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# The Relationship between Scaffolding Metacognitive Strategies identified through Dialogue Journals and Second Graders' Reading Comprehension, Science Achievement, and Metacognition using Expository Text

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FLORIDA INTERNATIONAL UNIVERSITY

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THE RELATIONSHIP BETWEEN SCAFFOLDING METACOGNITIVE  
STRATEGIES IDENTIFIED THROUGH DIALOGUE JOURNALS AND SECOND  
GRADERS' READING COMPREHENSION, SCIENCE ACHIEVEMENT, AND  
METACOGNITION USING EXPOSITORY TEXT

A dissertation submitted in partial fulfillment of the

requirements for the degree of

DOCTOR OF EDUCATION

in

CURRICULUM AND INSTRUCTION

by

Iliana Franco-Castillo

2013

To: Dean Delia C. Garcia  
College of Education

This dissertation, written by Iliana Franco-Castillo, and entitled The Relationship between Scaffolding Metacognitive Strategies identified through Dialogue Journals and Second Graders' Reading Comprehension, Science Achievement, and Metacognition using Expository Text, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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Elizabeth Cramer

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Laura Dinehart

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George O'Brien

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Joyce Fine, Major Professor

Date of Defense: November 12, 2013

The dissertation of Iliana Franco-Castillo is approved.

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Dean Lakshmi N. Reddi  
University Graduate School

Florida International University, 2013

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## DEDICATION

I dedicate this work to my patient and loving family and friends who believed in my research, and encouraged me to believe in myself. To my parents, without whom I would not have been able to fulfill my goals and dreams of educating America's future generations.

A very special dedication is owed to my colleagues who believed in my exploration of early childhood reading and supported me through my endeavors of being the best educator and researcher that I can be. Your unspoken words of kindness and support will never be forgotten.

Finally, to my two nieces Leyla and Cecilia, my shining stars. I hope that you will be encouraged to follow your dreams and realize the importance of continued education as I have.

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Finally, I would like to show appreciation to my beloved husband who demonstrated unwavering support and understanding as I worked through many years to complete the dream of earning this degree.

ABSTRACT OF THE DISSERTATION

THE RELATIONSHIP BETWEEN SCAFFOLDING METACOGNITIVE  
STRATEGIES IDENTIFIED THROUGH DIALOGUE JOURNALS AND SECOND  
GRADERS' READING COMPREHENSION, SCIENCE ACHIEVEMENT, AND  
METACOGNITION USING EXPOSITORY TEXT

by

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Florida International University, 2013

Miami, Florida

Professor Joyce Fine, Major Professor

Poor informational reading and writing skills in early grades and the need to provide students more experience with informational text have been identified by research as areas of concern. Wilkinson and Son (2011) support future research in dialogic approaches to investigate the impact dialogic teaching has on comprehension. This study ( $N = 39$ ) examined the gains in reading comprehension, science achievement, and metacognitive functioning of individual second grade students interacting with instructors using dialogue journals alongside their textbook.

The 38 week study consisted of two instructional phases, and three assessment points. After a period of oral metacognitive strategies, one class formed the treatment group ( $n=17$ ), consisting of two teachers following the co-teaching method, and two classes formed the comparison group ( $n=22$ ). The dialogue journal intervention for the treatment group embraced the transactional theory of instruction through the use of dialogic interaction between teachers and students. Students took notes on the assigned

lesson after an oral discussion. Teachers responded to students' entries with scaffolding using reading strategies (prior knowledge, skim, slow down, mental integration, and diagrams) modeled after Schraw's (1998) strategy evaluation matrix, to enhance students' comprehension. The comparison group utilized text-based, teacher-led whole group discussion.

Data were collected using different measures: (a) Florida Assessments for Instruction in Reading (FAIR) Broad Diagnostic Inventory; (b) Scott Foresman end of chapter tests; (c) Metacomprehension Strategy Index (Schmitt, 1990); and (d) researcher-made metacognitive scaffolding rubric. Statistical analyses were performed using paired sample *t*-tests, regression analysis of covariance, and two way analysis of covariance.

Findings from the study revealed that experimental participants performed significantly better on the linear combination of reading comprehension, science achievement, and metacognitive function, than their comparison group counterparts while controlling for pretest scores. Overall, results from the study established that teacher scaffolding using metacognitive strategies can potentially develop students' reading comprehension, science achievement, and metacognitive awareness. This suggests that early childhood students gain from the integration of reading and writing when using authentic materials (science textbooks) in science classrooms. A replication of this study with more students across more schools, and different grade levels would improve the generalizability of these results.



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# **CHAPTER I**

## **INTRODUCTION**

The current study investigated the use of dialogue journals in second grade, science classrooms, and its relationship to students' reading comprehension, science achievement, and metacognition. In the present study dialogue journals, a continually recurring written conversation in which a student writes an entry and the teacher responds to the student's entry, was used as an intervention enabling students and teachers to interact regularly. During this written conversation, teachers chose to respond with feedback to the students' notes by introducing new topics, modeling thought processes, offering suggestions, and requesting or giving clarifications.

This chapter provides the introduction to the study. First, the statement of the problem is described. Next, the purpose of the study is explained. Then, the research questions are presented followed by a description of the theoretical framework. This chapter also provides assumptions underlying the study. Finally, the definitions of terms are introduced and a summary of the chapter is provided.

### **Statement of the Problem**

Reading research has reflected the concern about poor informational reading and writing skills in the early grades, and has identified the need to provide students with more experience with informational text (Christie, 1987; Duke, 2002; Freeman & Pearson, 1992; Lemke, 1994). One of the problems is that early readers are mostly immersed in narrative text from the time they are very young. They often are not explicitly taught expository text structure and hence lack the strategies to handle expository text as they progress through the grades in school. Gender differences also

play an important role in the use of text and the importance of text exposure. Below, Fearington, Skinner, & Sorrell (2010) discovered that although boys prefer reading nonfiction and informational material that provides facts over fictional materials (Coles & Hall, 2001; Herz & Gallo, 1996) fictional reading is typically used during elementary school reading instruction (Brozo, 2002; Paris & Turner, 1994). Classroom instruction should consider gender differences and inequalities that lead to underachievement in reading and writing for boys.

According to Duke (2000), there is a need to scaffold primary students' understanding of expository text to build comprehension and engagement. According to Caswell and Duke (1998), students are relying on strategies used to comprehend narrative text, and have not been taught the proper strategies to grasp informational text. Therefore, it is important for early childhood teachers to provide effective reading strategy instruction to help decrease the number of students who continue to struggle in reading expository text throughout the higher grades.

According to the National Reading Panel (NRP, 2000), reading instruction should emphasize five areas: (a) phonemic awareness, (b) phonics, (c) fluency, (d) vocabulary, and (e) comprehension. Recently, the state of Florida added a sixth area, oral language. The six areas are interrelated and provide the essentials for successful reading. Reading comprehension is often viewed as the "essence of reading" (Durkin, 1993) where the reader interacts with the text to derive meaning of what is being read and to put that understanding to use.

The National Reading Panel's (2000, p.15) meta-analysis called for more research on which reading comprehension strategies are most effective for particular age groups

and sex to bridge the gap between decoding skills and comprehension. More research was also deemed necessary to determine whether the techniques apply to all types of text genres, including narrative and expository texts and whether the level of difficulty of the texts has an impact on the effectiveness of the strategies. Below et al. (2010) reviewed the National Reading Panel's report and identified several pre-reading skills that are thought to be necessary for reading skill development taking into consideration the impact of sex and learning. They emphasized that due to the hierarchical nature of early reading skill development, identifying both when deficits emerge (student grade level) and the specific early reading skills that boys have more difficulty mastering has clearly applied implications (e.g., alter procedures designed to enhance boy's specific skills at specific grade levels). Gurian and Stevens (2004) call for a movement to alter classrooms to better suit boys' learning patterns with the aim to lessen learning gaps in grades, discipline, and reading and writing that threaten future success in life. As discussed by Below et al. (2010) interest and motivation may also contribute to reading deficits in boys (Brozo, 2002; Millard, 1997).

Following the recommendations of this panel, and understanding the perspective of comprehension as a dynamic and context sensitive process, few advances have been made in recent comprehension research. The National Reading Panel's report focused on text and reader variables as the sole sources of variability in the comprehension process (Wilkinson & Son, 2011) not attending to the implication that good teaching of comprehension involved the teaching of the NRP's identified seven comprehension strategies, presuming that comprehension and comprehension instruction were relatively static. As schools are aiming to achieve the goals set by the No Child Left Behind Act of

2001, they are placing high priorities on teaching students the basic aspects for being able to read and understand text.

Nation, as cited in Allington and McGill-Franzen (2009, pp. 551-552) noted that even though both decoding skills and linguistic proficiency are necessary for reading, alone neither is sufficient for reading comprehension to occur. In a comprehensive review of psychological research on elementary school children with reading comprehension difficulties, Nation (2005) found that the majority of students with reading comprehension issues are good decoders. Most young readers are able to master decoding with ease and are able to transfer their knowledge to expand their vocabulary. An issue arises when these readers are expected to expand their decoding knowledge to understand varying text structures as well as to make meaning from text to communicate information with others about what was read.

Being able to communicate what was read fits into the fourth wave of comprehension instruction according to Wilkinson and Son (2011) who compiled a meta-analysis of the evolution of research on teaching comprehension strategies and determined that they can be grouped into three waves of studies: single strategy instruction, multiple strategies instruction, and transactional strategies instruction (Pressley, 1998, 2000a, 2000b, 2001, 2002a, 2002b, 2006; Pressley, Brown, El-Dinary, and Afflerbach 1995). The current study considered the importance of communication by reading and writing in a journal. This approach to comprehension fits within the third and newly created fourth wave of comprehension instruction: dialogic approaches to comprehension (Wilkinson & Son, 2011). Wilkinson and Son have supported future research in dialogic approaches to investigate the impact dialogic teaching has on



comprehension. They have also supported the investigation of discussions about text or instruction related to intertextuality that can help foster the habits of mind to enhance comprehension of texts when students read independently.

The Rand Study Group formulated a three-dimensional definition of reading comprehension, describing it as “the process of simultaneously extracting and constructing meaning through interaction and involvement with written language” (RAND Reading Study Group, 2002, p. 33) that synthesized transactional, social, and functional theories of reading comprehension. This definition includes three elements that are important for reading comprehension: the reader, the text, and the activity or purpose for reading. They called for further research on reading comprehension strategy instruction, the conditions in which strategy instruction leads to improved reading comprehension, and the role of direct strategy instruction in inquiry-based content areas (Randi, Grigorenko, & Sternberg, 2005).

The current study addressed the previously stated concerns by seeking to examine the gains in reading comprehension, science achievement, and metacognitive functioning of individual second grade students interacting with their teachers using dialogue journals alongside their expository science textbook.

In this study, dialogue journals between teachers and students were implemented as note-taking journals used during the science block in a second grade classroom. Each student was given a bound notebook with pages arranged as a metacognitive graphic organizer on the right side in which they made illustrations and summarized the content of the lesson. Teachers were able to then respond on the left side of the bound notebook to the student’s summary using metacognitive strategies (i.e., skim, slow down, activate

prior knowledge, mental integration, and diagrams) and scaffolded to encourage understanding of the topic.

By responding to what students had written about their reading, teachers had the opportunity to provide differentiated, personalized metacognitive instruction, enabling students to learn the needed specific skills at their own pace. Dialogue journals, with their regular interactive written conversational approach, enabled teachers to teach the comprehension strategies necessary for each student which made effective teaching viable (Peyton & Staton, 1993).

### **Purpose of the Study**

This investigation examined the relationship between teacher scaffolding through dialogue journals and students' change in reading comprehension scores by: (a) evaluating the change in scores of the Florida Assessment of Instruction in Reading (FAIR) Broad Diagnostic Inventory administered in August, January, and May. This inventory consists of a comprehension measure, an expressive vocabulary measure, and a group-administered spelling measure. The comprehension measure in the Broad Diagnostic Inventory consists of explicit and implicit questions based on narrative and expository texts that increase in difficulty over the grades. The reading comprehension task also includes scores for accuracy and fluency; (b) the change in science text comprehension by evaluating pretest and posttest using students' Scott Foresman end of chapter comprehension scores. This investigation also tested the relationship between teacher scaffolding through dialogue journals and students' change in metacognitive functioning through a pretest and posttest using the Metacomprehension Strategy Index

(MSI, Schmitt, 1990), which allowed students to self-report their use of strategies before, during, and after reading.

### **Research Questions**

Based on research that addresses the importance of strategy instruction in teaching children comprehension skills, (Brown, Pressley, Van Meter, & Schuder, 1996; Rosenshine & Meister, 1994), as well as research on sex and education (Below et al., 2010; Castsambis, Mulkey, Buttaro, Steelman, & Koch, 2012; Gurian & Stevens, 2004), the current study addressed five main research questions:

#### **Research Question 1**

Is there a significant improvement in reading comprehension from FAIR pretest to FAIR mid test after implementing metacognitive skills in both groups?

1a. Does sex account for a significant proportion of unique variance in predicting FAIR mid test scores while controlling for FAIR pretest scores?

#### **Research Question 2**

Is there a significant improvement in reading comprehension from FAIR mid test to FAIR posttest overall after implementing metacognitive skills in both groups?

2a. Do dialogue journals account for a significant proportion of unique variance in predicting reading comprehension gains while controlling for FAIR mid test scores?

2b. Is there an interaction between the use of dialogue journals and sex in predicting reading comprehension gains while controlling for FAIR mid test scores?

### **Research Question 3**

Do metacognitive skills improve from MSI pretest to MSI posttest over time?

3a. Do dialogue journals account for a significant proportion of unique variance in predicting metacognitive gains while controlling for MSI pretest scores?

3b. Is there an interaction between the use of dialogue journals and sex in predicting metacognitive gains?

### **Research Question 4**

Is there a significant improvement in science achievement over time?

4a. Do dialogue journals account for a significant proportion of unique variance in predicting science achievement while controlling for science end of chapter pretest scores?

4b. Is there an interaction between the use of dialogue journals and sex in predicting science achievement gains while controlling for science end of chapter pretest scores?

4c. Does fidelity of treatment account for a significant proportion of unique variance in predicting science achievement gains while controlling for science end of chapter pretest scores?

### **Research Question 5**

Is dialogue journal treatment significantly better in predicting the linear construct of reading comprehension, science achievement and metacognitive function while controlling for pretest scores compared to those not receiving dialogue journal treatment?

5a. Is there an interaction between those receiving dialogue journals and sex in predicting gains on the linear combination of reading comprehension, science achievement, and metacognitive function when compared to the comparison group?

### **Theoretical Framework**

Sociocultural perspectives of learning assume learners actively construct knowledge in dialogic interactions with others (Vygotsky, 1978). Learning involves a relationship between the learner's cognitive processes and the cultural, historical, and institutional settings in which the learner is situated (Wertsch, 1985). Knowledge is gained in the active relationship between the student and the environment, and learning takes place during the time the student is actively engaged with a complex, realistic instructional context (Raphael, George, Weber, & Nies, 2009). A classroom that incorporates a sociocultural perspective (point of view in that discussions are used as an instructional tool to improve learning from text) will facilitate students' development of their learning and understanding through talk and interaction with others. Social learning environments enable learners to observe and interact with more knowledgeable others as they engage in cognitive processes they may not be able to engage in independently (Almasi & York, 2009; Vygotsky, 1978).

Many advocates for expanding the role of dialogue in classrooms (Almasi & York, 2009; Au, 1980; Au & Mason, 1981; Raphael et al., 2009; Vygotsky, 1978) hold to perspectives that are grounded in transactional theory of reading and literary response (Rosenblatt, 1978, 1985, 1988). Rosenblatt's transactional theory posits a reciprocal role of the reader in the reading event. With the idea of applying the reciprocal role of the

reader in the classroom, teachers and students are able to share the responsibility in the learning environment. The reader navigates through the text not only to construct meaning, but to interpret his or her personal understanding in relation to that of the author, teacher, and world. These advocates for discussion in classrooms emphasize the importance of evolving from text-centered form of instruction to a more teacher-student interactive approach. Social learning environments enable learners to observe and interact with more knowledgeable others as they engage in cognitive processes they may not be able to engage in independently in their zone of proximal development (Almasi & Garas-York, 2009; Vygotsky). Dialogue journals are employed in social learning environments where students are able to assume the role of the reader and the teacher is there to interact and guide the learner.

Both sociocultural and transactional theories enable the classroom environment to encompass independent learners due to the active relationship that both teachers and students share in the learning environment. These theories underpin instructional methods that promote students' metacognitive development, knowledge about one's own thinking process, that specifically, enable readers' self-regulation. Teachers are able to individualize instruction and scaffold students to become independent in their reading by providing strategies that will aid them when reading text, as well as providing experiences to explain their strategies and reflect on the use of strategies (Pressley, 2002). Supporting learners in developing self-regulation mechanisms with dialogue journals is an important aspect of metacognitive literacy instruction.

## **Assumptions**

There are three underlying assumptions of the present study: (a) the participants investigated are a representative sample of second grade students of a large suburban public school district; (b) students were honest in their responses to the researcher and accurately reported their metacognitive awareness before, during, and after reading; (c) the researcher is assuming fidelity of treatment as there were a total of 2 groups.

## **Definitions and Operational Terms**

The key terms used throughout the current study are briefly defined here.

### **Comprehension**

As used in the study, comprehension is multifaceted and defined by The Rand Study Group's three-dimensional definition of reading comprehension, describing it as "the process of simultaneously extracting and constructing meaning through interaction and involvement with written language" (RAND Reading Study Group, 2002, p. 33). This definition includes three elements that are important for reading comprehension: the reader, the text, and the activity or purpose for reading.

### **Dialogue Journals**

A bound notebook in which students regularly carried on a private written conversation with the teacher for an extended period of time (19 weeks). Dialogue journals are functional, interactive, and deeply embedded in the continuing life of the classroom in which both student and teacher regularly write to each other in an informal, conversational style. In the current study, dialogue journals were used between students and teachers encompassing four major points: (a) writing lesson title, (b) using a metacognitive graphic organizer page in a three block format to write notes or

illustrations on information presented in the lesson, (c) teacher-scaffolded remarks, and (d) student responses.

### **Expository Text**

Text as found in Scott Foresman second grade science textbook, *Scott Foresman: Science*. They attempt to explain the social, physical, and biological world in which we live. They have different text structures such as problem-solution or cause and effect and often contain text features such as figures, charts, diagrams and headings that contain information (Fisher & Frey, 2011).

### **Metacognition**

Term that describes the awareness and knowledge of one's own mental processes such that one can monitor, regulate, and direct them as a desired end (Harris & Hodges, 1995).

### **Summary**

This chapter has provided the introduction to the study. First, the statement of the problem was described. Next, the purpose of the study was explained. Then, the research questions were presented followed by a description of the theoretical framework. This chapter also provided assumptions underlying the study. Finally, the definitions of terms were introduced and a summary of the chapter was provided.

