written language" (RAND Reading Study Group, 2002).

Students Approaching Mastery: For the purpose of this study, students identified as approaching mastery of comprehension of informational texts are broadly defined as those students who are not successful with school literacy tasks as determined by performance on assessment and/or informal evaluation. For inclusion in this study, students could successfully

decode grade-level text, and demonstrated a need for increased support with reading comprehension of informational texts.

Contribution to the Current Literature

To date, much of the evidence related to students' informational text comprehension has focused on middle and high school grade instruction (e.g., Barth et al., 2016; Dahl et al., 2021; Kendeou & Van den Broek, 2007; Lovett et al., 2012). And researchers have not investigated the impact of explicit text feature instruction on students' literacy performance. This study contributes to the literature by employing a single-case experimental design (SCED) to collect scientifically rigorous data that is well-suited for evaluating the effects of an intervention **(**Kratochwill & Levin, 2014**).** The current study is designed to achieve the What Works Clearinghouse (WWC) rating "Meets WWC Pilot Single-Case Design Standards without Reservations," indicating the highest level of evidence for a causal relationship (IES, n.d.).

Moreover, SCED lends itself to the study of individual treatment effects and how those effects vary across participants and time. This single-case multiple-baseline across participants design affords the ability to assess the ongoing and cumulative effectiveness of an informational text feature intervention tailored specifically for students in the intermediate grades identified as approaching mastery of comprehension of informational texts.

Finally, the current study will add to the current research base on multi-component approaches to informational text interventions. Previous single- and multi-strategy interventions have been conducted on the effects of informational text structure instruction, locating information, monitoring comprehension, and use of graphic organizers. While the previous studies focused on single-strategy, and different combinations of multi-strategy approaches to intervention the current study adds to the existing research with a focus on a multi-component

intervention combining complex texts, explicit instruction of text features, use of graphic organizers, comprehension monitoring through note-taking. To date, a majority of the interventions designed to support reading comprehension have primarily focused on informational text structure instruction, however, there are no previous studies that have specifically examined the effect of explicit instruction of informational text features on reading comprehension outcomes for intermediate students, nor are there studies that have included notetaking to support reading comprehension of informational texts. To contribute to the existing literature, my study seeks to provide additional approaches to support informational text comprehension.

CHAPTER TWO: REVIEW OF THE LITERATURE

The purpose of the current study is to examine the efficacy of a multi-component informational reading comprehension intervention with a focus on explicit instruction of text features. This intervention has the potential to contribute novel data regarding the readers' use of text features to comprehend informational text and evaluating the impact the intervention. In addition to the focus on explicit instruction of informational text features this intervention places an emphasis on the inclusion of complex text, the use of graphic organizers, and note-taking strategies to support comprehension.

Across the U.S., intermediate students continue to show a need for instructional supports and interventions to improve reading comprehension of informational texts (Li et al., 2018). Prior scholarship has advocated for the use of a host of effective research-based strategies to provide both single-strategy instruction and multi-strategy instruction (e.g., Mason et al., 2009; Baker, 2011; Kinniburgh, 2012; Ritchey, 2012; McCown, 2014; Ritchey, 2017; Kelly, 2019). However, there is a dearth of research examining the explicit instruction of text feature instruction to support informational text comprehension with intermediate students. To situate this study in its larger historical context, in this chapter, I review literature on informational text, the challenges with informational text, informational text materials, and effective research-based informational text intervention components.

The existing research base for intervention methods supports the use of these key reading comprehension features individually (e.g., Edmonds et al, 2009; Gajria et al., 2007; Gersten et al., 2001; Kinniburgh & Baxter, 2012; Wanzek et al, 2010; Wijekumar et al., 2012; Wijekumar et al., 2014) and in various strategic combinations (e.g., Ciullo et al., 2015; McCown & Thomason,

2014; Ritchey et al., 2017) and it is the goal of this intervention framework to determine if they are effective when integrated into one reading comprehension intervention for intermediate students who have difficulty with informational text comprehension. The current intervention is the first to incorporate explicit text feature instruction as part of a multicomponent informational text reading comprehension intervention.

Informational Text in the Intermediate Grades

Informational text (1) exposes students to specialized vocabulary and content-specific language (Duke & Kays, 1998; Duke et al., 2003), (2) supports the growth of background knowledge and promotes reading comprehension (Hirsch, 2003; Moss & Hendershot, 2002; Yopp & Yopp, 2000, Young et al., 2007), (3) increases reading motivation (Moss, 2005; Moss & Hendershot, 2002), and (4) increases exposure to text structure and text features necessary for later use in secondary schooling and the workplace (Kambrerelis, 1998; Ogle & Blachowicz, 2002).

Students in the upper-elementary or intermediate grades encounter increased academic demands as content becomes more complex as the curriculum is driven by higher-order skills and advanced concepts (Fletcher et al., 2007). This shift in learning places increased demand on intermediate students because they must read unfamiliar content, understand increasingly abstract concepts, and process technical vocabulary (Armbruster, 1984). The aforementioned shift is a result of the twenty-first century movement towards college and career readiness, which requires the ability to read, analyze, and evaluate informational texts (Cummins, 2013; Duke, et al., 2013; National Governors Association Center for Best Practices [NGA Center] & Council of Chief State School Officers [CCSSO], 2010).

Informational Text Materials

Policy initiatives such as N*o Child Left Behind* and *Reading First,* the adoption of Common Core State Standards (CCSS; National Governors Association Center for Best Practices (NGACBP) and Council of Chief State School Officers (CCSSO) 2010), and The Next Generation Science Standards (NGSS), have emphasized the importance of informational text comprehension in the elementary grades to prepare students to be successful in college, careers, and citizenship. The new standards require the use of informational text, with the intention to expose students, even in the early grades, to complex texts. The intention was for students to participate in active engagement with complex texts to support vocabulary growth, language, and knowledge acquisition to increase deep comprehension through intentional interaction between the reader and the text to extract or construct meaning (National Reading Panel, 2000; Santoro et al., 2016).

Federal policies, new standards, and the push for increased complexity has not produced the desired results. According to the 2022 National Assessment of Education Progress (NAEP) report the national average scores for reading comprehension nearly two thirds of American fourth graders can only read at or below the basic level (37% below basic and 29% at basic), meaning they exhibit only partial mastery of reading skills. Students who fall at or below the basic level are unable to integrate and interpret texts and apply their understanding of the text to draw conclusions and make evaluations and cannot make complex inferences and construct and support their inferential understanding of the text, nor can they apply their understanding of a text to make and support a judgment (NCES, 2022). This figure has decreased slightly since 1992, when the percentage at or below basic was 71%, indicating that the recent federal initiatives to improve reading skills have met with limited success.

Parallel to these changes in curricular demands, publishers have altered the amount of informational text included in core curriculum materials written specifically for elementary grade students (Cummins & Stallmeyer-Gerard 2011; Duke, et al., 2011; Moss, 2008). This increase in content reading is important because the basal readers are used in 95% of American classrooms (Moss & Newton, 2002); and, in many classrooms, basals are the primary source of exposure to the printed word.

Decades ago, Flood and Lapp (1986) looked across eight leading basal programs used across the US, examining pre-primer through sixth grade readers for amount of narrative, poetry, exposition, biography, and hybrid content. They discovered that despite differences in the amount, narrative format was most prevalent at all grade levels, expository text peaked at fourth grade, but still only accounted for 21% of the text.

Building on Flood and Lapp's (1986, 1987) earlier examination of basal reader content, Moss and Newton (2002) looked exclusively at children's informational trade books to examine the quantity found in second, fourth, and sixth grade student books for six popular reading programs used in the US. They examined the number of selections representing each genre and the number of pages devoted to each genre. The most frequently found selection at all levels were fiction 45%, poetry 29%, and informational literature, 18%. The mean percentage of selections devoted to informational literature ranged from 16% to 20% across grade levels. The largest number of pages was devoted to fiction 66%, followed by informational literature 20%, biography 6%, poetry 5%, and play 3%. The mean percentage of pages devoted to informational literature ranged from 18% to 24% across grade levels. Overall, 20% of the pages at all grade levels was devoted to informational text.

More recently, Moss (2008) compared the text genres represented in two California adopted basal readers in grades one through six and found that 40% of the pages/selections in

both series were devoted to nonfiction texts and that 50% of the nonfiction texts selections were expository and 33% were literary nonfiction. Despite the call for an increase in informational text in core curriculum, Moss (2008) indicates that basal readers expose students to more nonfiction text than in the past, but that the access to informational text is still less than what was recommended by the 2009 NAEP. In addition, the informational text in basal and curricular programs is limited to exposition.

The continued absence of necessary informational text in the intermediate grades is concerning given that these types of texts provide students with exposure to a variety of disciplinary content. Informational text consists of several different structures and contains a variety of text features making it more complicated to read than narrative text (Williams, 2005). Informational text typically contains low frequency academic vocabulary that is pertinent to the meaning of the text (Lee & Spratley, 2010). These words can carry multiple meanings different from that of the common, everyday language (Ciullo et al., 2016). Furthermore, the density of ideas, amount of ambiguous information, and increased use of details that are unrelated to the main idea can make some forms of informational text more complicated for reading (Lee & Spratley, 2010). In light of this, effective and appropriate instruction and interventions are necessary to meet the needs of students approaching mastery of informational text comprehension in the intermediate grades.

In addition, students need to gain familiarity with informational texts because 50 - 80% of reading passages on standardized tests are informational (Caulkins et al., 1998; Daniels, 2002). NAEP results show lower percentages of fourth- and eighth-grade students performing at or above proficient in reading in 2019 compared to 2017, with only 35% scoring at or above proficient. Given the persistent problem of reading failure in the United States there is a clear

need for publishers to devote more attention to complex informational text across the curriculum and support intermediate students reading comprehension.

Informational Text Instruction and Strategies

In addition to exposure to informational texts, establishing effective instructional approaches for informational text is vital because informational formats are especially difficult for students who have not yet mastered informational text comprehension (Saenz & Fuchs, 2002). This finding is especially concerning given the National Reading Panel's (2000) call for establishing methods for effective instruction in strategic informational reading comprehension (RAND Reading Study Group, 2000).

Evidence on effective informational text instruction supports engagement with increasingly complex texts (Chambliss & Calfee, 1998; Moss, 2008), the use of explicit strategy instruction including cognitive strategy instruction (e.g., awareness of prior knowledge, summarizing information) (Mason et al., 2006), the use of graphic organizers (Gajria et al., 2007), hands-on active participation, (Nietfeld et al., 2015), and note-taking (Mariage et al., 2020). Given the persistent problem of reading failure in the United States there is a clear need for teachers to provide research-based strategies across the curriculum to increase intermediate students' success with comprehension of informational texts across content areas.

Challenges of Comprehending Informational Text

Improving reading comprehension for intermediate students has been a difficult goal. Results for fourth grade reading comprehension on the 2022 National Assessment of Educational Progress (NAEP) found nearly two thirds of American fourth graders can only read at or below the basic level (37% below basic and 29% at basic), meaning they exhibit only partial mastery of reading skills. The ability to read and comprehend text is critical to achieving academic success

and later, success in the workplace. Reading comprehension is frequently an area of difficulty for intermediate students (Block & Pressley, 2002; Gersten et al., 2001; Mastropieri & Scruggs, 1997; Pearson & Hamm, 2005).

Intermediate students who score at or below proficient on national assessment are unable to integrate and interpret texts and apply their understanding of the text to draw conclusions, make evaluations, cannot make complex inferences and construct and support their inferential understanding of the text, nor can they apply their understanding of a text to make and support a judgment (NCES, 2022). They can have difficulty accessing text because of decoding issues and/or comprehension problems (Swanson & Alexander, 1997), and can also struggle to connect new information to prior knowledge, identify and ignore extraneous information, identify main ideas and supporting details, and make inferences (Kim, et al., 2004). In some cases, intermediate students may not apply the strategies they have already learned (Swanson, Hoskyn, & Lee, 1999). In light of the wide range of issues students encounter when reading informational texts, they require significant support.

Multicomponent Informational Text Reading Interventions

Comprehension strategies are procedures that allow students to become aware of their level of understanding as they read (RAND Reading Study Group, 2002). Several research syntheses (e.g., Gajria et al., 2007; Scamacca et al., 2007; Vaughn & Klinger, 2004) analyzed the evidence to inform effective comprehension strategy instruction. Research supports the implementation of a set of strategies that complement and build on each other in a scaffolded, sequenced manner. Swanson and colleagues (2011) recommend a sequence of previewing, generating questions, identifying the main idea (gist) of a paragraph or section of the text, and summarizing. The first wave of research in reading comprehension intervention provided validation of particular strategies. This research provides ample evidence of the effectiveness of

comprehension monitoring (Paris et al., 1984), strategic location of information (Pressley et al., 1989) including location of the main idea (Dreher & Gambrell, 1985), and explicit instruction of text structures (Englert & Mariage, 1991). As a result, reading comprehension research has progressed from evaluating individually taught single-strategy approaches to evaluating a more multifaceted approach to include multiple strategies. The current study contributes to the existing literature on multi-component interventions by incorporating complex text, explicit instruction of informational text features, graphic organizers and note-taking to support comprehension.

Complex Text

The conceptualization of text complexity varies, with the traditional text readability formulas focused on syntactic complexity (e.g. Fry Readability Graph; Fry 1968) or semantic difficulty (e.g., Dale-Chall readability formula; Chall and Dale, 1995), and subsequent attention to ideas rooted in the Vygotskian notion of the Zone of Proximal Development (ZPD; 1978) such as the match between the text and skills of the reader (e.g. Betts, 1946; Gray, 1915). The most widely used approach to matching readers with texts at their independent reading level comes from Betts' (1946) formula for selecting texts at three different levels: independent, instructional, and frustration. The independent reading level is considered to be a text that is accurately read at a rate of 95% or higher with a comprehension level of 90-100% as measured by questions. A text read accurately at a rate of 90-94% and a comprehension rate of 75-89% is considered instructional level, and texts read with 89% or less accuracy and less than 75% comprehension are considered to be frustration level. Typically, teachers use instructional level texts because they allow for enough challenges to focus attention on problem-solving skills at a level where decoding is not an issue and meaning is not lost. While it has become a common practice to strictly adhere to matching readers with leveled texts, concerns have persisted for decades in the extant literature (Chall & Conard, 1991; Killgallon, 1942; O'Connor et al., 2002; Weber, 1968).

These levels have been challenged, for example, Powell (1970) recommended 85% as a better predictor of student learning, which equates to students reading harder texts and Johnston (1984) purports there is little research supporting the leveled text placement practice and of the research focused on the topic, is unrealistic because it promoted the narrow idea that students can only read materials at their instructional level (Fisher et al., 2012).

Despite this history of matching readers to levels, students can experience success with complex texts with the provisions of instructional supports geared toward student needs (e.g., language, knowledge, skills, and metacognition). If educators can scaffold student support with increasingly complex text, it is not text difficulty that is the real issue, it is the instruction (Fisher et al., 2012).

In 2010 the widely adopted Common Core State Standards (CCSS) Initiative called for raising the level of text complexity in textbooks and reading materials used by students across all grade levels in the United States. The initiative brought renewed attention to text complexity, but rather than thinking about complexity in terms of difficulty, the standards instead took into account dimensions of text complexity to include qualitative and quantitative elements as well as the relationship between readers, texts, and tasks. Qualitative dimensions include the aspects of text complexity best measured or only measurable by an attentive human reader, such as levels of meaning or purpose; structure; language conventionality and clarity; and knowledge demands (NGA/CCSO, 2010b). Quantitative dimensions factors include the aspects such as word length or frequency, sentence length, and text cohesion, that are difficult for a human reader to evaluate efficiently (e.g., long texts now measured by computer software). The third dimension takes into account reader specific variables including motivation, knowledge, and experience and task elements including the purpose and complexity of the task assigned and the questions posed.

Research on text complexity is split between results that indicate elementary students' decoding accuracy, fluency rate, and comprehension decline when reading more complex texts (e.g., Amendum et al., 2016; Morris et al., 2013), while others suggest that student achievement can accelerate with increased text complexity during reading instruction (Shanahan, 2011). Still, others suggest students who struggle with comprehension, are also the students who spend less time reading. This population of students need exposure to grade-level text with complex syntax and complex background knowledge to backfill what students may be missing as a way to combat the Matthew Effect. Vaughn (2021) explains, students who read less learn fewer words, so background knowledge is compromised and the challenge of learning to read affects reading in content area learning in later grades. Valencia and colleagues (2014) argue that text complexity should be considered in relation to the specific task attached to reading complex text. Their perspective includes instructional conditions, curricular demands, and assessment. They argue tasks are malleable and can be used by the teacher to make a text more or less difficult for the reader (Goldman and Lee 2014).

The corpus of research is divided regarding how we level texts and methods for determining the complexity when considering a stand-alone text. However, complexity of a text can be moderated by additional factors including a reader's interaction with the text, and reader characteristics, or by the task or activity in which the reader/text interaction occurs (Valencia, 2014). In a synthesis of text difficulty and elementary students' fluency and comprehension, Amendum and colleagues (2017) found three intervention studies (Morgan et al. 2000; O'Connor et al. 2002, 2010) that demonstrated no significant differences in reading comprehension when students read texts that were more difficult than others. The studies reported students were receiving fluency support, whether from peers (Morgan et al. 2000) or in a supportive small-group setting from their teacher (O'Connor et al. 2002, 2010). These findings contribute to

existing work (Stahl and Heubach, 2005) focused on the benefits of reading difficult texts with others within supportive instructional contexts.

The current intervention aims to add to the growing body of literature that recognizes the need for an increase in exposure to literary works rich in content and vocabulary rather than leveled basal readers. Likewise, this intervention looks beyond the assumption of a fixed endpoint or data point typically considered essential to the quantification of student levels required for assessment (Brown & French, 1979; Campione et al., 1984). Additionally, the existing research base indicates that if we are to expose elementary students to complex text it should be done so with scaffolding and instructional support necessary to facilitate students' successful reading of complex texts. The present study incorporates active engagement with complex text through carefully selected task components and teacher scaffolding to provide varying levels of support where it is needed as a way to support reading comprehension.

Explicit Instruction of Informational Text Features

In the intermediate grades, students are required to read informational texts to learn more complex content. Accessing the information can be difficult due to the genre attributes associated with disciplinary content. Specifically, information texts often have concept-dense content and higher-level vocabulary knowledge (Allington, 2002). In addition to these complexities, informational texts often contain a variety of text features (e.g., titles, diagrams, captions, bold words, tables) that supplement and present important content that the student must read in order to fully comprehend the topic (Duke, 2000; Maloch and Boner, 2013a, b). Explicit instruction of operational definitions associated with informational text features is critical, as the ability to identify and discriminate between features is important and their role in communicating information is an essential component of ITMI.

Classroom observational research suggests students often ignore these essential text features (Kozdras, et al., 2015; Spencer, 2003), because they do not understand the role of these features in comprehending text. When students use text features, they become familiar with the text's organization and access important background knowledge related to the content (Honig, Diamond, & Gutlohn, 2000). They are able to make better predictions, anticipate their learning, and comprehend the content being studied (Kelley & Clausen-Grace, 2010).

Although research conducted between 2000- 2020 includes a significant amount of research on a variety of aspects of informational text, research on the impact of explicit instruction of text feature awareness and discrimination is not present in the corpus of studies addressing informational text and intermediate readers. The peer-reviewed articles on the topic of text feature instruction are focused on emergent readers and are written for practitioners outlining how to teach text features when reading informational texts.

Prior to the 1990s research focused on word and sentence level features (e.g., explicit cohesive ties, conjunctive signals, sentence length and/or word difficulty) (Jonassen, 1985; Meyer, 1981) and did not examine the types of text features that supplement the printed word.

All informational texts are not the same. It is essential to provide exposure to a wide range of informational texts in order to develop proficiency with the genre (Dreher & Voelker, 2004). Specific informational text types provide exposure to and familiarity with discourse forms associated with specific content areas; they provide opportunities to engage with visual representations such as maps, graphs, charts, and tables; and provide preparation for engagement with increasingly complex texts (Chambliss & Calfee, 1998; Moss, 2008). The ability to read different forms of informational texts (e.g., exposition, argumentation, persuasive, procedural texts, and documents) require different skills, but all are critical for reading and comprehending across the content areas (Moss, 2008; Saul, 2006).

In my study, I have integrated the explicit instruction of informational text features into each session. Though picture walks are commonplace in narrative text practices, this strategy is rarely used with informational text. Borrowing from this previewing strategy, during ITMI students will preview the text, identify all informational text features within the given text, and create a text feature key. Text features will be identified, defined, and labeled within the text. Discussions including their uses, and main function within a given text will also be thoroughly reviewed.

Graphic Organizers to Support Reading Comprehension

Explicit instruction in text features includes the act of locating and naming features, guiding students through features across the text (Kozdras, et al., 2015), and discussing the authorial purpose of such features. Seminal research by Meyer et al., (1980) found that readers who are unaware of text structure do not approach text with any plan of action. Therefore, these readers do not retrieve information in an organized way. In contrast, proficient readers tend to chunk information resulting in organized and accurate retellings. Anderson and Armbruster (1984) identified six major structures for organizing informational text: (1) description (of characteristics, traits, properties or functions), (2) temporal sequence events, (3) explanation (of concepts or terminology), (4) definition-example), (5) compare-contrast, and (6) problemsolution-effect. It is critical for teachers to explicitly teach readers to recognize the various text structures, not as an act of memorization, but to understand the role that these structures are used to communicate information. Understanding the macrostructure of a text (Hall et al., 2005; Williams et al., 2005) and the microstructures gives the reader deeper access to the layers of meaning in a text.

Readers' awareness of text structures can support the process of mapping, anticipating, locating, and processing content—processes that lead to higher order thinking. Often, the

informational texts that students encounter are not explicitly structured and can include a mix of structures, making it difficult for students to comprehend. One strategy for approaching multistructured informational texts is to impose a structure on portions of the text to help students understand the relationship between and across ideas to support deeper content knowledge (Hall et al., 2007). As students become aware of text structures and can identify them, graphic organizers can be used to help students comprehend and recall texts (Baker et al., 2011; Ciullo et al., 2015). Graphic organizers allow students to see the big picture and display textual relationships and provide readers with a way to "map out" the text in a meaningful way so that student can better understand both the topical and structural aspects of the text while visually representing the relationship across the content (Gajria et al., 2007).

Intermediate students approaching mastery of informational texts often have difficulty identifying and ignoring extraneous information (Dexter & Hughes, 2011), identifying main ideas and supporting details (Baumann, 1984; Holmes, 1985), making inferences (Hall, 2016), and connecting new information to prior knowledge (Johnson et al., 1997; Kim et al., 2004). To support readers in understanding the relationships between related information and concepts, the visual and spatial displays provided by graphic organizers (Gajria et al., 2007; Kim et al., 2004), facilitate understanding and retention of new information by making abstract concepts more concrete and to connect new information with prior knowledge (Ausbel, 1968; Mayer, 1979).

DiCecco and Gleason (2002) studied the effect of graphic organizers on content area learning of middle school students with learning disabilities (LD). In their investigation graphic organizers were used as a post reading activity, and students' relational knowledge statements in written essays were used as a comprehension measure. Twenty-four students with LD from Grades 6 to 8 were randomly assigned to a graphic organizer (GO) or no graphic organizer (NGO) group. The GO group received intensive instruction using teacher-constructed organizers

that explicitly represented the relationship between concepts in a social studies unit; the NGO group received identical instruction without organizers. The results indicated that the two groups did not differ in factual content knowledge as assessed by multiple choice tests. However, on relational content knowledge, the GO group provided significantly more relational knowledge statements on two written essays.

In a study examining student thinking processes while constructing graphic presentations of textbook content, Scott and Dreher (2016) randomly selected students from four middle schools and placed them in one of two settings (a) explicit instruction in identifying rhetorical patterns used to organize content in their social studies textbook and in constructing graphic representations that reflected the rhetorical content in that content, and (b) routine social studies instruction during which teachers made limited use of graphic representations.

Two thinking processes accounted for half of the verbalizations students produced while constructing graphic representations: restating and writing and graphic representation construction. The process of restating when writing appeared to provide support as the students constructed graphic representations. Scott and Dreher defined restating and writing as "the student restating or alluding to (using pronouns) ideas in text before, during or after writing the idea/s on the graphic representation" (p. 296). The process of restating when writing appeared to provide support as the students constructed graphic representations. Restating the test appeared to be evidence of students storing and processing the information in the working or short-term memory while they were writing it on the graphic representation. The students in the treatment condition produced 61 fewer restating and writing verbalizations. One explanation for this difference could be that students who received the treatment may have more easily recognized where a particular idea of detail would go, making it easier to retain the idea or detail without verbalizing it. The responses made by students who received the rhetorical pattern/graphic

representation intervention appear to indicate that knowing the rhetorical pattern used to organize the text-enabled them to construct an accurate representation of the content. The intervention appeared to be a tool that promoted deeper engagement with and comprehension of the content in the text.

Conversely, learner-generated graphic organizers are suggested to be of benefit because they promote generative learning (V.C. Hall, et al., 1997; Katamaya & Robinson, 2000) more accurately reflect the learner's understanding (McCagg & Dansereau, 2991), promote deeper processing during construction (Alvermann, 1981), allow teacher to assess and correct a learner's misconception, and promote better connections with prior knowledge (Kiewra et al., 1988). Graphic organizers constitute a valuable way to enhance comprehension because they can show the main information of a text at a glance and simultaneously clarify relations between ideas (Jones et al., 1988). In addition, graphic organizers can reveal the inferential relations among text elements (Graesser et al., 1994) and facilitate students' skill in quickly locating specific information (Robinson & Skinner, 1996).

Student construction of graphic representations were also studied by Stagliano and Boon (2009). They investigated the use of a story-mapping procedure with expository text in the elementary grades. Understandably, all previous published studies on story-mapping used narrative text. But these authors felt that the story-mapping procedures could be adapted to informational text. Their intervention borrowed from the mapping process for narrative text and applied it to informational text to include explicit instruction of elements and how to answer comprehension questions in a one-on-one setting. Three 4th grade students with learning disabilities used a graphic organizer to identify and record key information from a text. The map consisted of five main areas about the text. These areas included (1) time/place, (2) who/what, (3) problem/goal (4) solution/ending, and (5) main idea. The participants were individually

instructed on common elements of a text and taught to complete a map while reading expository text passages. After completing the map, the participants answered five comprehension questions.

Results of the study indicate that the use of the mapping procedure improved all three participants' percentage of correct comprehension questions. Participants' performance on reading comprehension questions during baseline was low. Mean percentages for correct answers was 6.67%, 36.67%, and 11.43%. During the intervention phase scores improve immensely with mean percentages for correct answers rising to 92%, 86.67%, and 86.67%. Maintenance probes suggest the effects of the intervention were sustained even after two weeks with no story mapping instruction. This study points to the importance of introducing elementary-aged students to different types of informational text structures and the use of evidence-based organizer strategies that have been found effective for enhancing students' comprehension skills.

In addition to investigating the efficacy of organizing strategies there is also an area of research focused on when and how the organizer is filled out. A contested vein of graphic organizer research is the learning by viewing versus learning by doing. Previous research by Barron and Schwartz (1984) conceptualized advanced organizers as "something the teacher did *for* students" (p. 279, original emphasis). In this study participants simply viewed the information provided in the graphic organizer and learned by viewing. It was thought that study participants may have viewed the information in the provided organizer as isolated pieces of information and therefore did not integrate the information with their existing knowledge structure.

Barron and Stone (1974) developed a technique referred to as a graphic post-organizer. They postulated that student participation in the process of developing the post-organizer would facilitate integration of new knowledge with their existing knowledge. The rationale for author

provided graphic organizers is based on cognitive load theory and the rationale for learner generated graphic organizers is based on activity theory. Research on author-provided graphic organizers suggests they are beneficial because they more accurately and coherently represent expert knowledge (Rewey, Dansereau, Skaggs, Hall, & Pitre, 1989; Robinson & Kiewra, 1995) and focus learners on the integrated concepts rather than the disconnected facts (R.H. Hall, Hall, & Saling, 1999; O'Donnell et al., 2002).

The utility of a graphic organizer intervention on multiple constructs is considered important for high-quality research (Gersten et al., 2000). There is still a need to measure the effectiveness of graphic organizers for intermediate students on multiple constructs rather than simply the ability to answer fact-level questions about a topic. Currently, there is no research investigating the impact of intermediate students utilizing graphic organizers to demonstrate competency of reading comprehension on measures of oral retell. ITMI utilizes and contributes to the previous graphic organizer research by (a) investigating the impact of utilizing graphic organizers on a measure of oral retell of informational text, (b) the incorporation of a unique combination of both semantic and cognitive mapping, and (c) by merging author-provided and learner-generated graphic organizers through the utilization of the actual text as the organizer.

Building on previous studies, Dexter and Hughes (2011) conducted a meta-analysis of graphic organizer studies and found large overall standardized effects of graphic organizers on the posttest performance (e.g., multiple-choice comprehension, vocabulary, written recall) of students with learning disabilities, and large posttest effects for all subject areas except mathematics (English, writing/reading, science and social studies). Implications for practice from this study demonstrated that regardless of the graphic organizer type (e.g., cognitive mapping, semantic mapping, semantic feature analysis syntactic/semantic feature analysis) explicit

instruction of graphic organizers positively impacts the intervention's effectiveness. Graphic organizers support students approaching mastery of informational text comprehension by helping them recognize differences between main and supporting ideas and help to synthesize the content being learned (Dexter & Hughes, 2011).

Note-Taking

Similar to student-generated graphic organizers, another approach to improving informational text comprehension is writing or acts of composition. Research suggests that writing about information enhances comprehension or causes new learning to occur (Klein, 1999; Newell, 2007).

Klein (1999) argued that writing may facilitate learning in the following ways: 1) writing fosters explicitness and structured thinking through semantic and syntactic choices, 2) it creates a permanent product that can be reviewed and transformed when contradictions arise, 3) it encourages authors to construct relationships among ideas, and 4) it may help writers to generate and revise goals for the audience based on new content or ideas. Additionally, it has been suggested that the cognitive processes or metacognitive aspects of note-taking allow students to improve their learning through the active engagement of thinking about their thinking assisting in the ability to monitor, evaluate, and apply strategies to build conceptual frameworks, elaborate ideas, and synthesize information (Bangert-Drowns et al., 2004; Hebert et al., 2014).

The practice of note-taking is widespread in higher education (Chen, 2019; Wu, 2020), and much of the existing research focused on note-taking is focused on older students- typically high school or college (Boyle, 2010; Faber et al., 2000; Kobayashi, 2005, 2006; Rahmani and Sadeghi, 2011; Shrager and Mayer, 1989) and predominately conducted in countries where the participants' first language was something other than English (Bahrami, & Nosratzadeh, 2017; Chang and Ku, 2015; Marzuki & Wekke, 2018). Studies conducted with high school and college

students suggest note-taking is effective because it helps students to recall and engage with the content (Salame & Thompson, 2020). This is because note-taking appears to not only improve student learning (van de Sande, et al., 2017), but also performance (Luo et al., 2018).

Note-taking is considered a common practice for older students as an approach to test preparation, however with the increased focus on reading to learn in the intermediate grades, and the demand for an increase in complex informational text in the curriculum (NAEP, 2019) the need for quality note-taking to support comprehension in elementary grades is warranted. Studies indicate there is a high degree of correlation between whether learners incorporate reading comprehension strategies and the extent to which they comprehend reading materials (Lau, 2006; Magliano et al., 1999; Pressley, 2002; Samuelstuen & Braten, 2005). Research suggests that the active process of strategic note-taking seems to improve student learning (Prince, 2004). Notetaking supports the development of coherent outlines of informational text and serves as an active participation approach to reading informational text (Cook & Mayer, 1983). Research suggests that student achievement improves when students actively engage in the learning activity. More specifically, they perform better on student-generated materials as opposed to the passive alternative wherein materials are created by others and provided to the student (Lee et al., 2007).

It has been suggested that student note-taking can positively impact reading comprehension including recall and retention (Kiewra, Benton, Kim, Risch, & Christensen, 1995). In a recent study, researchers found that college students' note-taking improved learning and increased understanding through active engagement in note-taking with the content (Bohay et al., 2011). When students actively listen and write down important information, it allows them to cognitively process it, which in turn allows them to better understand the information that they are learning. Pioliat and colleagues (2005) suggest this is because the process of writing

notetaking supports comprehension through storage in long-term memory. This cognitive approach supports students' ability to meaningfully integrate reading material with prior knowledge during the note-taking process as students are better able to analyze information in depth and distinguish between main ideas and details.

However, not all note-taking practices are effective, and the extent to which the information students record is accurate and complete can impact the level of comprehension gleaned from the process. If students are poor note-takers they do not use critical thinking skills to record information in a format personal to their understanding of the text (different from the original text), making it less likely to achieve the maximum benefit (Faber et al., 2000; Piolat et al., 2005). This barrier to deep comprehension makes teacher modeling of the note-taking process critical to support students' ability to develop their own effective note-taking skills (Kiewra, 1989). Research shows that copying notes verbatim from a text impedes deeper comprehension, as such, teacher modeling of effective note-taking strategies necessary to demonstrate how to summarize or conceptually map information and rewrite it in their own words as a way to incorporate prior knowledge in the process (Kiewra, 1985).

There have been few studies on the impact note-taking has on reading comprehension outcomes for younger students. Previous systematic reviews have not identified studies that have examined the effects of note-taking on the informational text comprehension of fourth-grade students or younger (see Graham & Hebert, 2010, 2011).

Extending the literature on the effectiveness of note-taking for younger students Hebert and Colleagues (2014) conducted a study spanning 4 days to investigate whether note-taking or extended writing improved the reading comprehension of fourth-grade writers. 209 students from 13 fourth-grade classrooms across three schools from a rural and suburban district were randomly placed in one of three treatment conditions: (a) reading and studying with no writing (n

=69), (b) note-taking (n = 70), and extended writing (n = 70). The findings of this study provide partial support for the theory that writing about text improves reading comprehension for fourthgrade students. A significant difference was found between the writing treatment groups and the control group. The effect size was small to moderate (ES = 0.34), which suggests a very slight increase in the number of reading comprehension questions students answered correctly. Students in the treatment groups scored an average of 3.8% higher than students in the control group, or half a point higher on a 15-point multiple choice test. Findings suggest that writing may have been more effective in improving the scores of some students, but not others. Therefore, this finding is limited and interpreted cautiously.

A subsequent study conducted by Chang and Ku (2015) examined the effects of a five week note-taking and reading comprehension performance of 349 middle-class fourth-grade students in two elementary schools in Taiwan and determined that teaching students the notetaking strategy significantly improved their performance in comprehension. Students were taught specific note-taking strategies including highlighting the main idea, reducing the quantity of information recorded, identifying keywords, organizing information with a visual representation, and awareness of the text structure. The aim of the note-taking strategy was to reduce verbatim copying and support students working towards mastery of determining what content in a passage is most important and transform it into a concise statement without changing the meaning of a text to form a cohesive summary of the text. Analysis revealed a significant main effect for the treatment group as measured by post-intervention scores on a researcher-designed reading comprehension assessment, F92, 333) = 9.23, $p < .05$, partial $n^2 = .053$. The note-taking treatment group (M = 12.31, *SD* = 2.59) scored higher than those in the free note-taking without instruction group (M = 10.81, *SD* = 2.67) and the free-recall writing group (M = 11.29, *SD* =

2.77). These results suggest that note-taking instruction has a positive impact on students' reading comprehension.

An important component to note-taking is the students' ability to identify important information within a text including the main idea and details. The constant increase of information requires development of effective information-seeking strategies (Dreher, 1993), yet content analyses and experimental research continue to demonstrate a lack of proficiency on a most information seeking tasks (Guthrie, 1988; Guthrie et al., 1991; Symons & Pressley, 1993). It was theorized that this lack of proficiency is a result of a mismatch between school and workplace literacy tasks. School tasks primarily focused on reading comprehension rather than reading to find information (Mikulecky, 1982).

Conversely, studies aimed at making students more strategic in their approach to seeking information have demonstrated an ability for students to improve text search skills. Kobasigawa and colleagues, have shown that students in elementary and middle school can improve their search for information by being cued to skim text (Kobasigawa et al., 1988; Kobasigawa et al, 1980), use headings (Kobasigawa, et al., 1988), and using text features including the table of contents (Kobasigawa, 1983).

More recent research conducted by Symons and colleagues (2001) found that intermediate students benefited from direct explanation and guided practice of a strategic approach to locating information particularly when monitoring was incorporated into the instruction. Participants were taught to be strategic through instructor modeling. Participants were also taught to monitor their success while searching for information in text. In the first study, 180 children were randomly assigned to receive strategy instruction with monitoring, strategy instruction only, or no instruction. A search performance task was conducted to determine participants ability to locate information for three questions within 5 minutes. Search

accuracy was measured as the number of correct answers located, with partial scores given for partially correct answers. Grade three children who were taught the strategy without monitoring instruction were more successful than control children, whereas grade 4 and grade 5 students benefited from instruction only when they were also encouraged to monitor their performance. In the second study, grade 3 and grade 4 students transfer the strategy to an unfamiliar informational book. There was a significant main effect for strategy conditions on accuracy of information provided by participants. Students in the treatment condition found more correct answers to questions than the control group indicating that children benefited from direct explanation and guided practice of a strategic approach to locating information, particularly when success monitoring was incorporated into the instruction.

Mason and colleagues (2006) used explicit instruction followed by a group discussion to develop main ideas, summaries, and written outline notes. The aim was to help students in selecting important details based on text with "low achieving" fourth-grade students with and without disabilities. They found students demonstrated improvement in reading comprehension by producing more correct text main ideas in oral retelling, outlining, and written retelling. Gains in the number of information units orally recalled from the text reflect an increased memory for the text.

ITMI extends the current literature on the effectiveness of note-taking in the English language for younger students in the U.S. and contributes to this body of work through the implementation of student note-taking within the graphic organizer during reading. This is accomplished first, through interventionist modeling of the note-taking strategy with the guided release of responsibility to students as they become more skilled at identifying main ideas, supporting details, and key information to support comprehension and oral retelling performance. Additionally, ITMI makes use of effective information seeking strategies through the

incorporation of student created note-takings within the graphic organizer/text during and after reading. This is accomplished first, through modeling of the note-taking strategy with guided release of responsibility to participants as they become more skilled at identifying key information and marking the text in locations where they find important information. IMTI also incorporates student discussion to locate and confirm the main idea of the text to support comprehension and oral retelling performance.

Summary

The aforementioned body of research suggests students in the United States are not where they need to be in reading. Much of the literature on reading comprehension at the elementary level focuses on narrative texts and what little research that has been conducted on informational text is focused on the early grades, resulting in a significant gap in the literature related to informational text comprehension in the intermediate grades. Further, the research argues certain strategy approaches to informational text are effective in supporting intermediate students' mastery of reading comprehension, but these studies do not provide evidence for instruction dedicated to the explicit instruction of informational text features to improve intermediate students' comprehension of informational texts. My review reveals that although many effective multi-component strategy interventions have been examined, there remains work to be done within this body of research. First, previous research has not agreed on an effective combination of research-based strategy approaches to informational text interventions. Further, while there is a significant amount of research on narrative text comprehension in elementary grades, there is very little on informational text despite the need for an increased focus on the genre. Finally, there are no studies that have examined the effect of explicit instruction on informational text comprehension. In chapter three, I describe how I addressed these problems in this research and the methods by which I undertook the current study.

CHAPTER THREE: METHOD

The purpose of this study was to examine a novel reading comprehension intervention in a classroom context. this study examined a novel reading comprehension intervention (Informational Text Mapping Intervention) designed to increase students' reading comprehension of informational texts through explicit text feature instruction in a classroom context. The specific research aims were to determine: (a) the extent to which participation in ITMI improves fourth-grade students' oral retell scores, (b) the extent to which participation in ITMI improves fourth-grade students' main idea statement scores, and (c) the extent to which fourth-grade students who are participating in ITMI demonstrate changes in their reading comprehension as measured with pre-and posttest assessment.

Research Questions

It was hypothesized that students' oral retelling of informational text and main idea statements would increase significantly as a result of ITMI. The null hypothesis stated that the intervention will have no effect on the main idea and oral retell scores. The following research questions were examined:

1. To what extent does participation in ITMI improve fourth-grade students' oral retell scores?
2. To what extent does participation in ITMI improve fourth-grade students' main idea statement scores?
3. To what extent do fourth-grade students who are participating in ITMI demonstrate changes in their reading comprehension as measured with pre-and posttest assessment?

Research Design

This intervention combined high-quality instruction provided by the researcher, an experienced and certified reading and Exceptional Student Education (ESE) teacher, to small groups of students in one classroom (e.g., students reading above-level, on-level and below grade level with various levels of comprehension ability) during the literacy block.

Role of Reading Comprehension

In the current study my epistemological approach to reading comprehension as it pertains to the participants, materials, and measurement of reading comprehension plays a significant role in how reading comprehension is operationally defined. In this section, I contextualize two components of reading comprehension, (e.g., multimodality and comprehension as process/product) to explain design choices.

First, considering new digital technologies that are altering the nature of literacy and how it is taught and measured, literacy education is being re-conceptualized (Capello, Felini, & Hobbs, 2011; Hung, Chiu & Yeh, 2013). New literacies merge multiple forms of traditional and digital media termed multimodal media (MMM) to develop critical reading, writing/composing, and thinking skills needed to prepare readers to participate in the world beyond the classroom. Digital communication technology skills are now expected in the workplace and necessitate formal academic instruction in how to read, interpret, analyze, and produce multimodal text (Edwards-Groves, C., 2012; Hobbs, 2011). It is these newer approaches to literacy and reading comprehension that represent knowledge as art or transmediation and invites non-academic strengths and embodiment into the academic reading comprehension process (Kress, Van Leeuwen, 2006). Although I recognize this shift in literacy practices, the current intervention was built around an analog format, which is the predominant mode for teaching reading

comprehension. As such MMM approaches to reading are not included in the current study, however, future iterations of ITMI could potentially be altered to include this approach.

Second, the nature of ITMI incorporates steps during the reading process that are different when comparing baseline to intervention. During baseline, participants read word-by-word with a measure that required participants to demonstrate their ability to memorize what was read to provide the main idea and oral retell statements. During intervention, the process included additional steps to bring attention to informational text features, discussion about those features, and the information they provide. Both processes involve cognitive skills (e.g., reasoning) which could impact measurement outcomes. The current intervention places importance on comprehension as the product in that the text map becomes a record of thinking created by the reader and the collective efforts of the small groups, resulting in different products and perspectives on the same text, and the potential to result in different results on researcher designed measurements of reading comprehension

Single-Case Experimental Design (SCED)

In the current study a single case, multiple baseline and staggered intervention start across participants (Byun et al., 2017) was employed. This study aimed to determine if ITMI is effective in improving reading comprehension on measures of oral retell and main idea generation as compared to baseline, typical guided reading practices for intermediate students in a fourth-grade classroom. A multiple baseline design was selected for its methodological rigor in identifying changes in the dependent variable as a result of an intervention by means of staggering treatment phases across time. The design is also conducive to the use of select statistical analyses (e.g., multi-level modeling) for the purpose of detecting significant treatment effects (Biglan, Ary, & Wagenaar, 2000).

Single-case experimental design (SCED) was used to repeatedly measure the dependent variables within and across different phases that were defined by the absence or presence of treatment. This design allows for a scientifically rigorous alternative to randomized clinical trials (RCTs) and is often used when researchers are interested in evaluating the effects of an intervention (Ferron & Jones 2014; Kratochwill et al., 2021).

The current study consisted of two phases: baseline and treatment. Treatment phases were staggered, and groups of participants were randomly selected to start intervention at preestablished start points. The first group was randomly assigned to start intervention at the sixth data points (i.e., after five baseline observations). The second group was randomly selected to start intervention at the tenth data point (i.e., after the ninth baseline observation). The third group started treatment at the thirteenth data point (i.e., after twelve baseline points). By starting the treatment for one participant while the others remained in baseline, any changes in the target behaviors were likely due to the treatment and not extraneous factors. Treatment starts for the participants were assigned randomly using Excel's randomization function for 25,200 possible combinations and permutations, where C (*n, t)* is the number of combinations of people taken at *t* time:

C (10,4) * C (6,3) * C (3,3) = 210 * 20 * 1 =4,200.

Multiplied by the number of permutations of the three groups:

3! = 6, 4,200 * 6 = 25, 200.

Randomization allows for statistical analyses that measure the treatment effect (Byun et al., 2017).

Additionally, each case that had not yet received the intervention had outcome data collected in a session where another case first received the intervention.

Visual Analysis

During the within-phase examination of baseline and treatment phases, the researcher used visual analysis to assess whether baseline probe points were consistent in level (e.g., the data points in relation to the x-axis) and trend (e.g. the overall direction of the data). The researcher used visual impressions and a response-guided approach to determine the stability of the data and when to make transitions (Thompson, 2006), or, when necessary, to extend the baseline phase based on stability, thus systematically manipulating the independent variable.

The data was graphed for visual analysis and then the graphs were masked for analysis by a professor of educational measurement and research who specializes in the application of statistical methods to educational data. Each outcome variable was measured systematically over time by more than one assessor to collect inter-assessor agreement. The inter-assessor agreement met the minimum thresholds (Kratochwill et al., 2010) on at least twenty percent of the data points in each condition (e.g., baseline, intervention) and met the evidence standards (What Works Clearinghouse, 2022).