The researcher has explained how sociocultural and transactional theories support teacher scaffolding through dialogue journals to increase students' comprehension of science text and metacognitive knowledge. The No Child Left Behind Act of 2001 also emphasized attending to individual student's comprehension needs. This study examined if second grade students would attain measurable gains in reading comprehension,



science achievement, and metacognitive knowledge after being provided individual instruction using dialogue journals alongside their expository science textbook. The research questions presented in this study have addressed the issues found in current reading research on the lack of instruction regarding the impact of teaching reading strategies in elementary content areas. The current study inquired on the relationship between dialogue journals and reading comprehension and science achievement, as well as the impact dialogue journals have on metacognition.

## CHAPTER II

### REVIEW OF LITERATURE

Reading research has responded to the concerns about poor informational reading and writing skills in the early grades, and identified the need to provide students with more experience with informational text (Christie, 1987; Duke, 2002; Freeman & Pearson, 1992; Lemke, 1994). Therefore, it is important for teachers in the field of early childhood education to provide effective reading strategy instruction to help decrease the number of students who continue to struggle in reading informational text. One of the problems is that early readers are mostly immersed in narrative text from the time they are very young, but often are not systematically drawn into reading expository texts as they progress through the grades in school and, therefore, lack the strategies to handle such textbooks. According to Duke (2000), there is a need to scaffold primary students' understanding of expository text to build comprehension and engage with this type of text.

Dolores Durkin's 1979 landmark study of classroom reading instruction found that teachers taught comprehension less than one percent of the time, and that this instruction was more a matter of "mentioning" than actual explanation or demonstration. Durkin's contribution to the literature triggered much research in comprehension; more recent research has found that there is still little comprehension instruction (Beck, McKeown, & Gromell, 1989; Wharton-McDonald & Pressley, 1998). This study builds on the suggestion of explaining and demonstrating during reading instruction by examining one way to scaffold students' comprehension.

In this chapter literature pertinent to this topic is reviewed. The chapter is organized in seven sections. The first section discusses teacher student interaction. The second section deals with the relationship between teacher scaffolding and student achievement. The third section focuses on the need for understanding reading instruction in the early childhood stages. The fourth section gives attention to the area of expository text. The fifth section considers research studies that investigated the relationship between reading instruction and comprehension. The sixth section discusses the important role of metacognition in reading. The seventh section explains the use of dialogue journals to gather information on student's comprehension as well as their cognitive functioning. This chapter concludes with a summary of the research supporting the current study.

The subject of investigation in this study is the use of dialogue journals in primary classrooms to improve students' reading comprehension of their science textbook, and consequently enhance metacognition. More specifically, the purpose of the present study was to gather information on whether the interaction between teacher and second grade students through dialogue journals focusing on metacognitive strategies had a beneficial effect on students' reading comprehension of their expository science text.

Sociocultural perspectives of learning assume learners actively construct knowledge in dialogic interactions with others (Vygotsky, 1978). Learning involves a relationship between the learner's cognitive processes and the cultural, historical, and institutional settings in which the learner is situated (Wertsch, 1985). Au's work (Au, 1980; Au & Mason, 1981) provides accounts of talk story-like participation structures in reading lessons taught to Hawaiian children. These talk story-like reading lessons served

as one of the first documented examples of culturally responsive instruction. These articles make the link between talk story-like participation structures and proximal indices of reading achievement (specifically: [a] time engaged in reading; [b] student responses; [c] responses reflecting practice in reading skills; [d] appropriate responses; and [e] ideas or content covered as shown in student responses). The link discussed in Au's work suggests that cultural responsiveness can contribute to improved academic learning by students of diverse backgrounds. The research conducted by Au and colleagues allows for an understanding of how constructivist classrooms' instructional settings can mesh the cognitive behaviors students engage in before, during, and after reading within a sociocultural perspective.

Knowledge is gained in the active relationship between the student and the environment, and learning takes place during the time the student is actively engaged with a complex, realistic instructional context (Raphael, George, Weber & Nies, 2009). A classroom that establishes itself within a sociocultural theoretical framework will enable students to develop their learning and understanding through talk and interaction with others. Social learning environments enable learners to observe and interact with more knowledgeable others as they engage in cognitive processes they may not be able to engage in independently (Almasi & York, 2009; Vygotsky, 1978).

Many advocates (Almasi & York, 2009; Au, 1980; Au & Mason, 1981; Raphael et al. 2009; Vygotsky, 1978) for expanding the role of dialogue in classrooms hold to perspectives that are grounded in transactional theory of reading and literary response (Rosenblatt, 1978, 1985, 1988). Rosenblatt's transactional theory acknowledges the reciprocal role of the reader in the reading event. The reader takes the position of

understanding the author's point of view, and navigates through the text not only to construct meaning, but to interpret his or her personal understanding in relation to that of the author, teacher, and world. With the use of dialogue journals, journals where students write an entry and the teacher writes back to extend the students' entry, a student and teacher are able to participate in a written conversation where students may write as much as they choose on any topic and the teacher writes back. During these written conversations, teachers chose to respond with feedback to the students' notes by introducing new topics, modeling thought processes, offering suggestions, and requesting or giving clarifications. Social learning environments enable learners to observe and interact with more knowledgeable others as they engage in cognitive processes they may not be able to engage in independently (Almasi, & Garas-York, 2009; Vygotsky). Dialogue journals are nurtured in social learning environments where students are able to assume the role of the reader and the teacher is there to interact and guide the learner (Garmon, 2001).

### **Teacher Student Interaction**

Teacher-student interactions vary in the early childhood classrooms, but the most common form of instruction consists of teacher talk, instruction, and practice (Raphael et al., 2009). The traditional approaches of learning have lately been questioned in their ability to provide the learner with "rich" rather than "minimalistic" environments (Perkins, 1996), and with "authentic" experiences of learning which are meaningful to the learner in some intrinsic manner (Kahn, 1997).

In an analysis of classroom practices, Cuban (1993) observes that in a teacher-centered curriculum: (a) teacher talk exceeds student talk; (b) instruction occurs

frequently with the whole class; small group or individual instruction occurs less often; (c) use of class time is largely determined by the teacher; (d) teachers look upon the textbook to guide curricular and instructional decision making; (e) classroom furniture is arranged into rows of desks or chairs facing a chalkboard. In a student-centered curriculum, on the other hand, "students exercise a substantial degree of responsibility for what is taught, how it is learned, and for movement within a classroom," (Cuban, p. 7). The need for more student-centered classrooms is called for which will enable students to take a more eminent position in their learning.

Raphael et al. (2009) discussed how sociolinguistics began unpacking the nature of language used in teaching, describing the prevalent use of a pattern of talk known as I-R-E, initiation, response, evaluation, or feedback, in which a teacher begins the exchange by asking a question, calls upon a student to respond, and the teacher then evaluates the accuracy of the response. This traditional form of talk, I-R-E can be viewed as an appropriate teaching style, but often derails learning for children who have not grow up in mainstream, white, middle class households (Au et al., 2009). A substantial amount of the literature (Braunger & Lewis, 1998; Butler & Turbil, 1988; Kreft-Peyton, 1993; Moffett, 1975) has discussed the benefits of turning away from the traditional roles in the classroom and moving more into an interdependent relationship between teacher and student in the learning process. The importance of turning away from the traditional text-centered form of instruction has also been discussed by many educators (Christenson, 2002). A shift from a teacher-centered environment to a teacher-student, interactive learning environment is likely to enable the student to take ownership and interest in his or her learning.

Theoretical perspectives on the importance of teacher-student interaction include Vygotsky's views on learning, based on language and social interaction and the idea of a continuing exchange between a more knowledgeable person and a child, in this case a teacher and a student (Vygotsky, 1978). The notion of the zone of proximal development (ZPD) suggests that children have varying capacity in which material or information ranges from easy-to-learn to difficult-to-learn (without going beyond their ability to learn). The adult plays a critical role particularly when the material is at the upper end of the child's range for learning.

Complementary to Vygotsky, Ginsburg and Opper (1975) argue that the teacher's role is not to transmit facts or concepts to the child, but to guide him or her to act on both physical and mental levels. The role of the learner ought to be balanced by the teacher and the student. Both must be active participants in the classroom in order for effective learning to take place. As Chaiklin (2003) discusses, it is not the competence of the more knowledgeable person that is important, what is important is understanding the meaning of that assistance in relation to a child's learning and development. In the classroom, this may refer to those intellectual actions that a child is able to use when interacting with others, but unable to use during independent performance.

With this in mind, it is important to think of the amount of emphasis placed on the classroom when students are being challenged to meet standards in comprehension and reading levels, without their individual learning styles being taken into consideration. Christenson (2001) cited the work of Spiegel (1992) on the belief of bringing constructivist programs to skill-oriented strategy instruction with the idea that combining the two would enable teachers to help every child reach his or her learning potential.

Strategy instruction in the classroom emphasizes the interactive and collaborative role of the learner (Meichenbaum, 1977). As such, the teacher can provide the conditions through which the student can discover for himself or herself which strategies to employ. Based on Michenbaum's view, the teachers' role in the classroom is to guide and scaffold the students while they develop higher order thinking and comprehension strategies through reading and writing.

The teacher's role in the classroom should be examined for its importance in student achievement. Teacher interaction begins during the instructional period and should continue while students are demonstrating understanding of the content presented. The focus of teacher-student interaction should be seen in the ever-changing roles of all learners. Perry, Donohue, and Weinstein (2007) investigated the effects of teacher practices in promoting student academic achievement, behavioral adjustment, and feelings of competence in 257 first grade students. Their study investigated whether child-centered practices predicted both average levels of achievement and the percentages of students who acquired enough skill to meet the academic standards in the areas of reading and math specified by the school district in alignment with current reform efforts. The results of their study are important because they analyze a population of early childhood students (first graders) who has received little attention in the literature. As described by Perry et al. (2007), first grade is a particularly important year to examine because it plays a pivotal role in initiating either a positive or negative academic trajectory that children are likely to follow for the remainder of their school career (Alexander & Entwisle, 1988). Perry et al. (2007) conducted achievement tests both at the beginning and the end of the school year, which allowed for a demonstration of the



effects of teacher practices taking into account initial differences that existed among children at entry level.

Hierarchical linear modeling was used to examine whether instructionally, socially, and emotionally supportive teacher practices predicted variation between classrooms in average levels of achievement, behavior, and self-perceived competence. Limited between-class variance on the reading skills variable were found and thus they were unable to fully explore the role of teacher practices as predictors of a full range of variables.

In understanding the need for teacher-student interaction there should be reference to the importance of teacher scaffolding. Meyer (2003) emphasized the importance of not only scaffolding for cognitive competence, but also for a child's motivational and social competence. Such scaffolding must occur from a non-evaluative stance in which the adult is present and available for social, cognitive, and motivational support as a "safety net" (Meyer, 1993, p. 44).

### **Teacher Scaffolding and Student Achievement**

Drawing upon Wood, Bruner, and Ross's (1976) idea of scaffolding and Vygotskian (Vygotsky, 1978) ideas of development, Gibbons (2002) defined scaffolding as "temporary assistance by which a teacher helps a learner know how to do something so that the learner will later be able to complete a similar task alone" (p.10). The teacher is the more knowledgeable other who cues, prompts for correct responses, or guides students' thinking to lead to the understanding of the subject matter. Perkins and Solomon (1989) point out that an expert's behavior appears to be strongly driven by prior knowledge. When faced with an unfamiliar problem, he or she may construct a similar

but simpler problem. In this way, the expert learner manages his or her own gradual self-regulation and enables himself or herself to grow to meet the new task successfully.

How teachers interact with students as they complete a task is important to the students' ability to perform the activity. Lutz, Guthrie, and Davis (2006) examined reading comprehension outcomes, student engagement, task complexity and teacher scaffolding during integrated reading-science instruction and traditional reading instruction. The authors used a coding system to assess student learning engagement during three fourth-grade reading lessons. The classes were classified into two classes that received integrated reading-science instruction and one that received traditional instruction. Teacher practices providing motivational, cognitive, conception or social support for engagement (scaffolds for engagement) were coded during 30-second intervals. Even though all classes demonstrated high engagement in learning, students in the integrated instruction classes gained more in reading comprehension and reading strategy. Analyses of task complexity and practices that teachers used to scaffold students' cognitive processes and motivation suggest that measuring student engagement in conjunction with these variables may be critical for developing a deeper understanding of how academic gains are made. Findings in their study suggest that the teachers of students in the two classes demonstrating greater reading comprehension gains implemented a greater number and variety of scaffolds during the lessons. It is also suggested that in elementary school classes with high reading comprehension, two components are evident: (a) at least moderate engagement in learning and (b) high complexity of literacy tasks in which students are engaged. In the present study, students

were reading and writing in their dialogue journals to ensure physical and motivational support as teacher scaffolding and student engagement took place.

Another study examined the analysis of the use of teacher scaffolding but explored scaffolding with emergent readers that gave insight into what allows for the development of proper skills for success in the strategic classroom. Elster (1994) sought to identify and describe multiple reading and talk strategies used by emergent readers within 36 Head Start students while reading text to the author or university researchers. The Sulzby's scale used in the study revealed five patterns of shifting strategies of emergent reading and talk within individual readings: (a) building momentum, (b) intrusion of nonnarrative episodes into narration, (c) attention to predictable text, (d) attention to print format, and (e) child-initiated interaction. These patterns were related to three factors: the reader, the book read, and the setting in which it occurred.

The results lead to the suggestions that readings can be multistrategic; students will use a repertoire of reading strategies and apply them appropriately to different text genres to grasp a better and more in-depth understanding of the text at hand. One limitation was found in the results when analyzing the distribution of strategies within emergent readings; they do not reflect the absolute number of units of each strategy. Even though it shows that readers retain old strategies as they develop new ones they do not reflect the fact that older strategies may be used frequently or infrequently in a particular reading, signifying that even though older strategies may be retained, they may have a relatively minor place in readings dominated by new strategies. His study called for continued attention in the social interactions which scaffold young children's emergent reading and writing development.

Social interaction with teachers and peers plays an important role not only in the learning of new information but also of transferring prior knowledge to new situations. Teacher scaffolding is an aid during this process and can be considered to take form in various ways. Almasi and York (2009, p. 474) found two types of teacher scaffolding through discussion that foster distinct types of comprehension growth. Microgenetic scaffolding is done on a moment-by-moment basis to assist comprehension. Teachers in discussions that feature microgenetic scaffolding ask more open-ended questions, queries, and probes designed to help students think and comprehend at deeper levels. The second form of teacher-scaffolded comprehension is ontogenetic scaffolding. Ontogenesis involves long-term development in which natural processes interact with cultural or social processes to create growth and change (Wertsch, 1985, 1991). The current study used microgenetic scaffolding as it occurred on a daily basis through dialogue journal interaction. Students received immediate scaffolding based on the strategies they chose to apply during reading of their science text. Teachers fostered discussion based on the students' zone of proximal development using metacognitive strategies, and open-ended discussion.

Many (2002) conducted a study of the nature of instructional scaffolding that occurred as students and teachers constructed meaning of narrative and expository texts using instructional conversations. Fifty students in multiage third through fifth grade classrooms were studied. Many (2002) examined conversations between teachers and students and between peers to describe the nature of the instructional scaffolding that occurred as students constructed meaning of literary and nonfiction texts. The findings show that scaffolding gave students the help needed to attain more complex conceptual

understanding of the texts, and ability to develop a repertoire of strategies for reading, writing, and working from texts, and strategies for socially constructing knowledge. Scaffolding reflected varying degrees of support for some students while others were using the same knowledge of strategy use on their own. Ontogenetic scaffolding is applied in the classroom not for immediate cognitive development, but for students' abilities to interpret text and learn to sustain conversations about text longitudinally. Almasi et al. (2005) used a panel design to gain insight into the intra-individual and inter-individual changes that occurred during the students' kindergarten to third grade schooling. The same cohort of students were measured repeatedly on a number of variables at successive points in time to understand the impact peer discussion had on individual students' interpretive strategy use and language development. Findings showed that when children had consistent opportunities to engage in peer discussions of text they were able to use interpretive strategies as tools to achieve deeper levels of comprehension as early as first grade, and with increasing frequency throughout third grade, as well as sustain highly developed conversations about topics or text.

The research previously reviewed enables educators to directly view the positive effects of scaffolding and teacher-student interaction. In order for scaffolding to be successful and take a role in the classroom as a tool to aid in teaching and learning, it should be conducted as a teacher-student joint effort to allow students' to take ownership of their learning. In researching the importance of the roles between teachers and students in the classroom, it is necessary to gain a stronger awareness of the basis for academic instruction.

## **Reading Instruction**

Stephen Krashen (2003) proposed that people acquire language when they engage in a single, all-important act, understanding messages. Acquisition results from the comprehension of messages that contain elements of language slightly above one's current level of competence. Reading involves using both the information that is present on the written page, as well as the information the reader already has in his or her mind. Teachers must be sure that every student has acquired the necessary prior knowledge to comprehend. Reading instruction varies in form especially when considering the stages of reading development.

Lonigan, Burgess, and Anthony (2000) examined the joint and unique predictive significance of emergent literacy skills for both later emergent literacy skills and reading in two samples of preschoolers. Ninety-six children (mean age of 3 years 5 months) were followed from early to late preschool, and 97 children (mean age of 5 years) were followed from late preschool to kindergarten or first grade. Observations in the classrooms found that the curriculum fostered social and interpersonal growth and introduced the children to a variety of educationally relevant concepts such as letters, numbers, and storybooks, but centers discouraged explicit teaching of concepts. Children in the younger sample completed four standardized tests of oral language, four tests of phonological sensitivity, and two tests of nonverbal cognitive ability during Time 1 testing, and they completed four tests of phonological sensitivity, two tests of letter knowledge, an environmental print task, and a print concepts task during Time 2 testing.

Children in the older sample completed one test of oral language, four tests of phonological sensitivity, two tests of letter knowledge, an environmental print task, and a

print concepts task during Time 1 testing, and they completed four tests of phonological sensitivity, two tests of letter knowledge, a print concepts task, and two text decoding tasks during Time 2 testing. Structural equation modeling was used to examine the longitudinal relations between emergent literacy and either later emergent literacy skills (younger sample) or both later emergent literacy skills and text decoding (older sample). The results of this study demonstrate that the developmental origins of a large component of childrens' reading skills in kindergarten and first grade can be found in the preschool period when language development is stressed. This study is significant as it restates the importance of early childhood reading instruction. As Lonigan et al. (2000) concluded, the development of language occurs at an early age, unfortunately students are mostly exposed to narrative text during this time which constricts them to only master the strategies needed for this form of text. As Duke (2002) has stated young children are not exposed to a breadth of expository text which limits their development of language and reading.

Wise, Sevcik, Morris, Lovett, and Wolf (2007) examined the causal relationships among expressive vocabulary, receptive vocabulary, listening comprehension, and different measures of reading achievement in a group of children with reading disabilities. Two hundred and seventy-nine, second and third grade students participated in the study using measures assessing pre-reading skills, word identification, reading comprehension, and general language skills.

Wise et al. (2007) used structural equation modeling analyses which indicated that receptive and expressive vocabulary knowledge were independently related to pre-reading skills. Expressive vocabulary knowledge and listening comprehension skills were

found to be independently related to word identification abilities. The results from their study support that oral language skills are related to reading achievement.

Reading instruction takes many forms and every child's developmental level must be considered in order for instruction and assessment to be successful. An important construct influencing the comprehension curriculum of schools is reading skills. Students' awareness of the reading process, as well as scaffolded reading experiences allow them not only to take the most from reading events, but also to dominate the most complex aspect of reading: reading to analyze and evaluate information to possess a point of view.

### **Expository Text**

Expository texts are texts designed to present facts and information such as essays, speeches, lab procedures, journals, newspaper and magazine articles, and directions, among other things. While each type of text shares certain characteristics with the others, they each make their own demands on the reader through the unique use of structure, devices, features, and conventions. Students require instruction on how to read the varying styles of text to be able to maximize comprehension. A beneficial factor of including informational text in the classroom is that it allows for teachers to target areas of student interest. Children are able to learn language, reading and expressive skills by using texts that interest them as well as provide a personal link to topics they are being exposed to in the classroom.

Many studies have responded to the concerns about poor informational reading and writing skills in the early grades, and identify the need to provide students with more



experience with informational text (Christie, 1987; Duke, 2002; Freeman & Pearson, 1992; Lemke, 1994). Barbara Moss (1997) continued the research of Pappas (1993) to explore the importance of retellings to examine children's comprehension of expository text. She examined 20 first graders' ability to comprehend expository text measured through an oral retelling after a read aloud of *How Kittens Grow* (Selsman, 1973). The retellings were assessed qualitatively using the 5-point Scale for Judging Richness of Retellings (Irwin & Mitchell, 1983) which assessed student ability to identify main ideas, relevant details, and overall text structure as well as summarize, infer beyond the text, and relate textual information to their own life. Eighteen of the 20 students received a score of 3 or more, which suggests that young children are capable of comprehending expository text when it is presented orally. Moss is able to confirm that young children are readily able to summarize text information, identify important information, provide opinions and rationale for their opinions, and infer beyond the text. With the conclusion of Moss' study a further understanding of elementary grade children's comprehension of and response to expository text is provided.

This brings to light the ability of young learners to infer, summarize and relate text to self and text to the world which enables students as readers to nurture their skills for success in their development of comprehension of a variety of text.

Duke (2000) defines informational texts as texts and contexts having many or all of the following features: (a) a function to communicate information about the natural or social world, typically from one presumed to be more knowledgeable on the subject to one presumed to be less so; (b) an expectation of durable factual content; (c) timeless

verb constructions; (d) generic noun constructions; (e) technical vocabulary; (f)classificatory and definitional material; (g) comparative/contrastive, problem/solution, cause/effect, or like text structures; (h) frequent repetition of the topical theme; and (i) graphical elements such as diagrams, indices, page numbers, and maps.

As Nell Duke (2000) described “the ability to read and write informational text is one form of semiotic capital valued in multiple settings in advanced schooling, community, and work”. She coined the term semiotic capital to describe a form of cultural capital that is valued in a particular social group. She continues her line of reasoning by contending that to become strong readers and writers of informational texts, a learner would need substantial experience comprehending and producing such text. Allowing students to gain access to experiences using expository text enables them to extend their prior knowledge to new information. Understanding the world around them allows students to receive experiences through text that will facilitate their gain of prior knowledge that in turn aids them in understanding new subject matter and information.

### **Reading Comprehension Strategies**

Gillam, Fargo, and St. Clair Robertson (2009) defined comprehension as

a complex set of processes that involves the encoding of facts, the activation of knowledge, and the generation of inferences to connect information in ways that make it understandable and memorable. When children have difficulty applying world knowledge to oral or written discourse, remembering what they have heard or read (Kibby, Marks, Morgan, & Long, 2004), or focusing on the important ideas and concepts presented in discourse (Alexander et al., 1997), they are said to have a problem with comprehension. A number of linguistic and cognitive processes contribute to comprehension, including knowledge of figurative language, vocabulary, experience, use of context (Cain, Oakhill, & Elbro, 2003), understanding of morphology and story structure (Nation, Clarke, Marshall, & Durand, 2004), and memory (Nation, Adams, Bowyer-Crane, & Snowling, 1999; Yuill & Oakhill, 1991). p.82

The Rand Study Group formulated a three-dimensional definition of reading comprehension that synthesized transactional, social, and functional theories of reading comprehension. They called for further research on reading comprehension strategy instruction, the conditions in which strategy instruction leads to improved reading comprehension, and the role of direct strategy instruction in inquiry-based content areas (Randi et al., 2005, p. 25).

The importance of reading comprehension is a critical part of academic achievement (Collins Block & Lacina, 2009) and students continue to show deficits that may ultimately impede their academic success (Allington & McGill-Franzen, 2009). Significant research has been conducted on the importance of teaching reading strategies and the effect they have on reading skills, especially reading comprehension. Berninger, Abbott, Vermeulen, and Fulton (2006) report the results of two studies that further investigated reading comprehension and related skills in at-risk second-grade readers following the National Reading Panel results for effective instructional practices in the general education classroom. Both studies were guided by a conceptual framework that designed assessment and instruction based on levels of language theory and functional systems theory. The Berninger et al. (2006) study is functional in explaining the usefulness of the different reading components necessary during reading instruction: knowledge of alphabetic principle, phonological decoding, automatic word reading, fluent text reading, vocabulary knowledge, and reading comprehension. The criterion-referenced comprehension test represented authentic assessment used during the study that replicated assessment of comprehension during instruction. Although this study

yielded superior results in improving scores, it is limited to a small population of students working below grade level. Little information was provided on how typically-developing second grade readers develop their reading comprehension. Future research can extend their study to provide information on the evolving nature of reading comprehension for novice and skilled readers.

Evolution of research on teaching comprehension strategies can be grouped into three waves of studies (Pressley, 1998, 2000a, 2000b, 2001, 2002a, 2002b, 2006; Pressley et al., 1995): single strategy instruction, multiple strategies instruction, and transactional strategies instruction. Reading comprehension research has also taken a turn to a more dialogic approach to learning and teaching as there is a better understanding of the dynamic and flexible characteristics of comprehension.

Wade, Trathen, and Schraw (1990) defined strategic reading as a configuration of different tactics used to meet a particular goal and monitored for effectiveness. A student is able to select the strategies needed to be able to attain the ultimate goal of reading: comprehension. Past research has identified a number of strategies that support good reading comprehension, and has established that a good reader is able to deploy a variety of strategies (Wade et al., 1990).

The first wave of studies, conducted in the 1970's and early 1980's, focused on the effects of teaching students individual comprehension strategies. Single strategy instruction focused on the development of instructional approaches for teaching students comprehension but did not improve comprehension ability (Raphael, George, Weber & Nies, 2009). Strategic reading has been detailed by Paris, Lipson, & Wixson (1983) as they stated the differences among declarative, procedural, and conditional knowledge and

the importance of teaching the differences to students. This also led to the understanding of Au and Raphael's (1998) Gradual Release Model, which describes the relative changes in activity level and control between teacher and student. Since 1999, researchers (Haddad et al. 2003; Hall, Sabey, & McClellan 2005; Jitendra, Hoppes, & Xin, 2000; Joffe, Cain, & Maric, 2007; Pappa, Zafiropoulou, & Metallidou, 2003; Wilder & Williams, 2001) have investigated the effects of teaching students individual comprehension strategies such as main idea identification, story theme identification, self-regulation, semantic mapping, use of expository text structure, and use of mental imagery.

In a study conducted by Fisher and Frey (2003), the use of gradual release model during writing instruction was analyzed. Fisher co-taught 31 ninth-grade students enrolled in a first-year section of "genre studies" at an urban high school in San Diego, California. The "genre studies" course lasted 90 minutes a day. Students enrolled in the class were considered "significantly below grade level" and would not be able to enroll in an English class until receiving credit for the "genre studies" course. The class followed the Language Experience Approach (LEA) and the instruction was structured to be shared reading or read aloud first and then explicit writing instruction for the beginning of the semester. Over the course of the term, instruction moved from teacher-controlled to student-directed writing. Using the LEA approach students initially brainstormed ideas and discussed topics that were of interest to them, and then moved on to interactive writing. Writing models, such as power writing and independent writing, were introduced to achieve the gradual release control from teacher to student. In terms of writing, students were assessed on writing fluency, accuracy, and length of response.

In October students produced a class average of 4.9 words in one minute, by January students increased to 19.1 words in one minute, sentence length increased, and students' miscues in sentences decreased. Similar achievement levels were also found in the students' reading development. In the beginning of the course the average students scored a 5.47 on the Gates-MacGinitie Reading test, by the end of the term the class average increased to a 6.88, and these results demonstrated to be statistically significant ( $t = 2.15, p < 0.3$ ). The results gathered by Fisher and Frey allow us to understand the need for the gradual release model to take part in many classrooms, especially those servicing struggling readers beneficial to accelerate achievement. The Gradual Release Model guided theories and understanding of the use of comprehension strategies before, during, and after reading with an interactive classroom perspective.

The work of previous scholars allowed for differing views in understanding the role that comprehension instruction takes in a classroom. With the knowledge of positive results from multiple strategies in sense-making, these strategies were beginning to be used in meaningful classroom activities, such as Reciprocal Teaching, and other frameworks, for instance Students Achieving Independent Learning, also known as the SAIL framework (Raphael et al., 2009), all of which use a multiple strategy approach. The second wave, conducted in the 1980's, focused on the effects of teaching students multiple strategies, with the most prominent being Palincsar and Brown's 1984 study on reciprocal teaching. During the second wave, the direct explanation approach to strategy instruction came to the forefront (Duffy et al., 1987). Many of the strategy instruction studies published since 1999 are consistent with Pressley's second wave research (Faggella-Luby, Schumaker, & Deshler, 2007; Fung, Wilkinson, & Moore, 2003;

Johnson-Glenber, 2000) that has continued to investigate the effects of teaching students small repertoires of strategies with teacher modeling, and guided as well as independent practice. The research has shown evidence that students could be taught to use multiple strategies in addition to demonstrate beneficial effects on experimenter-developed and standardized tests of reading comprehension.

Reciprocal Teaching is the foundational framework for implementing multiple-strategy instruction. Teachers would model instruction and comprehension using four strategies (summarizing, questioning, seeking clarification, and predicting upcoming text) and as students demonstrated understanding of the strategy, responsibility would increase on the students' part to lead discussion and facilitate comprehension. In a review of 16 published and unpublished studies of reciprocal teaching, Rosenshine and Meister (1994) analyzed the use of reciprocal teaching in classrooms and consistently found positive results, reporting an overall effect size of .32 when the outcomes were measured by standard tests of comprehension and .88 when the outcomes' measures were teacher-developed. In these 16 reciprocal teaching studies, investigators achieved significant gains by teaching from 2 to 10 cognitive strategies. A number of studies outside the reciprocal teaching tradition that taught only single strategies also obtained significant results. This meta-analysis provided tables and examples of reciprocal teaching models that included an array of strategies as well as the impact that instruction and learning had when particular strategies were not found.

The SAIL framework enables transactional instruction to take place. Teachers explicitly teach and model several comprehension strategies (predicting, visualizing, questioning, clarifying, making associations, and summarizing), and students are

encouraged during instruction to discuss the comprehension of texts, as well as what strategies they used to make meaning. The emphasis of the SAIL framework is to help students learn when to use which comprehension strategy which in turn develops metacognitive awareness and builds a broader knowledge of reading strategies.

Strategy instruction is important in order for all students to attain the knowledge needed to comprehend text. As previously mentioned, comprehension is the positive outcome when a student knows when to employ the strategies necessary to gain an understanding of text. Reciprocal Teaching and SAIL are all supportive of strategy instruction in a classroom and prove that not only will multiple strategy instruction benefit student-centered classrooms but also aid in students becoming self sufficient readers and comprehenders of text.

The third wave of strategy instruction, which began in 1989, was an approach that Pressley and his colleagues (Pressley et al., 1992) developed and designated Transactional Strategies Instruction (TSI). TSI is another form of multiple strategy instruction which is designed to improve comprehension through the use of explicit strategy instruction, students practice with teacher feedback and scaffolding about where and when to use the strategies. This approach emphasized transactions between readers and text, transactions among participants, and joint construction of understanding. Brown, Pressley, Van Meter, and Schuder (1996) studied the effects of TSI on second-grade childrens' reading during a year-long quasi-experiment. Their study compared five classrooms where teachers used TSI and the comparison group where teachers were just regarded as language-arts teachers. By the spring of second grade, students in the TSI classrooms outperformed the control group, but also gained more content knowledge,



enjoyment in reading, and self-confidence through the course of the school year. Results showed robust effects on experimenter-developed measures of strategy awareness, strategy use, and comprehension, as well as on standardized measures of reading achievement in favor of students receiving TSI. This is also one of the few studies (Pearson & Duke, 2002; Stahl, 2004) demonstrating the viability of multiple strategy instruction with children in the early grades. Although the TSI approach provides many benefits to the classroom, many educators have steered away from this approach due to its demands of time, teachers relinquishing control of the class, as well as it being labor intensive.

The fourth wave of research on comprehension instruction emphasizes dialogic approaches to comprehension instruction that include: content-rich instruction, discussion, argumentation, and intertextuality. Content-rich instruction highlights the benefit of bringing strategy instruction and comprehension instruction into a dialogic relationship with subject-matter teaching.

The joining of strategy instruction and comprehension instruction can be found in different programs of research such as: Concept-Oriented Reading Instruction (Guthrie, Wigfield, & Percencevich, 2004), In-Depth Expanded Application of Science (Romance & Vitale, 1992, 2001), and Reading Apprenticeship (Greenleaf, Schoenbach, and colleagues, 2001, 2003). The belief in this dialogic perspective is that meaning and understanding emerges from the interaction and struggle from different voices.

Classroom discussion as a means of promoting reading comprehension is now expanded to the effects of discussion on students' comprehension, and the proliferation of approaches of conducting high-quality discussions about text. Conducting discussions

can be distinguished in terms of degree of control exerted by the teacher versus the students and the dominant stance toward the text (Chinn, Anderson, & Waggoner, 2001). Discussions can be categorized in terms of aesthetic or reader-focused stance (ex. Book Clubs, Literature Circles, and Grand Conversations), efferent or text-focused response (ex. Instructional Conversations, Questioning the Author, and Junior Great Books Shared Inquiry), or critical-analytic stance wherein teachers and students share control over text and topic (ex. Collaborative Reasoning, Paideia Seminars, and Philosophy for Children).

Reznitskaya et al. (2008) described argumentation research as “a reasonable account of the extent to which dialogic approaches to instruction enable students to internalize the schema for a well-formed argument and to acquire the disposition to reason critically and reflectively about text as well as other sources of information”. Argumentation has been much studied as a means of promoting conceptual change in science, and can be found in approaches such as: Discussion Web (Alvermann, Hynd, & Qian, 1995), Science Writing Heuristic (Burke, Greenbowe, & Hand, 2006), and the instructional model “scientific explanation” framework (McNeill, Lizotte, Krajcik, & Marx, 2006; Moje et al., 2004).

Intertextuality is the final dialogic approach discussed in the fourth wave of research on comprehension instruction that entails the shaping of texts' meanings by other texts. Many researchers (Lenski, 1999; 2001; Pappas, Varelas, Barry, & Rife, 2003; Short, 1992; Sipe, 1996; 1998, 2000, 2001; Soter, Connors, & Rudge, 2008; Varelas & Pappas, 2006) have studied the area of intertextuality and have focused on the nature of students' cognitive processing and representation of texts. There have been few studies investigating the classroom environments or instructional practices that promote

intertextual connections, how connections change over time, or their effect of the connections on students' comprehension. With a look into the future of comprehension research the current study has established itself within the third and fourth wave of comprehension instruction.

Wilkinson and Son (2011) supported future research in dialogic approaches, and the impact dialogic teaching has on comprehension, as well as to show that discussions about text or instruction related to intertextuality can help foster the habits of mind to enhance comprehension of texts when students read independently. In following through with the understanding of the importance of teacher modeling, explicit instruction, guided practice, and independent use of multiple comprehension strategies, dialogue journals would be a suitable approach to follow through on the transactional strategy and dialogical framework. Dialogue journals enable students to reflect on their reading, and use strategies previously discussed and modeled by the teacher. Dialogue journals also promote peer interaction found to be important in the sociocultural perspective.

### **Metacognition**

Metacognition is a term that describes the cognitive functioning of a person. With this idea, many understandings and definitions come to explain the importance of the awareness one has about his or her learning.

Baker (2005) has composed an explanation to better understand and grasp the importance of metacognition in education

Metacognitive control in the domain of reading includes comprehension monitoring, which entails whether or not individuals understand (evaluation) and taking appropriate steps to correct whatever comprehension problems they detect (regulation). Baker and Brown (1984) give an explanation of metacognition based on the two important realms that arise: knowledge of cognition and regulation of cognition. They define knowledge of cognition as the ability of individuals to reflect on their own cognitive processes and include knowledge about when, how, and why to engage in various cognitive activities. They proceed to explain regulation of cognition as the use of strategies that enable individuals to control their cognitive efforts. (p. 62)

Metacognitive studies provide literacy educators with greater understanding of reading comprehension processes and compensatory strategies that successful readers employ to support text understanding. Many researchers (Baker & Brown, 1984; Garner, 1987; Meece, Blumenfeld, & Hoyle, 1988; Pressley, 2000) have found that when instructional context leads to student passivity and disengagement, comprehension suffers. Proficient comprehension requires active cognitive engagement in which readers construct meaning and use metacognitive and self-regulatory strategies to make sense. The information provided by metacognitive studies offers teachers a route to identify struggling readers in need of strategies to monitor their comprehension. Comprehension is then viewed not only as a task but as a process.

In explaining the reasoning associated with using reading strategies, Duffy et al. (1987) conducted research on how to make decisions about when and how to explain the mental processing associated with using reading skills as strategies. Twenty third-grade teachers and their students in low reading groups participated in the study; 10 teachers were randomly assigned to the treatment group and were taught how to make decisions

about when and how to explain the mental processing associated with using reading skills as strategies, the remaining 10 served as a treated-control group. The difference between the treatment and treated-control groups was that the treatment teachers were taught to modify the curricular and instructional skill prescriptions of the basal text so that the emphasis was on the mental processing involved in using skills as strategies. The treated-control teachers, in contrast, followed their usual instructional routines regarding basal textbook instruction. A repeated-measures ANOVA was performed to identify the treatment effects across the academic year, a significant main effect was found favoring the treatment teachers' explanations,  $F(1,18) = 9.267, p < .001$ . Their study was noteworthy because it utilized authentic material (basal series) to instruct the students. It kept many things constant especially in controlling for differences in the teachers. Their research argues for the naturalistic study of instructional phenomena, in which instruction is viewed as a collaborative interaction between the minds of teachers and students. Duffy et al. calls for future instructional research on building an understanding of the subtle complexities which characterize the reciprocal mediation between teachers providing responsive explanations and students engaged in learning. The current study followed Duffy et al.'s study as it included authentic materials, Scott Foresman Science textbook and workbooks during instruction and as support in dialogue journals treatment.