Hierarchical Linear Modeling (HLM)

Hierarchical linear modeling (HLM) was utilized to test the hypotheses that participation in ITMI would improve fourth-grade students' oral retell scores and main idea statement scores. The data set in this study and the research questions are suited to HLM for the following reasons. First, the development of hierarchical linear models provides and effective means of researching individual change **(**Van den Noortgate & Onghena, 2007). It is best applied within valid measurements from a multiple-time-point design which permits the study of the structures and predictors of an individual's growth, in this case, growth in reading comprehension (Van den Noortgate & Onghena, 2003). Second, HLM provides flexibility for testing effects of independent variables on the initial status of the slope and change in the slope over time, which

allows for the study of variable effects in terms of the intervention (Van den Noortgate & Onghena, 2003). Third, an important advantage to using HLM to study growth in conjunction with maximum likelihood estimation is the flexibility of the approach to handling missing data, which is an essential consideration in that student attendance factors can yield an incomplete data set (Maas & Snijders, 2003). HLM is therefore the most appropriate approach for answering two of the research questions:

1. To what extent does participation in ITMI improve fourth-grade students' oral retell scores?

2. To what extent does participation in ITMI improve fourth-grade students' main idea statement scores?

Wilcoxon Signed-Rank Test

The Wilcoxon Signed-Rank test was used to compare pre- and post-QRI-7 outcomes on participants ability to answer implicit and explicit comprehension questions with and without lookbacks in the text and ability to provide an oral retell including the main idea and related details. The Wilcoxon Signed-Rank test was the most appropriate approach for answering the third research question:

3) To what extent do fourth-grade students who are participating in ITMI demonstrate changes in their reading comprehension as measured with pre-and posttest assessment?

By using a combination of Visual Analysis, HLM, and the Wilcoxon Signed-Rank test a clear picture will emerge regarding the efficacy of ITMI on the reading comprehension of fourth grade students approaching mastery of informational text comprehension at both the child and group levels.

Participant Characteristics and Criteria

The participants in this study were 10 fourth-grade students from one classroom between the ages of nine and 11 years old. All ten participants in the study identified as Caucasian, and none were identified as English Language Learners or students with disabilities.

Student participants were recruited via a flyer (Appendix A) and parental consent form (see Appendix B) distributed by the classroom teacher. Using convenience sampling, participants from one fourth-grade classroom were included in the study if parents or guardians submitted signed consent forms. Students whose parent or guardian signed consent forms provided an oral verbal assent (see Appendix C) prior to the beginning of baseline phase. Exclusion criteria included participants who were determined to have decoding deficiencies of one grade level or below according to an informal reading inventory, Qualitative Reading Inventory-7 (Leslie & Caldwell, 2021). All students demonstrated grade-level decoding abilities and no students were excluded from the study.

Additionally, present reading levels were determined according to district data. Renaissance Star Assessments for Early Literacy (Star Assessments for Early Literacy, 2018) conducted in the Spring of 2022 all participants reported by Renaissance determined the students to be reading at the third-grade level upon exiting the third grade in May of 2022. Further, the district changed assessment measures for the 2022-2023 school year, adopting the Florida Assessment of Thinking (FAST, 2022) and meaningful comparisons of student data between Spring 2022 and Fall 2022 could not be made using district data.

As outlined in Table 3.1, FAST reading achievement data for student performance of the B.E.S.T. content standards (Florida Department of Education, 2020) from September 2022 prior to intervention phase indicated one participant scored *2*, one participant scored *Below Satisfactory*, four participants scored *On-Grade-Level,* two students scored *Proficient*, and 2

students scored *Mastery*. Results for participants' performance on informational text comprehension indicated four students score above the standard and six participants scored at or near the standard (see Table 3.1).

Table 3.1. *Florida Assessment of Student Thinking Scores*

Student	Achievement Score	Achievement Description	Achievement Indicators	Reading Informational Text Score
Kenny	1	Inadequate	Highly likely to need substantial support for the next grade/course	At or near the Standard
Hailey	2	Below Satisfactory	Likely to need substantial support for the next grade/ course	At or near the Standard
Brandt	3	On-Grade-Level	May need additional support for the next grade/ course	At or near the Standard
Anna	3	On-Grade-Level	May need additional support for the next grade/ course	At or near the Standard
Mika	3	On-Grade-Level	May need additional support for the next grade/ course	At or near the Standard
David	3	On-Grade-Level	May need additional support for the next grade/ course	At or near the Standard
Addy	4	Proficient	Likely to excel in the next grade/ course	Above the Standard
Faith	4	Proficient	Likely to excel in the next grade/ course	Above the Standard
Beth	5	Mastery	Highly likely to excel in the next grade/ course	Above the Standard
Becka	5	Mastery	Highly likely to excel in the next grade/ course	Above the Standard

Setting

The school site for the study was determined by the school district's Department of Assessment, Accountability, and Research. The elementary school site administrator recruited the participating classroom teacher. The study took place in a public suburban general education fourth-grade classroom in one of the largest school districts in south Florida, encompassing more than 150 schools and serving more than 110,000 students through both traditional K-12 schools and a variety of other programs. Total student enrollment at the study site for the 2021-2022 school year was 861, including Caucasian (56.9%), Hispanic (20.3%), Black/African American (14.1%), Asian (6%), Multiracial (1.9%), and Subgroups (0.8%). Approximately 50.9% were identified as economically disadvantaged based on demographic information provided by the school district. A small percentage of students (2.7%) were classified as English Language Learners and 12.5% were identified as students with disabilities. The school was not considered a Title I school for the 2021-2022 or the 2022-2023 school year as the student body did not meet the eligibility requirements.

The study participants included one classroom teacher and 10 students who assented to participate and whose parents consented to their child's participation. The participants were randomly assigned to three groups: group 1 (n = 4), group 2 (n = 3), group 3 (n = 3). Randomization was conducted using the Google random generator with numbers assigned to student names. Random assignment allowed for heterogeneous grouping. Heterogenous grouping was purposeful so that I could examine peer collaboration amongst students reading and comprehending on- or above-grade level placement and those who demonstrated a need for increased support with reading comprehension based on performance on the QRI-7 and Florida Assessment of Thinking data conducted by the district.

Ethical Considerations

This study was approved by the University of South Florida Division of Research Integrity and Compliance Institutional Review Board (IRB) and a large school public school district's Department of Assessment, Accountability, and Research. The researcher ensured that participants were treated ethically, and that confidentiality was maintained. Each participant was assigned a single pseudonym that was used for the data entry and reporting results. The pseudonym data was stored on a password-protected computer.

Participation. This study was voluntary, and participants were informed that they may stop participation at any time they desired. They were notified there would be no penalty if participants decided to stop once the study had started. The decision to participate or not participate did not affect their status as students.

Materials

The researcher curated a selection of four informational trade books identified from a larger series, *Scientists in the Field* published by Houghton Mifflin Harcourt, written for readers between the ages of 9 to 14, from the Sibert Informational Book Medal list, a national award presented by the American Library Association (https://www.ala.org/alsc/awardsgrants/bookmedia/sibert). To control for genre the researcher selected trade books with a focus on science topics. The researcher reviewed all 40 trade books in the series with specific criteria for selection: similar topic/content, inclusion of a variety of informational text features, and text difficulty. Thirty books were excluded based on the lack of inclusion of a wide variety of informational text features (e.g., texts with only photographs and captions containing fewer than 10 other informational text features). The remaining trade books were selected based on their proximity to one another to control for text difficulty.

In other words, all of the selected trade books were identified to fall within the Lexile® level range of 1000L to 1070L. This Lexile® band falls within the grade five to grade six College and Career Ready Stretch Bands (Lexile Framework for Reading, n.d.). The selection of trade books in a Lexile® level range of 1000L to 1070L was purposeful in order to select complex texts the students could read with the support of the researcher in small group settings (Valencai et al., 2014). The order in which the trade books were used across baseline and intervention phases was determined using the RANDOM.ORG application to randomly select the order of implementation. See Table 3.2 for trade books used in the baseline and intervention phases.

Table 3. 2. *Trade Book Descriptions*

Title	Lexile Level	Synopsis	Chapters	Big Ideas in Chapter
The Next Wave: The Quest To Harness The Power Of The Oceans (2014)	1070	Engineers and scientists work to harness the punishing force of our oceans, one of nature's powerful and renewable energy sources in the Pacific Northwest to power our lives in a cleaner, more sustainable way.	1. The Power of Waves	7
			2. The Mikes	11
			3. Building Buoys	13
			4. Steel in the Water	11
			5. Ducking the Waves	13
Eruption!: Volcanoes And The Science Of Saving Lives (2017)	1000	Scientists belonging to a volcano crisis team investigate volcanoes from Columbia to the Philippines, from Chili to Indonesia to predict future eruptions and prevent the death of more than one billion people worldwide live in volcanic danger zones.	1. Sleeping Giant	5
			2. Never Again	5
			3. Mount Pinatubo	6
			4. To Evacuate or Not to Evacuate	8
The Big One: The Cascadia Earthquakes And The Science Of Saving Lives (2020)	1070	A small group of scientists work tirelessly to learn as much as they can from marsh soil, ocean sediments, landslide debris, and *ghost forests*--and investigate geological features running along the coast that trigger massive earthquakes in other parts of the world.	1. The Mystery of the Missing Earthquakes	5
			2. Sherlock of the Marshes	6
			3. Clues from the Past	11
Park Scientists: Gila Monsters, Geysers, And Grizzly Bears In America's Own Backyard (2014)	1040	Scientists and researchers perform long term studies of a wide number of subjects including salamanders, geothermal geysers, grizzly bears, and cacti.	1. Natural Wonder of Water & Heat	7
			2. Yellowstone's Biggest Bears	16
			3. Tracking Monsters	9
			4. Counting Cacti	5
			5. Smoky Mountain Salamanders	16

Participant Inclusion Measures

Reading Fluency and Comprehension

The QRI-7 is an informal reading comprehension inventory instrument (cite). It was used to measure oral reading accuracy and reading comprehension to provide information about students' present level of reading and their instructional needs. This informal reading inventory evaluates comprehension "with minimal confounds due to decoding difficulty" (Carpenter & Paris, 2005, p. 286). The instrument provides lengthy informational and narrative passages with alternate form reliability of at least .80 at each of the 10 difficulty levels (pre-primer, primer, grades 1 through 6, upper middle school, and high school). This instrument was used to find an entry point to each students' instructional reading level.

The Qualitative Reading Inventory-7 (QRI-7) (Leslie & Caldwell, 2021) was administered prior to baseline treatment phase to determine several components of the students' instructional informational reading level and upon completion of the intervention phase to measure growth (see Table 3.x for results). Several components of the students' instructional reading level were assessed including prior knowledge, word pronunciation errors, words correct per minute (WCPM), prosody, oral retell, and implicit/explicit comprehension. The students' prior knowledge was evaluated to determine their comprehension in relation to their knowledge base (familiar and unfamiliar topics). Assessment of word pronunciation errors, fluency, and prosody were examined to determine students' word identification strategies (in context) by counting total miscues. Students' fluency was evaluated by calculating words correct per minute (WCPM) and using the Oral Reading Prosody Scale. The students' comprehension was assessed by asking the student to retell the text and answer explicit/implicit questions about the text both with and without look-backs to correct any errors.

QRI-7 Word Identification List. Participants' starting point for passage administration instructional reading levels were evaluated using the QRI-7 Word Identification List. Participants read words without the support of passage context. The researcher selected an informational passage at the same level as the highest level where the participant scored 90% or higher on the word list, which is estimated to be the instructional reading level with context.

QRI-7 Assessment of Prior Knowledge. Participants were asked three to four concept questions that were scored on a 3-2-1-0 scale of familiarity (see Table 3.3). This allowed the researcher to determine whether the topic of selection was familiar to the student. The passages at the fourth-grade level and above center on topics that may be unfamiliar to the readers to allow for assessing the level of a student's reading of unfamiliar material to indicate the nature of instruction that is needed. This allowed the researcher to evaluate comprehension in relation to the student's knowledge base.

QRI-7 Assessment of Word Pronunciation Errors, Fluency, and Prosody. Based on the results of the Word Identification List the participants' read the informational passage commensurate with participants' score on the word list. As the participant orally read the passage, the researcher examined the participants' fluency to calculate WCPM and also considered the participants' prosody (see Table 3.3). As directed by the QRI instrument, prosody was scored on a scale of 1 to 4. A score of 4 indicates the student reads primarily in larger, meaningful phrase groups. Some or most of the story is read with expression. A score of 3 indicates the student reads primarily in three- or four- word phrase groups. Little or no expressive interpretation is present. A score of 2 indicates the student reads primarily in twoword phrases with some three- or four- word groupings. Word groupings may be awkward. A score of 1 indicates the student reads primarily word-by-word with occasional two-word or three-word phrases. Results of the QRI-7 Fluency measures for informational text placed David at a grade 2

passage, Hailey and Kenny at a grade 3 passage, Addy, Mika, and Anna at a grade 4 passage, and Faith, Beth, Brandt, and Becka at a grade 5 passage. All students demonstrated adequate prosody scores between 3 and 4 on the prosody scale and demonstrated adequate decoding abilities.

Table 3.3 *Participant QRI-7 Fluency Scores*

Name	Passage Grade Level	Passage Familiarity	Miscue Analysis		Oral Reading		
		Unfamiliar < 55% Familiar 55% +	Total Miscues	Meaning Miscues	Prosody Scale	WCPM	Total Acceptability
David	2	22%	4	0	3	120	100%
Hailey	3	63%	3	0	3	139	100%
Kenny	3	72%	3	0	4	149	100%
Addy	4	50%	1	0	3	144	100%
Mika	4	100%	3	1	4	114	100%
Anna	4	100%	0	0	4	132	100%
Faith	5	50%	3	1	4	105	100%
Beth	5	50%	3	1	3	114	100%
Brandt	5	50%	3	0	4	144	100%
Becka	5	50%	0	0	4	177	100%

QRI-7 Assessment of Comprehension. After the participants read the text orally the researcher asked the student to retell what was read and scored the responses according to the QRI-7 retelling scoring sheet with a focus on main idea and details (see Table 3.4 for results). After completing the retelling portion of the inventory, the participants' answered implicit and explicit questions. Selections had five, six, eight, or ten questions depending on the grade level of the passage. Participants first answered comprehension questions without lookbacks into the text and then were given the text to allow for lookbacks to provide an opportunity to correct any erroneous answers. The intent of the QRI-7 is to find the students' instructional reading level, to recognize areas of comprehension strengths and areas of need to determine next steps for instruction (Leslie & Caldwell, 2021).

The QRI-7 does not incorporate the untimed oral retelling of the main idea and detail results into the overall comprehension score, as such the scores for participants are based solely on their ability to answer the implicit and explicit comprehension questions with and without lookbacks. However, in order to provide a comprehensive pre- and post- intervention QRI-7 score for participants the oral retell scores were scored, reported, but not included in the overall comprehension score according to the scoring guide for the QRI-7. All students scored at the independent level for word identification (e.g., reading words in context within the passage) while overall scores for comprehension ranged from frustration to independent level based on the students' ability to answer implicit and explicit questions subsequent to reading the text.

A majority of the participants' scores for answering implicit and explicit questions increased when they were given access to the text to lookback and answer questions. For example, David scored a 25% on implicit questions without the text and his score increased to 75% when given the ability to look back into the text to answer. His score for explicit questions was 50% without the text and increased to 100% when allowed to look back in the text. Faith scored a 50% on implicit questions without the text and her score increased to 75% with the text. She scored a 100% on explicit questions without the text, thus not needing the text for lookbacks to correct any missed or erroneous answers.

A majority of the students were unable to provide the main idea of the text scoring a 0%. Kenny and Mika were able to provide 50% of the possible main ideas and Addy was able to provide 25% of the possible main idea statements. This figure was reached by dividing the total amount of main idea statements provided by the participant by the number of total possible main idea statements. Where retelling the details from the text, Faith scored the highest with 27%, while the three participants, David, Mike, and Anna were unable to retell any details scoring 0%, and all remaining participants scoring between 4% to 14.28%. These figures were reached by

dividing the total amount of details provided by the participant by the number of total possible details.

Table 3.4 *Participant QRI-7 Comprehension Scores*

Name	Passage Grade Level	Comprehension Scores						Overall Passage Score	
		Retell Main Idea	Retell Details	Implicit without Lookbacks	Implicit with Lookbacks	Explicit without Lookbacks	Explicit with Lookbacks	Word Identification	Overall Comprehension Score
David	2	0%	0%	25%	75%	50%	100%	IN	IS
Hailey	3	0%	14.28	75%	75%	50%	100%	IN	IS
Kenny	3	50%	6%	67%	100%	25%	100%	IN	IN
Addy	4	25%	4.34%	25%	75%	0%	75%	IN	IS
Mika	4	50%	0%	0%	25%	25%	25%	IN	FR
Anna	4	0%	0%	0%	25%	0%	75%	IN	FR
Faith	5	0%	27%	50%	75%	100%	NA	IN	IS
Beth	5	0%	12%	25%	50%	100%	NA	IN	IS
Brandt	5	0%	4%	0%	0%	0%	100%	IN	FR
Becka	5	0%	8%	67%	67%	75%	100%	IN	IS

Note. IN = Independent level; IS = Instructional level; FR = Frustration level

Study Outcome Measures

Reading Comprehension. In addition to utilizing the QRI-7 to select participants, the inventory was conducted at the completion of the intervention phase to compare pre- and postintervention outcome measures for comprehension questions and oral retell. Additionally, the researcher created an Oral Retell Rubric and Main Idea Statement Rubric to measure reading comprehension outcomes (see Table 3.4 for results).

Oral Retell. In this study, the untimed oral retelling rubric was used to measure proximal reading comprehension/oral retell outcomes (primary outcome). Borrowing from the QRI-7 Oral Retell Rubric format the researcher parsed the text into big ideas for each of the 17 chapters within the four trade books used in the study. The big ideas across the trade books ranged from

five to thirteen depending on the chapter's length and the amount of topics contained in each chapter (see Figure 3.1 for big idea text parsing).

Chapter Number	Title	Big Idea 1 (start text)	Big Idea 1 (end text)	Big Idea 2 (start text)	Big Idea 2 (end text)	Big Idea 3 (start text)	Big Idea 3 (end text)	Big Idea 4 (start text)	Big Idea 4 (end text)	Big Idea 5 (start text)	Big Idea 5 (end text)	Big Idea 6 (start text)
Chapter 1	The Power of Waves	(p. 7) Never turn your back....	...knock you down. (p. 7)	(p. 7) Waves carve rock and . . .	out in the open ocean. (p. 7)	(p. 8) In 2001, . . .	...many were not so fortunate (p. 9).	(p. 9) Around the globe, . . .	number is much higher (p. 10)	(p. 10) Throughout human history, . . .	power our lives (p. 10)	(p. 10) We are in desperate need . . .
	(my thinking/reasoning)	BI 1: this is about getting the reader to think about waves and their power		This is giving examples of what the waves can do		all about the cruise ship Caledonian Star		general about the ships crashing/disappearing		long ago vs now		What is needed - new energy source
Chapter 2	The Mikes	(p. 13) Mike Morrow . . .	new inventions (p. 14).	(p. 14) When he got to elementary school . . .	...I didn't know what (p. 14)	(p. 14) When Mike Morrow was 17...)	Interesting (p .16)	(p 16) Mike didn't think of it again until	track down own materials (p. 16)	(p.16) The Mikes found . . .	passed over him (p. 16)	(p. 16) Waves cause temporary pressure . . .
		Introduction to idea/person		elementary school		initial thoughts about waves		idea but no university support		beginning of plan to prove idea		what they really want to discover
Chapter 3	Building Buoys	(p. 23) A few years. . .	...wasn't sure how (p. 24)	(p.24) Annette grew up...	opportunity arose	The ocean simply...	make a real difference (p. 25)	Annette wanted to try...	various buoys together (26)	Their first prototypes...	and it floated.	(p.27) The next step...
		Introduction to idea/person										
Chapter 4	Steel in the Water	It's one thing...	she says (p. 31).	So, they went back to the drawing...	hoped and prayed it would work.	In Oct. 2007,	more energetic waves.	Finally, the weather... (p. 32)	back to shore.	The team was not ready (p. 33)	future testing.	Then another big (p. 33)
		Introduction to idea		redesign		testing phase		ocean testing phase		not safe to leave out		New storm/article written

Figure 3.1 *Big Idea Text Parsing Example*

To increase confidence, an Interobserver agreement (IOA) researcher also parsed all book chapters into big ideas until both the researcher and the IOA researcher reached one-hundred percent agreement for big idea parsing across the trade books. The rubrics were used during baseline and intervention phases. Audio/video recordings of participants' oral retells were transcribed using Otter.ai and scored during baseline and intervention phases. Responses were independently scored by the researcher and an IOA researcher based upon the Otter.ai transcripts using the researcher developed rubrics for each specific chapter across the trade books (see Appendix D).

Main Idea. In this study, the Main Idea Statement Rubric was adapted from Tarlow (1990) and used to measure proximal reading comprehension/main idea outcomes (primary outcome). The rubric contained six different possible scores using a 0 to 5-point scale for participants main idea statement generations. Students scored a 0 for no answer, 1-point for a main idea that included minimal or no understanding of the main idea, 2-points if their statement

indicated inaccurate or incomplete understanding of the main idea, 3-points if their statement stated or implied the main idea from the text, 4-points if their statement included a clear generalization that stated or implied the main idea, and 5-points if their statement demonstrated the ability to read beyond the literal words and included references beyond the text to demonstrate meaning. The rubric was used during baseline and intervention. Audio recordings of participants' main idea statement generations were transcribed using Otter.ai and scored during baseline and intervention phases. Responses were independently scored by the researcher and an Interobserver agreement (IOA) researcher based upon the Otter.ai transcripts using the researcher developed Main Idea Statement Rubric (see Appendix E).

Informational Text Mapping Intervention

The independent variable for this study is the Informational Text Mapping Intervention (ITMI). Two dependent variables were measured based upon the causal relationship between the independent variable and the dependent variables (performance on main idea statement generation rubric and the oral retelling rubric). Baseline and intervention phases were comprised of 17 sessions lasting between 20 to 30 minutes each. The sessions took place two days per week for 15 weeks. The researcher met with two groups per day on a rotating schedule until all groups completed intervention phase.

The ITMI is an intensive, small group intervention. The intervention is an explicit, active reading, collaborative approach to strengthening informational text reading skills because it produces a visual record of thinking and creates a concrete model for abstract ideas. This method allows readers to bridge the gap between text and graphic organizer by turning the text itself into a graphic organizer, drawing attention to nonfiction text features often ignored by students who struggle with reading comprehension (Kozdras et al., 2015). ITMI is not a scripted lesson and most researcher moves will be based on the researcher's expert knowledge and are related to (a)

what the students already know; (b) the students' responses during the session; and (c) the opportunities in the think aloud, discussions, and note-takings composed by students. Researcher actions are designed around student strengths as prescriptive, inflexible programs are not adequate as interventions for students and skilled teaching responses are required.

This intervention is not a packaged program. Each student or group's program is determined by the child's strengths and needs; and the researcher works to improve areas approaching mastery. What the child can currently do determines the shifts that might be made. Researchers have the autonomy to observe children's reading behaviors and make decisions to support informational text reading success.

Procedures

During the baseline phase, all participants read one trade book chapter per session in their small group. Upon completion of the session each student independently generated a main idea statement and provided an oral retell of the text. The session and each individual student's outcome measure was recorded (video and audio) via iPhone, and two iPads. During this phase, the researcher did not provide prompting or instructional guidance to students regarding attention to informational text features or to taking notes while reading. These sessions took 20 to 30 minutes and the individual student's main idea statement generation and oral retelling took three to five minutes. The step-by-step procedures for the baseline phase are further explained in the forthcoming section.

During the intervention phase, all participants read one trade book chapter per session with their small group. Upon completion of the session each student independently generated a main idea statement and provided an oral retell of the text. The session and each individual student's outcome measure were recorded (video and audio) via iPhone, and two iPads. During this phase prompting and instructional guidance was provided to direct participants' attention to

all informational text features and note-taking while reading. These sessions took 45 to 60 minutes and the individual student's main idea statement generation and oral retell took three to five minutes. The step-by-step procedures for the intervention phase is further explained in the forthcoming section.

Baseline Implementation

The baseline phase in the current study included the following components: small group shared reading, main idea statement generation and oral retell of the text. The following steps were implemented during each session of the baseline condition:

1. The researcher introduced the trade book chapter and provided a brief overview of the topic following the typical small group reading structure already in place in the study classroom (e.g., reading with questions related to the purpose and skill/strategy focus for the current lesson).

2. The researcher informed the students that after they read the chapter, they will be asked to generate a main idea statement and provide an oral retell of the text.

3. Begin the session by reading the chapter interactively with the students (take turns reading on a voluntary basis).

4. Upon completion of the reading, remove the text from the students and meet with each student individually to ask them to generate a main idea statement and untimed oral retell of the text.

Intervention Implementation

The intervention phase included the following components: text preparation, researcher modeling of ITMI strategies, and gradual release of responsibility for reading, marking informational text features, and note-taking related to identifying the main idea and oral retell. ...

Text Preparation.

1. The researcher copied the text and stapled the pages together end-to-end. This allowed the reader to see the entire text at once, making it easier for readers to make connections across several pages (see Figure 3.2).
2. The researcher adhered the connected text to butcher paper leaving an equal amount of blank space above and below the taped pages. These areas served as the "workspace" for students to take notes to support comprehension with the goal of outlining the main idea and details. During each session the researcher and/or students recorded their thinking around the sections of the text as they read (see Figure 3.2).

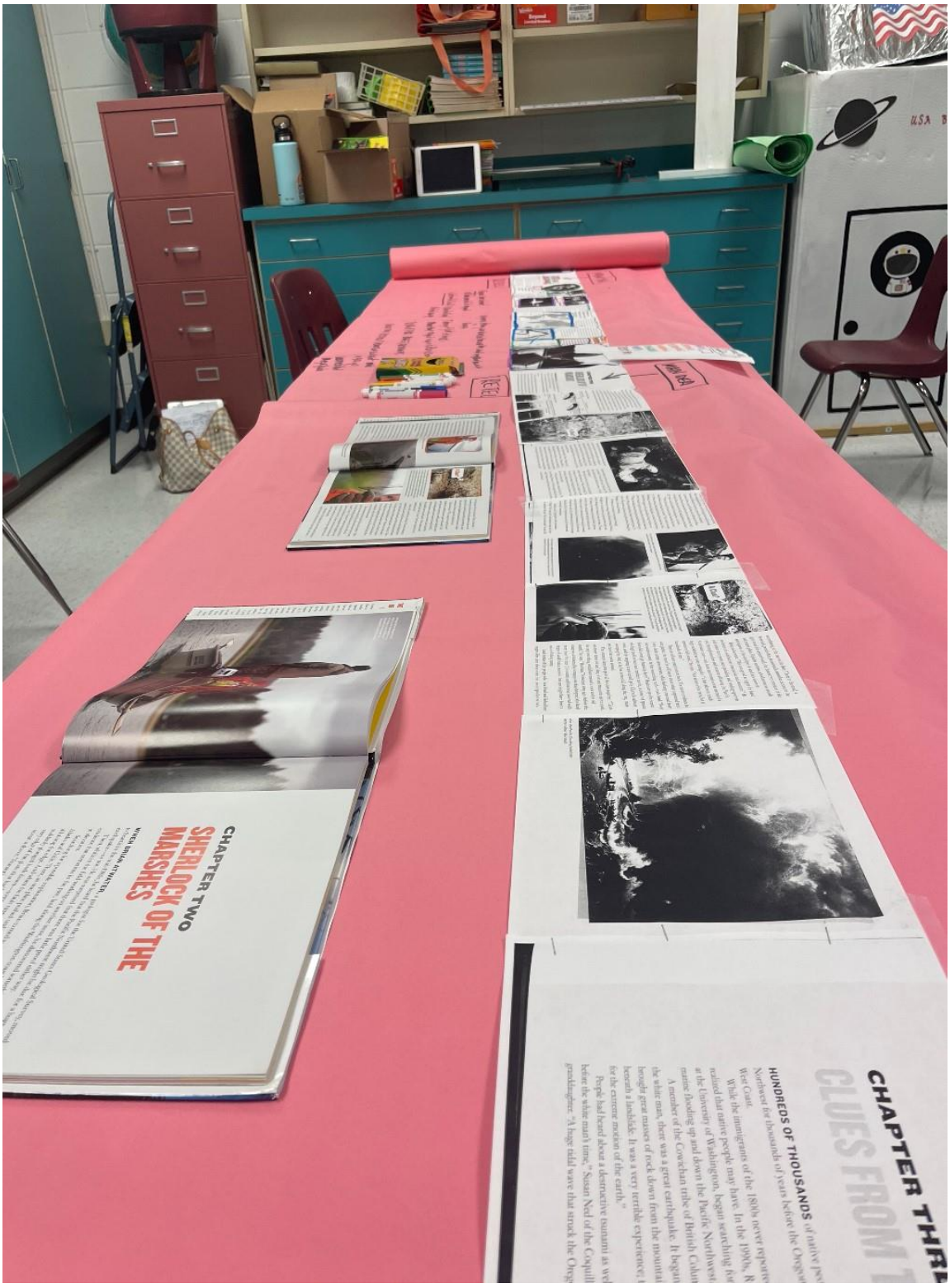

Figure 3.2 *Text Map Text Preparation*

Modeling and Gradual Release of Responsibility. During the first intervention session, the researcher moved through three stages of reading the text, the "I do, we do, you do" process of gradual release moving from teacher model to student cooperative work (Pearson & Gallagher, 1983). Gradually moving from direct teacher instruction to student-led learning allowed the researcher to gradually withdraw support as students became more proficient with each step of the strategy. Scaffolds were flexible and remained in place for some students that continue to need support. The modeling and gradual release of I do, we do, you do phase included the following components:

I do. First, the researcher controlled the lesson and demonstrated the process for students.

1. The researcher introduced the technique by rolling out the elongated informational trade book workspace/graphic organizer and had students gather around it on multiple tables organized together to display the text map, making sure that all students had easy access to read and mark the text.
2. The researcher displayed the literacy focus on the text map then began the read aloud and modeling portions of the "I do" phase. In the current study the focus was determining the main idea and oral retell of the text.
3. The researcher informed the students that after they read the chapter, they would be asked to generate a main idea statement and provide an oral retell of the text.
4. The researcher explained that text features included all the components of the trade book that were not in the main body called the "text stream" in ITMI. The researcher discussed the purpose of ITMI placing special attention on the importance of attending to the informational text features readers could incorporate into their reading practice on a daily basis. The researcher led a discussion wherein the small group searched across the text

for informational text features, then identified each feature by title and the purpose it served within a text (e.g., Typically a caption describes what the reader sees in illustrations and photographs)

5. During the introduction the researcher demonstrated the following steps:
   a. Reviewed the text feature key with the group. Guided a discussion to verify that all students are familiar with informational text features. Discussed how outlining each feature draws their attention to it and reminded the reader to acknowledge its existence and its relation to the words in the text.
   b. Marked the text stream in black. It didn't stop until the end of the text and should be able to "flow" undisturbed throughout.
   c. Modeled a single example of marking each informational text feature for students each of the following steps. Students completed the mapping:

- Box photos in purple.
- Box each caption in pink.
- Box each heading in red.
- Box each subheading in orange.
- Box each diagram in green
- Box each map in blue
- Box each text box in brown.
- Highlight vocabulary words in yellow.
- Box each illustration in aqua blue.
- Box each chart in violet.
- Box each graph in grey.

Each informational text feature was outlined in a different color to support students' understanding of identifying the text feature and distinguishing each text feature from the others. This component of the intervention provided students with the opportunity to learn the name and function of each text feature (e.g., explaining the difference between a chart and a graph; graphs are mostly numerical representations of data while charts are the visual representation of where categories may or may not be related). This explicit instruction of informational text features provided an opportunity for students to specifically refer to the text feature during an oral retell with the intent to provide a retell that included any supplemental information gleaned from their attention to informational text features in addition to the text stream.

6. Next, the researcher modeled the "think aloud" process, while reading.
    a. During the shared reading of the text the researcher and students read the text stream on each page in its entirety, then moved back through all informational text features, viewing and/or reading the supplemental information provided within so as to not interfere with the flow of reading the text stream. In the case where a text feature was explicitly referred to in the text stream, the researcher and students paused reading the text stream to attend to the feature. As students viewed and/or read the informational text features they drew arrows from the text feature to the area of text where it is referenced (implicitly or explicitly). This "lifted" the text features from the text stream and helped the students to visualize how the information was connected or provided visual context to the print. In some cases, there was text in the stream several pages later that can also be connected by an arrow to a text feature previously viewed. This allowed the students to see how information across a text could be connected and provided a holistic view of the text (see Figure 3.3).

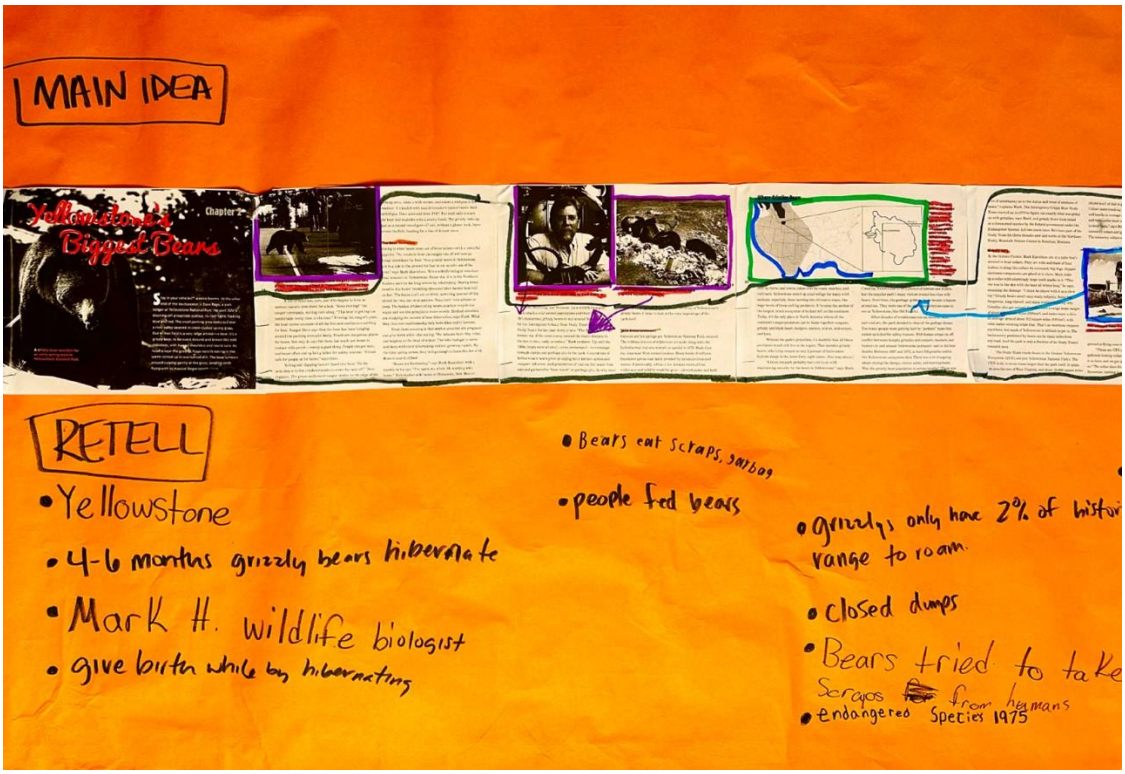

Figure 3.3 *Example of arrows connecting text features to text stream*

b. Students wrote any notes (see Figure 3.4) important to retelling and generated a main idea statement on the graphic organizer workspace surrounding the text to model how to create a record of thinking. Notes were written directly on the paper surrounding the text. Researcher continued to think aloud when information was read that is important to the oral retelling and main idea statement generation. The researcher wrote bullet points or sentences to track researcher's think aloud process on the blank spaces around the text. These notes became a cumulative record of the information important to determining the main idea and orally retelling the text.

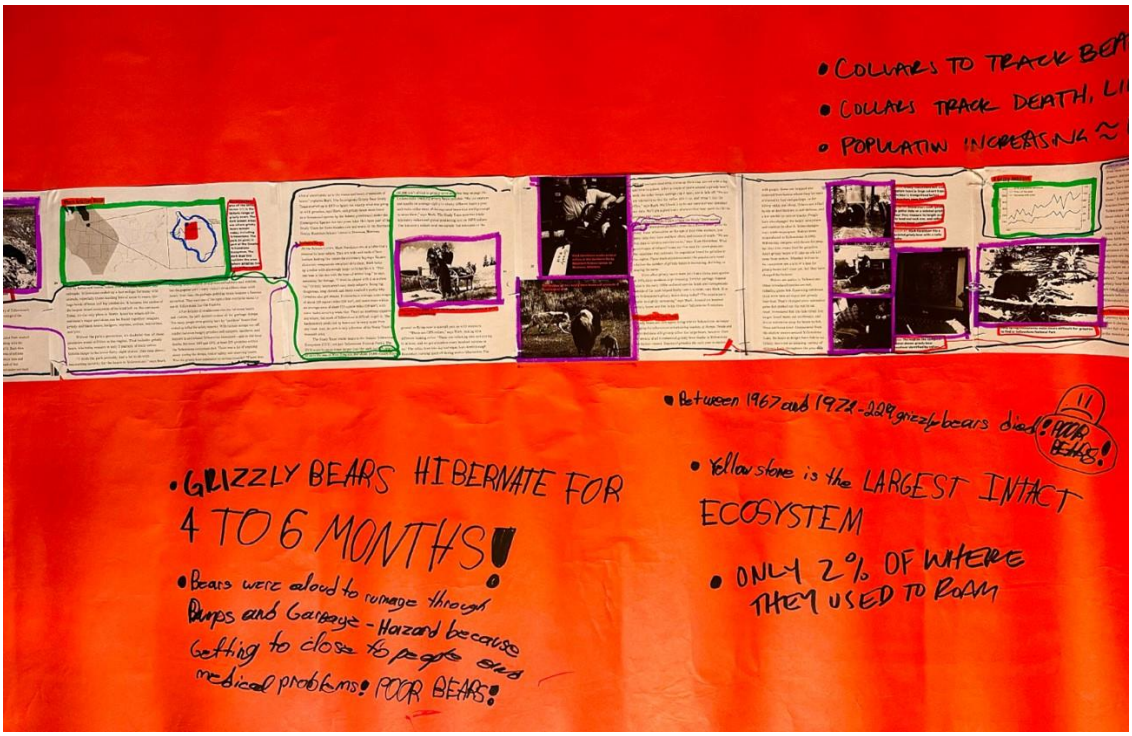

Figure 3.4 *Example of note-taking*

We do. Next, the researcher started to share the work of reading, marking the text, and note-taking with the students through the gradual release of responsibility. Students volunteered to become "text feature specialists" and marked the text features with researcher guidance. Each student was given a specific text feature to mark throughout the remainder of the text, (e.g., "Mark all of the vocabulary words." or "Draw a box around each photograph.") until all text features had been marked.

You do. Lastly, the group worked independently.

1. First, the researcher instructed students to complete a "text walk" to identify and mark the features in the remaining text with little to no teacher instruction if possible. The researcher encouraged students to discuss any questions or concerns they had about text feature identification and marking with their peers if they needed confirmation.
2. Next, the researcher instructed students to read the remaining pages.

Students volunteered to share read as much or as little as they preferred as long as they completed the book in order to mark all text features. During this time students took notes to record important information they learned from the text stream and text features related to the oral retell and main idea statement generation tasks.

3. Upon completion of the reading, the researcher removed the text from the students and met with each student individually to ask them to generate a main idea statement and untimed oral retell of the text.

Internal Validity

Internal validity was needed to infer a causal relationship between an independent and dependent variable and was determined by the study's design (Kratochwill et al., 2010). The current SCED study was designed to address major threats to internal validity through structure of the design and systematic replication of the effect within the course of the experiment (Kratochwill & Levin, 1992). To ensure internal validity the current study provided clarity on temporal precedence regarding which variable was the cause and which is the effect. Selection was addressed as participants were exposed to both the baseline and intervention treatment. Regression was addressed within the participant selection as they were not selected on the basis of pre-experimental or baseline measures and did not suggest a high need or priority for intervention. Concerns of instrumentation were addressed through consistent assessment methods across baseline, intervention, and pretest to posttest.

History was certainly a factor in the current study but represented reading comprehension intervention in its natural environment. There may have been additional unaccounted variables during the period of time between pretest and posttest of the QRI-7 and between the onset of baseline treatment and conclusion of intervention treatment. Another threat to internal validity was maturation, which can happen as individuals' comprehension abilities develop over time of

the study with potential impacts on differences across baseline and intervention and pretest and posttest QRI-7 outcomes. The fourth-grade participants developed in many ways from baseline to intervention and pretest and posttest, but this is also a natural aspect of education.

Treatment Fidelity

To ensure fidelity of treatment, baseline and intervention phases were implemented by only the researcher at the same time of day for every session and followed the same procedures across all three groups across baseline and intervention phases. All sessions were video recorded via two iPads and all dependent measures (Main Idea Statement generation and Oral Retell Statement) were audio/visual recorded via two iPads and an iPhone to measure the fidelity of interobserver agreement of the dependent measures. During the recording, the researcher and the participant sat on one side of a table, the iPads were placed in front of them so that each person could be clearly seen. All small group sessions, individual Main Idea Statements, and individual Oral Retell Statements were recorded in "the cloud" for later retrieval and analysis.

Interobserver Agreement (IOA)

Interobserver Agreement (IOA) of dependent measures was conducted for 100% of the participant main idea statements and untimed oral retell statements. In addition to the researcher, a second qualified doctoral candidate with a literacy teaching background, both independently scored and compared the results of the transcribed Oral Retell Rubric scores and Main Idea Statement Rubric scores (dependent comprehension measures).

Each individual Main Idea Statement for all participants across the 17 baseline and intervention phases were calculated by taking the total number of agreements divided by the total number of agreements and disagreements and multiplied by 100. Overall, the IOA data was

97.9% when scored item by item across all 10 participants. Overall, when Main Idea Statements were scored by total score for each participant the IOA data was 100% for Hailey, Mika, David, Faith, Kenny, Beth, and Addy, and 88.2% for Brandt, and 94.1% for Anna and Becky.

Each individual Oral Retell for all participants across the 17 baseline and intervention phases were calculated by taking the total number of agreements divided by the total number of agreements and disagreements and multiplied by 100. Overall, the IOA data was 100% when scored item by item across all 10 participants.

Data Analysis

In this study, visual analysis and Hierarchical Linear Modeling were used to gain a comprehensive understanding of the intervention effects (Baek et al., 2014; Moeyaert, 2020).

Ten participants served as their own control for evaluating change (Hammond & Gast, 2010) across two adjacent conditions (baseline and intervention) to evaluate participants' performance session to session through continuous collection of oral retell and main idea statement generation.

Visual Analysis. Based upon WWC Single Case Design Handbook (Kratchowill et al., 2010), six features can assess the effects of within- and between-phase data patterns: level, trend, variability, immediacy of the effect, overlap, and consistency of patterns across similar phases. According to WWC (2010), "level" refers to the mean score for the data within a phase. "Trend" refers to the slope of the best-fitting strait line for the data within a phase. "Variability" refers to the range or standard deviation of data about the best-fitting straight line. "Immediacy of the effect" refers to the change in level between the last three data points in one phase and the first three data points of the next. "Overlap" refers to the proportion of data from one phase that overlaps with data from the previous phase. Lastly, "consistency of data in similar phases"

involves looking at data from all phases within the same condition and examining the extent to which there is consistency in the data patterns from phases within the same conditions.

Visual analysis was conducted by analyzing three of these six key features (level, trend, immediacy of the effect, overlap, and consistency of data patterns) for each individual participant and the results will be discussed in chapter four.

Masked Visual Analysis. Masked visual analysis (MVA) replaced a traditional randomization test in the current study in order to control Type 1 error rates (Ferron & Jones, 2006). The data analyst was a professor of educational measurement and research who specializes in the application of statistical methods to educational data who was blind to the participants' (Ferron & Jones, 2006). MVA increases the internal validity of single-case designs and aims to reduce the influence of experimenter bias based on single-case design while still using a response-guided approach to ensure each phase of the study exhibits a consistent and interpretable pattern (Byun et al., 2017). MVA also allows researchers to incorporate an element of randomization and thus make use of statistical hypothesis tests, but it does so without posing too great a risk that data will be compromised by demonstrations of Non effect.

Hierarchical Linear Modeling

Visual analysis of results in Single Case Experimental Design only captures the most obvious effects, while more subtle, yet significant, effects may be undetected (Brossart et al., 2006). Hierarchical linear modeling (HLM) has been proposed as an alternative analysis for Single Case Experimental Design data because of the flexibility to accommodate nested data (Davis et al., 2013). Using HLM descriptively instead of inferentially allows for the capture of numeric trends in small samples that might otherwise be too diffuse for visual detection (McNeish, 2019). The results of HLM provide individual and group growth patterns to capture numeric information that may be too variable for visual analysis.