Reading and writing may be thought of as complimentary processes involving the use of similar cognitive strategies, including planning and goal setting, tapping into prior knowledge, organizing ideas, monitoring, revising meaning, and evaluating. Although connected, the two processes require deployment of processes in somewhat different

ways. Langer (1986) indicated that formulating meaning occurs more recursively during writing because the writer must constantly generate new text. In addition, readers are involved in adapting their representation of the text to fit the author's message; the writer is engaged in a process of fitting the text to the needs of another person, a reader, and to the constraints of formal prose. Although metacognition concerns higher level cognitive operations and processes and is generally found in more mature and older students, there is evidence that young children are also able to monitor and regulate their cognitive processes during reading and writing activities.

Brailsford, Snart, and Das (2001) investigated a remedial strategy training program with the intent of improving performance on tests of cognitive synthesis and tasks of reading comprehension using the theoretical framework of the simultaneous-successive model of information processing. The 24 students with learning disabilities selected were assigned to either experimental (strategy training) or control groups (reading resource). Simultaneous and successive processing was tested using a battery of tests consistently used in factor analytic studies of information-integration theory (Das et al, 1979). To test reading comprehension levels, scores from the Gates-MacGinitie comprehension subtest were used; individual student comprehension scores were taken from The Standard Reading Inventory. Both the experimental and control groups continued receiving regular reading instruction in the classroom but each, in addition, had 15 hours of remedial assistance. In analyzing the standard reading inventory instructional reading levels for both groups, 8 out of the 12 experimental subjects improved by at least one standard deviation, while only 2 out of the 12 control group subjects improved by one or more standard deviation. Although both groups improved over time, improvement could be

attributed to maturation and practice effects. The results could indicate that a cognitive strategy training program may be a viable addition to a reading resource room program, with the objective of teaching strategies that may be transferred to tasks of reading comprehension.

A child must develop self-regulatory skills to successfully complete tasks by actively participating in the process with adults or more knowledgeable others, who gradually withdraw their support (Meyer, 2003). In 1988, Stevens studied the relative effectiveness of four methods for teaching remedial reading students how to identify the main idea of expository paragraphs. Fifty-six students in grades 6-11, who met the criteria of reading 2 years below grade level, were selected. A pretest was given as a measure of students' entering ability (determining main idea and inference on expository passage) and to determine which students were most appropriate for the intervention. Unknown expository passages were selected as the material to use during intervention due to the fact that it is the form of text found more frequently in secondary classes. After taking the pretest, students were randomly assigned by a computer to one of four treatment groups: strategy training (treatment provided students with explicit instruction in comprehension-fostering strategies and metacomprehension strategies, and an explanation of their usefulness in understanding and remembering the information presented in the paragraph), classification skills training (provided students with word-level comprehension activities as an introduction to paragraph-level comprehension activities), combined treatment (received both the strategy training and classification skills training), and control group (practiced only on topic and main idea questions about expository paragraphs).

These results support the training of remedial reading students in strategies for identifying the main idea of paragraphs and related metacognitive strategies which in turn improves their ability to identify the main idea of expository paragraphs. The drawback of Steven's (1988) study was that the results indicated little or no transfer of either strategy training or classification skill training to students' ability to answer inference questions about paragraphs they have read. Due to this further research called for a necessity to study remedial reading during initial instruction in reading comprehension, as well as researching with elementary level students who are beginning to learn reading and comprehension processes. A disadvantage of his study is that the instructional interventions were implemented by means of computer-assisted instruction. Due to the fact that this might not be available in schools, and the lack of person-to-person contact, it is difficult to tell if this intervention will work with an actual instructor.

Incorporating metacognitive strategies in this review of literature allows an educated perspective on the importance of the use of different strategies in the classroom, and the important results they yield in improving students' strategies while reading and writing. With the results suggesting for more research on students' differing needs and learning styles, there is an imperative need to study the relationship between implementing metacognitive strategies and the use of dialogue journals to support instruction.

### **Dialogue Journals**

Dialogic discussions provide a social environment in which students can observe the cognitive and social processes of their peers and begin to use the strategies they



observe for interpreting literature and interacting with one another in a productive manner (Almasi & York, 2009). Discussion is part of a dialogic classroom where students and teachers are cognitively, socially, and affectively engaged in collaboratively constructing meaning or considering alternate interpretations of texts to arrive at new understanding (Almasi, 2002).

One must first understand the process of reading and writing before being able to appreciate the importance of their use for discussion in a classroom. According to Fitzgerald and Shanahan (2000) reading and writing consists of “analogous processes and isomorphic knowledge” (p. 39), which these authors contend is the reason children are able to transition their acquired knowledge from one domain to the next. As students gather an understanding of reading, they are able to express this understanding in other matters of discourse, such as writing. In turn, writing is a form of communication that allows students to express their thoughts and ideas. Teachers can also use students’ writing to examine academic proficiency levels. One form of communication that not only enables teachers to gain information on student knowledge, but works toward improving it, is dialogue journals. Dialogue journals facilitate teacher scaffolding and simultaneously enable students to learn at their individual pace. In his review of the literature, Garmon (2001) discussed several studies which have suggested that dialogue journals are an excellent tool for helping teachers both identify where their students are and provide the appropriate support to promote their continued growth.

With this perspective in mind, multiple and conflicting interpretations can co-exist among the teacher, students, and peers. Discussion allows for critical and

evaluative thinking which allows students to interpret, make judgments and evaluate the ideas of others. With a dialogue in place, an individual could have come into the discussion with one understanding of the text or topic, but after deliberating with respondents, their individual interpretations are shaped, and altered by the discussion at hand.

When discussing the need for dialogue in the classroom instructional conversations should be discussed due to their influence in teaching and understanding text. Goldenberg (1993) defines instructional conversations as

discussions in which teachers promote analysis, reflection and critical thinking among students. Students engage in dialogic conversation with each other and the teacher about textual ideas. Instructional Conversations are instructional and conversational and feature fewer literal or “known answer” questions by the teacher. They feature responsiveness to student contributions, connected discourse, a challenging atmosphere, and general participation. (p. 318)

McIntyre, Kyle, and Moore (2006) researched an instructional conversation where one primary-grade teacher promoted small-group dialogue about books and literacy concepts. The teacher guided 12 students in first and second grade from the beginning of a lesson in ways that later led to dialogue during a videotaped four-day lesson sequence. The authors analyzed interaction of teacher-student talk during the sequence that involved reading, talking about, and responding to mysteries by coding (labeling indicators of instructional conversation) the tapes.

During the lesson, the teacher exhibited additional instructional patterns not previously recognized as essential for promoting dialogue, such as non-evaluative responses, encouragement and praise, and providing examples and suggestions. This allowed for an understanding on how the teacher guided the students from the beginning

of the lesson that lead to dialogue and the construction of new understandings. McIntyre et al. (2006) study was based on larger studies of the relationships among curriculum, instruction, and student development in classrooms that serve diverse populations. It was grounded with assumptions of both transactional and cultural historical activity theory that supports the use of dialogue in the classroom. Their study contributes findings that confirm the importance of teaching diverse students how to dialogue about books.

Saunders and Goldenberg (1999) studied the effects of literature logs and instructional conversations in five classrooms of fourth and fifth graders (half the students were English learners completing their first or second year of English language arts). During the last quarter of the school year, students were randomly assigned to 1 of 4 treatment conditions: literature logs only, instructional conversation only, literature log and instructional conversation, and a control group. The treatment was divided into three phases: Phase 1 was used for pretesting and whole-class preparatory activities; Phase 2 began the literature units with treatment conditions; Phase 3 comprised of posttesting.

Students participating in literature logs had to write a personal experience matching that of the characters. The instructional conversation comprised of oral discussions of themes found in the stories. Students in the instructional conversation, and literature log and instructional conversation groups scored significantly higher on story comprehension than the control group. Students in all three experimental groups were significantly more likely to demonstrate an understanding of the story themes than the control group. The combined effects of literature logs and instructional conversations on students' essays demonstrated a benefit for limited-English-proficient students' essays.

Saunders and Goldenberg's (1999) study is evidence on how a written discussion between teacher and students benefit students' comprehension, as well as allows for teachers to analyze individual student's understanding of readings. Their study demonstrated that within a short period of time a treatment can be conducted to discover benefits in students' learning. The current study used Saunders and Goldenberg's research as a guide on how to structure the phases and timeline of intervention within a short period of time to yield results in students' learning.

Elaborative interrogation is a strategy that facilitates the acquisition of knowledge from text. In this strategy higher-order questioning is used to encourage students to connect new information in their own richly developed knowledge base. As reading and writing become more inherent activities "...elaborative interrogation permits readers to direct their attention to crucial segments of the text rather than to insignificant information" (Ozgunor & Guthrie, 2004, p. 438). The use of elaborative interrogation in the writing processes is beneficial to the writer because it facilitates learners to analyze what they are writing and considers the possible realm of what their completed task will be. Less skilled writers are able to benefit from this form of writing strategy because it entails the writer rereading what was written, and using elaborative interrogation as a self-questioning method where "...elaborative interrogation encourages students to generate inferences to a superior degree than they would in the absence of the condition.... this benefit is even more evident for students who lack other mediums such as interest and knowledge to prompt learning" (Ozgunor et al., 2004, pp. 442-443). This strategy allows writers to become and feel more successful in their own writing skills.

Flower and Hayes (1981) developed four principles in the cognitive process model that described the actual process of composing. They believe that writing is best understood as a set of distinctive thinking processes that writers orchestrate or organize during the act of composing. Mental processes are devised while the writing is actually being done. The processes of writing are hierarchically organized, with component processes embedded within other components. The mental activities occur in no particular order, with the mind being unpredictably associational rather than linear. In the act of composing, writers create a hierarchical network of goals and these in turn guide the writing process. Writers create their own goals in two key ways: by generating goals and support goals which embody a purpose; and, at times, by changing or regenerating their own top-level goals in light of what they have learned by writing. Writers go back and revise those goals as necessary.

Flower and Hayes' principles for the process of writing reflect those precursor ideas of reading as well. Reading is a process where, at first, there has to be understanding of text and topic. The reader must also struggle with ongoing self-regulation (rereading, self-questioning) to monitor understanding and clarity. Using writing with reading has been shown to be helpful. One method of integrating writing with reading is the use of dialogue journals.

Dialogue journals have been used in different classrooms to aid in language learning and communication. Dialogue journals were examined for their use as a method of communication that enables learners to be competent in a skill, in this case reading skills. Garmon (2001) studied prospective teachers' perceptions of the benefits and drawbacks of doing dialogue journals. The sample size was 22 college students enrolled

in a multicultural education course in a university. The author solicited students' evaluative comments about journals on two occasions during the semester, and these comments constituted the data source for the study. Midway through the semester, students were required to write a journal entry in which they evaluated the journals. Also, at the end of the semester the students were asked to write any additional comments that they wanted to make about journals, especially if their perception of journals had changed.

The author analyzed the students' comments based on five predetermined categories based on the research question. The analysis of students' evaluative comments on the dialogue journals revealed that they seem to hold a decidedly positive perception of the dialogue journal and its benefits. Due to the fact that the sample size was small and students were self-selected participants who volunteered and may have been the ones who liked to write, they may have been predisposed to respond favorably to journaling. These results do suggest that the use of dialogue journals in teacher education courses may offer a number of benefits to prospective teachers. First, the use of dialogue journals may serve to enhance students learning of the course materials as well as appear to promote greater self-reflection and self-understanding by the students. These findings support the use of dialogue journals in the classroom as an expressive tool for students as well as a resource for teachers to understand the interpretation of the lessons that the students are conveying.

Focusing on the use of dialogue journals to understand students' progress in the classroom and support their specific needs, Werderich (2002) examined the use of

dialogue journals as a means of differentiating reading instruction for individual seventh-grade students. A simple random sampling method was used by selecting 15 journals from the 46 created by two advanced reading classes; chosen participants in this yearlong study were enrolled in seventh-grade advanced reading program on the basis of reading placement scores, grades and teacher recommendation. The students in the study were required to write a minimum of one letter a week to a peer and one letter every 2 weeks to the teacher. Students were given a letter at the beginning of the year discussing the format (friendly letter), procedure, and purpose of their journal writing. Students were also given suggestions on what could be included such as: write what you noticed about how the author wrote, why you think he or she wrote this way, what a book said and meant to you, what it reminded you of, and tell of a way it surprised you, and tell how you read a book and why. The goal in reading through each of the journals was to look for ways in which the teacher promoted personalized reading instruction. Four response patterns evolved: student interests, personal discoveries, setting challenges, and teaching strategies. Analyzing the teacher and student correspondence provided a new perspective for developing response categories.

This new perspective takes into account the role of the teacher in creating meaningful, challenging dialogue based on the individual needs of the students. Future research is required to examine the teacher's influence as a contributing factor on young students' response to literature.

Werderich's (2002) study gave considerations for the use of dialogue journals by teachers such as:

1. The teacher's role in the dialogue journal is important, particularly in promoting personalized learning. How a teacher responds to students' journal letters is a key component of personalized learning.
2. Large-group discussions, minilessons, and read alouds make good topics for journal letters. What a teacher contributes to the classroom environment also becomes part of journal letter conversations and personalized learning.
3. The dialogue journal provides an effective way of accommodating individual differences, even if the students are tracked by ability.
4. Rereading students' journal letters should be done frequently throughout the school year.

In considering different forms of the use of dialogue journals, Regan (2003) implemented dialogue journals to form relationships with her students with emotional disturbance. Six journals were examined as part of a daily greeting activity in a sixth-eight grade special education classroom where students would write a letter to the teacher daily, and the teacher would respond back. These "personal journals" were used to facilitate personal connections with each student. Journals were used as a communication for students to discuss their progress in school, personal relationships with peers, as well as family environment.

Through her qualitative study, Regan (2003) was able to categorize the journal entries into nine categories: requests to an adult or asking question; feelings, emotions, and hopes; empathy and kindness; family and home; school and peers; self and



reflections; out-of-school topics; weekend; wishes and wants. These journal communications showed to be beneficial for students with emotional disturbance by: (a) motivating less-skilled students to write, (b) allowing additional outlets for students to express themselves appropriately, (c) teachers can model and encourage appropriate social skills, (d) strengthening student-teacher relationships.

Her study supports the use of dialogic interaction in a classroom as it shows that building student-teacher rapport benefits the students in many different educational facets. The current study has linked the previous research of dialogic communication from being personal dialogue to now being studied as a source of academic support.

This information reinforced the impact that dialogue journals have in promoting teacher-student interaction and reading comprehension. The current study utilized literacy experts to review journals on a weekly basis in the interest of measuring the amount of teacher scaffolding and interaction that occurred during written conversations.

### **Summary of Research**

This chapter is divided into seven sections. The first section discusses teacher student interaction. Perkins (1996), Kahn (1997), and Cuban (1993) focused on traditional classroom environments and the need to move into a teacher-student centered environment. Perry et al. (2007) investigated the effects of teacher practices in promoting students' academic achievement, behavioral adjustment, and feelings of competence. The second section deals with the relationship between teacher scaffolding and student achievement. Lutz et al. (2006) examined reading comprehension outcomes, student engagement, task complexity and teacher scaffolding during integrated reading-science instruction and traditional reading instruction. Extending the research to

scaffolding in an early childhood classroom, Elster (1994) sought to identify and describe multiple reading and talk strategies used by emergent readers. Taking into consideration the varying strategies of scaffolding, the terms microgenetic scaffolding and ontogenetic scaffolding were discussed. Many (2002) conducted a study of the nature of instructional scaffolding that occurred as students and teachers constructed meaning of narrative and expository texts using instructional conversations. Her study showed how scaffolding provided students with a more complex understanding of text, as well as developed their repertoire for strategy use. Ontogenetic scaffolding was examined in a longitudinal study by Almasi et al. (2005) to gain insight into the intra-individual and inter-individual changes that occurred during the students' kindergarten- third grade years. They found that if students engaged in peer discussion they would be able to use an interpretive strategy to gain deeper levels of comprehension.

The third section focused on the need for understanding reading instruction in the early childhood stages. Lonigan et al. (2000) examined the joint and unique predictive significance of emergent literacy skills for later emergent literacy skills and reading in two samples of preschoolers. The results of their study demonstrated that the developmental origins of a large component of children's reading skills in kindergarten and first grade can be found in the preschool period.

With this comes an understanding that children must have experiences with reading and language to be successful in the reading classroom in later years. As students progress in reading instruction some students begin to struggle and fall behind. Wise et al. (2007) examined the causal relationships among expressive vocabulary, receptive vocabulary,

listening comprehension, and different measures of reading achievement in a group of second-third grade students with reading disabilities.

The fourth section gives attention to the area of expository text. When discussing reading instruction this review of literature focused on expository text instruction because of its importance in students' ability to acquire strategies and information. Barbara Moss (1997) continued the research of Pappas (1993) to explore the importance of retellings to examine first grade childrens' comprehension of expository text. Moss is able to confirm that young children are readily able to summarize text information, identify important information, provide opinions and rationale for their opinions, and infer beyond the text with text provided orally. This study confirmed the need to teach and assess students' understanding of expository text in the primary grades.

The fifth section considers research studies that investigated the relationship between reading instruction strategies and comprehension. The Rand Study Group formulated a three-dimensional definition of reading comprehension that synthesized transactional, social, and functional theories of reading comprehension which led to a need for future research to gain understanding in comprehension and strategy instruction. The study conducted by Berninger et al. (2006) looked into the comprehensiveness of reading instruction and analyzed students while explaining the usefulness of the different reading components necessary during reading instruction. Wilkinson and Son (2011) introduced a new wave of strategy instruction: dialogic approaches that intersect the two "types" of comprehension instruction: text-based discussions and strategy instruction.

The sixth section discussed the important role of metacognition in reading. Duffy et al. (1987) focused on the subject of making decisions about when and how to explain

the mental processing associated with using reading skills as strategies. Brailsford et al., (2001) investigated a remedial strategy training program with the intent of improving performance on tests of cognitive synthesis and tasks of reading comprehension. Stevens (1988) studied the relative effectiveness of four methods for teaching remedial reading students how to identify the main idea of expository paragraphs using technological progress.

The seventh section explained the use of dialogue journals to gather information on students' comprehension as well as their cognitive functioning. Dialogue journals were supported in this review of literature by Saunders and Goldenberg (1999), Garmon (2001), Werderich (2002), Regan (2003), and McIntyre et al. (2006) as a tool used in learning environments with emphasis on communication of lessons, comprehension, and interaction between teachers and students. In the examples presented, they studied prospective teachers' perceptions of the benefits and drawbacks of doing dialogue journals. The use of dialogue journals as a means of differentiating reading instruction for individual seventh-grade students was also analyzed. In reviewing the literature for dialogue journals, instructional conversations were considered because of their application in teaching and understanding text following sociocultural theories.