The models fit consist of HLM. At HLM Level 1, observation within the individual students' reading comprehension was represented by an individual growth trajectory that depends on a unique set of parameters. These individual growth parameters became the outcome variables in HLM Level 2 in that they were dependent on person-level performance on main idea statement generation and oral retell across participants.

The unconditional model provides an important estimate of the variances within and between participants for the fourth-grade students' reading comprehension and it is demonstrated as following:

Individual level: $\Upsilon_{Comprehension} = \pi_{0i} + \pi_{1i} * Phase_{ti} + e_{ti}$

$\pi_{0i} = \beta_{00} + r_{0i}$

Participants level: $\pi_{1i} = \beta_{10} + r_{1i}$

Combined Model: $Y_{Comprehension} = \beta_{00} + \beta_{10} * Phase_{ti} + r_{0i} + r_{1i} * Phase_{ti} + e_{ti}$

$\Upsilon_{Comprehension} = \pi_{0i} + \pi_{1i} * Phase_{ti} + e_{ti}$

$\pi_{0i} = \beta_{00} + r_{0i}$

$\pi_{1i} = \beta_{10} + r_{1i}$

$\Upsilon_{Comprehension} = \beta_{00} + \beta_{10} * Phase_{ti} + r_{0i} + r_{1i} * Phase_{ti} + e_{ti}$

Summary

Visual analysis, hierarchical linear modeling, and the Wilcoxon Signed-Rank test were used to contribute to what is known about intermediate students who are approaching mastery of informational text reading comprehension. Visual and HLM analyses are beneficial to this study as individual performance and differences across repeated measures can be conducted (Stage,

2001), and the Wilcoxon singed-rank test was beneficial as it allowed for the comparison of pretest and posttest comprehension data for participants.

The use of visual analysis, HLM, and the Wilcoxon Signed-Rank test in this study were appropriate for the formulation of adequate conclusions to the research questions and contributed to the existing research investigating how ITMI and the explicit instruction of informational text features impacts intermediate students' reading comprehension of informational texts.

CHAPTER FOUR: RESULTS

Reading is a complex act and reading comprehension rests on many components including motivation, fluency, and the application of strategic reading behaviors. There are a wide variety of constructs and theories that guide the many models of reading comprehension and a significant number of differing processes that can be implemented when approaching reading comprehension.

This study examined a novel reading comprehension intervention (Informational Text Mapping Intervention) designed to increase students' reading comprehension of informational texts through explicit text feature instruction in a classroom context. The specific research aims were to determine: (a) the extent to which participation in ITMI improves fourth-grade students' oral retell scores, (b) the extent to which participation in ITMI improves fourth-grade students' main idea statement scores, and (c) the extent to which fourth-grade students who are participating in ITMI demonstrate changes in their reading comprehension as measured with preand posttest assessment.

This chapter presents the data collected through the current study in order to address the three research questions:

1. To what extent does participation in ITMI improve fourth-grade students' oral retell scores?
2. To what extent does participation in ITMI improve fourth-grade students' main idea statement scores?
3. To what extent do fourth-grade students who are participating in ITMI demonstrate changes in their reading comprehension as measured with pre-and posttest assessment?

The first research question investigated the extent to which participation in ITMI improved fourth-grade students' oral retell scores. These changes were measured using a researcher designed oral retell rubric. The second research question investigated the extent to which participation in ITMI improve fourth-grade students' main idea statement scores. These changes were measured using a researcher designed main idea statement rubric. The third research question investigated the extent to which participants demonstrated changes in their reading comprehension as measured with pre-and posttest assessment. These changes were measured via the Qualitative Reading Inventory-7 (Leslie & Caldwell, 2021). The chapter begins with the results of the visual analyses followed by a review of the multi-level modeling for each of the dependent variables and a review of the Wilcoxon Signed-Rank test for the pretest and posttest QRI-7 results.

Student Profiles

Participants completed interest inventories intended to provide insight regarding their reading preferences in and outside of school (see Table 4.1). Students were asked to rank topics on a scale of 1 to 4 with 4 representing the highest score for preference and 1 representing the lowest score for preference. Beth and David's results showed that topics covered in the complex texts used in baseline and intervention were not preferred assigning scores of 1 and 2 to all subjects. Hailey and David reported that they did not read at home outside of school. Most of the participants reported they preferred fiction over nonfiction texts with the exception of Brandt and Kenny.

Table 4.1 *Student Reading Preferences*

Student	Study Text Preferences				How do you feel when	Fiction vs Nonfiction you read?	How much do you read at home each day?
	Natural Disaster	Oceans	Earthquakes	Volcanoes			
Addy	3	2	4	4	Happy	Fiction	1 hour
Becka	3	4	2	2	Happy	Fiction	A lot
Faith	1	4	2	3	Happy	Fiction	20-30 minutes
Beth	1	2	1	1	Happy	Fiction	Up to 2 hours
Mika	3	3	3	3	Happy	Fiction	20-30 minutes
Hailey	3	4	3	1	Bored	Fiction	None
Brandt	2	4	2	3	Happy	Nonfiction	1 hour
Anna	3	3	3	2	Happy	Fiction	A lot
Kenny	4	3	4	4	Happy	Nonfiction	Not that much
David	1	1	2	2	Bored	Fiction	None

Participants also filled out a survey to determine student interests and how they spent their free time inside and outside of the classroom (see Table 4.2). Across all questions, students had the option to answer each question with always, usually, sometimes, seldom, or never.

Table 4.2 *Student Interests*

	I check out books from the public library	***I check out books from the school library***	***I purchase books***	***I watch television***	***I read for fun at home or other places***	***I spend time on the internet***	***I play video games***
Addy	Sometimes	Usually	Always	Usually	Usually	Sometimes	Seldom
Becka	Seldom	Usually	Seldom	Usually	Usually	Sometimes	Seldom
Faith	Seldom	Usually	Sometimes	Usually	Usually	Sometimes	Sometimes
Beth	Usually	Sometimes	Sometimes	Usually	Usually	Sometimes	Sometimes
Mika	Usually	Always	Seldom	Always	Sometimes	Usually	Usually
Hailey	Seldom	Always	Never	Always	Seldom	Always	Never
Brandt	Sometimes	Always	Sometimes	Usually	Sometimes	Usually	Always
Anna	Never	Usually	Usually	Sometimes	Always	Never	Sometimes
Kenny	Sometimes	Usually	Seldom	Always	Never	Usually	Sometimes
David	Never	Usually	Usually	Always	Sometimes	Always	Always

The following student scores across main idea and oral retell statements could have potentially been impacted positively or negatively because of students' reading preferences and student personal interests.

Textmapping Intervention Process Results

During the intervention phase, when students gradually took over responsibility for identifying text features, marking text features, taking notes, and connecting text features to the text stream during the "we do" and "you do" phases of the intervention, each participant and each group had very different experiences in terms of participation. Beth, Faith, Becka, and Maddie entered the intervention phase first and had more opportunities to textmap than the two subsequent groups however this extended exposure to textmapping did not result in higher scores for oral retell and main idea statements than others who only had five to eight opportunities to participate in textmapping. David, Kenny, and Mika were the last group to enter the intervention phase and tended to score higher than the other participants for oral retell and main idea statements.

Individual participation varied in terms of participants who were eager to read aloud. Addy, Faith, Becka, Anna, and Mika were frequent volunteers, while Kenny rarely read, Beth never read aloud, and Brandt did not begin to read aloud until the fourth intervention session and his participation increased with each session.

Although each group read the same texts, the note-taking results varied from group to group when students began taking over the role of identifying important information to record on the textmap. Some groups recorded very little information, while other groups recorded a great deal of information because some participants were more eager to be the person writing notes and would point out information frequently wanting to write it down. There tended to be some

competition at times as to who could find the important information so they could be the note taker.

In some cases, key pieces of information were missed and required interventionist support to recognize the importance of the information through discussion. In the instances where groups did not independently record important information necessary to provide an accurate oral retell and main idea statement, interventionist guidance led to ultimately including the information by discussing how the information was related to the overall focus or meaning of the text. The amount of notes written during intervention did vary greatly across the three groups with the first intervention group typically including much more information than the other two groups.

Additionally, there were always various levels of engagement across baseline and intervention phases. This could be a result of a nonpreferred topic being reading during a particular session or attributed to host of unknown factors not obvious to the interventionist during the study.

Single Case Experimental Design Visual Analysis

This chapter presents the data collected through the current study in order to address the three research questions. Single Case Experimental Design Visual Analysis and Hierarchical Linear Modeling were used to analyze participants' oral retell statements and main idea statement scores in order to answer the research questions. Wilcoxon signed-rank test was used to examine QRI-7 pretest and posttest scores on comprehension questions and oral retell scores. Specifically, this study focused on to what extent ITMI impacts participants' reading comprehension of informational text.

Oral Retell Statement Results. To conduct visual inspection, session scores for each participant (n = 10) were graphed for each of the oral retell measures during baseline and intervention (See Figures 4.1 - 4.3). Visual analysis of participants' oral retell data revealed

highly variable data across participants. Visual analysis of participants' main idea data revealed highly variable data across participants. Visual analysis was conducted by analyzing level (e.g., the change in performance between baseline and intervention phases), the immediacy of the effect (e.g., the extent to which performance changed simultaneously with a condition change), and nonoverlap (e.g., the extent to which data points in baseline and intervention phases do not overlap) individual participant. The following visual analysis of participants' results is ordered starting with the best responders to the intervention to the least responsive to the intervention, considering the change in level from baseline to intervention and taking into consideration the amount of nonoverlap present across the baseline and intervention phases.

Becka. Results for Becka indicate she responded positively to the intervention (See Figure 4.1). Data demonstrated a clear change in level with the mean score in baseline of 11.2% (M = 11.2) and intervention at 39.8% (M = 39.8). Nonoverlap was 90.9% of the data points falling outside the range of the baseline data, however, the immediacy of effect was not evident due to the variability during the onset of the intervention phase. Her scores are indicative of improvement and establish a basic effect between the intervention and oral retell score. During baseline, Becka provided the following retell which was similar to all five of her baseline retells:

"That there was a science fair, and they didn't want to use any ideas that were given to them. So they studied a lot of things and got a person to help them and made a compressor thing that would spin a turbine when the wave pressed down on the bag and make it electricity."

On this day Becka was only able to retell two out of 11 big ideas parsed for the chapter, leaving out a significant amount of information. Unlike the following oral retell statement Becka provided during the intervention phase which provides much more information and was representative of her ability during intervention:

"So, they were they were just like examining all the cacti to research them. And then they figured out that they were dying and how many had been in 1935 so they thought that there was an illness, so they started taking away all the sick ones to leave the healthy ones but then they figured out that it wasn't that they were dying because they were either too cold or too hot, because the nurse trees were being ripped up for lumber and things. So they made it a national parks so the loggers couldn't just come in and chop down the nurse trees."

In this particular oral retelling Becka was able to provide four out of the five big ideas parsed within the chapter. She also included a specific date from the chapter which was only mentioned within a caption describing when and how cacti were dying in Saguaro National Park.

Kenny. Results for Kenny indicated she responded positively to intervention (See Figure 4.3). Data demonstrated a clear change in level with mean scores in baseline of 7.5% (M = 7.5) and intervention at 30% (M = 30). The immediacy of effect was evident with the last three data points in baseline of 0%, 17%, and 0%, and the first three data points in intervention phase of 43%, 25%, 55% out of a possible score of 100%. The nonoverlap in the data points across baseline and intervention phases was 100%. There was consistency of data in similar phases as Kenny's baseline scores ranged between 0% and 20% while the intervention scores ranged between 25% to 60%. The changes in level are in the desired direction, immediate, readily discernible, and maintained over time and it was concluded that changes in oral retell scores across phases are resultant of the intervention treatment and are indicative of improvement, establishing a basic effect between intervention and oral retell score. The following oral retell represents the highest level of information present in Kenny's oral retell statements as her highest scores across baseline as five out of her 10 baseline scores were zero for oral retell:

"They were talking about like how the wind like in the last section they were talking about you know the thing and then he was like saying that he doesn't care about like, the anything breaking and he'll go back to it after and stuff."

On this day Kenny was only able to provide information from one out of the possible 11 big ideas parsed for this chapter and referred to the ending of the chapter, however the information she provided was the beginning of the chapter read on that day. Kenny demonstrated clear improvement in her ability to provide increased information across the chapters in intervention phase. The following oral retell is representative of her performance across the intervention phase:

"Um well so I remember that that the animals help pollinate the cactuses blossoms. And then I remember they they'll die without the nursing tree there in Saguaro National Park, and people are coming all over the world to come to the cacti and stuff and some animals eat the cactuses and I remember that there was the cactuses in some places were really tall and then they got really short and that's because the cattle stomped all over them. And I remember that that's how in the diagram it shows like 15 to I think it was 20 years it will grow like was it like five feet."

For this particular oral retell statement Kenny was able to retell details for three of the five big ideas parsed for the chapter and it should also be noted that she referenced information directly from a text feature when she referenced the diagram from the chapter showing how cacti grow over time.

Addy. Results for Addy indicate she responded positively to intervention (See Figure 4.2). Evaluation of each condition indicated data were variable during intervention. Evaluation of level change within conditions indicated performance was deteriorating during baseline and improving during intervention. Data demonstrated a clear change in level with mean score in baseline of

15.6% (M = 15.6) and intervention at 31.83% (M = 31.83). Nonoverlap was 83.3% of the data points in intervention falling outside the range of the baseline data, however, immediacy of effect was not evident, and there is not stability within the phases. Her scores are indicative of improvement and establish a basic effect between the intervention and oral retell score.

David. Results for David indicate he responded positively to intervention as the change in level was in the desired direction (See Figure 4.1). The mean score in baseline was 7.3% (M = 7.3) and intervention was 20% (M = 20). Nonoverlap was 60% of the data points falling outside the range of the baseline data. The immediacy of effect was evident with the last three data points in baseline of 20%, 17%, and 9% and the first three data points in intervention phase of 57%, 38%, and 44% out of a possible score of 100%, however, evaluation of each condition indicated data were variable during baseline and intervention. His scores are indicative of improvement and establish a basic effect between the intervention and oral retell score.

Brandt. Results for Brandt indicate he had a moderate response to intervention as change in level was in the desired direction (See Figure 4.1). The mean score in baseline was 10.1% (M = 10.1) and intervention was 27.3% (M = 27.3). Evaluation of each condition indicated data were variable during baseline and intervention. Nonoverlap was 50% of the data points falling outside the range of the baseline data. Brandt was a passive participant during the baseline phase and rarely volunteered to read aloud except for when Mika encouraged him or volunteered him to read captions, which he seemed to do with a positive attitude when these occurrences took place. Towards the last five sessions, Brandt began to offer to read longer sections of the text stream and began to ask if he could read captions for text features without encouragement from peers. The following is a representative oral retell for a Brandt during the baseline phase:

"They had to make a new buoy because the other ones broke. And they tested it and the waves, and they had to get a trailer to move it to the ocean it worked out perfectly."

On this day Brandt was only able to provide one out of the 13 possible big ideas parsed for the chapter. This was typical for Brandt during baseline phase with little change as evidenced by the following oral retell he provided during intervention which is representative of his performance:

"This guy, he had a partner with them, and they were crossing the boardwalk and they got up to this mountain and he got out on his instruments, and he stuck it into the ground to see how hot it was. And he said, people might not be able to walk across it because it was too hot."

On this day Brandt was only able to provide two out of the possible seven big ideas parsed for the chapter, which is representative of his ability throughout intervention except for one outlier score of 60% which was his highest score across baseline and treatment phases. Brandt is a good example of what the moderate responses looked like across the other moderate responders (e.g., Mika, Beth, Faith, and Anna).

Mika. Results for Mika indicate she had a moderate response to intervention, as the change in level was in the desired direction (See Figure 4.2). The mean score at baseline was 8.1% (M = 8.1) and intervention was 29% (M = 29). Nonoverlap was 33.3% of the data points failing outside the range of the baseline data. This participant only has three intervention data points due to absences resulting in incomplete data for full comparison between baseline and intervention phases.

Beth. Results for Beth indicate she did respond positively to intervention as change in level was in the desired direction (See Figure 4.3). The mean score at baseline was 21% (M = 21) and intervention was 35% (M = 35). Nonoverlap was 45.4% of the data points falling outside the range of the baseline data. There was no immediacy of effect due to the variability of the data in baseline and intervention phases. Her scores are indicative of improvement and establish a basic effect between the intervention and oral retell score.

Faith. Results for Faith indicate she responded positively to intervention with a minimal change in level with a mean score in baseline of 45.2% (M = 45.2) and intervention at 58.8% (M = 58.8) (See Figure 4.1). Nonoverlap was 25% of the data points falling outside the range of the baseline data. There was no immediacy of effect due to the variability of the data in baseline and intervention phases. Her scores are indicative of improvement and establish a basic effect between the intervention and oral retell score.

Anna. Results for Anna indicate she did have a moderate response to intervention as the change in level was in the desired direction (See Figure 4.3). The mean score in baseline was 13.3% (M = 13.3) and intervention was 25.9% (M = 25.9). Nonoverlap was 37.5% of the data points falling outside the range of the baseline data. Evaluation of each condition indicated data were variable during baseline and intervention. There was no immediacy of effect due to the variability of the data in baseline and intervention phases.

Hailey. Results for Hailey indicate she had no reliable pattern of change during the intervention phase and no visually discernable changes in the level of scores between baseline and intervention phases (See Figure 4.2). The mean score in baseline was 17.1% (M = 17.1) and intervention was 23% (M = 23). Nonoverlap was 0% as no data points fell outside the range of the baseline data. Evaluation of each condition indicated data were variable during baseline and intervention. The following is a typical oral retell during baseline phase:

"So first she like she and her team built a device for the put on the water and when they did, it wasn't really the right thing they were looking for, so they built another thing. Again, not the right thing. They were looking for it. And then the final thing the last thing was that that that food looking stand it sinks, but they were too late. They were too late to build another thing because another team already beat them."

Hailey provided a somewhat lengthy oral retell; however, it was inaccurate and misrepresented the information, which was a regular occurrence for Hailey across baseline and intervention phases. She was only able to provide one accurate big idea out of the possible 11 for this chapter. The following is representative of the oral retells Hailey provided during intervention phase:

"So first, when the tsunami came, when it came, they were like about 13 houses were destroyed and they were rushing up to the hills the tsunami happened because of the...I can't remember."

Hailey was only able to provide one big idea out of the possible 11 for this chapter. While there are multiple pieces of information in the retell a majority was inaccurate. Hailey was the only participant who regularly included inaccurate information in oral retell.

The above analysis took into consideration several aspects of visual analysis including change in level, nonoverlap, and immediacy of effect to report participants' results in an order based on these factors. An alternative way to examine the results is to view the participants' performances in groups of best responders on visual inspection (see Figure 4.1). Looking across the Figure, Becka and Faith belong to the first group to enter the intervention phase, Brandt belongs to the second group to enter intervention phase, and David belongs to the last group to enter intervention phase and each of these participants are the best responders to the intervention upon visual analysis of performance.

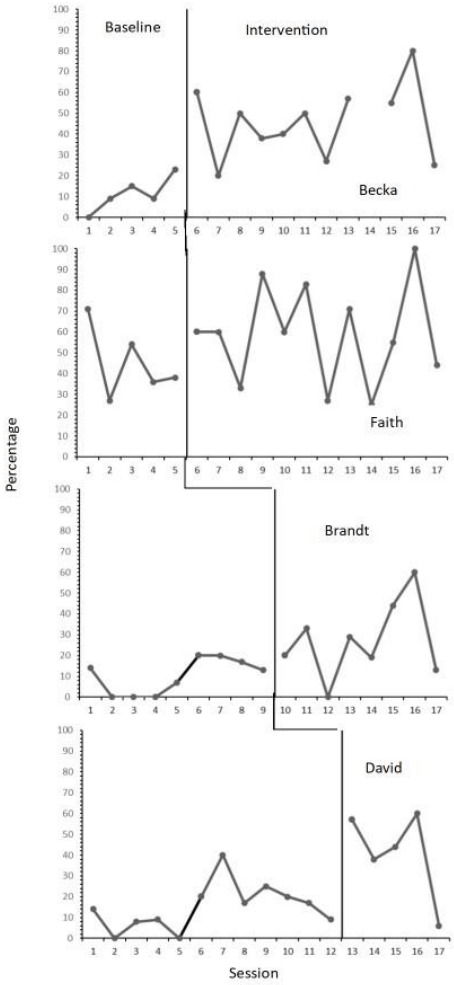

Figure 4.1 *Oral Retell Scores for Best Responders on Visual Inspection*

Note: Oral retell scores are representative of the best responders on visual inspection for each of the three staggered groups as Becka (first group to enter intervention phase), Brandt (second group to enter intervention phase), and David (last group to enter intervention phase), demonstrated the best visual response to intervention compared to peers in their respective intervention start time groups.

The next group consists of Addy, Hailey, and Mika. Upon visual inspection of performance on oral retell these students performed as the least responsive from their respective groups entering intervention.

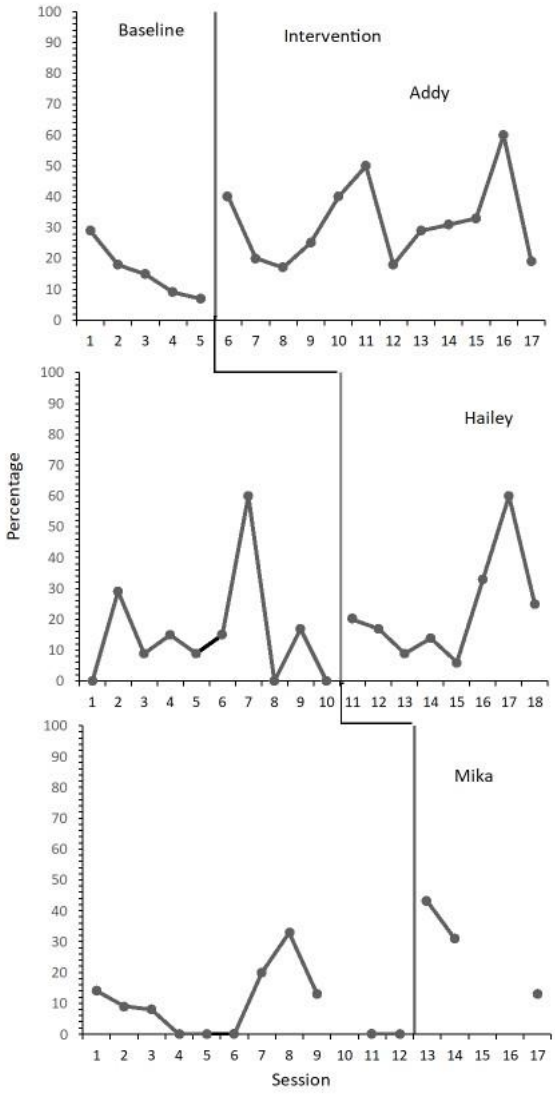

Figure 4.2 *Oral Retell Scores for Least Responsive on Visual Inspection*

Note: Oral retell scores are representative of the least responsive participants on visual inspection for each of the three staggered groups as Addy (first group to enter intervention phase), Hailey (second group to enter intervention phase), and Mika (last group to enter intervention phase), demonstrated the least response to intervention compared to peers in their respective intervention start time groups.