Instructional conversations were analyzed as a form of intervention for English language learners. McIntyre et al. (2006) researched an instructional conversation where one primary-grade teacher promoted small-group dialogue about books and literacy concepts in first and second grade classrooms. Their study allowed for an understanding on the importance of teacher guidance from the beginning of the lesson that leads to dialogue and the construction of new understandings. They contribute findings that

confirm teaching students (including a population of students historically less successful in school such as the poor) how to dialogue about books,

Overall, this review of the literature encompasses the review of research studies regarding the importance of studying reading comprehension and the necessity of increasing improved teacher student interactions. This current study has added to the research by investigating the use of dialogue journals in second grade science classrooms and its relationship to students' reading comprehension as measured by district assessments (FAIR) , science academic achievement as measured by Scott Foresman science chapter tests, as well as metacognition measured through the Metacomprehension Strategy Index (MSI).

## CHAPTER III

### METHODOLOGY

The purpose of this quasi-experimental study was to investigate the effectiveness of a dialogue journal intervention on second grade students' success in science comprehension. This study examined the use of dialogue journals, a method of written communication between teachers and students. Each student in the experimental classrooms had a journal with formatted pages. The teacher then responded to the student's summary using metacognitive strategies and scaffolding to prompt understanding of the expository text. The goal of the study was to test the effects of participating in the dialogue journal intervention on second graders' reading comprehension, science achievement and use of metacognition strategies.

This study was guided by five main hypotheses.

#### **Hypothesis 1**

Students will demonstrate significant improvement in reading comprehension from FAIR pretest to FAIR mid test after implementing metacognitive strategies to both groups.

1a. It is hypothesized that sex differences account for a significant proportion of unique variance in predicting FAIR mid test scores while controlling for FAIR pretest scores.

#### **Hypothesis 2**

Students will demonstrate significant improvement in reading comprehension from FAIR mid test to FAIR post test after implementing metacognitive strategies to both groups.

2a. It is hypothesized that dialogue journal treatment will demonstrate significant proportion of unique variance in predicting reading comprehension gains while controlling for the FAIR mid test scores.

2b. It is hypothesized that there is an interaction between the use of dialogue journals and sex in predicting reading comprehension gains while controlling for FAIR mid test scores.

### **Hypothesis 3**

Students will demonstrate significant improvement in metacognition from MSI pretest to MSI posttest after implementing metacognitive strategies to both groups.

3a. It is hypothesized that dialogue journals account for a significant proportion of unique variance in predicting metacognitive gains while controlling for MSI pretest scores.

3b. It is hypothesized that there is an interaction between the use of dialogue journals and sex in predicting metacognitive gains.

### **Hypothesis 4**

Students will demonstrate significant improvement in science achievement from science end of chapter pretest to posttest after implementing metacognitive strategies to both groups.

4a. It is hypothesized that dialogue journals account for a significant proportion of unique variance in predicting science achievement while controlling for science end of chapter pretest scores.

4b. It is hypothesized that there is an interaction between the use of dialogue journals and sex in predicting science achievement while controlling for science end of chapter pretest scores.

4c. It is hypothesized that fidelity of treatment accounts for a significant proportion of unique variance in predicting science achievement gains while controlling for science end of chapter pretest scores.

### **Hypothesis 5**

It is hypothesized that students participating in dialogue journal treatment will perform significantly better on the linear combination of reading comprehension, science achievement, and metacognitive function than their comparison group counterparts while controlling for pretest scores.

5a. It is hypothesized there is an interaction between receiving dialogue journal treatment and sex in predicting gains on the linear combination of reading comprehension, science achievement, and metacognitive function when compared to the comparison group.

This chapter describes the methodology that was used for the present study. The first section provides an overview of the site where the study was conducted and the convenience sample of students participating. The second section describes the data collection measures and the third section explains the procedures of the study. The research design of the study is found in the fourth section. Finally, a description of the statistical analyses that was conducted is found in the fifth section.



## Sample and Participant Selection

The current study was conducted in a major metropolitan area in Southeastern United States where school districts are predominately Hispanic. The school was a school of convenience as the researcher was employed there. For purposes of confidentiality and privacy of the participants in the study, the participating Title I elementary school is referred to from this point on as Metropolitan Public School (MPS).

Participating teachers (N=4) were all experienced elementary school teachers. The teachers were all established teachers in the school system (see Appendix A for demographic summary), two teachers had additional special education certification.

The demographics of the school population, as shown in Table 1 is predominantly Hispanic (94%). All participating students in the current study were of Hispanic descent.

Table 1

*Demographics of the Population of Student Body at MPS*

Race/ Ethnicity	Percentage of students
African American	1%
Asian/Indian/Multiracial	5%
Hispanic	94%
Other	5%

Taking into consideration the population of the school, it was imperative to investigate the educational track of students attending MPS. Due to the fact that the current study investigated reading and writing in the science classroom, only those receiving standard instruction would participate in the study. As shown in Table 2 the

majority of the students (79%) received standard instruction, these were the students to whom consent forms were given to participate in the study.

Table 2

*Demographics of Students' Educational Track at MPS*

Educational Track	Percentage of students
English Speakers of Other Languages (ESOL)	31%
Gifted education	7%
Special education programs	14%
Standard instruction	79%

The participants ( $N = 39$ ), were those students who returned the consent forms that were distributed on the first day of school as part of the Back to School packet. A meet and greet letter was sent home informing parents of the opportunity during Open House to come meet the researcher and discuss any questions they may have before signing the consent form. Students were given a week to return the consent forms, the participating students were then given an assent form detailing their role as participants to a research study. After all expectations were discussed, as well as the rewards for participating, students were then asked to sign their agreement to participate in the current study.

Due to the low enrollment of second grade students there was a classroom change in which one second grade teacher was moved to a different grade level. With this change a population shift occurred with the purpose of meeting state mandated class-size regulations. Two classrooms had 16 students each, and one classroom had 29 students. Due to the fact that one classroom was over class size a co-teaching model was established to meet teacher-student ratio of one teacher per 18 students. The 39

participants were 7-8 year old students, in three different heterogeneous second grade classrooms. The sample consisted of non-probabilistic convenience groups because students were non-randomly assigned to a classroom at the beginning of the school year. One second grade classroom was the experimental classroom with two teachers ( $n = 22$ ), following the co-teaching method. One second grade classroom with one participating teacher ( $n = 9$ ), and one second grade classroom with one participating teacher ( $n = 8$ ) were the comparison classrooms.

### **Data Collection and Measures**

The data were collected using different measures: (a) Florida Assessments for Instruction in Reading (FAIR) Broad Diagnostic Inventory; (b) Scott Foresman end of chapter tests; (c) Metacomprehension Strategy Index (MSI, Schmitt, 1990); and (d) researcher-made metacognitive scaffolding rubric

#### **Florida Assessments for Instruction in Reading (FAIR; Florida Department of Education, 2009-2010)**

The FAIR is a screening, diagnostic and ongoing progress monitoring assessment that measures phonemic awareness, phonics, fluency, vocabulary and comprehension. The FAIR are individually administered three times a year by teachers to students and are comprised of four types of assessments: (a) Broad Screen/Progress Monitoring Tool, which includes a timed word reading task; (b) Broad Diagnostic Inventory, which includes comprehension and vocabulary tasks; (c) Targeted Diagnostic Inventory, which includes a word building task; and (d) Ongoing Progress Monitoring

The present study used only the Broad Diagnostic Inventory section of the FAIR assessment to measure the reading comprehension levels of all participating students.

To determine the reliability of the FAIR three explicit and two implicit comprehension questions were written for each passage and tried out with Grade 1 and Grade 2 students. Students' responses were coded as correct or incorrect, with coders achieving inter-rater reliability of at least 0.80. The Florida Sunshine State Standards, as well as national standards provided the content validity for the FAIR (Resnick & Hampton, 2009).

### **Metacomprehension Strategy Index (MSI, Schmitt, 1990)**

The Metacomprehension Strategy Index is a multiple choice questionnaire used to measure students' awareness of a variety of strategic reading processes that are appropriate for before, during, and after reading a text.

Previous studies (Baumann et al., 1987; Lonberger, 1988; Pereira-Laird & Deane, 1997) that have used this instrument have reported good reliability estimates for the MSI when used to measure metacomprehension in intervention studies. Lonberger (1988) reported an MSI internal consistency value of .87 using the Kuder-Richardson Formula 20. Pereira-Laird and Deane (1997) reported a Cronbach alpha of .68. Schmitt (1988) found a statistically significant correlation between the questionnaire and the Index of Reading Awareness ( $r = .48, p < .001$ ). In the same study, there were also statistically significant correlations between the MSI and two measures used to assess metacomprehension ability: an error detection task ( $r = .50, p < .001$ ) and a cloze task ( $r = .49, p < .001$ ).

### **Metacognitive Scaffolding Rubric**

Teacher fidelity of implementation of metacognitive strategies was measured through the use of a researcher made Metacognitive Scaffolding Rubric. The metacognitive scaffolding rubric consists of five metacognitive strategies deemed by

Schraw (1998) as effective metacognitive scaffolding strategies. The metacognitive scaffolding rubric ascertained whether: (a) teachers asked students to think about what is already known (prior knowledge), (b) teachers prompted students to search for headings, highlighted words (skim strategy), (c) teachers reminded students to reread information (reread strategy), (d) teachers gave students themes to relate main ideas, or conclusions (mental integration), and (e) teachers guided students to find supporting details from pictures, captions, and graphs (visuals/diagrams).

The Metacognitive Scaffolding Rubric was used to determine the levels (e.g., excellent, satisfactory, fair, and seldom) to which participating teachers implemented the previously mentioned effective metacognitive scaffolding strategies, according to the study procedures. To suitably measure the levels to which participating teachers implemented metacognitive scaffolding, the Metacognitive Strategy Rubric was used at two different time points. First, as an oral metacognitive scaffolding rubric used in both the comparison and experimental groups, throughout the duration of the study. Then as a dialogue journal metacognitive scaffolding rubric, used only with the experimental group during the dialogue journal intervention.

Content validity of the Metacognitive Strategy Rubric was examined with expert judgment of the researcher and four FIU Reading Education professors. The rubric was evaluated using a table of specifications created by the researcher. The table of specifications allowed the expert judges to analyze if the evidence of strategy use coordinated with the metacognitive strategy found in Schraw's Metacognitive Strategy Index. Researcher and expert judges agreed 90% of the time that the item estimated the use of metacognitive strategy.

**Oral metacognitive scaffolding.** The Metacognitive Scaffolding Rubric was used as a procedure to measure teacher fidelity of implementation of the metacognitive scaffolding strategies during oral science instruction. The format used to measure oral metacognitive scaffolding can be found in the Appendix B. The rubric determined the levels (e.g., excellent, satisfactory, fair, and seldom) to which participating teacher orally discussed and scaffolded using metacognitive strategies.

**Dialogue journal metacognitive scaffolding.** The metacognitive scaffolding rubric was used as a procedure during dialogue journal treatment to measure teacher fidelity of implementation of the metacognitive scaffolding strategies during dialogue journal treatment. The format used to measure dialogue journal metacognitive scaffolding can be found in the Appendix B. The purpose of this rubric was to determine the levels (e.g., excellent, satisfactory, fair, and seldom) to which each experimental teacher scaffolded using metacognitive strategies as part of their dialogue journal entries.

### **Study Procedures**

The present study was conducted throughout 38 weeks of the 2012-2013 Public school year consisting of three phases of science instruction and three assessment time points (see Appendix C for a procedures outline). Treatment began during the 19th week of school and lasted for 19 weeks.

#### **Metacognition Workshops**

The summer prior to the current study commencing, the researcher contacted the MPS second grade participating teachers ( $n=4$ ) and provided a welcome packet including a letter explaining the current study and asking for their participation. The packet also included a demographic survey that was to be completed and submitted during the

metacognitive workshop. The participating teachers were asked to choose between dates to attend a 2-day workshop.

Participating teachers attended a two-session metacognition workshop to aid in the teacher directed metacognitive scaffolding during science instruction. Teachers were provided with a researcher made handbook to inform them about metacognitive strategies, following Schraw's (1998) Strategy Evaluation Matrix. This served as a scaffolding tool that was used during their classroom science instruction. Demonstrations following the Scott Foresman chapters, and examples were given by the researcher to provide teachers with ideas on how to orally respond, as well as how to probe students. Teachers were given the opportunity to discuss and provide feedback allowing the researcher to make any appropriate changes to the scaffolding procedures. All teachers were in agreement with the strategies and procedures delineated by the researcher.

During the second day of the workshop MPS participating teachers continued role-playing with oral metacognitive scaffolding strategies. The teachers also created a metacognitive strategies poster that included a picture icon for each strategy and a brief explanation to use as a reference tool. These posters were a shortened replica of the handbook provided. Each participating teacher was asked to create a replica poster with their students during the first week of school to introduce and discuss the metacognitive strategies that would be used during science instruction. The Metacognitive Scaffolding rubric was introduced as the procedure for measuring teacher fidelity of implementation of metacognitive strategies during oral science instruction.

Participating experimental teachers ( $n=2$ ) had an additional two session metacognition workshop to address the use of the strategies during dialogue journal

intervention, as well as to review the gradual release of responsibility model (Pearson & Gallagher, 1993) to teach students the proper way to write in the journals, and communicate with the teacher. The previously provided handbook was discussed as a scaffolding tool to be used during responses to dialogue journal entries. During this workshop, teachers were given sample material from Scott Foresman lessons that were used to practice and discuss different metacognitive strategies that could be used with the student entries. Gradual release of responsibility was discussed with the emphasis of the roles and behaviors that the teacher has during the teaching phase (e.g. guided practice and demonstration), and during the practice phase (e.g. guided practice and application). The Metacognitive Scaffolding rubric was presented as the procedure for measuring teacher fidelity of implementation of metacognitive scaffolding during dialogue journal responses. Appendix D provides a summary of topics addressed during the workshops.

Due to teacher attrition because of retirement, the researcher had to conduct a metacognitive workshop for the two new participating teachers taking over the classrooms. These teachers were established teachers in the participating school that had an assignment change. These teachers were willing to move to the new grade level which allowed the researcher to feel comfortable that the study can resume without any interruptions. Before winter recess the researcher contacted the new MPS second grade participating teachers ( $n= 2$ ) and provided the welcome packet including a letter explaining the current study and asking for their participation. The researcher scheduled a workshop for these teachers in which the handbook and rubric were explained. They received all instruction and modeling as the previous participants. For the reason that



these teachers were taking over the comparison classrooms a need was not found to describe the dialogue journal treatment.

### **Science Instruction**

**Science instruction phase one.** All students participated in the first phase of science instruction commencing on the first day of school and lasting until the winter recess (18 week period). The school's science curriculum was implemented biweekly within a 50-minute block. Grade level meetings were held weekly to monitor and verify that all classroom instruction was following the Common Core Sunshine State Standards pacing guide to instruct students throughout the school year. Regular science instruction consisted of implementation of Scott Foresman second grade science textbooks, workbooks, and hands-on activities or labs. Due to the importance of consistency throughout the study, each teacher was given a schedule to use alongside the district pacing guides.

During the first phase of instruction, the researcher randomly observed science instruction, using the metacognitive scaffolding rubric, to measure the fidelity of implementation of metacognitive strategies during oral discussion. To reduce bias and increase consistency, after receiving a thorough training, the MPS reading coach assisted the researcher in completing the metacognitive scaffolding rubric for each participating teacher ( $n=4$ ) during three separate time points.

**Science instruction phase two.** The second phase of science instruction consisted of a 19 week period, starting on week 19 and lasting until the 38th week of the school year. Intervention began during this phase.

Students in the comparison classroom continued to receive regular science instruction using oral metacognitive strategies. The researcher and MPS reading coach randomly observed teacher fidelity of implementation of oral metacognitive strategies during science instruction, using the metacognitive scaffolding rubric, for each comparison teacher ( $n=2$ ), during three separate time points.

Students in the experimental classroom began the dialogue journal intervention. Dialogue journals consists of four major points: (a) writing lesson title, (b) using three block format to write notes or illustrations based on vocabulary, important facts, and captions presented in the lesson, (c) teacher scaffolded remarks, and (d) student responses. Teachers followed the gradual release of responsibility model (Pearson & Gallagher, 1993) in the interest of teaching students the proper way to write in their journals, and communicate with the teacher.

The participating experimental classroom began dialogue journals in January after students' science comprehension baseline score was assessed. Students had a whole group practice session, before the winter recess, which allowed the teachers ( $n=2$ ) to demonstrate reading the lesson and taking notes using the dialogue journal. Students participated in completing the dialogue journal and responded to teachers' prompts. After a 2-week whole-group lesson, students began their individual dialogue journals.

The first 15 minutes of the science block consisted of whole-group instruction focusing on the lesson of the week or day. Together, the class and the teacher read the assigned pages for the chapter. Oral discussion took place to obtain students prior knowledge and understanding of the assigned lesson. Oral readings consisted of teacher guided metacognitive instruction using the designated chapter and lesson from the

science pacing guide. For the remaining 30 minutes, the class independently completed their dialogue journal entry taking notes on the important aspects of the lesson. Students reread the lesson independently and completed the dialogue journal using the metacognitive graphic organizer provided in their journal to complete their entry and monitor their understanding.

During those 30 minutes of independent student work, the teachers used that time to scaffold and respond to any student who needed guidance, as well as began written scaffolding for those students who had completed their entry for the day. After every lesson and journal entry teachers responded to students' entries using metacognitive strategies to scaffold misconceptions or misunderstandings from the text. Teachers were expected to respond back to each student's entry by the third day of the lesson allowing ample time for students to attend to teacher feedback entries made in their metacognitive organizer.

During the study, the researcher and MPS reading coach observed science instruction in the experimental classroom using the metacognitive scaffolding rubric, to measure teacher fidelity of implementation of metacognitive strategies during oral discussion, for each participating experimental teacher ( $n=2$ ), during three separate time points.

***Dialogue journal scaffolding evaluation.*** The researcher and MPS reading coach also reviewed student journal entries using the metacognitive scaffolding rubric, to measure fidelity of implementation of metacognitive strategies during written discussion. To increase the likelihood of the intervention being accurately implemented, the researcher randomly selected student journals, and verified that the dialogue journal

process was being conducted appropriately in regards to the use of scaffolding metacognitive strategies.

Student journals were selected based on the instructional level groups assigned by the FAIR Broad Diagnostic Inventory assessment period one results. The researcher indiscriminately selected journals from each instructional level group, using a random number table based upon the number associated with each student's gradebook roster, totaling five journals per chapter. To reduce bias and increase consistency, after receiving a thorough training, the MPS reading coach assisted the researcher in completing the metacognitive scaffolding rubric for all the participants ( $n= 17$ ) throughout the intervention. If the researcher and MPS reading coach established a 90% consistency rating in following the metacognitive scaffolding rubric, then the intervention was deemed accurately implemented. If the researcher and MPS reading coach discovered that the dialogue journal process was not being conducted appropriately, the researcher would have conferenced with the participating teacher and reviewed the handbook provided during the metacognition workshops. Additional guided practice and supplemental material would have been provided to enhance the fidelity of treatment. Throughout the duration of the study the researcher and MPS reading coach agreed that intervention was accurately implemented. There was no evidence that teachers needed any additional guided practice or review.

**Science instruction phase three.** The third phase of science instruction consisted of a 2 week period in which traditional textbook science instruction was given for all participating students. The school's science curriculum was implemented biweekly within a 50-minute block.

## **Assessment Time points**

**Assessment time point one.** During the first two weeks of school (August) participating teachers, researcher, and MPS reading coach administered the FAIR Broad Diagnostic Inventory (FAIR) to obtain students' initial reading comprehension scores. Teachers attended a brief workshop on the FAIR to refresh their knowledge on the assessment and receive their testing materials.

The MSI (Schmitt, 1990) pretest was administered during a 30-minute group session the first week of school to obtain students' self-report on metacognition. The MSI assessed declarative and conditional awareness of a variety of metacomprehension behaviors that is comprised of six broad categories: drawing from background knowledge, previewing, purpose setting, predicting and verifying, self-questioning, and summarizing and applying fix-up strategies.

Science baseline comprehension scores were obtained by gathering a mean of individual student scores on end of chapter Scott Foresman exams throughout the first 15 weeks of instruction. Students completed comprehension exams after chapter lesson was completed in their Scott Foresman science textbook ( $N=39$ ).

**assessment time point two.** During the 16 and 17<sup>th</sup> week of school (December), the teacher and MPS reading coach conducted the FAIR Broad Diagnostic Inventory to obtain the reading comprehension scores after 15 weeks of metacognitive scaffolding. Science comprehension scores were obtained by gathering a mean of individual student scores on end of chapter Scott Foresman exams conducted between the 19<sup>th</sup> and 36<sup>th</sup> week of instruction. Students completed comprehension exams after each chapter was completed in their Scott Foresman science textbook ( $N=39$ ).

**Assessment time point three.** Time three of assessments took place during the 37th-38th week of school (May); the teacher and MPS reading coach conducted the FAIR Broad Diagnostic Inventory to obtain reading comprehension scores after treatment was implemented. The MSI (Schmitt, 1990) posttest was conducted to obtain students' self-report scores on metacognition strategy use.

### **Research Design**

The present quasi-experimental study used a two group (experimental, comparison) non-randomized longitudinal time design (Newman, Newman, Brown, & McNeely, 2006) with repeated measures that allowed the researcher to create a baseline growth using the FAIR Broad Diagnostic Inventory results, and control for any dependent data, external factors, or typical age-related growth. For example, assessing students' reading comprehension at Time 1 and then again at Time 2 after receiving regular science instruction, allowed the researcher to determine each student's normal growth, regardless of the classroom. The growth could have been the result of several factors, such as teacher effects on students' learning or maturity of the students in each classroom. A strength of this design is that the additional pretests allowed for control of pretest sensitization. The additional posttests allowed the opportunity of assessing gains. Another important strength of this design is that multiple observations served to illustrate the effects of maturation both with and without the experimental treatment. Conversely, a weakness of this design is that frequent testing is arduous and often subjects are lost for different reasons. This design is mediocre in internal validity, but it is important in longitudinal research (Newman et al., 2006).

This research design also controlled for extraneous factors that may have, inadvertently, caused improvements or growth in the outcome measure. In the context of this study, one example of within-subject control was to explore the individual growth of students. This method allowed the researcher to control for typical age-related change and development. By creating a baseline for each student, the researcher was able to analyze each student's normal growth and consider this growth when interpreting the results.

Between-subject control was maintained by comparing the results of the experimental group who received the dialogue journal treatment to the comparison group who did not receive the dialogue journal treatment during Instructional Phase 2. This method helped control for dependent data such as teacher effects. Since both the comparison group and the experimental group received regular science instruction using oral metacognitive strategies during Phase 1, the difference in growth between the two groups can be attributed to classroom or teacher effects. By using the multiphase design, teacher and classroom effects were measured and statistically controlled.

### **Statistical Analysis Plan**

Preliminary correlations were conducted to determine the demographic variables (age, sex, etc.) that should be included as control variables in any further analyses. Next, the hypotheses were explored by conducting multiple regression analyses using the SPSS 20.0.0 statistical program. Effect size was calculated using Cohen's (1977) representational model defined by three effect sizes: small ( $>.15$ ), medium ( $.15$  to  $.35$ ) and large ( $<.35$ ; Newman, Fraas, & Kelly, 2012). Power analysis was calculated to

determine the probability of a Type II error at a level of .05, given the small sample size of  $N=39$ , it is necessary to calculate the power for this study.

General Linear Model (MLR) was used in the present study to analyze the variance in predicting from one variable to another and in covarying some of the variables to test the alternative hypotheses. With multiple linear regression, one can write the models that reflect the specific research question being asked. In addition, Newman et al. (2011) point out that with multiple linear regressions one can test relationships between categorical variables, between categorical and continuous variables, or between continuous variables.

The present study used multivariate analysis of variance (MANOVA) to determine if the use of the dialogue journal treatment ( $n= 17$ ) was statistically significant when evaluating the effects of the dependent variables: reading comprehension, science achievement, and metacognition compared the comparison group ( $n=22$ ). The use of a MANOVA allowed the researcher to test the hypotheses while taking into account the intercorrelations among the dependent variables. The assumption that a MANOVA is a robust test that can stand up to departures from multivariate normality in terms of Type I error rate was important to this study due to the small sample size (Field, 2009; Stevens, J.P., 2009).

In addition, a two way analysis of covariance (Field, 2009) was conducted, using the SPSS statistical package, to determine if there was a significant interaction in reading comprehension, science achievement, and metacognition between sex, as well as between students, while controlling for pretest scores. A paired-samples  $t$ -test (Newman et al.,



2006) was conducted to compare reading comprehension, science achievement, and metacognition between the dialogue journal treatment group and the comparison group.

### **Summary**

This chapter has provided the methodology for the present study. The first section provided an overview of the site where the study was conducted as well as the sample of students participating. The second and third section explained the data collection measures and the procedures of the study respectively. The fourth section described the research design of the study. Finally, the fifth section informs of the statistical analyses that was conducted.

The participants ( $N= 39$ ) were recruited from a single, predominantly Hispanic, suburban, Title I elementary school. The researcher has explained how this study will examine the implementation of oral metacognitive scaffolding as well as dialogue journal intervention as a means to improve reading comprehension, science text achievement, and improve student metacognition. The data were collected using different measures: (a) Florida Assessments for Instruction in Reading (FAIR) Broad Diagnostic Inventory; (b) Scott Foresman, End of Chapter tests; (c) Metacomprehension Strategy Index (MSI, Schmitt, 1990); and (d) researcher-made metacognitive scaffolding rubric.

The present study was conducted throughout 38 weeks of the 2012-2013 Public school year consisting of three phases of science instruction and three assessment time points. Treatment began during the 19th week of school and carried on for 19 weeks. Teachers ( $n=4$ ) were provided with a metacognition workshop, as well as researcher made handbook to inform them on metacognitive strategies, following Schraw's (1998) Strategy Evaluation Matrix, that would be used during the present study.

The present quasi-experimental study used a two group (experimental, comparison) non-randomized longitudinal time design (Newman, Newman, Brown, & McNeely, 2006) with repeated measures to allow the researcher to create a baseline growth using the FAIR Broad Diagnostic Inventory results, and control for any dependent data, external factors, or typical age-related growth.

The present study also used multivariate analysis of variance (MANOVA) to determine if the use of the dialogue journal treatment ( $n = 17$ ) was statistically significant when evaluating the effects of the dependent variables: reading comprehension, science achievement, and metacognition compared to the comparison group ( $n = 22$ ). In addition, a two way analysis of covariance (Field, 2009) was conducted, using the SPSS statistical package, to determine if there was a significant interaction in reading comprehension, science achievement, and metacognition between sex, as well as between students, while controlling for pretest scores.

Finally, a paired-samples  $t$ -test (Newman et al., 2006) was conducted to compare reading comprehension, science achievement, and metacognition between the groups.

## CHAPTER IV

### RESULTS

The results section is divided into three parts. The first part consists of explanatory data analyses, which contains an examination of whether or not the demographic and extraneous factors played a role in reading comprehension, science achievement, and metacognition. The next part addresses the results of the general and specific research questions. To examine the hypotheses, a multiple regression analyses was conducted to determine the effects of metacognitive scaffolding through dialogue journals across a 19 week period. The hypotheses were explored using a multivariate analysis of variance (MANOVA) to determine if the use of the dialogue journal treatment ( $n= 17$ ) was statistically significant when evaluating the effects of the dependent variables: reading comprehension, science achievement, and metacognition compared the comparison group ( $n=22$ ). A paired-samples *t*-test (Newman et al., 2006) was conducted to compare reading comprehension, science achievement, and metacognition within the dialogue journal treatment group and the comparison group.

Finally, a two way analysis of covariance (Field, 2009) was conducted to determine if there is a significant interaction in reading comprehension, science achievement, and metacognition between sex, as well as between students who participated in dialogue journals and students who did not participate, while controlling for pretest scores.

#### **Exploring Demographic and Extraneous Factors**

As one can see from Table 3 there are 39 participants in this study. The comparison group accounted for 56.4% of the total number of participants and consisted

of 22 students, 11 of whom were girls and 11 boys. The treatment group consisted of 17 participants and accounted for 43.6% of the total number of participants which includes nine females and eight males.

Table 3

*Demographic of Participants N=39*

Sex	Comparison		Treatment	
	N	%	N	%
Male	11	50	8	47
Female	11	50	9	53
Total number of Participants	22	56.4	17	43.6

Table 4 presents means and standard deviations for the four measures utilized in this study disaggregated by treatment. The FAIR pretest for the treatment group had a mean score of  $1.98 \pm 0.34$  and the comparison group has a mean of  $2.03 \pm 0.38$ . The FAIR Mid scores for the treatment group had a mean of  $2.14 \pm 0.38$  and the comparison group reported a mean of  $2.24 \pm 0.37$ . FAIR Post test scores for the treatment group had a mean score of  $2.33 \pm 0.33$  and the comparison group reported a mean score of  $2.41 \pm 0.16$ . The FAIR pretest, mid, and posttest scores are based on a maximum score of 2.9.

The Metacognitive pretest reported for the treatment group is  $8.59 \pm 2.91$ . The comparison group reported  $6.73 \pm 1.88$ . The metacognitive posttest for the treatment group had a mean score of  $9.82 \pm 4.05$  while the comparison scored  $11.55 \pm 4.86$ . Both the metacognitive pretest and posttest were out of a possible twenty five points.

The science pretest mean score for the treatment group was  $182.19 \pm 48.09$  and the comparison group reported  $211.41 \pm 39.45$ . The science posttest scores for the treatment

group was 210.29 $\pm$ 62.41 and the comparison group was 226.36 $\pm$ 35.38. Both the science pretest and posttest consisted of a possible 300 points.

Teacher fidelity of scaffolding implementation pretest measured by the metacognitive scaffolding rubric had a mean score of 15.83 for the treatment group and 17.83 for the comparison group. Teacher fidelity of implementation posttest scores reported that the treatment group had a mean score of 17.33 and the comparison reported 17.5 each out of a possible twenty five points.

Table 4

*Descriptive Statistics  
Means and Standard Deviations of Test Scores and Disaggregated by Treatment*

Test Measures	Comparison (N=22)		Treatment (N=17)	
	M	SD	M	SD
FAIR Pretest	2.03	0.38	1.98	0.34
FAIR Midtest	2.24	0.37	2.14	0.38
FAIR Posttest	2.41	0.16	2.33	0.33
Metacognitive Pretest	6.73	1.88	8.59	2.91
Metacognitive Posttest	11.55	4.86	9.82	4.05
Science Pretest	211.41	39.45	182.19	48.09
Science Posttest	226.36	35.38	210.29	62.41
Teacher Fidelity Pretest	17.83	1.33	15.83	2.48
Teacher Fidelity Posttest	17.5	2.07	17.33	1.37

Cronbach's alpha was run on the teacher fidelity measure. The teacher fidelity had a total of five items and four levels and reported a Cronbach's alpha of .416 (see Table 5.) According to Kline (1999) alpha levels running from 0.7 – 0.80 are acceptable while alpha levels ranging from 0.6 – 0.7 are questionable, and alpha levels of 0.5 -0.6

are considered poor. Therefore, one needs to be careful when interpreting the results of the teacher fidelity of implementation measure.

Table 5

*Internal Consistency of Fidelity Measure Using Cronbach's Alpha*

	<i>N</i> of Items	$\alpha$
Teacher Fidelity	5	.416

**Exploring Hypotheses**

General Research Hypothesis 1 tested the significant improvement in reading comprehension from FAIR 1 to FAIR 2 after implementing metacognitive strategies to both groups. A paired sample *t*-test was conducted to test this research hypothesis and was found to be significant ( $t(36)=-5.59, p = <.001$ ) (see row one in Table 6).

Table 6

*Paired Sample t-test Investigating Mean Changes Across Time*

Pairs	Comparison		Treatment		Paired <i>-t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
FAIR 1 – FAIR 2	2.01	0.36	2.25	0.31	-5.59	36	<0.001	0.31
FAIR 2 – FAIR 3	2.2	0.37	2.37	0.25	-4.67	38	<0.001	0.26
FAIR 1 – FAIR 3	2.01	0.36	2.41	0.15	-7.96	36	<0.001	0.41
Meta Pre – Meta Post	7.54	2.53	10.79	4.55	-4.37	38	<0.001	0.56
Science Pre- Science Post	199.11	45.11	221.58	47.58	-3.81	37	0.001	5.29

Specific Research Hypothesis 1a investigates if sex differences account for a significant proportion of unique variance in predicting FAIR 2 scores while controlling for FAIR 1 scores. A regression analysis of covariance was conducted and as one can see from Table 7 sex does not account for a significant proportion of unique variance in

predicting reading comprehension scores from FAIR 1 to FAIR 2 ( $R^2_{\text{Change}}=.03$ ,  $F_{\text{Change}(1,34)}=2.182$  , and  $p=.149$ ).

Table 7

*Regression Analysis Summary for Sex predicting Reading Comprehension Posttest Scores While Controlling for Pretest Scores*

Model	Predictors	B	SE B	$\beta$	t	P
Restricted	(Constant)	1.03	0.21		5.03	0.000
	Pretest	0.6	0.1	0.71	6.01	0.000
Full	(Constant)	1.07	0.2		5.25	0.000
	Pretest	0.61	0.1	0.72	6.19	0.000
	Sex	-0.1	0.07	-0.17	-1.48	0.149

Note.  $R^2_{\text{Change}}=.03$  with an  $F_{\text{Change}(1,34)}=2.182$  and  $p=.149$

General Research Hypothesis 2 investigates if there a significant improvement in reading comprehension from FAIR 2 to FAIR 3 in both groups. A paired sample *t*-test was conducted to test this research hypothesis and was found to be significant ( $t(38)=-4.67$ ,  $p<.001$ ; see Table 6).

Specific Research Hypothesis 2a investigates if the treatment of dialogue journals account for a significant proportion of unique variance in predicting reading comprehension gains while controlling for the FAIR mid test. A regression analysis of covariance was conducted and reported that dialogue journals do not account for a unique proportion of unique variance in predicting FAIR posttest scores ( $R^2_{\text{Change}}=.003$ ,  $F_{\text{Change}(1,36)}=.293$  , and  $p=.592$ ; see Table 8).

Table 8

*Regression Analysis Summary for Dialogue Journals predicting Reading Comprehension Post-test Scores While Controlling for Pretest Scores*

Model	Predictors	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Restricted	(Constant)	1.23	0.15		8.06	0.000
	Pretest	0.52	0.07	0.78	7.67	0.000
Full	(Constant)	1.25	0.16		7.84	0.000
	Pretest	0.52	0.07	0.78	7.46	0.000
	Dialogue Journals	-0.03	0.05	-0.06	-0.54	0.592

*Note.*  $R^2_{\text{Change}}=.003$ ,  $F_{\text{Change}(1,36)}=.293$ , and  $p=.592$

Specific Research Hypothesis 2b investigates if there is an interaction between the use of dialogue journals and sex in predicting reading comprehension gain while controlling for FAIR mid test. A two way analysis of covariance was conducted and was found that there was no statistical significance interaction ( $F=1.51$ ,  $p=.23$  and  $\eta^2=.042$ ).

Table 9

*Summary Table for a Two Way Analysis of Variance of the Effects of Dialogue Journals and Sex on Reading Comprehension Post Test Scores*

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>	$\eta^2$
FAIR Mid	1	1.37	1.37	53.36	0.00	.611
Group	1	0.01	0.01	0.25	0.62	.007
Sex	1	0.00	0.00	0.06	0.81	.002
Group * Sex	1	0.04	0.04	1.51	0.23	.042
Within Group	34	0.87	0.03			
Total	39	222.24				

*Note.* Results are for posttest scores while controlling for pretest

General Research Hypothesis 3 investigates if metacognitive skills improve over time after implementing metacognitive strategies to both groups. A paired *t*-test was



conducted to test this hypothesis and as one can see from Table 6 there is a significant statistical improvement over time in both groups ( $t(38)=-4.37, p<.001$ ).

Specific Research hypothesis 3a investigates if the use of dialogue journals account for a significant proportion of unique variance in predicting metacognitive gains while controlling for pretest scores. A regression analysis of covariance was conducted and reported that dialogue journals do not account for a unique proportion of unique variance in predicting metacognitive posttest scores (see Table 10) ( $R^2_{\text{Change}}=.089, F_{\text{Change}(1,36)}=3.765$ , and  $p=0.06$ ).