The final group of visual analysis graphs (see Figure 4.3) include the remaining participants who neither represent the best or least responsive performers from their respective staggered start groups entering intervention and include Beth, Anna, and Kenny.

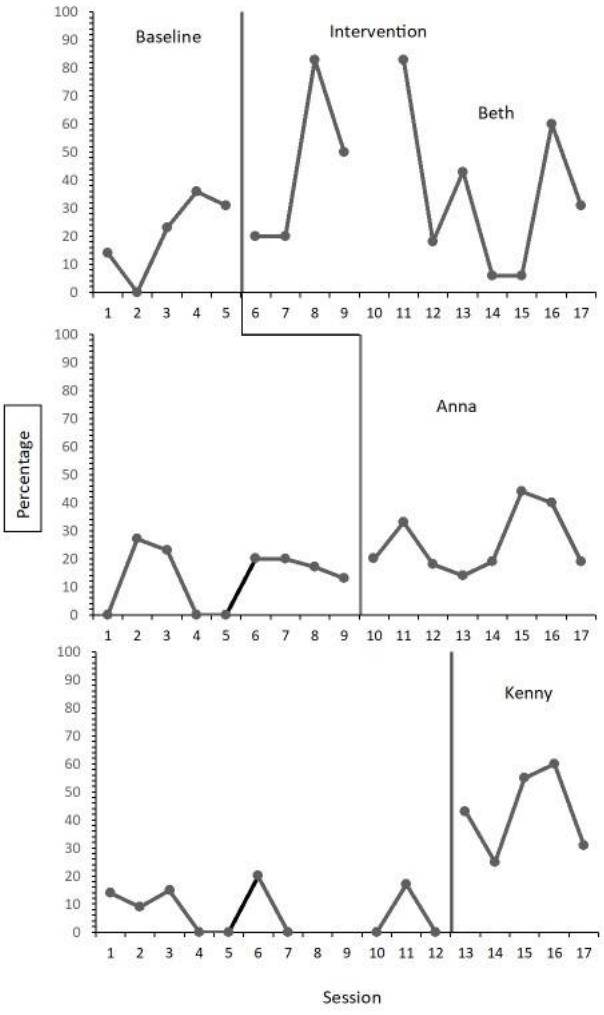

Figure 4.3 *Oral Retell Scores for Remaining Participants*

Note: Oral retell scores are representative of the participants who did not upon visual inspection fall into the best or least to respond to intervention.

Oral Retell Statement Summary. In summary, visual inspection revealed that all ten participants showed various levels of improvement with Kenny and David showing clear visual improvements in the intervention phase with an obvious change in level between baseline and intervention phases, high percentage of nonoverlap between phases, and through immediacy of effect. Becka and Addy demonstrated a change in level and high percentages of nonoverlap but no immediacy of effect. While Brandt, Mika, Beth, Faith, and Anna demonstrated moderate

improvements based on change in level and nonoverlap percentages, and Hailey demonstrated very little improvement with a change in level of only 5.9% and zero nonoverlap. Due to the variability across phases for the majority of the participants, Hierarchical Linear Modeling was applied to examine the effects of the intervention from the student and group levels to further address the respective research questions. These results are provided in the coming sections.

Main Idea Statement Results. To conduct visual inspection, session scores for each participant (n = 10) were graphed for each of the main idea statement measures during baseline and intervention (See Figures 4.4 - 4.6). Visual analysis of participants' main idea data revealed highly variable data across participants. Visual analysis was conducted by analyzing level (e.g., the change in performance between baseline and intervention phases), immediacy of the effect (e.g., the extent to which performance changed simultaneously with a condition change), and nonoverlap (e.g., the extent to which data points in baseline and intervention phases do not overlap) individual participant. The following visual analysis of participants' results is ordered starting with the best responders to the intervention to least responsive to the intervention, considering the change in level from baseline to intervention and taking into consideration the amount of nonoverlap present across the baseline and intervention phases.

David. Results for David indicated a change in level in a positive direction with a mean score in the baseline of 2 (M = 2) and intervention at 3.8 (M = 3.8) (See Figure 4.4). Nonoverlap was 80% of the data points falling outside the range of the baseline data. Immediacy of effect was evident with the last three data points in baseline of 2, 2, 2, and first three data points in intervention phase of 4, 4, 4 out of a possible score of 5. His scores are indicative of improvement, and they establish a basic effect between the intervention and main idea score. During baseline David provided the following main idea statement which was similar to all 12 of his baseline main idea statements:

"like the waves and like creating companies and like building how they build how they're gonna build and testing the devices like electrically device."

David typically provided main idea statements that indicated an inaccurate or incomplete understanding of the main idea, scoring 2's for eight out of 12 main idea statements. However, during intervention, David's ability to determine the main idea improved. The following main idea statement is representative of David's main idea statements during the intervention phase:

"So the main idea was basically geysers, hot springs, steam vents and hydrothermal features. and the like Hank the geologist checking out how they were in Yellowstone."

On this main idea statement, David was able to provide a clear generalization that stated or implied the main idea from the text scoring a 4 out of a possible 5.

Kenny. Results for Kenny indicated she responded positively to intervention (See Figure 4.6). Data demonstrated a clear change in level with mean scores in baseline of 1.4 (M = 1.4) and intervention at 3 (M = 3). Immediacy of effect was evident with the last three data points in baseline of 2, 1, 2, and first three data points in intervention phase of 3, 4, 3 out of a possible score of 5. The nonoverlap in the data points across baseline and intervention phases was 80%. There was consistency of data in similar phases as Kenny's baseline scores ranged between 1 and 2 while the intervention scores ranged between 2 and 4. The changes in level are in the desired direction, immediate, readily discernible, and maintained over time and it was concluded that changes in main idea scores across phases are resultant of the intervention treatment and are indicative of improvement, establishing a basic effect between intervention and main idea score.

Addy. Data demonstrated a change in level in a positive direction with mean score in baseline of 2 (M = 2) and intervention at 3.4 (M = 3.4) (See Figure 4.4). Nonoverlap was 50% of the data points in intervention falling outside the range of the baseline data, however, immediacy of effect was not evident, and there is not stability within the phases.

Mika. Data demonstrated a change in level in a positive direction with a mean score in the baseline of 1.7 (M = 1.7) and intervention at 3 (M = 3) (See Figure 4.5). Nonoverlap was 33.3% of the data points falling outside the range of the baseline data. Immediacy of effect was not evident due to the variability in baseline and intervention phases.

Beth. Data demonstrated a change in level in a positive direction with a mean score in the baseline of 1.6 (M = 1.6) and intervention at 2.9 (M = 2.9) (See Figure 4.6). Nonoverlap was 27.3% of the data points falling outside the range of the baseline data. Immediacy of effect was not evident due to the variability in the baseline and intervention phases.

Anna. Data demonstrated a change in level in a positive direction with mean score in baseline of 1.9 (M = 1.9) and intervention at 2.9 (M = 2.9) (See Figure 4.x). Nonoverlap was 25% of the data points falling outside the range of the baseline data, and immediacy of effect was not evident due to the variability during baseline and intervention phases.

Becka. Data demonstrated a change in level in a positive direction with mean score in baseline of 2.8 (M = 2.8) and intervention at 3.72 (M = 3.72) (See Figure 4.4). Nonoverlap was 0% of the data points falling outside the range of the baseline data, and immediacy of effect was not evident due to the variability during end of baseline phase.

Hailey. Data demonstrated a change in level in a positive direction with a mean score in the baseline of 1.8 (M = 1.8) and intervention at 2.5 (M = 2.5) (See Figure 4.5). Nonoverlap was 63% of the data points failing outside the range of the baseline data. Immediacy of effect was not evident due to the variability in intervention phase.

Brandt. Data demonstrated a change in level in a positive direction with a mean score in baseline of 1.7 (M = 1.7) and intervention at 2.5 (M = 2.5) (See Figure 4.6). Nonoverlap was 50% of the data points falling outside the range of the baseline data. Immediacy of effect was not evident due to the variability during baseline and intervention phases.

Faith. Data demonstrated a change in level in a positive direction with mean score in baseline of 2.8 (M = 2.8) and intervention at 3.2 (M = 3.2) (See Figure 4.5). Nonoverlap was 8.3% of the data points falling outside the range of the baseline data, and immediacy of effect was not evident due to the variability during baseline and intervention phases. The following main idea statement represents the typical statement Faith provided during baseline:

"The main idea from chapter four would be that she, that Annette is that Annette tried to figure out another way, but some other people tried to do, tried to do a little bit the same thing. And when they did that, they did a prototype. I forgot what the name was buoy something. And they used and they made it in the made like...And they made like a little buoy. It was like round and tall."

Faith scored a 2 on three out of the five baseline sessions, providing statements that indicated an inaccurate or incomplete understanding of the main idea. However, during the intervention phase, she was able to provide main idea statements that included a clear generalization that stated or implied the main idea as the following examples shows:

"The main idea from chapter four would be that she, that Annette is that Annette tried to figure out another way, but some other people tried to do, tried to do a little bit the same thing. And when they did that, they did a prototype. I forgot what the name was buoy something. And they used and they made it in the made like...And they made like a little buoy. It was like round and tall."

Faith was the only participant who scored a 5 over the course of the study. The following statement was provided on the final day of intervention:

"I think the main idea of the chapter was that, um, so, Amy would show that Amy was trying to… is trying to collect the DNA from the salamanders so that you can try and save them and try to see what's in trying to see how they're going to respond to the future."

On this day Faith demonstrated the ability to read beyond the literal words and her main idea included references beyond the text to demonstrate meaning. When she explained that Amy was trying to see how salamanders would respond in the future, she provided information not explicitly stated in the text but was able to make this inference based on the content within the text and her background knowledge.

The above analysis took into consideration several aspects of visual analysis including change in level, nonoverlap, and immediacy of effect to report participants' results in an order based on these factors. An alternative way to examine the results is to view the participants' performances in groups of best responders on visual inspection (see Figure 4.4). Looking across the Figure, Becka and Addy belong to the first group to enter the intervention phase, Anna belongs to the second group to enter intervention phase, and David belongs to the last group to enter intervention phase and each of these participants are the best responders to the intervention upon visual analysis of performance.

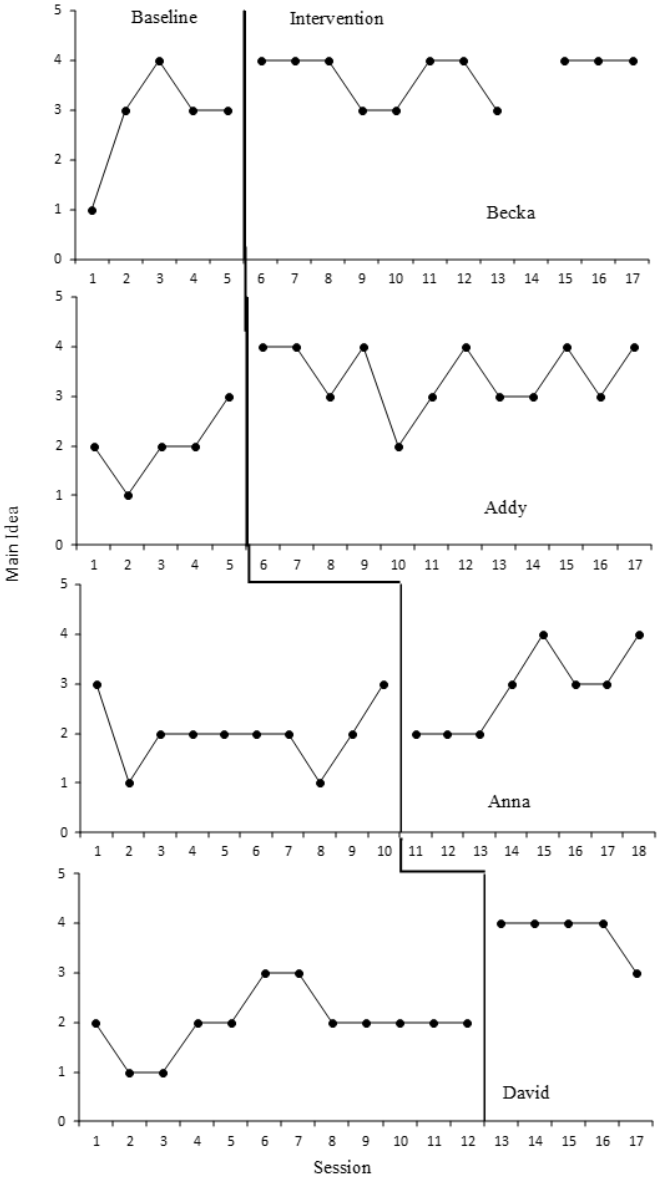

Figure 4.4 *Main Idea Scores for Best Responders on Visual Inspection*

Note: Main idea scores are representative of the best responders on visual inspection for each of the three staggered groups as Becka and Addy (first group to enter intervention phase), Anna (second group to enter intervention phase), and David (last group to enter intervention phase), demonstrated the best visual response to intervention compared to peers in their respective intervention start time groups.

The next group consists of Faith, Hailey, and Mika. Upon visual inspection of performance on oral retell these students performed as the least responsive from their respective groups entering intervention.

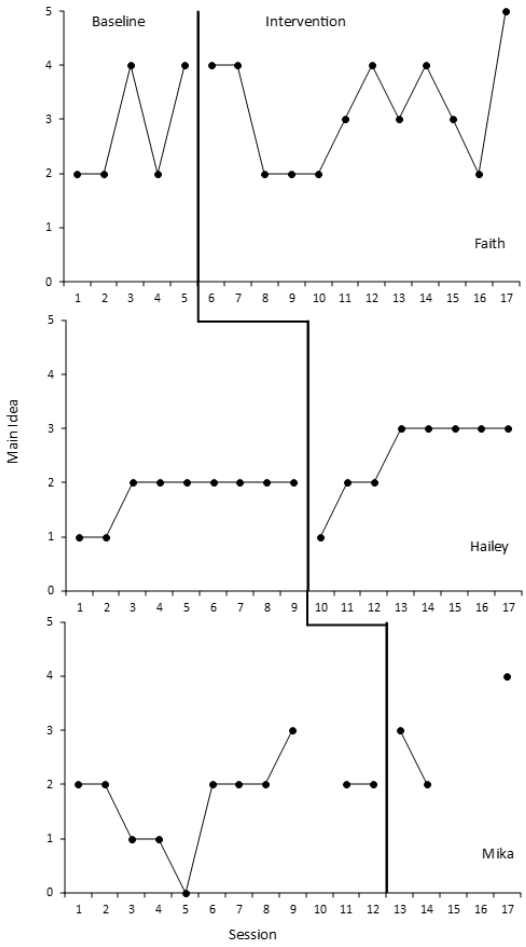

Figure 4.5 *Main Idea Statement Scores for Least Responsive on Visual Inspection*

Note: Main idea scores are representative of the least responsive participants on visual inspection for each of the three staggered groups as Faith (first group to enter intervention phase), Hailey (second group to enter intervention phase), and Mika (last group to enter intervention phase), demonstrated the least response to intervention compared to peers in their respective intervention start time groups.

The final group of visual analysis graphs (see Figure 4.6) includes the remaining participants who neither represent the best or least responsive performers from their respective staggered start groups entering intervention and include Beth, Brandt, and Kenny.

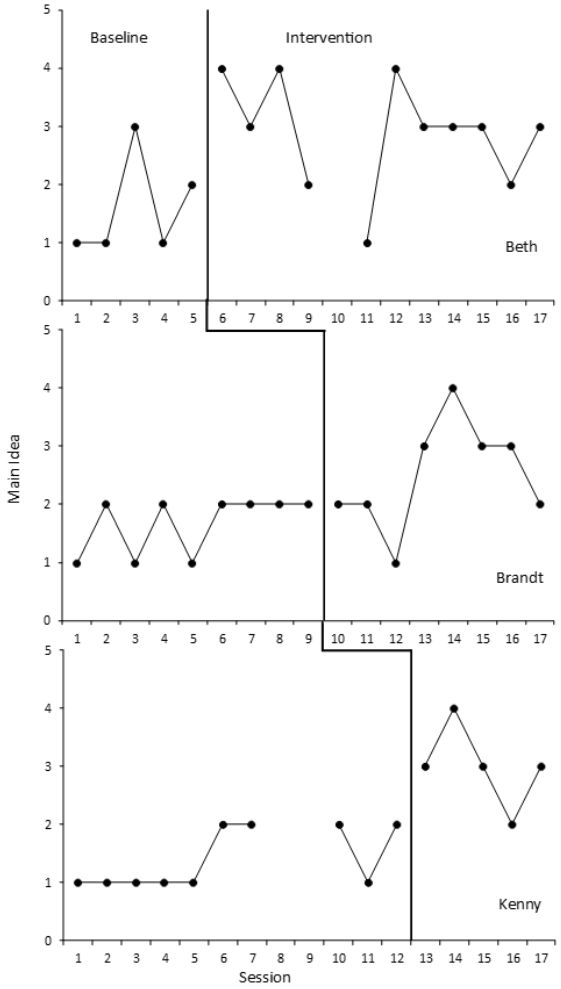

Figure 4.6 *Main Idea Statement Scores for Remaining Participants*

Note: Oral retell scores are representative of the participants who did not upon visual inspection fall into the best or least to respond to intervention.

Main Idea Statement Summary. In summary, visual inspection revealed that all ten participants showed various levels of improvement with David and Kenny showing clear visual improvements in the intervention phase high percentage of nonoverlap between phases, and through immediacy of effect. All remaining participants demonstrated a change in level; however they did not demonstrate high percentages of nonoverlap or immediacy of effect. Due to the variability across phases for the majority of the participants, Hierarchical Linear Modeling was

applied to examine the effects of the intervention from the student and group levels to further address the respective research questions. These results are provided in the coming sections.

Masked Visual Analysis. An expert in the single-case design served as the visual analyst in the current study. The analyst was blind to the participants intervention staggered start times and uninvolved in the intervention process. The visual analyst studied masked graphs of each participant and estimated which participant received the intervention at each of the three intervention condition start times (Ferron & Jones, 2006). The analyst's estimations were not aligned with the assignments on the oral retell measure and main idea statement generation in the first 210 guesses, thus $p > .05$ thus, the results are inconclusive and there may or may not have been treatment effects.

Hierarchical Linear Modeling (HLM) Analysis

Hierarchical Linear Modeling was applied to examine the effect of intervention on the reading comprehension of the fourth-grade students to address the respective research questions. Specifically, this study focused on the efficacy of Informational Text Mapping Intervention and the interventions impact on fourth-grade students' ability to generate main idea statements and oral retells for an informational text. Note that the restricted maximum likelihood (REML) estimation method was used assuming the estimation was performed as simple statistics.

The model fit to the data was a two–level HLM model where at Level 1, each individual's level of reading comprehension was represented by the outcomes on the oral retell score and main idea statement score across the 17 sessions. At Level 2, the average effect for all participants' reading comprehension was represented by the average outcomes on the oral retell scores and main idea statement scores.

The first hierarchical linear model fit was the random coefficient model, which estimates the average change in level, the variance in baseline levels, and the variance in treatment levels.

Level 1 of the random coefficient model is a linear model of main idea and oral retell scores in the outcome over time. Level 2 of the random coefficient model allows the estimation of the variance components of the intercept and slope terms across participants. Level 1 of the random coefficient model can be written as

$$\Upsilon_{Comprehension} = \pi_{0i} + \pi_{1i} * Phase_{ti} + e_{ti}$$

Where $\Upsilon_{Comprehension}$ signifies the outcome measure (main idea statement score) for student i at time t. π_{0i} signifies the baseline of main idea statement at the first assessment administration, while π_{1i} signifies the slope or growth rate. The variable Phase is the time of individual i.

In the random coefficient model at Level 2, the variation in the initial status and the variation of slope across participants were examined. The equations below model the variation in main idea and oral retell scores as a function of the grand mean slope across all participants. In the first equation specified below, π_{0i} is the average baseline for main idea and oral retell scores as measured by researcher-designed rubrics; β_{00} is the grand mean for average baseline across cases, and r_{0i} is the residual for participant i. In the equation that follows, π_{1i} is the participants intervention effect, β_{10} is the grand mean overall average intervention effect, and r_{1i} is the residual for student i in main idea and oral retell score.

$$\pi_{0i} = \beta_{00} + r_{0i}$$

$$\pi_{1i} = \beta_{10} + r_{1i}$$

Oral Retell Statement Data Analysis. The across case average treatment effect was estimated to be 20.2, which was statistically significant (t (9) = 6.60, p = <.0001 (see Table 4.3).

Table 4.3 *Oral Retell Fixed Effects Results*

Coefficients:				95% CI	
	Value	Standard Error	P Value	LL	UL
Intercept	16.0	3.22	0.0008	8.84	23.18
Phase	20.2	3.06	<.0001	13.44	26.93

The Empirical Bayes estimates for the individuals is provided in Table 4.4. The minimum shift in the levels is Hailey with 25.33 and the maximum is Becka, with 48.2. Results indicate the shift in the level from baseline to intervention was statistically significant for David (p = .006), Faith (p = .001), Kenny (p = .0006), Beth (p = .01), Addy (p = .05), and Becka (p = .0001).

Table 4.4 *Oral Retell Empirical Bayes Estimates*

Coefficients		Shift in Level From Baseline	
	Baseline average	Shift in the level	p Value
Hailey	16.09	25.33	.50
Mika	10.4	34.4	.13
Brandt	11.68	33.3	.06
David	15.07	41.9	.006***
Anna	13.73	30.2	.20
Faith	33	43.4	.001***
Kenny	10.29	47.7	.0006***
Beth	19.1	36.9	.01**
Addy	16.02	33.9	.05*
Becka	14.6	48.2	.0001***

* p < .05, ** p <.01, *** p <.001

Covariance parameter estimates for Oral Retell are in table 4.5.

Table 4.5 *Oral Retell Covariance Parameter Estimates*

Covariance Parameter Estimates					
Cov Parm	Subject	Estimate	Standard Error	Z Value	Pr > Z
Intercept	person	69.2185	45.0707	1.53	0.0628
Phase	person	21.0024	38.5758		
Residual		265.41	31.0092	8.72	<.0001

Main Idea Statement Data Analysis. The across case average treatment effect was estimated to be 1.11, which was statistically significant (t (9) = 8.56, p = <.0001 (see Table 4.6).