Table 10

*Regression Analysis Summary for Dialogue Journals Predicting Metacognitive Function Post-test Scores While Controlling for Pretest Scores*

Model	Predictors	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Restricted	(Constant)	7.57	2.28		3.32	0.002
	Metacognitive Pretest	0.43	0.29	0.24	1.49	0.145
Full	(Constant)	7.23	2.21		3.28	0.002
	Metacognitive Pretest	0.64	0.3	0.36	2.15	0.038
	Dialogue Journals	-2.92	1.5	-0.32	-1.94	0.06

*Note.*  $R^2_{\text{Change}}=.089, F_{\text{Change}(1,36)}=3.765$ , and  $p=0.06$

Specific Research hypothesis 3b investigates if there is an interaction between sex and dialogue journals in predicting metacognitive gains. A two way analysis of covariance was conducted and as one can see from Table 11 there was no statistically significant interaction between the use of dialogue journals and sex in predicting metacognitive function posttest ( $F=0.0, p=.982$  and  $\eta^2=.000$ )

Table 11

*Summary Table for a Two Way Analysis of Variance of the Effects of Dialogue Journals and Sex on Metacognitive Function Post Test Scores*

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>	$\eta^2$
Metacognitive Pretest	1	78.35	78.35	4.01	.053	.106
Sex	1	9.05	9.05	0.46	.501	.013
Group	1	71.45	71.45	3.66	.064	.097
Sex * Group	1	0.01	0.01	0.00	.982	.000
Within Group	34	664.16	19.53			
Total	39	5333.00				

*Note.* Results are for posttest scores while controlling for pretest

General Research Hypothesis 4 investigates if there is a significant improvement in science achievement over time. A paired sample *t*-test was conducted and was found to be statistically significant ( $t(37)=-3.81, p=.001$ ; see Table 6)

Specific Research hypothesis 4a investigates if the use of dialogue journals account for a significant proportion of unique variance in predicting science achievement while controlling for pretest scores. A regression analysis of covariance was conducted and as one can see from Table 12 there was no statistical significance reported

( $R^2_{\text{Change}}=.012, F_{\text{Change}(1,36)}=.856$ , and  $p=0.361$ )

Table 12

*Regression Analysis Summary for Dialogue Journals Predicting Science Achievement Post-test Scores While Controlling for Pretest Scores*

Model	Predictors	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Restricted	(Constant)	75.90	25.84		2.94	.006
	Science Pretest	0.73	0.13	0.69	5.78	.000
Full	(Constant)	63.18	29.32		2.16	.038
	Science Pretest	0.77	0.13	0.73	5.75	.000
	Dialogue Journals	11.19	12.09	0.12	0.93	.361

*Note.*  $R^2_{\text{Change}}=.012, F_{\text{Change}(1,36)}=.856$ , and  $p=0.361$

Specific Research hypothesis 4b investigates if there is an interaction between dialogue journals and sex in predicting science achievement while controlling for pretest scores. A two way analysis of covariance was conducted and as one can see from Table 13 there is no statistically significant interaction between dialogue journals and sex in predicting science achievement while controlling for pretest scores ( $F=0.56, p=.460$  and  $\eta^2=.017$ )

Table 13

*Summary Table for a Two Way Analysis of Variance of the Effects of Dialogue Journals and Sex on Science Achievement Post Test Scores*

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>	$\eta^2$
Science Pretest	1	39473.68	39473.68	31.25	.000	.486
Group	1	862.51	862.51	0.68	.415	.020
Sex	1	125.86	125.86	0.10	.754	.003
Group * Sex	1	707.38	707.38	0.56	.460	.017
Within Group	33	41680.43	1263.04			
Total	38	1949470.00				

*Note.* Results are for posttest scores while controlling for pretest

Specific Research hypothesis 4c investigates if teacher fidelity accounts for a significant proportion of unique variance in predicting science achievement gains while controlling for pretest scores. A regression analysis of covariance was conducted and as one can see in Table 14 teacher fidelity does not account for a statistically significant proportion of unique variance reporting an  $R^2_{\text{Change}}=.012, F_{\text{Change}(1,35)}=.856$  , and  $p=0.361$

Table 14

*Regression Analysis Summary for Dialogue Journals Predicting Science Achievement Post-test Scores While Controlling for Pretest Scores*

Model	Predictors	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Restricted	(Constant)	75.90	25.84		2.94	.006
	Science Pretest	0.73	0.13	0.69	5.78	.000
Full	(Constant)	1215.32	1231.45		0.99	.330
	Science Pretest	0.77	0.13	0.73	5.75	.000
	Teacher Fidelity	-65.84	71.14	-0.12	-0.93	.361

Note.  $R^2_{\text{Change}}=.012$ ,  $F_{\text{Change}(1,35)}=.856$ , and  $p=0.361$

As one can see from Table 15 there is a statistically significant relationship between metacognitive function and reading comprehension ( $r=.27, p<.05$ ). There is also a statistically significant relationship between the science achievement posttest and metacognitive function ( $r=.42, p<.01$ ). As well as a statistically significant relationship between science achievement and reading comprehension ( $r=.63, p<.01$ ).

Table 15

*Correlation Coefficients for Between Three Measures of the Metacognitive Content Area Reading Comprehension Construct of Reading Comprehension, Science Achievement, and Metacognitive Function*

	1	2	3
1. Metacognitive Post	-		
2. Science Post	0.42**	-	
3. FAIR Post	0.27*	0.63**	-

Note. \* $p<.05$  \*\* $p<.01$  \*\*\* $p<.001$

General Research Hypothesis 5 investigates is those who received dialogue journals perform significantly better on the linear combination of reading comprehension, science achievement, and metacognitive function than their comparison group counterparts while controlling for pretest scores. A multivariate analysis of covariance was

conducted and as one can see from Table 16 there is a statistically significant improvement reported for those who received dialogue journal treatment on the linear combination of reading comprehension, science achievement, and metacognitive function while controlling for pretest scores where ( $F=2.66$   $p=.033$   $\eta^2=.21$ ).

Table 16

*Multivariate and Univariate Analysis of Covariance for the Metacognitive Content Area Reading Comprehension Construct by Group*

Source	Multivariate			Univariate								
	$F^a$	$p$	$\eta^2$	Science Achievement			Metacognitive Function			Reading Comprehension		
Group	$F^a$	$p$	$\eta^2$	$F^b$	$p$	$\eta^2$	$F^b$	$p$	$\eta^2$	$F^b$	$p$	$\eta^2$
Group	2.66	.033	0.21	1.66	.100	0.05	2.11	.077	0.06	2.10	.078	0.06

*Note.* Multivariate  $F$  ratios were generated from Pillai's statistics. <sup>a</sup>Multivariate  $df=1, 37$ . <sup>b</sup>Univariate  $df=1, 32$ .

The final Specific Research Hypothesis 5a investigates if there is an interaction between those receiving dialogue journals and sex in predicting gains on the linear combination of reading comprehension, science achievement, and metacognitive function when compared to the comparison group. A multivariate analysis of covariance was conducted to investigate this research question and as one can see from Table 17 was found to not be statistically significant where ( $F=1.27$   $p=.152$   $\eta^2=.12$ )

Table 17

*Multivariate and Univariate Analysis of Covariance for the Metacognitive Content Area Reading Comprehension Construct by Group and Sex*

Source	Multivariate			Univariate								
				Science Achievement			Metacognitive Function			Reading Comprehension		
	$F^a$	$p$	$\eta^2$	$F^b$	$p$	$\eta^2$	$F^b$	$p$	$\eta^2$	$F^b$	$p$	$\eta^2$
Group	2.68	.033	0.22	2.02	.083	0.06	2.14	.077	0.07	1.83	.093	0.06
Sex	0.63	.301	0.06	0.81	.093	0.03	0.23	.159	0.01	0.33	.142	0.01
G*Sex	1.27	.152	0.12	1.96	.086	0.06	0.08	.386	0.00	0.41	.263	0.01

Note. Multivariate  $F$  ratios were generated from Pillai's statistics. <sup>a</sup>Multivariate  $df=1, 37$ . <sup>b</sup>Univariate  $df=1, 30$ .

### Summary

Results of this quasi-experimental study are summarized in Table 18. When analyzing the five general hypotheses, the paired sample  $t$ -tests established significance for the overall improvement of reading comprehension, science achievement, and metacognition for all participants ( $N= 39$ ).

With the purpose of analyzing the importance of sex in student achievement, a regression analysis of covariance was conducted to analyze specific research hypotheses and established that sex does not account for significant proportion of unique variance in predicting reading comprehension, science achievement, or metacognition.

To evaluate the treatment of dialogue journals in student achievement, a regression analysis of covariance was conducted to analyze specific research hypotheses and established that treatment does not account for significant proportion of unique variance in predicting FAIR post test scores, science achievement, or metacognition post test scores. A regression analysis of covariance was also used to analyze the specific research hypothesis of teacher fidelity and determined that teacher fidelity does not

account for a significant proportion of unique variance in predicting science achievement gains while controlling for pretest scores.

A two way analysis of covariance was conducted to address specific research hypotheses, and determined there is no significant interaction in reading comprehension, science achievement, and metacognition between sex, as well as students who participate in dialogue journals and students who did not participate, while controlling for pretest scores.

Finally, a multivariate analysis of covariance (MANOVA) was conducted and reported a statistically significant improvement for those who received dialogue journal treatment on the linear combination of reading comprehension, science achievement, and metacognitive function while controlling for pretest scores. The MANOVA also investigated if there is an interaction between those receiving dialogue journals and sex in predicting gains on the linear combination of reading comprehension, science achievement, and metacognitive function when compared to the comparison group and was found to not be statistically significant.

The results and implications of these findings for research and practice are presented in Chapter 5.

Table 18

*Summary Table for General and Specific Research Hypothesis*

RH #	Research Hypothesis	<i>T</i> or <i>F</i>	<i>p</i>	Sig
<b>GH1</b>	<b>General Research hypothesis 1:</b> Is there a significant improvement in reading comprehension from FAIR 1 to FAIR 2 after implementing metacognitive skills in both groups?	$t=-5.59$	<.001	Yes
SH1a	<i>Specific Research hypothesis 1a:</i> Does sex differences account for a significant proportion of unique variance in predicting FAIR 2 scores while controlling for FAIR 1?	$F=2.182$	0.149	No
<b>GH2</b>	<b>General Research hypothesis 2:</b> Is there a significant improvement in reading comprehension from FAIR 2 to FAIR 3 overall?	$t=-4.67$	<.001	Yes
SH2a	<i>Specific Research hypothesis 2a:</i> Does dialogue journals account for a significant proportion of unique variance in predicting reading comprehension gains while controlling for the FAIR mid test?	$F=.293$	0.592	No
SH2b	<i>Specific Research hypothesis 2b:</i> Is there an interaction between dialogue journals and sex in predicting reading comprehension gain while controlling for FAIR mid test?	$F=1.51$	0.23	No
<b>GH3</b>	<b>General Research hypothesis 3:</b> Does metacognitive skills improve over time after implementing metacognitive strategies to both groups?	$t=-4.37$	<.001	Yes
SH3a	<i>Specific Research hypothesis 3a:</i> Do dialogue journals account for a significant proportion of unique variance in predicting metacognitive gains while controlling for pretest?	$t=-1.94$	0.06	No
SH3b	<i>Specific Research hypothesis 3b:</i> Is there an interaction between sex and dialogue journals in predicting metacognitive gains?	$F=0.00$	0.982	No
<b>GH4</b>	<b>General Research hypothesis 4:</b> Is there a significant improvement in science achievement over time?	$t=-3.81$	0.001	Yes
SH4a	<i>Specific Research hypothesis 4a:</i> Does dialogue journals account for a significant proportion of unique variance in predicting science achievement while controlling for pretest scores?	$t=0.93$	0.361	No



SH4b	<i>Specific Research hypothesis 4b:</i> Is there an interaction between dialogue journals and sex in predicting science achievement while controlling for pretest scores?	$F=.56$	0.46	No
SH4c	<i>Specific Research hypothesis 4c:</i> Does teacher fidelity account for a significant proportion of unique variance in predicting science achievement gains while controlling for pretest scores?	$t=-0.93$	0.361	No
<b>GH5</b>	<b>General Research hypothesis 5:</b> Do students who receive dialogue journals perform significantly better on the linear combination of reading comprehension, science achievement, and metacognitive function than their comparison group counterparts while controlling for pretest scores?	$F=2.66$	0.033	Yes
SH5a	<i>Specific Research hypothesis 5a:</i> Is there an interaction between those receive dialogue journals and sex in predicting gains on the linear combination of reading comprehension, science achievement, and metacognitive function when compared to the comparison group?	$F=1.27$	0.152	No

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## CHAPTER V

### DISCUSSION

The major goal of this study was to investigate the use of dialogue journals in second grade science classrooms, and its relationship to students' reading comprehension, science achievement, and metacognitive awareness. To better consider the results of this study, the current chapter provides a synopsis of the results, an interpretation of the findings, description of the implications and applications, and addresses the limitations of the study. The chapter concludes with suggestions for future research.

#### **Synopsis of Results**

Based on previous studies which indicated poor informational reading and writing skills in the early grades, and identified the need to provide students with more experience with informational text (Christie, 1987; Duke, 2002; Freeman & Pearson, 1992; Lemke, 1994), the current study provided students with metacognitive reading strategies, as well as scaffolding using a dialogue journal treatment to enable students to comprehend their science text, as well as increase their reading comprehension and metacognition. The following section provides a synopsis of the current study's findings.

#### **Overall Effects of Scaffolding using Oral Metacognitive Strategies**

Findings from this study show that implementing oral metacognitive strategies during science instruction will improve students' reading comprehension. After conducting a paired sample *t*-test the hypothesis was found to be significant in where students in both the treatment and comparison groups increased in reading comprehension from FAIR pretest to FAIR mid test, ( $t=-5.59, p < .001$ ). These results suggest that providing students with oral metacognitive reading strategies, specifically

assessing prior knowledge, skimming the text, slowing down and rereading, making mental integrations, and using diagrams will increase their understanding of text.

Due to the possibility of sex differences a regression analysis of covariance was conducted and demonstrated that sex does not account for significant proportion of unique variance in predicting FAIR mid test scores while controlling for FAIR pretest scores.

Therefore, findings demonstrate that it is possible that students can increase their reading comprehension, regardless of their sex, if teachers provide them with oral metacognitive strategies as they receive grade level science instruction.

### **Results of Dialogue Journals on Reading Comprehension**

As the findings of the study demonstrated, implementing oral metacognitive strategies during science instruction will likely improve students' reading comprehension. The researcher investigated whether the significant improvement in reading comprehension continued from FAIR mid test to FAIR posttest in both groups. A paired sample *t*-test was conducted to test this research hypothesis and was found to be significant ( $t=-4.67$ ,  $p < .001$ ). Both groups made significant improvement in their reading comprehension as measured by the FAIR.

More specifically, the researcher then conducted a regression analysis of covariance to investigate if the treatment of dialogue journals (use of written metacognitive strategies) accounted for a significant proportion of unique variance in predicting reading comprehension gains while controlling for the FAIR mid test. This analysis reported that dialogue journals do not account for a unique proportion of unique variance in predicting FAIR posttest scores. Therefore, it can be concluded that it is a

possibility for students to improve their reading comprehension regardless of the method in which they receive the scaffolding of metacognitive strategies.

Due to the possibility of sex differences, a two-way analysis of covariance was conducted to investigate if there is an interaction between the use of dialogue journals and sex in predicting comprehension gain while controlling for FAIR mid test. It was demonstrated that sex does not account for significant proportion of unique variance in predicting FAIR mid test scores while controlling for FAIR pretest scores. It is then reaffirmed that sex is not a factor when implementing these reading strategies to increase reading comprehension.

### **Results of Dialogue Journals on Metacognition**

As all students received oral metacognitive strategies, it was important to analyze if the oral scaffolding of these strategies improved students overall metacognition. Results of a paired *t*-test indicated a significant statistical improvement over time for both treatment and comparison groups when investigating if metacognitive skills improve over time after implementing metacognitive strategies to both groups ( $t=-4.37, p < .001$ ).

For the reason that the current study analyzed the treatment of dialogue journals as a written form of metacognitive scaffolding, the researcher reviewed if the use of dialogue journals accounted for a significant proportion of unique variance in predicting metacognitive gains while controlling for pretest scores. A regression analysis of covariance was conducted and reported that dialogue journals do not account for a unique proportion of unique variance in predicting metacognitive posttest scores. Hence, additionally including the written form of scaffolding metacognitive strategies does not have an effect on predicting student metacognition.

Furthermore, the researcher explored the existence of an interaction between sex and dialogue journals in predicting metacognitive gains by conducting a two way analysis of covariance which revealed there was no statistically significant interaction between the use of dialogue journals and sex in predicting metacognitive function posttest scores. After controlling for sex, the same results were found indicating that sex was not a predictor variable in analyzing metacognitive function.

### **Effects of Dialogue Journals on Science Achievement**

This study also found relevance in analyzing the students' science achievement over time. An investigation was conducted to determine this significance, a paired sample *t*-test was conducted, which was found to be statistically significant ( $t=-3.81, p= 0.001$ ). Therefore, results confirm that all participating students demonstrated improvement in science posttest scores while controlling for science pretest scores.

Further data analysis was conducted to determine the effects of the dialogue journal treatment. Through a regression analysis of covariance, the researcher was able to examine if the use of dialogue journals accounted for a significant proportion of unique variance in predicting science achievement while controlling for pretest scores. The analysis reported no statistical significance. Hence, the dialogue journal treatment does not affect students' science achievement. A two way analysis of covariance was conducted and established that there is no statistically significant interaction between dialogue journals and sex in predicting science achievement while controlling for pretest scores.

Finally, in investigating the teacher effects on student achievement a regression analysis of covariance was conducted, which investigated if teacher fidelity of metacognitive

scaffolding accounted for a significant proportion of unique variance in predicting science achievement gains while controlling for pretest scores. Results indicated that teacher fidelity does not account for a statistically significant proportion of unique variance.

With these results, the use of oral metacognitive strategies will likely improve students' science achievement regardless of sex, and written dialogue journal treatment. In addition, teacher fidelity of treatment is important, but does not prove to be a significant factor when demonstrating gains in science posttest scores when controlling for pretest scores.

### **Overall effect of Dialogue Journal Treatment**

It has been established in disaggregating the data that all students showed improvement in reading comprehension, science achievement, and metacognition regardless of the form of metacognitive scaffolding they received. Therefore, it was of great importance to investigate if those students who received dialogue journal treatment performed significantly better on the linear combination of reading comprehension, science achievement, and metacognitive function, than their comparison group counterparts while controlling for pretest scores. A multivariate analysis of covariance was conducted and results show,  $F=2.66, p = 0.033$ , there is a statistically significant improvement reported for those who received the dialogue journal treatment. Hence, these findings are noteworthy as they confirm that the experimental group, students who received written metacognitive scaffolding through dialogue journals in addition to the oral metacognitive scaffolding, demonstrated larger gains in reading comprehension,

science achievement and metacognition when compared to the comparison group, who received regular science instruction with oral metacognitive scaffolding.

### **Interpretation**

This section presents an interpretation of the findings in relation to several of the topics discussed in the Literature Review. These topics include the effects of teacher scaffolding and student achievement, the use of reading comprehension strategies in expository text, metacognition, and the role of dialogic interaction in science achievement.

### **Effects of Teacher Scaffolding and Student Achievement**

This study was designed to support a rethinking of the method in which teacher scaffolding has been put into practice. Meyer (2003) emphasized the importance of not only scaffolding for cognitive competence, but also for a child's motivational and social competence. Students' interaction with their personal journal increased motivational factors as students were responsible for their own learning. Teacher scaffolding became a resource for students as they were able to build their comprehension with the guidance of the teacher while removing any anxiety, or social apprehension that could potentially inhibit them from responding to the text. When students were first told they would be note-taking in their dialogue journals they initially waited for the teacher to tell them what to write, or copied from the book. As they became accustomed to the teacher scaffolding and writing notes in their journal they began to experiment with more creative representations of the lesson without copying the diagrams in the textbook. Students also became more aware of condensing and writing their notes instead of copying vocabulary or sentences in the textbook. Once they received support and praise

from the teacher they understood that the understanding of text does not come with only one correct structure or answer.

Students showed an increase in enthusiasm as they became more accustomed to the dialogic interaction between themselves and the teacher. When dialogue journals were first introduced, some of the struggling readers were apprehensive in writing notes. They refused to use their journals, and would always refer to their workbook or textbook. With the use of the gradual release of responsibility the teachers gathered students in a small group and guided them through teacher modeling. As the study progressed these students were becoming more independent. Gradually some students were sent back to work independently and to practice the new strategies the teacher had provided for them. After three weeks of small group dialogue journal instruction, these initially apprehensive students were working independently at their seats and were excited to share their drawings and notes with the teachers.