Table 4.6 *Fixed Effects Results*

Coefficients:				95% CI	
	Value	Standard Error	P Value	LL	UL
Intercept	1.93	0.14	<.0001	1.63	2.23
Phase	1.11	0.13	<.0001	0.83	1.39

Note: CI = Confidence Interval, LL = Lower Level, UL = Upper Level

The Empirical Bayes estimates for the individuals is provided in Table 4.7. The minimum shift in the levels is Becka with 1.7 and the maximum is Faith with 2.71. Results indicate the shift in the level from baseline to intervention was statistically significant for all participants except for Becka (p = .07) and Anna (p = .06).

Table 4.7 *Main Idea Empirical Bayes Estimates*

Coefficients		Shift in Level From Baseline	
	Baseline average	Shift in the level	p Value
Hailey	1.78	2.13	.002*
Mika	2.38	1.81	.03*
Brandt	2.4	2.32	.0003**
David	2	2.41	<.0001***
Anna	1.74	1.83	.06
Faith	1.98	2.71	<.0001***
Kenny	1.57	2.35	.001***
Beth	1.89	1.98	.008**
Addy	1.74	1.77	.04*
Becka	1.81	1.7	.07

* p < .05, ** p <.01, *** p <.001

Covariance parameter estimates for Main Idea are in table 4.8.

Table 4.8 *Main Idea Covariance Parameter Estimates*

Covariance Parameter Estimates					
Cov Parm	Subject	Estimate	Standard Error	Z Value	Pr > Z
Intercept	person	0.09891	0.07344	1.35	0.0890
Phase	person	0	.	.	
Residual		0.6014	0.07497	8.02	<.0001

Qualitative Reading Inventory-7 Comprehension Questions

Participants were assessed with the QRI-7 prior to the start of baseline treatment and upon the completion of intervention treatment. Pretest and Post-Intervention results indicate a majority of the participants demonstrated an increased ability to answer explicit and implicit comprehension questions with and without lookbacks at the text (see Table 4.9).

Kenny. During pretest Kenny's assigned instructional reading passage level was grade 3 and during posttest her assigned instructional reading passage level was grade 4. In pretest Kenny scored a 67% answering implicit questions without lookbacks on level 3 and 25% correct on level 4 in posttest. She answered all questions correctly (100%) without lookbacks on level 3 and

75% with lookbacks on level 4. She answered 25% of explicit questions on level 3 without lookbacks and 0% during posttest on level 4. She scored 100% of the explicit questions with lookbacks on both pretest and posttest. She scored within the independent range on level 3 and instructional on level 4.

Addy. During pretest and posttest Addy's assigned instructional reading passage level was grade 4. Addy correctly answered 25% of the implicit questions without lookbacks in pretest and 50% in posttest. She answered 75% of implicit questions with lookbacks correctly in pretest and 100% in posttest. She answered 0% of explicit questions without lookbacks in pretest and 100% in posttest, and 75% of explicit questions with lookbacks in pretest and 100% in posttest. At pretest the level 4 passage was considered her instructional level and at posttest she scored within the independent level.

Becka. During pretest and posttest Becka's assigned instructional reading passage level was grade 5. Becka correctly answered 67% of the implicit questions without lookbacks in pretest and 100% in posttest, resulting in no need to offer lookbacks in posttest. She was unable to answer any additional questions correctly with lookbacks in pretest, and her score remained at 67%. She answered 75% of explicit questions without lookbacks in pretest and 100% in posttest. Becka was able to increase her score to 100% of correctly answered explicit questions with lookbacks in pretest and did not require lookbacks in posttest because she answered all questions correctly without lookbacks. At pretest the level 5 passage was considered her instructional level and at posttest she scored within the independent level.

Faith. During pretest and posttest Faith's assigned instructional reading passage level was grade 5. Faith correctly answered 50% of the implicit questions without lookbacks in pretest and 100% in posttest, resulting in no need to offer lookbacks in posttest. She was able to answer additional questions correctly with lookbacks in pretest and increased her score to at 75%. She

answered 100% of explicit questions without lookbacks in pretest and 75% in posttest. Faith did not require lookbacks on the pretest and was able to increase her score to 100% of correctly answered explicit questions with lookbacks in posttest. At pretest the level 5 passage was considered her instructional level and at posttest she scored within the independent level.

Anna. During pretest and posttest Anna's assigned instructional reading passage level was grade 4. Becka correctly answered 67% of the implicit questions without lookbacks in pretest and 100% in posttest, resulting in no need to offer lookbacks in posttest. She was unable to answer any additional questions correctly with lookbacks in pretest, and her score remained at 67%. She answered 75% of explicit questions without lookbacks in pretest and 100% in posttest. Becka was able to increase her score to 100% of correctly answered explicit questions with lookbacks in pretest and did not require lookbacks in posttest because she answered all questions correctly without lookbacks. At pretest the level 5 passage was considered her instructional level and at posttest she scored within the independent level.

Brandt. During pretest and posttest Brandt's assigned instructional reading passage level was grade 5. Brandt correctly answered 0% of the implicit questions without lookbacks in pretest and 50% in posttest, resulting in no need to offer lookbacks in posttest. He was unable to answer any additional questions correctly with lookbacks in pretest, and his score remained at 0%. He correctly answered 100% of the implicit questions in posttest with lookbacks. He answered 0% of explicit questions without lookbacks in pretest and posttest and 100% and of explicit questions with lookbacks in pretest and posttest. At pretest the level 5 passage was considered his frustration level and at posttest he scored within the independent level.

Hailey. During pretest Hailey's assigned instructional reading level was grade 3 and posttest and posttest reading passage level was grade 4. Hailey correctly answered 67% of the implicit questions without lookbacks in pretest and 100% in posttest, resulting in no need to offer

lookbacks in posttest. She was unable to answer any additional questions correctly with lookbacks in pretest, and her score remained at 67%. She answered 75% of explicit questions without lookbacks in pretest and 100% in posttest. Becka was able to increase her score to 100% of correctly answered explicit questions with lookbacks in pretest and did not require lookbacks in posttest because she answered all questions correctly without lookbacks. At pretest the level 5 passage was considered her instructional level and at posttest she scored within the independent level.

David. During pretest and posttest David's assigned instructional reading passage level was grade 2. David correctly answered 25% of the implicit questions without lookbacks in pretest and 50% in posttest. He was able to correctly answer more questions with lookbacks and scored 75% of the implicit questions in pretest and posttest. On pretest David scored 50% on explicit questions without lookbacks and 25% at posttest. When allowed to lookback at the text he scored 100% in pretest and posttest. At pretest and posttest the level 2 passage was considered his instructional level.

Mika. During pretest and posttest Mika's assigned instructional reading passage level was grade 4. Mika correctly answered 0% of the implicit questions without lookbacks and 50% during posttest. She scored 15% correct on implicit questions with lookbacks in pretest and 75% correct in posttest. Mika scored 25% correct on explicit questions without lookbacks in pretest and posttest, then scored 25% on explicit questions with lookbacks in pretest and 75% correct in posttest. At pretest the level 4 passage was considered her frustrational level and in posttest she scored within the instructional level.

Beth. During pretest and posttest Beth's assigned instructional reading passage level was grade 5. Beth answered 25% of implicit questions without lookbacks and 100% on posttest. She was able to answer additional implicit questions with lookbacks during pretest and increased her

score to 50%. On explicit questions without lookbacks, Beth scored 100% on pretest and 75% on posttest. She did not require lookbacks on the pretest, but she increased her score on posttest with lookbacks to 100%. At pretest, the level 5 passage was considered her instructional level and in posttest she scored within the independent level.

Table 4.9 *QRI-7 Comprehension Question Scores*

Name	Passage Grade Level		Comprehension Question Scores								Overall Score	
			Implicit WOL	Implicit WOL	Implicit WL	Implicit WL	Explicit WOL	Explicit WOL	Explicit WL	Explicit WL		
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
David	2	2	25%	50%	75%	75%	50%	25%	100%	100%	IS	IS
Hailey	3	4	75%	25%	75%	25%	50%	25%	100%	100%	IS	FR
Kenny	3	4	67%	25%	100%	75%	25%	0%	100%	100%	IN	IS
Addy	4	4	25%	50%	75%	100%	0%	100%	75%	100%	IS	ID
Mika	4	4	0%	50%	25%	75%	25%	25%	25%	75%	FR	IS
Anna	4	4	0%	50%	25%	50%	0%	75%	75%	100%	FR	IS
Faith	5	5	50%	100%	75%	NA	100%	75%	NA	100%	IS	ID
Beth	5	5	25%	100%	50%	NA	100%	75%	NA	100%	IS	ID
Brandt	5	5	0%	50%	0%	100%	0%	0%	100%	100%	FR	ID
Becka	5	5	67%	100%	67%	NA	75%	100%	100%	NA	IS	ID

Note: WOL = Without Lookbacks, WL = With Lookbacks, Pre = Pretest Intervention, Post = Post-Intervention, ID = Independent Reading Level, IS = Instructional Reading Level, FR = Frustration Reading Level

The Wilcoxon signed-rank test statistics were used to evaluate the difference of pretest and posttest QRI-7 scores on participants' ability to answer (a) implicit comprehension questions without lookbacks (b) with lookbacks, (c) explicit comprehension questions without lookbacks and (d) with lookbacks. Table 4.7 shows that two participants changed passage levels between pretest and posttest and could not be included in the Wilcoxon signed-rank test for comparison on comprehension questions. Table 4.7 also shows that out of the remaining eight participants all eight showed improvement between pretest and posttest on implicit comprehension questions without lookbacks. The change from pretest to posttest was statistically significant on the

Wilcoxon signed-rank text $p = .0078$. Therefore, the null hypothesis was rejected, suggesting a correlation between ITMI and improvement on students' ability to answer implicit questions without lookbacks.

On the measure of implicit comprehension questions with lookbacks, of the eight participants, one remained the same with 75% for pretest and posttest, four showed improvement and three did not require lookbacks as they were able to answer all questions without looking back into the text. The change from pretest to posttest was statistically significant on the Wilcoxon singed-rank test $p = .0156$. Therefore, the null hypothesis was rejected, suggesting a correlation between ITMI and improvement on students' ability to answer implicit questions with lookbacks.

On the measure of explicit comprehension questions without lookbacks, of the eight participants, four received a lower score on posttest than pretest, three demonstrated improved scores, and two received the same score across pretest and posttest. The change from pretest to posttest was not statistically significant on the Wilcoxon singed-rank test $p = .6563$. Therefore, the null hypothesis was not rejected, suggesting no correlation between ITMI and improvement on students' ability to answer explicit questions without lookbacks.

On the measure of explicit comprehension questions with lookbacks, of the eight participants, two had the same score across pretest and posttest, three demonstrated improved scores between pretest and posttest, two did not require lookback in pretest but scored 100% on posttest, which made their results incomparable, and one did not require lookbacks in posttest also making the score incomparable. The change from pretest to posttest was not statistically significant on the Wilcoxon singed-rank test $p = .2500$. Therefore, the null hypothesis was not rejected, suggesting no correlation between ITMI and improvement on students' ability to answer explicit questions with lookbacks.

Qualitative Reading Inventory-7 Oral Retell. Participants were assessed with the QRI-7 prior to the start of baseline treatment and upon the completion of intervention treatment. Pretest and Post-Intervention results indicate a majority of the participants (e.g. Kenny, Addy, Becka, Faith, Anna, Brandt, Hailey, Mika, and Beth) demonstrated an increased ability to provide oral retell of main idea and details from the passages with David showing minimal improvement for including details in oral retell (see Table 4.10).

Kenny. On a level 3 passage on pretest assessment, Kenny scored a 50% for main idea and 6% on details in her oral retell. On posttest on a level 4 passage, she scored 75% for main idea and 9% on details, showing a slight improvement in oral retell with a more difficult passage.

Addy. On a level 4 passage Addy scored 25% for main idea and 4% on details in pretest and demonstrated an improved ability to provide an oral retell in posttest with a main idea score of 80% and detail score of 73%.

Becka. On a level 5 passage, Becka's oral retell score was a 0% for main idea and 8% for details on pretest with an improved score of 67% for main idea and 28% for details provided in her oral retell on post-assessment.

Faith. On a level 5 passage, Faith's oral retell score was 0% for main idea and 27% for details in pretest with an improved score of 100% on main idea and 41% for details provided in her oral retell on posttest.

Anna. On a level 4 passage on pretest, Anna's oral retell score was 0% for main idea and 0% for details on pretest with an improved score of 60% on main idea and 35% on details provided in her oral retell on posttest.

Brandt. On a level 5 passage, Brandt's oral retell score was 0% for main idea and 4% for details in pretest with an improved score of 33% on main idea and 11% on details provided in his oral retell on posttest.

Hailey. On a level 3 passage on pretest, Hailey scored 0% for main idea and 14% on details. On posttest on a more difficult level 4 passage, she scored 60% on main idea and 35% on details in her oral retell, demonstrating an increase in her ability to provide an oral retell.

David. On a Level 2 passage, David's oral retell score was a 0% on main idea in pretest and posttest, showing no improvement and scored a 0% on pretest for details with a slight increase to 27% in posttest.

Mika. On a level 4 passage, Mika's oral retell score was a 50% on main idea and 0% for details in pretest with an improved score of 60% for main idea and 20% on details in her oral retell on posttest.

Beth. On a level 5 passage Beth's oral retell score was 0% for main idea and 12% for details in pretest with an improved score of 67% on main idea and 22% on details provided in her oral retell on posttest.

Table 4.10 *QRI-7 Oral Retell Scores*

Name	Passage Grade Level		Oral Retell Sores			
			Main Idea	Main Idea	Details	Details
	Pre	Post	Pre	Post	Pre	Post
David	2	2	0%	0%	0%	27%
Hailey	3	4	0%	60%	14%	35%
Kenny	3	4	50%	75%	6%	9%
Addy	4	4	25%	80%	4%	73%
Mika	4	4	50%	60%	0%	20%
Anna	4	4	0%	60%	0%	35%
Faith	5	5	0%	100%	27%	41%
Beth	5	5	0%	67%	12%	22%
Brandt	5	5	0%	33%	4%	11%
Becka	5	5	0%	67%	8%	28%

The Wilcoxon signed-rank test statistics were used to evaluate the difference of pretest and posttest QRI-7 scores on participants' ability to provide an oral retell including (a) main ideas and (b) supporting details. Table 4.8 shows that two participants changed passage levels between pretest and posttest and could not be included in the Wilcoxon signed-rank test for comparison on the measure of students' ability to provide the main ideas in an oral retell. Table 4.8 also shows that out of the remaining eight participants one student's score remained the same across pretest and posttest, and seven demonstrated improved scores on providing the main ideas in oral retell. The change from pretest to posttest was statistically significant on the Wilcoxon signed-rank text $p = .0078$. Therefore, the null hypothesis was rejected, suggesting a correlation between ITMI and improvement on students' ability to provide the main ideas in an oral retell.

On the measure of participants' ability to provide details in an oral retell all eight participants showed improvement between pretest and posttest. The change from pretest to posttest was statistically significant on the Wilcoxon signed-rank text $p = .0078$. Therefore, the null hypothesis was rejected, suggesting a correlation between ITMI and improvement on students' ability to provide details in an oral retell.

Summary

The data gleaned from visual analyses, masked visual analysis, and HLM were triangulated to determine the presence of a treatment effect on measures of providing main idea statements and oral retell. A treatment effect was considered truly present for a dependent variable when 1) visual analysis indicated at least three demonstrations of a treatment effect, 2) MVA conducted by the analyst led to the rejection of the null hypothesis and 3) the HLM indicated a shift in the level from baseline to intervention was statistically significant. When two of the three statistical analyses yielded significant results, partial evidence of treatment effect was assumed. No treatment effect was assumed when all three statistical analyses yielded insignificant results. Triangulation of data indicated ITMI was improvement for many of the participants over the course of the study for determining the main idea of an informational text and providing an oral retell. Data gleaned from the Wilcoxon signed-rank test for pretest and posttest performance on the QRI-7 for answering implicit and explicit questions with and without lookbacks and students' ability to provide main ideas and details in an oral retell were examined to determine if there was evidence of correlation between ITMI and improved outcomes on the QRI-7. When the statistical analyses yielded significant results, correlation was assumed. No correlation was assumed when the statistical analyses yielded insignificant results.

A comprehensive summary of the results for participants' oral retell and main idea statement generations based on the three statistical analyses, and the pretest and post-intervention QRI-7 results are presented in the next chapter.

CHAPTER FIVE: DISCUSSION

This study examined a novel reading comprehension intervention (Informational Text Mapping Intervention) designed to increase students' reading comprehension of informational texts through explicit text feature instruction in a classroom context. The specific research aims were to determine: (a) the extent to which participation in ITMI improves fourth-grade students' oral retell scores, (b) the extent to which participation in ITMI improves fourth-grade students' main idea statement scores, and (c) the extent to which fourth-grade students who are participating in ITMI demonstrate changes in their reading comprehension as measured with pretest and posttest assessment.

Examining the successful characteristics of interventions can provide insights for establishing even more comprehensive efforts to help students who struggle with comprehension of informational texts.

The data gleaned from visual analyses, masked visual analysis, and HLM were triangulated to determine the presence of a treatment effect on measures of providing main idea statements and oral retell. A treatment effect was considered truly present for a dependent variable when 1) visual analysis indicated at least three demonstrations of a treatment effect, 2) MVA conducted by the analyst led to the rejection of the null hypothesis and 3) the HLM indicated a shift in the level from baseline to intervention was statistically significant. When two of the three statistical analyses yielded significant results, partial evidence of treatment effect was assumed. No treatment effect was assumed when all three statistical analyses yielded insignificant results. Triangulation of data indicated ITMI resulted in improved comprehension for some of the participants over the course of the study for determining the main idea of an

informational text and providing an oral retell. Data gleaned from the Wilcoxon signed-rank test for pretest and posttest performance on the QRI-7 for answering implicit and explicit questions with and without lookbacks and students' ability to provide a main ideas and details in an oral retell were examined to determine if there was evidence of correlation between ITMI and improved outcomes on the QRI-7. When the statistical analyses yielded significant results, correlation was assumed. No correlation was assumed when the statistical analyses yielded insignificant results.

It is critical to investigate effective methods to teach comprehension strategies for intermediate readers. Reading comprehension provides promising pathways related to future educational opportunities, enhanced work and career related opportunities, and even life success (Seidenberg, 2017). Intermediate students who are unable to read and understand complex texts are unlikely to yield similar work and life benefits of those who have adequate or better reading comprehension (Vaughn & Barnes, 2023). Thus, reading comprehension is an essential life skill worthy of considerable educational attention.

When children have reading challenges, they are precluded from understanding content area texts, and they may have increased potential for developing negative attitudes towards reading, which might prevent students from reading for enjoyment and becoming successful, lifelong readers. As students encounter informational text and more complex content, the strategies need to work for the genres they read, which includes numerous text features.

Effective multicomponent informational text interventions have the potential to decrease the comprehension difficulties students typically face in elementary school and prevent negative outcomes later in life such as low academic achievement.

The novel intervention examined in the current study contributes to the field as a promising intervention that may be implemented in classrooms to meet the needs of students who

enter the intermediate grades with wide ranging areas of comprehension needs, and differing abilities including literacy skills, strategies, and background knowledge (Riddle-Buly, & Valencia, 2002; Valencia et al., 2010).

Main Idea Statements and Oral Retell Statements

Reading Comprehension is a complex construct that is not easily measurable (O'Reilly et al., 2014). Comprehension is demonstrated when readers can derive meaning from a text (Mastropieri & Scruggs, 1997). The effectiveness of directly teaching reading comprehension strategies such as main idea prompts (Dreher & Gambrell, 1985), retelling (Brown & Day, 1983), and comprehension monitoring (Paris et al., 1984) has been well documented in the literature. Empirical evidence supports generating main idea statements and oral retell statements not only as an instructional strategy that helps to improve comprehension and learning, but also measure comprehension (Armbruster et al., 1987; Madnani et al., 2013; Mason, 2004; Wijekumar et al., 2012). Researchers have stated that determining the main idea and oral retelling can be useful assessments of reading comprehension because an accurate and complete main idea and oral retell contain the macrostructure of the text, only essential information, and the most important ideas across the text (Blachowicz & Ogle, 2008; Fuchs & Fuchs, 1992).

Therefore, because main idea statements and oral retell statements can be an indicator of improved reading comprehension, two key findings related were identified: (1) The main idea measures indicate there may or may not have been treatment effects, as some of the participants demonstrated statistically significant results, and many of the participants improved over the course of the intervention, however there is some ambiguity based on MVA and HLM data; (2) The oral retell measure indicate there may or may not have been treatment effects, as some of the participants demonstrated statistically significant results as triangulation of data resulted in the presence of two out of the three elements necessary to claim partial evidence of treatment effect,

and many of the participants improved over the course of the intervention, however there is some ambiguity based on MVA and HLM data.

Participants' Oral Retell Statements

The first research questions was, "To what extent does participation in ITMI improve fourth-grade students' oral retell scores?" To answer this question, a researcher designed rubric was used to score students' oral retell statements in baseline and intervention conditions. Visual analysis indicated Kenny and David demonstrated obvious positive outcomes with mean scores increasing between baseline and intervention phases, minimal overlap, and presence of immediacy of effect, while Addy, Becka, Faith, Beth, Mika, Hailey, Brandt, and Anna demonstrated slight changes in mean scores between baseline and intervention phases with less obvious outcomes due to variability in baseline and intervention phases, significant overlap in data points across phases, and lack of immediacy of effect.

HLM analysis indicated a statistically significant effect on students' ability to determine the main idea as a result of the intervention. The across case average treatment was statistically significant and Empirical Bayes estimates showed statistically significant shifts in oral retell scores between baseline and intervention for Kenny, Addy, Faith, David, Beth, Mika, Hailey, and Brandt. Regardless of the HLM analysis, because the null hypothesis could not be accepted based on MVA there is some ambiguity as to whether or not the improvement for participants was due to the intervention.

Findings from this study indicate there was improvement across main idea statements for many of the participants, although to different degrees. A functional relationship between the independent variable, ITMI and the dependent variable, main idea statement measure is plausible as the null hypothesis cannot be rejected. Caution should be taken when analyzing these scores as

other factors could have impacted the variable results. Please refer to limitations of the study for further comment a review.

Participants' Main Idea Statements

To what extent does participation in ITMI improve fourth-grade students' main idea statement scores? To answer this question, a researcher designed rubric was used to score students' main idea statement generation in baseline and intervention conditions.