Additionally, the current study supported the ideas and results of Elster's (1994) study, which examined the use of teacher scaffolding with emergent readers. His study gave insight into what allows for the development of proper skills for success in the strategic classroom. The results of the current study, correspondingly lead to the suggestions that readings can be multistrategic. As supported in the current study, students will use a repertoire of reading strategies and apply them appropriately while reading text genres to grasp a better and more in-depth understanding of the text at hand.

### **The Use of Reading Comprehension Strategies in Expository Text**

Early childhood readers are mostly immersed in narrative text during the beginning stages of their reading development. As decoding and fluency are recognized



as one the most important strategies that readers attain early on, comprehension is conversely the most complex and complicated component of reading. The National Reading Panel's (2000, p.15) meta-analysis called for more research on which reading comprehension strategies are most effective for particular age groups to bridge the gap between decoding skills and comprehension. The reading strategies used in the current study were demonstrated to be effective in improving and developing students' reading comprehension, and science achievement. More research was also deemed necessary to determine whether the techniques apply to all types of text genres, including narrative and expository texts and whether the level of difficulty of the texts has an impact on the effectiveness of the strategies. With this in hand, one can confirm that the scaffolded reading strategies: prior knowledge, slow-down, skim, mental integration, and diagrams are a cluster of strategies that can be used to enhance expository comprehension.

This study also responds to Duke's (2000) call for the need to scaffold primary students' understanding of expository text to build comprehension and engagement. Allowing students the opportunity to learn reading strategies alongside their district adopted science textbook provides them with the opportunity to put into practice reading strategies with relevant materials. The use of these materials provides the students with the opportunity to be engaged during instruction, identify with their peers as they are jointly using identical material, and become engaged with their daily learning objectives.

### **Metacognition**

Metacognition is the awareness and knowledge of one's own mental processes such that one can monitor, regulate, and direct them as a desired end (Harris & Hodges, 1995). Findings from this study suggest that the combination of scaffolding using metacognitive

strategies improves students' reading comprehension and science achievement. Although it is possible that students' improved metacognitive awareness was associated with typical maturation, the findings provide support for the importance of cognitive engagement because all participants that received metacognitive scaffolding (oral and dialogue journal) were then able to construct new meaning, and use metacognitive and self-regulatory strategies to make sense of text.

Many researchers (Baker & Brown, 1984; Garner, 1987; Meece, Blumenfeld, & Hoyle, 1988; Pressley, 2000) have found that when instructional context leads to student passivity and disengagement, comprehension suffers. The current study demonstrated that the application of metacognitive strategies scaffolded through the dialogue journals lead to increased comprehension, and as participating teachers expressed, student engagement and a more rich discussion.

The current study was shaped after Duffy et al.'s (1987) study as it included authentic materials, and also conducted research on how to make decisions about when and how to explain the mental processing associated with using reading skills as strategies, using the Scott Foresman Science textbook and workbooks during instruction and as support in dialogue journals interaction. The decision-making on teaching the reading strategies was unique as each student had the opportunity to independently receive support from the teacher. The dialogue journal treatment permitted the researcher to analyze the effect of individual scaffolding on students' reading comprehension. Because of this individual attention students were forced to be engaged in their learning which in turn leads to a

better understanding of strategies to employ before, during, and after reading, and leads to improved comprehension.

Finally, the current study responded to Duffy et al.'s (1987) calls for future instructional research on building an understanding of the subtle complexities which characterize the reciprocal mediation between teachers providing responsive explanations and students' engagement in learning.

### **The Role of Dialogic Interaction in Science Achievement**

One of the advantages of the current study is that it allowed the students in the treatment group the opportunity to rely on the support of the teacher as an aid to comprehend their science text. Findings suggest that the dialogue journal treatment enabled students to apply the reading strategies to support their understanding of the lessons, and in turn achieve greater comprehension as the teacher was interacting with them alongside their text to provide support. Wilkinson and Son (2011) supported future research in dialogic approaches to investigate the impact dialogic teaching has on comprehension, as well as to show that discussions about text or instruction related to intertextuality can help foster the habits of mind to enhance comprehension of texts when students read independently. With the constant reinforcement that students received, they were able to build on their metacognition as they were always guided and scaffolded by the teacher. On a daily basis the students were made to think of strategies they had been employing, and to judge if they were leading to successful comprehension.

## **Applications and Implications**

The results of this study are highly important for early childhood educational practice as it represents a form of dialogic interaction that holds promise for use in early childhood classrooms. This dialogic interaction was based on the scaffolding of reading strategies to promote metacognitive awareness and in turn improve expository reading comprehension. This would imply that using dialogue journals as a tool for communication and scaffolding is beneficial for children to develop reading strategies that will build on their metacognition. Although it may have an effect on some students more than others, it is implied that the exposure and practice with reading strategies may help students develop their metacognitive awareness, that will result in improved reading comprehension.

Teachers were pleased to see the constant growth that all students demonstrated while participating in dialogue journal treatment; they also became aware that the change in teacher-student dynamic led to a more balanced form of communication in the classroom during oral discussions. Although, this was not the initial reaction teachers displayed at the commencement of the treatment intervention, it is of importance to note that participating teachers were open and encouraged by their own experiences to moving towards a more dialogic interaction in addition to the text-based form of instruction.

In transitioning and introducing the dialogue journals, the participating experimental teachers seemed overwhelmed with the gradual release of responsibility that had to be given to the students in order for them to complete the journals. As the students had more practice with independent writing, the participating teachers mentioned how it was interesting to take note on the learning styles of students. Some students gravitated

to first drawing illustrations of what they had comprehended, and then writing notes based on their diagrams. Other students made lists or webs to cluster the information. This representation of dialogic interaction in an early childhood classroom enabled teachers to not only visualize students' independent thinking, but make personal decisions on the scaffolding that was needed for varying educational needs.

Most importantly, the findings of this study imply that a dialogic approach to scaffolding reading strategies is beneficial and imperative as new research (Wilkinson & Son, 2011) has described, a new wave of comprehension instruction emphasizing dialogic approaches to comprehension instruction that include: content-rich instruction, discussion, argumentation, and intertextuality. Findings from this study suggest important implications for reading education and encourage the use of dialogue journals, as they provide the teacher with the opportunity to engage students in their personal learning style as well as use their schemata to build better comprehension. While more research is still needed in this area, using dialogue journals to promote understanding of the reading strategies guided by Schraw's (1998) Strategy Evaluation Matrix may lead to better reading comprehension in other subject areas. These results may also imply that students who receive instruction using dialogic interactions will benefit in communication and dialogic skills throughout the school years.

### **Limitations**

This study was conducted at MPS, a single suburban public school in Southeastern United States, causing student and teacher attrition to become a limitation of the study. Prior to the school year beginning one of the second grade teachers was moved to a first grade classroom, leaving only three second grade teachers assigned for the 2012-2013

school year. When evenly distributing students, one classroom was over the state class size limit, which caused a need to restructure to a co-teaching model. Additionally, two out of the four second grade teachers retired during the school year. While it would have been ideal for there to be consistency throughout the study, this was out of the researcher's control. The researcher trained the two new participating teachers after the winter recess in January. The replacement teachers received the metacognitive handbook, as well as training on the oral metacognitive scaffolding strategies. Although this study was monitored carefully, the aforementioned changes in classroom structure may have had an effect on the results of the study.

Another limitation of this study is that the sample size was small, with only 22 students in the comparison group and 17 students in the treatment group, small samples always make generalizing tentative without replication.

### **Future Research**

There are several ways in which future research can better investigate some of the areas examined in the present study. First, future research can be conducted to repeat the study in several schools to attain a higher sample size. Replication with more students across more schools will improve the generalizability of the current study's results. Implementing the dialogue journal treatment to several schools will not only allow for more participants, but will also serve as a better analysis of the importance of teacher effects. Another recommendation for future study would be to follow the participants as a cohort to different grade levels. Designing a longitudinal study will allow the researcher to investigate if students will retain the use of metacognitive reading strategies for a prolonged time, as well as determine the effects of continuous scaffolding.

Given that there is little research on dialogue journals used as a written note taking tool in early childhood education this study can be a catalyst to future research on dialogic interactions in early childhood classrooms. Students are exposed at an early age to the importance of note-taking and are provided with the necessary skills to apply this new study strategy. It is possible that this type of individualized instruction and intervention may result in improved comprehension skills of young students because of the opportunities that arise for discussion, scaffolding and differentiated instruction. Another consideration for future research is to examine the effects of a dialogue journal treatment in a third, fourth or fifth grade classroom to determine if this type of instruction is more effective in a grade level where students have had more experience and understanding of the concept of informational textbooks.

Finally, with the current change in educational practice providing for the implementation of common core standards and assessment, it is essential for future research to explore the impact of scaffolding metacognitive strategies in conjunction with the common core reading strategies that have been recognized as highly effective. In addition, the common core implementation of writing throughout the curriculum is of high importance to explore in conjunction with dialogic interaction.

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Appendix A



*Summary of teacher demographics*

<b>Participating Teacher</b>	<b>Years of Experience</b>	<b>Highest Degree</b>	<b>Rating on personal view of effectiveness as elementary teacher</b>	<b>Subject Area of Preference</b>	<b>Major Portion of Science Instruction is spent</b>	<b>Rating on personal view of effectiveness as elementary science teacher</b>
<b>Comparison 1</b>	32	BA/BS	Above Average	Reading/ Language Arts Mathematics	More textbook-based presentation than anything else	Average-A typical teacher of elementary science
<b>Comparison 2</b>	40	MS/MA	Superior	Reading/ Language Arts Mathematics	An equal amount of text-book based presentation and activity-based instruction	Above Average
<b>Treatment 1</b>	12	BS/BA	Above Average	Reading/Language Arts	An equal amount of text-book based presentation and activity-based instruction	Above Average
<b>Treatment 2</b>	26	MS/MA	Above Average	Science/Social Studies	More activity-based instruction than text-book based presentation	Average-A typical teacher of elementary science
<b>Winter Comparison 1</b>	23	Specialist	Above Average	Mathematics	An equal amount of text-book based presentation and activity-based instruction	Average-A typical teacher of elementary science
<b>Winter Comparison 2</b>	24	Specialist	Above Average	Mathematics	More activity-based instruction than text-book based presentation	Above Average



## Appendix B

Rubric consisting of five metacognitive strategies deemed necessary for effective dialogue journal scaffolding

<b>Dialogue Journal Metacognitive Scaffolding Rubric</b>				
<b>Directions:</b> For each of the following criteria, mark to demonstrate evidence of the following metacognitive strategies evident in student's journals. Circle the appropriate evaluation to assess the use of metacognitive strategies and scaffolding during dialogue journal instruction.				
<b>Activate prior knowledge strategy</b>	<b>Excellent-4</b> Teacher asks student to associate what is already known from life experiences, previous lessons, and vocabulary.	<b>Satisfactory-3</b> Teacher refers student to associate what is already known from previous lessons.	<b>Fair-2</b> Teacher prompts student to relate to life experiences.	<b>Seldom-1</b> Teacher rarely prompts student to relate to previous life experiences.
<b>Skim strategy</b>	<b>Excellent-4</b> Teacher prompts student to search for headings, and highlighted words and uses them during written conversation and clarification.	<b>Satisfactory-3</b> Teacher prompts student to search for headings, and highlighted words with minimal clarification.	<b>Fair-2</b> Teacher prompts student to search for headings, and highlighted words.	<b>Seldom-1</b> Teacher rarely prompts student to search for headings, and highlighted words.
<b>Slow down Strategy</b>	<b>Excellent-4</b> Teacher reminds student to reread information and continues written conversation until topic is understood.	<b>Satisfactory-3</b> Teacher reminds student to reread information and provides minimal written conversation about the topic.	<b>Fair-2</b> Teacher reminds student to reread information.	<b>Seldom-1</b> Teacher rarely reminds student to reread information
<b>Mental integration strategy</b>	<b>Excellent-4</b> Teacher gives student themes to relate main ideas, or conclusions. Uses written conversation to prompt new questions and clarify.	<b>Satisfactory-3</b> Teacher gives student themes to relate main ideas, or conclusions with minimal written conversation.	<b>Fair-2</b> Teacher gives student themes to relate main ideas, or conclusions.	<b>Seldom-1</b> Teacher rarely gives student themes to relate main ideas or conclusions.
<b>Diagrams strategy</b>	<b>Excellent-4</b> Teacher guides student to find supporting details from pictures, captions, and graphs. Uses captions to generate written conversations and higher order thinking.	<b>Satisfactory-3</b> Teacher guides student to find supporting details from pictures, captions, and graphs with minimal written conversation.	<b>Fair-2</b> Teacher guides student to find supporting details.	<b>Seldom-1</b> Teacher rarely guides student to find supporting details.
<b>Total percentage of evidence in use of strategy:</b>				

Adapted from: Knowledge of cognition: Strategy evaluation matrix (SEM) (Schraw, 1998, p. 120)

Rubric consisting of five metacognitive strategies deemed necessary for effective teacher metacognitive scaffolding

<b>Oral Metacognitive Scaffolding Rubric</b>				
<b>Directions:</b> For each of the following criteria, mark to demonstrate evidence of the following metacognitive strategies evident in teacher-student oral discussion. Circle the appropriate evaluation to assess the use of metacognitive strategies and scaffolding during science instruction.				
<b>Activate prior knowledge strategy</b>	<b>Excellent-4</b> Teacher asks student to think-aloud about what is already known from life experiences, previous lessons, and vocabulary.	<b>Satisfactory-3</b> Teacher refers student to think-aloud about what is already known from previous lessons.	<b>Fair-2</b> Teacher prompts student to relate to life experiences.	<b>Seldom-1</b> Teacher rarely prompts student to relate to previous life experiences.
<b>Skim strategy</b>	<b>Excellent-4</b> Teacher prompts student to search for headings, and highlighted words and uses them during conversation and clarification.	<b>Satisfactory-3</b> Teacher prompts student to search for headings, and highlighted words with minimal clarification.	<b>Fair-2</b> Teacher prompts student to search for headings, and highlighted words.	<b>Seldom-1</b> Teacher rarely prompts student to search for headings, and highlighted words.
<b>Slow down Strategy</b>	<b>Excellent-4</b> Teacher reminds student to reread information and continues conversation until topic is understood.	<b>Satisfactory-3</b> Teacher reminds student to reread information and provides minimal conversation about the topic.	<b>Fair-2</b> Teacher reminds student to reread information.	<b>Seldom-1</b> Teacher rarely reminds student to reread information
<b>Mental integration strategy</b>	<b>Excellent-4</b> Teacher gives student themes to relate main ideas, or conclusions. Uses conversation to prompt new questions and clarify.	<b>Satisfactory-3</b> Teacher gives student themes to relate main ideas, or conclusions with minimal conversation.	<b>Fair-2</b> Teacher gives student themes to relate main ideas, or conclusions.	<b>Seldom-1</b> Teacher rarely gives student themes to relate main ideas or conclusions.
<b>Diagrams strategy</b>	<b>Excellent-4</b> Teacher guides student to find supporting details from pictures, captions, and graphs. Uses captions to generate conversations and higher order thinking.	<b>Satisfactory-3</b> Teacher guides student to find supporting details from pictures, captions, and graphs with minimal conversation.	<b>Fair-2</b> Teacher guides student to find supporting details.	<b>Seldom-1</b> Teacher rarely guides student to find supporting details.
<b>Total percentage of evidence in use of strategy:</b>				

Adapted from: Knowledge of cognition: Strategy evaluation matrix (SEM) (Schraw, 1998, p. 120)



## Appendix C

*Outline of procedures including timeframes of science instructional phases and assessment periods*

Phase	Duration (weeks)	Science Instruction	Assessment
1	17	All Participants (N=39) Miami Dade Common Core Instruction using Scott Foresman textbook and workbook  Introduction of oral metacognitive strategies	FAIR Broad Diagnostic Inventory  Metacomprehension Strategy Index (Schmitt, 1990)  Mean score of Scott Foresman end of chapter exams  Metacognitive Scaffolding Rubric (oral)
2	19	Comparison Group (n=22): Miami Dade Common Core Instruction using Scott Foresman textbook and workbook  Oral Metacognitive strategies	FAIR Broad Diagnostic Inventory  Mean score of Scott Foresman end of chapter exams  Metacognitive Scaffolding rubric (oral)
-----			
		Experimental Group (n=17): Miami Dade Common Core Instruction using Scott Foresman textbook and workbook  Oral Metacognitive strategies  Introduction of dialogue journals	FAIR Broad Diagnostic Inventory  Mean score of Scott Foresman end of chapter exams  Metacognitive Scaffolding rubric (oral and written)
3	2	All Participants (N=39) Miami Dade Common Core Instruction using Scott Foresman textbook and workbook	FAIR Broad Diagnostic Inventory  Metacomprehension Strategy Index (Schmitt, 1990)





Appendix D

*Summary of metacognitive workshop topics*

<b>Summer 2012 Metacognition Workshop</b> <ul style="list-style-type: none"><li>▪ <b>Demographic Survey completed by each participating teacher</b></li></ul>	
<b>Comparison teachers (n=2):</b> <ul style="list-style-type: none"><li>▪ Researcher made metacognitive scaffolding handbook following Schraw's (1998) Strategy Evaluation Matrix</li><li>▪ Metacognitive scaffolding rubric</li></ul>	<b>Experimental teachers (n=2):</b> <ul style="list-style-type: none"><li>▪ Researcher made metacognitive scaffolding handbook following Schraw's (1998) Strategy Evaluation Matrix</li><li>▪ Metacognitive Scaffolding Rubric</li></ul> <b>Additional day</b> <ul style="list-style-type: none"><li>▪ Gradual Release of Responsibility model (Pearson and Gallagher, 1993)<ul style="list-style-type: none"><li>▪ Researcher-led guided practice</li></ul></li></ul>

<b>Winter 2012 Metacognition Workshop</b> <ul style="list-style-type: none"><li>▪ <b>Demographic Survey completed by each participating teacher</b></li></ul>	
<b>Comparison teachers (n=2):</b> <ul style="list-style-type: none"><li>▪ Researcher made metacognitive scaffolding handbook following Schraw's (1998) Strategy Evaluation Matrix</li><li>▪ Metacognitive scaffolding rubric</li></ul>	

## VITA

### ILIANA FRANCO-CASTILLO

Born, Miami, Florida

- |               |   |
|---------------|---|
| 2003          | B.A., Special Education<br>Florida International University<br>Miami, Florida                               |
| 2003-2004     | ESE Teacher<br>Royal Green Elementary<br>Miami, Florida   |
| 2004          | Rookie Teacher of the Year<br>Royal Green Elementary<br>Miami, Florida                                      |
| 2004- Present | Kindergarten Teacher<br>Royal Green Elementary<br>Miami, Florida  |
| 2006          | M.S., Reading Education (K-12)<br>Florida International University<br>Miami, Florida                        |
| 2010          | Teacher of the Year<br>Royal Green Elementary<br>Miami, Florida   |
| 2011          | Ed. S., Curriculum and Instruction, Reading Education<br>Florida International University<br>Miami, Florida |
| 2013          | Doctoral Candidate, Teaching and Learning<br>Florida International University<br>Miami, Florida             |