Visual analysis indicated Kenny and David demonstrated obvious positive outcomes with mean scores increasing between baseline and intervention phases, minimal overlap, and presence of immediacy of effect, while Addy, Becka, Faith, and Beth demonstrated obvious positive outcomes with mean scores increasing between baseline and intervention phases, and Mika, Hailey, Brandt, Anna demonstrated slight changes in mean scores between baseline and intervention phases with less obvious positive outcomes, a large degree of overlap in data points across phases, and lack of immediacy of effect.

HLM analysis indicated a statistically significant effect on students' ability to provide an oral retell as a result of the intervention. The across case average treatment was statistically significant and Empirical Bayes estimates showed statistically significant shifts in oral retell scores between baseline and intervention for Kenny, Addy, Becka, Faith, David, and Beth. Regardless of the HLM analysis, because the null hypothesis could not be accepted based on MVA there is some ambiguity as to whether or not the improvement for participants was due to the intervention.

Findings from this study indicate there was improvement across oral retell statements for many of the participants, although to different degrees. Caution should be taken when analyzing these scores as other factors could have impacted the variable results. Please refer to limitations of the study for further comment a review.

Participants' QRI-7 Pretest and Post-Test Scores

The third research question was, "To what extent do fourth-grade students who are participating in ITMI demonstrate changes in their reading comprehension as measured with pretest_and posttest assessment? To answer this question the Wilcoxon Signed-Rank test was conducted to compare pretest and posttest scores on participants' ability to answer comprehension questions without lookbacks and with lookbacks for explicit and implicit questions, and the ability to provide an oral retell statement. Participants' scores for determining the main idea demonstrated obvious improvement from pretest to posttest for all participants with the exception of David who showed only moderate improvement due to lack of increase in score for answering explicit questions without lookbacks. It could be argued that Kenny showed improvement from pretest to posttest as the passage level jump from grade 3 at independent to 4 at instructional demonstrated her ability to answer comprehension questions at grade level expectation on posttest.

All participants demonstrated improved ability to provide an oral retell of the test from pretest to posttest. In a majority of cases the participants were unable to provide any main idea information in their oral retells scoring zero on pretest, later demonstrating their ability to do so on posttest. The change from pretest to posttest was statistically significant on the Wilcoxon signed-rank text, the null hypothesis was rejected. This suggested a correlation between ITMI and improvement on students' ability to provide the main ideas in an oral retell. However, this result is not a causal indicator, and this should be considered when interpreting the QRI-7 data as the measure is not aligned with ITMI. The QRI-7 is different from ITMI in that the passages are much shorter in length than the texts used in ITMI. It should be taken into consideration that the pretest and posttest took place four months apart and there is a possibility that with the second exposure to the QRI-7 the participants were more familiar with the structure of the inventory, and

this could have been a contributing factor to the increase in scores for comprehension questions and oral retell.

The Role of Textmapping Activity

Explicit Instruction

The intervention was a strategy taught by the interventionist and the independent variable in its entirety. The design of the independent variable was shaped by explicit and systematic components (Fisher & Frey, 2013; P.D. Pearson & Gallgher, 1983; Vaughn & Wanzek, 2014). Participants learned the textmapping process – designed to improve comprehension of informational text – to locate and record important information to determine the main idea and provide an accurate oral retell, attend to all informational text features to improve overall comprehension of a text. The scaffolded approach provided in the gradual release of responsibility through the "I do" "We do" "You do" process created an environment where participants were able to learn the process required to (a) read complex informational text to support knowledge acquisition (O'Brien, & Leighton, 2015), (b) attend to text features to support comprehension (Kozdras et al., 2015; Spencer, 2003, (c) use the graphic organizer to support understanding the relationships between related information and concepts (Gajria et al., 2007; Kim et al., 2004), and (d) take notes to enhance comprehension or cause new learning to occur (Klein, 1999; Newell, 2007). Findings from this study add to the literature in that participant in the fourth-grade were successful in providing oral retells and main idea statements through scaffolded, explicit instruction in ITMI.

Modeling and Support

Factors such as interventionist modeling through the "I do" "We do" "You do" process can play an important role in improving reading comprehension for intermediate students and is a key construct in demonstrating how to use the strategies in ITMI to increase reading

comprehension and the scaffolded support is a key component to exposing elementary students to complex text with the instructional support necessary to facilitate students' successful reading of complex texts. The present study used modeling as a part of an effective instructional approach to reading complex informational text to support comprehension (Kamil, et al., 2008; P.D. Pearson & Gallagher, 1983). The inclusion of modeling can promote mastery learning for intermediate students and this study adds to the research base that promotes the use of modeling as part of explicit instruction. The study also incorporated active engagement with complex text through carefully selected task components and interventionist scaffolding to provide varying levels of support where it is needed as a way to support reading comprehension (Valencia, 2014).

Limitations

The present study was associated with several limitations. Due to small sample size, the study may not have obtained enough data to accurately detect treatment effects using multi-level modeling. However, the random assignment of participants to groups and masked visual analysis of single case graphs may have helped reduce the Type 1 error rate and increase power (Ferron & Jones, 2006). Moreover, the convenience sampling via recruitment of participants from one classroom may have prevented the generalization of results. The homogeneous nature of the sample, however, may have increased the generalizability of results to similar populations (i.e., middle-class, fourth-grade students). Additionally, the a_priori selection of intervention start points may have prevented the study from establishing stable baselines. Baseline lengths were pretest_established due to the limited time allowed per the school district's study approval conditions.

There are less plausible explanations for the variability across the participants' scores across baseline and intervention phases including the effect of concurrent classroom instruction as part of the district's curriculum during the time of the study, however, there was not a specific

focus on determining the main idea or generating oral retell statements based on reading informational texts during the duration of the current study. It is also possible that particular texts used across baseline and intervention phases were more or less desirable topics across the study resulting in different levels of attention while reading, which could have led to the variable results for ability to orally retell and generate main idea statements.

The length of chapters and complex content slightly above the participants' present instructional reading levels could have impacted the participant's scores because of the effort and time participants spent reading challenging informational texts which tend to include significantly more words than the texts from the district's adopted curriculum for whole and small group instruction.

In light of the challenges with developing rubrics to score students' main idea statements and oral retell statements, great efforts were focused on developing the rubrics for main idea and oral retell for big ideas across the chapters. However, there is a possibility that further parsing of the texts could have resulted in different scores allowing for more points attributed to information provided within the retell (e.g., breaking big ideas down into smaller units). Similarly, if the main idea rubric was re-designed with attention to multiple main ideas within a chapter, this could result in different scores (e.g., allowing for more than one main idea based on smaller paragraph units across the chapter).

Throughout the baseline phase participants were frequently unable to provide an oral retell, earning a zero score. However, in intervention there was only one instance of a participant earning a zero for oral retell. This demonstrates a level of strength in the scoring rubric because it provided the ability to see growth for participants. While students' shift in the mean score was minimal in some cases, the effectiveness and participants' ability to earn a higher score may be demonstrated on an adjusted scoring method. It is important to recognize the scoring system for

oral retell was far more detailed and robust than what a classroom teacher would use, or what is currently demanded of students in district and state level standardized computerized tests. Furthermore, researchers have noted oral retell is not always objective to score (Kintsch, 2004); thus, the methods for parsing texts for scoring could have impacted overall scores.

Researchers and the field of education in general face challenging issues when measuring reading outcomes to evaluate the effects of an intervention (O'Reilly et al., 2014). Because of the complexity of comprehension, there are layers of various decisions to be made including materials or texts to be used, the purpose of the assessment, the constructs to measure and how to measure them (O'Reilly et al., 2014). Furthermore, time constraints and costs impact the type of assessments used to evaluate instructional interventions. Common practice across in the U.S. is to assess reading comprehension in the form of multiple-choice questions connected to brief passages or abbreviated stories. The current study approached comprehension, specifically oral retell and main idea statements in a way that allowed for student perception to be accounted for in the response, in place of multiple-choice response. This required the participants to utilize very different cognitive processes to demonstrate comprehension. For example, generating main idea statements and providing an oral retell shows global understanding of a text and identification of the most important information while answering multiple choice questions requires readers to only identify the best possible answer among possible options (Head et al., 1989).

O'Reilly et al., (2014) argue that the "misalignment between the goals of the intervention and the assessment" (p. 404) can impact the demonstrated effect. For the current study, previous research and careful consideration of the constructs being measured impacted the decisions regarding the assessments. The dependent variables, a researcher designed Oral Retell Rubric was guided by previous research (Leslie & Caldwell, 2019) and the researcher-designed Main Idea Rubric was also based on previous research (Tarlow, 1990) and were closely aligned to the

treatment. Though the scoring methods were guided by previous research, the scoring method was novel. It could have impacted the participants' effects, and replication of the study could strengthen the scoring method. A standardized measure was not used in the examination of the effects; thus the effects cannot be assumed to be transferable to more broad reading comprehension tasks.

Future Research

The results of this study point to several areas that warrant future research. The current study found partial evidence for the use of ITMI as a method to improve fourth-grade students' ability to generate main idea statements based on an informational text and produce an oral retell of an informational text. Future studies should investigate the effect ITMI has on the amount of information provided in oral retells that is gleaned solely from informational text features when the information is not present in the text stream to determine whether ITMI is effective in increasing reader's attentiveness to text features and increased comprehension of the text.

Due to convenience sampling this study did not include participants identified as having reading disabilities, persons of color, or students from a variety of socio-economic backgrounds. Depending on recruitment methods and opportunities, future studies should be replicated with a sample of students different from the population of the current study.

Future studies should allow for extended baseline sessions without the use of a priori start points in order to establish stable baseline and more accurately identify treatment effects. Follow-up studies should include assessment of maintenance of changes in dependent variables over time.

Given the current intervention's attention to analog texts future iterations of this intervention should include ways to apply this framework to multimodal texts to investigate the efficacy with texts that merge multiple forms of traditional and digital media termed multimodal

media (MMM) to develop critical reading, writing/composing, and thinking skills needed to prepare readers to participate in the world beyond the classroom.

Implications

Students must be able to understand complex texts in order to succeed academically, socially, and economically (Oakhill, et al., 2015; Rapp, et al., 2007). Thus, the findings of the current study indicate it is plausible that ITMI is an effective method to increase fourth-grade students' reading comprehension, specifically their ability to determine the main idea of an informational text and provide an oral retell of an informational text. Despite the limitations of the study, all participants demonstrated some level of improvement in their ability to provide an improved oral retell during the intervention phase and most demonstrated improved ability to determine the main idea of informational texts, but not on a consistent or statistical basis. The current study demonstrates the potential of ITMI as an intermediate intervention to improve the reading comprehension outcomes of fourth-grade students and can be adapted for classroom instruction.

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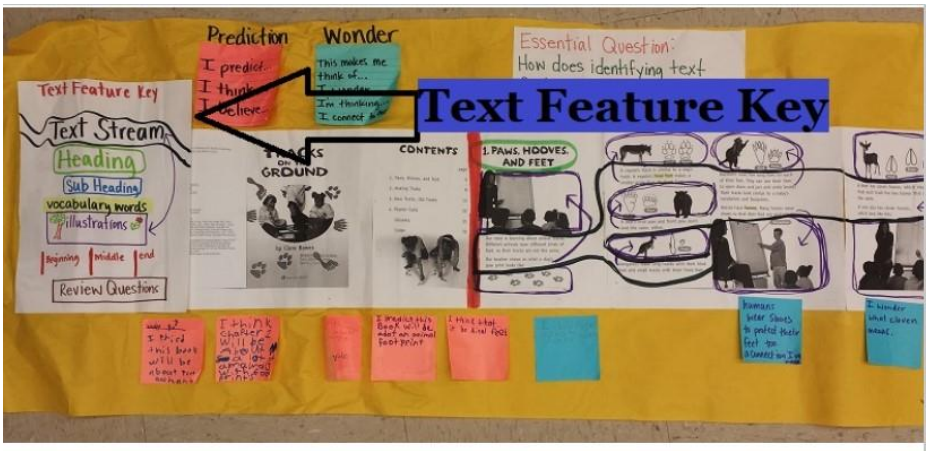
Children's Literature

Park Scientists: Gila Monsters, Geysers, And Grizzly Bears In America's Own
The Big One: The Cascadia Earthquakes and the Science of Saving Lives
Eruption!: Volcanoes and the Science of Saving Lives
The Next Wave: The Quest to Harness the Power of the Oceans

APPENDIX A: STUDENT RECRUITMENT FLYER



PARTICIPATE IN AN INFORMATIONAL TEXT READING COMPREHENSION RESEARCH STUDY

I am a researcher from the University of South Florida, and I want to learn more about an intervention designed to support reading comprehension of informational texts.

You are being asked to take part because your child's teacher has agreed to participate in this study. If you also agree to participate, your child will take part in informational text instructional activities, take reading comprehension assessments, and participate in a 30 minute interview at school September through November for 7 to 12 hours total, over a 2 to 7 week period.

We do not know if your child will receive any benefit from participation. There is no cost to participate. More details are available on the attached consent form.

Questions? Please contact Lesley Noel lesleynoel@usf.edu IRB STUDY #003927

Figure A.1. Student Recruitment Flyer

APPENDIX B: PARENTAL CONSENT FORM

UNIVERSITY OF SOUTH FLORIDA

USF RESEARCH & INNOVATION

Informational Text Mapping Intervention

Study #

Informed Consent to Participate in Research Involving Minimal Risk

Information to Consider Before Taking Part in this Research Study

Title: Informational Text Mapping Intervention: A Reading Comprehension Intervention for Students At-Risk for Reading Failure - A Single Case Design

Study # _____

Overview: You are being asked to take part in a research study. The following information is being presented to help you decide whether or not you would like to be a part of a research study. This document is called an informed consent form. Please read this information carefully. If you have any questions or if you do not understand the information, we encourage you to ask the researcher.

Study Staff: The person who is in charge of this research study is Lesley Noel, a graduate student at USF in the College of Education. This person is called the Principal Investigator. She is being guided in this research by Dr. Jenifer Schneider.

Study Details: This study is being conducted in a Polk County Public School. The purpose of this study is to determine whether Informational Text Mapping Intervention (ITMI) is an effective intervention to enhance reading comprehension for students at-risk for reading failure in the elementary grades, with a focus on the identification and utilization of non-fiction text features. This study will take place during the 2021-2022 school year. You will be asked to allow your students to participate in typical guided reading and ITMI with the researcher for 30-45 minutes per day during the literacy block, for a minimum of 10 sessions occurring over three to five months. Your students will participate in typical guided reading lessons initially and then transfer to the intervention treatment around three to five weeks into the study. I will also ask to view the contents of your district approved basal reader and classroom library. You will also be asked to participate in one 30 to 45 minute interview to discuss informational text instruction.

Subjects: You are being asked to take part because you teach in a Polk County Public School.

Voluntary Participation: Your participation is voluntary. You do not have to participate and may stop participation at any time if she desires. There will be no penalty if you do not participate or decide to stop once the study has started. Your decision to participate or not participate will not affect your job status, employment record, employee evaluations, or advancement opportunities.

Benefits, Compensation, and Risk: You will not receive any benefit from your participation. There is no cost to participate. The research is considered minimal risk. Minimal risk means that study risks are the same as the risks you face in daily life.

Informational Text Mapping Intervention

Study #

Confidentiality: Even if we publish the findings from this study, we will keep your study information private and confidential. Anyone with the authority to look at your records must keep them confidential.

Study Procedures:

If you take part in this study, you will be asked to:

- Allow the primary investigator to observe your students participate in the literacy block. This includes small groups, whole class, and intervention sessions.
- Allow the primary investigator to examine your classroom library.
- Participate in a 30 to 45 minute semi-structured interview about your perceptions of and beliefs about informational text instruction and practices.
- Examine the district provided basal reader for whole class instruction.
- Allow the primary investigator to conduct guided reading lessons that mirror the guided reading lessons already taking place in the classroom and intervention lessons that may take thirty to forty-five minutes per session.
- Allow the primary investigator to video-record your classroom activities three times during the school year for a total of six hours. I will be recording and analyzing the types of activities that take place during the literacy block. The video will be used for data analysis purposes. At no time will your name be associated with the video. Only research personnel will have access to the videos. Videos will be maintained for 5 years after the Final Report is submitted to IRB, at which time they will be deleted from computers and servers. These videos will not be used for evaluations or sharted with supervisors.

Total Number of Participants

A total of 10 to 20 students and one classroom teacher will participate in this study in one study classroom site.

Alternatives / Voluntary Participation / Withdrawal

You do not have to participate in this research study.

You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at anytime. There will be no penalty if you stop taking part in the study. Your decision to participate or not to participate will not affect your job status.

Benefits

You will not receive any benefits by taking part in this research study.

Risks or Discomfort

This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. There is a risk of transmission of the novel coronavirus from these procedures, and while precautions will be taken (all members of the research team are vaccinated, and will wear masks when in the school), we cannot guarantee that participants will not be exposed to the virus.

Compensation

You will receive no payment or other compensation for taking part in this study.

Cost

It will **not** cost you anything to let your child take part in this study.

Conflict of Interest

There is no conflict of interest.

Privacy and Confidentiality

We will do our best to keep your records private and confidential. We cannot guarantee absolute confidentiality. Your personal information may be disclosed if required by law. Certain people may need to see your study records. These individuals include:

- The research team, including the Principal Investigator and research supervisor.
- Certain government and university people who need to know more about the study, and individuals who provide oversight to ensure that we are doing the study in the right way. They also need to make sure that we are protecting your rights and your safety.
- Any agency of the federal, state, or local government that regulates this research., including the Office for Human Research Protection (OHRP).
- The USF Institutional Review Board (IRB) and related staff who have oversight responsibilities for this study, including staff in USF Research Integrity and Compliance.

We may publish what we learn from this study. Our publications may include documents from guided reading and intervention lessons. If we do, we will not include your name. We will not publish anything that would let people know who you are.

Your information or samples collected as part of the research, even if identifiers are removed, will NOT be used or distributed for future research studies.

UNIVERSITY OF SOUTH FLORIDA

USF RESEARCH & INNOVATION

Informational Text Mapping Intervention

Study #

To maintain confidentiality, you will be assigned a pseudonym to be used in all data collection and organization. You will not be identified by name at any point in the research. I will transcribe the observations notes in a Word document on a laptop computer.

You can get the answers to your questions, concerns, or complaints.

If you have any questions, concerns or complaints about this study, call Lesley Noel at (727) 644-9180. If you have questions about your child's rights, or have complaints, concerns or issues you want to discuss with someone outside the research, call the USF IRB at (813) 974-5638 or contact by email at RSCH-IRB@usf.edu.

Consent to Take Part in Research

I freely give my permission to take part in this study. I understand that by signing this form I am agreeing to take part in research. I have received a signed copy of this form to take with me.

_____ _____

Signature of Person Taking Part in Study Date

_____

Printed Name of Person Taking Part in Study

_____ _____

Cell Phone Number of Participant Email Address of Participant

APPENDIX C: STUDENT VERBAL ASSENT

University of South Florida Institutional Review Board Study#
Title of Study: Informational Text Mapping Intervention: A Reading Comprehension Intervention for Students At-Risk for Reading Failure - A Single Case Design
Verbal Assent Document for Research Study

PI: Lesley Noel
Institution: University of South Florida

This Assent document applies to children who are nine years, 0 months to 11 years 11 months.

Name of participant_____ Age_____
SCRIPT: Hi (child's name). My name is Lesley Noel. I talked to your mom / dad and they said that it was okay if you worked with me during guided reading for the next several weeks. We are going to do some activities to learn more about book features and how they support your reading. Would you like to do that with me? We'll work with a small group during the guided reading time during your regular class time and when we are finished you'll return to your desk. If you decide that you don't want to participate in the guided reading lesson anymore, you just let me know. We will stop and you can go back to your desk.

I verify that I have read the assent script to the child.

Assent script read by: _____
Printed Name, Signature, and Date

APPENDIX D: RESEARCHER DEVELOPED ORAL RETELL RUBRIC

Chapter Number	Title	Big Idea 1 (start text)	Big Idea 1 (end text)	Big Idea 2 (start text)	Big Idea 2 (end text)	Big Idea 3 (start text)	Big Idea 3 (end text)
Chapter 1	**The Power of Waves**	(p. 7) Never turn your back....	...knock you down. (p. 7)	(p. 7) Waves carve rock and . . .	out in the open ocean. (p. 7)	(p. 8) In 2001, . . .	...many were not so fortunate (p. 9).
	(my thinking/reasoning)	BI 1: this is about getting the reader to think about waves and their power		This is giving examples of what the waves can do		all about the cruise ship Caledonian Star	
Chapter 2	**The Mikes**	(p. 13) Mike Morrow . . .	new inventions (p. 14).	(p. 14) When he got to elementary school . . .	...I didn't know what (p. 14)	(p. 14) When Mike Morrow was 17...)	Interesting (p .16)
		Introduction to idea/person		elementary school		initial thoughts about waves	
Chapter 3	**Building Buoys**	(p. 23) A few years. . .	...wasn't sure how (p. 24)	(p.24) Annette grew up...	opportunity arose	The ocean simply...	make a real difference (p. 25)

Figure A.2. Researcher Developed Oral Retell Rubric

APPENDIX E: RESEARCHER DEVELOPED MAIN IDEA STATEMENT RUBRIC

Score	Main Idea Description
5	Ability to read beyond the literal words. Main idea includes inferences beyond the text to demonstrate meaning.
4	Includes a clear generalization that states or implies the main idea
3	The answer states or implies the main idea from the text
2	Indicates inaccurate or incomplete understanding of the main idea
1	Includes minimal or no understanding of the main idea
0	No answer

Figure A.3. Researcher Developed Main Idea Statement Rubric

APPENDIX F: IRB APPROVAL LETTER

UNIVERSITY of SOUTH FLORIDA

APPROVAL

June 10, 2022

Dear Mrs. Lesley Noel:

On 6/10/2022, the IRB reviewed and approved the following protocol:

Application Type:	Initial Study
IRB ID:	STUDY003927
Review Type:	Expedited 6,7
Title:	Informational Text Mapping Intervention for Students At-Risk for Reading Failure: A Single Case Design
Funding:	None
IND, IDE, or HDE:	None
Approved Protocol and Consent(s)/Assent(s):	• HRP-503a VERSION1.NOEL.Social-Behavioral IRB Protocol_CleanVersion.pdf • HRP-502b(2) Social Behavioral Child Assent.pdf • HRP-502b(3) Social Behavioral Combined Consent and Parental Permission.V1.pdf • Social Behavioral Adult Approved study documents can be found under the 'Documents' tab in the main study workspace. Use the stamped consent found under the 'Last Finalized' column under the 'Documents' tab.

Within 30 days of the anniversary date of study approval, confirm your research is ongoing by clicking Confirm Ongoing Research in BullsIRB, or if your research is complete, submit a study closure request in BullsIRB by clicking Create Modification/CR.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

This research involving children as participants was approved under 45 CFR 46.404/21 CFR 50.51: Research not involving greater than minimal risk to children is presented.